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AUTH.NAME AUTHOR AFFILIATION
SORENSEN,G.C. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Responds to Insp Rept 50-397/91-27 & delineates program & schedule for resolving issues identified in rept,per 910828 & 29 meetings w/NRC.Program developed to create new EOPs & plant-specific technical guidelines will be reviewed.

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November 21, 1991
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Docket No. 50-397

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: NUCLEAR PLANT NO. 2, OPERATING LICENSE NPF-21
NRC INSPECTION OF WNP-2 EMERGENCY OPERATING PROCEDURES
(NRC INSPECTION REPORT NO. 91-27)

This letter provides the Supply System's response to NRC Inspection Report 50-397/91-27 covering our Emergency Operating Procedure technical development.

This letter also satisfies the commitment to delineate our program and a schedule for resolving the issues discussed in the report, as well as verbally outlined in our August 28 and 29, 1991 meetings at Rockville, Maryland with WT Russell, Associate Director for Inspection & Technical Assessment and others.

Our response is separated into three broad areas of discussion to provide information on the Technical Adequacy of our EOPs, resolution of the Human Factors Concerns, and a description of our Phase II EOP Upgrade Program.

As clarified through subsequent discussion with NRC Regional management, we have limited our response consistent with our commitment to provide the program description in this letter and not the additional technical justification for the remaining deviations as requested in the report summary. We have, however, restated our technical positions in summary fashion for those issues discussed in the subject Inspection Report which we believe were not accurately represented based upon our understanding of the agreements reached in our August meeting. These are included in Appendix 1.

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Technical Adequacy of the EOPs

The NRC inspection effort to date has identified four programmatic concerns with our EOP development process. These four concerns include:

- Failure to identify or adequately justify deviations from selected BWROG EPG provisions.
- Inappropriate application of licensing basis design analysis to justify certain deviations.
- Inadequate safety significance analysis of the removal of certain accident mitigation strategies found in our EOPs.
- Inconsistencies in certain Plant Specific Technical Guideline specifications and EOP implementing flowcharts.

With respect to the adequacy of our identification and quality of justification documentation, we will conduct a thorough review of our Plant Specific Technical Guidelines (PSTG) in comparison with the BWROG Emergency Procedure Guidelines (EPG) and the associated Appendix B EPG bases document. We have also retained the services of a highly qualified consultant who was the principle author of the EPG Appendix B document to assist in this review. This consultant will work with us to ensure we identify all PSTG/EPG deviations using a standard of comparison consistent with our BWR industry survey.

After the comparison review, a Technical Document will be produced which identifies and fully justifies each deviation. Justifications will be consistent with standards based on the industry comparison survey and on agreements reached with the NRC at the August meeting. In general, those agreements recognized some elements of an acceptable basis as:

- A qualitative discussion or comparison of the benefits of implementing certain EPG strategies versus the complexity of implementation for our design that adversely affects safety due to inappropriate diversion of operator attention.
- A quantitative analysis of the impact of delaying certain actions within the mitigation strategy while confirmation of design bases responses is obtained.
- The provision that certain mitigation decisions be reserved for senior operations management manning emergency positions rather than burdening operating crews with difficult to implement actions. The decision to use these pre-planned and staged procedures will include consideration of this approach as a viable departure from the EPGs.

Finally, a complete verification process will be applied to the Technical Document to confirm alignment with the EPGs and assure completeness of the justification documentation.

Concerning the appropriateness and consistency of our application of licensing basis design analysis, we will reevaluate the specific cases where we have utilized license basis arguments to ensure we do not adversely affect the mitigation benefits of the EPG strategy and that we consistently apply licensing basis compliance logic in the formulation of our deviations. This implies that some of our existing positions, though based upon technically sound evaluation, may be changed. The Technical Document will contain sufficient information to adequately justify remaining deviations, again consistent with the bases standards previously discussed. Appendix 1 contains a synopsis of our current major deviations in summary format and outlines resolution approaches for those positions in this category.

In the area of adequacy of safety significance analyses supporting removal of certain accident mitigation strategies, we will reevaluate our present positions in light of the bases standards established at the August meeting. For those deviations lacking sufficient technical bases, we will revise our EOPs to eliminate the deviation and implement the EPG strategies. For those deviations remaining following the screening, we will augment the information presented earlier in support of the August meetings and include it in the Technical Document. Again, refer to the Appendix 1 discussion on each deviation to ascertain which deviations will remain, which will be modified and which will be reevaluated.

In the area of inconsistencies between the PSTG and EOPs, we believe these existed principally because our verification and validation process was not completed on the document revisions examined in July by the inspection team. We had identified needed changes in the PSTG which encompassed the inconsistencies identified. The PSTG document was under verification in parallel with the EOP generation and not all modifications were incorporated at the time of the inspection. We do believe that parallel development and finalization of the PSTG with the EOPs was a weakness in our Phase I EOP Upgrade Program. In our Phase II effort, our goal will be to finalize the Technical Document (the PSTG replacement) (which will be verified against EPGs and Engineering positions) before EOP revision begins. In part, this contributes to the length of the Phase II efforts. Review of the Technical Document is a specific element in the scope of work specified for the consultant we have retained. Our intent is to eliminate differences or inconsistencies between the Technical Document and the EOPs. Although we don't believe the data supports a conclusion that our verification and validation (V&V) process was flawed in its execution and quality, we intend to strengthen the V&V effort nonetheless. The later discussion on the Phase II program and schedule amplifies our V&V improvement efforts.

Human Factors Concerns

The Inspection Report also identified that, although our EOPs generally incorporated appropriate human factors principles, certain human factors concerns remain. These concerns include:

- Inconsistent and excessive use of transitions between EOP logic.
- Embedded logic/decision steps.
- Lack of EOP development criteria on the use of color coding and override decision steps.
- Lack of guidance on placekeeping in management of response actions on the flow charts and the intent of contingency statements.

During the course of the July inspection we indicated that we would evaluate the specifics of these human factors concerns and address necessary changes to the EOPs and controlling procedures as necessary. In general, we intend to restructure the EOP presentation on the flowcharts to provide clearer override and contingency action logic. In addition, this change in logic presentation will strive to reduce the transitions required around the totality of the EOP flowcharts. The services of a professional human factors expert will be retained to formulate this restructuring. One product from the consultant's support will be a revised EOP Writer's Guide that will provide the necessary policy guidance to address color coding transitions, override decision steps, placekeeping, etc. Our procedure verification efforts will ensure consistent application of the guidance in our revised EOPs.

We have developed a program to create new Emergency Operating Procedures. The associated procedure generation package addresses each of these four programmatic areas of concern, as well as the human factors issues discussed in the subject Inspection Report.

Phase II EOP Upgrade Program

The Phase II EOP Upgrade Program has a number of elements including:

- Plant Specific Technical Guidelines (PSTG) document review.
- BWR Owner's Group Emergency Procedure Guideline (EPG) Appendix C WNP-2 Design Bases calculation review.
- EOP flowchart restructuring/Emergency Support Procedure (ESP) Review and Revision.
- EOP Verification, Validation and Maintenance Program Review and Revision.
- EOP Writer's Guide Review and Revision.

- EOP/ESP Verification and Validation.
- EOP Technical Document development.
- EOP Training Manual development.
- Human Factors review of the EOP/ESP revisions.

Each of these program elements requires further amplification as to their objectives and inter-relationships to fully understand how the upgrade program will address the programmatic issues discussed earlier.

The PSTG document review will compare our current revision with the BWR Owner's Group EPGs and its bases document (Appendix B) to identify any deviations. These deviations will be reviewed for appropriateness and justification developed for those deviations considered as valid. The EOP Technical Document will document the justification for the deviations.

The EPG Appendix C design bases calculation review will perform selected confirmation calculations using WNP-2 design inputs to verify our EOP support database generation process. It will also verify that we have properly translated the design limitations into the EOPs/ESPs.

The EOP flowchart restructuring will implement a significant simplification of the logic override structure in our current EOPs. Using human factors principles the number of transitions, the embedded logic in tables, the reverse logic in certain decision points, and the re-entry points in the logic when conditions change will be reviewed and revised to make implementation more straight forward. A significant review of the changes will be conducted using the operating crews who are tasked with implementing the EOPs. This will both familiarize the crews with the new EOP lay-out as well as provide them an opportunity to have input into the resolution of known difficult areas in the EOPs. This operator involvement process is critical to the success of our Phase II efforts. It prepares the crews for change such that formal training will be more effective and it achieves buy-in on issue resolution.

The EOP V&V maintenance program development will establish appropriate polices and improve administrative controls that govern the EOP verification and validation process as well as the revision of the EOPs. Such policies will define requirements for the operator involvement process, status and tracking of EOP related issues, determination that EOP revisions are required, the extent of EOP reverification and re-validation upon revision, as well as the involvement of a multi-disciplinary team approach to EOP revisions.

The EOP Writer's Guide review effort will establish policies with respect to EOP format/logic control and EOP reproduction. In addition, it will establish development criteria for the use of human factors techniques such as color-coding, override logic, placekeeping and contingency statements. The product of this review effort will be a revised plant procedure.

The EOP/ESP verification activity will perform a detailed, multi-disciplinary review of the alignment between the BWROG EPGs, the EOP Technical Document and the EOPs/ESPs to ensure all deviations are identified and adequately justified as defined by our criteria developed through peer review of other utilities. The validation effort will exercise as much of the EOPs/ESPs as practical on the simulator to ensure that the strategies/actions are appropriate. For those portions of the flowcharts that cannot be validated with the simulator, table top reviews with operator crews will be used. Our previous Phase I validation efforts covered roughly 95% of the flowcharts in the simulator with 5% being addressed with table top walk throughs. We expect a similar level of validation in Phase II.

The EOP Technical Document development effort will combine the PSTG and the deviation document into a single, controlled document that is the single source of information for the development of our EOPs. Its general format will include the BWROG EPG step, the WNP-2 EOP corresponding step, the plant specific guidance concerning that step, a discussion of any deviation between the two steps with the justification and bases included as appropriate.

The EOP training document will contain information on each EOP step that amplifies operator understanding, the bases for the strategy the step implements, any WNP-2 unique requirements not addressed by the EPGs, any special WNP-2 operating policies or restrictions applicable to the EOP step and any "skill of the operator" assumptions implicit in our operator training which we rely upon for consistent implementation. In addition the training document will describe operator knowledge requirements for logic layout, use of symbols and terminology.

The human factors review will focus on the principle products like the EOP flowcharts, ESPs, the Writer's Guide and Maintenance Program manual to ensure consistent definition and application of the principles are provided in the upgrade effort.

The schedule for this upgrade effort is displayed in Appendix 3. We began the effort the first week in November, 1991 and anticipate having completed EOPs by the end of June 1992. This overall schedule is driven by our desire to have three full requalification training cycles on the new EOPs for each crew prior to their annual requalification exams which are scheduled in November 1992. The complexity of the technical reviews and the degree of multi-discipline involvement require serial activity to ensure the quality of the EOPs remains as high as our expectations. This is a lesson learned from our Phase I efforts, as change control given the intra-dependency of the documents was difficult to manage. As a result, we will spend the first half of 1992 completing our new EOPs and the balance of 1992 training both our existing operators and hot license operator candidates.

In our response we have outlined a significant program to address both the programmatic, as well as the specific concerns with our Emergency Operating Procedures. We recognize the need to significantly improve the quality of our deviation justification documentation. Our Technical Document will contain sufficient information on those deviations which we elect to maintain in accordance with the standards we now fully appreciate. We have included a discussion of certain technical issues to ensure the record represented in the Inspection Report is balanced with our perspectives. We very much want to move on with our efforts to improve our EOPs and have modified several positions. We remain committed to further interaction to support closure of the Inspection Report's open item. We trust the Region's open item closure process can judiciously assess the adequacy of our revised EOPs.

With regard to the NRC observation regarding feedback to on-shift crews, the EOP training program was rapidly evolving at the time of the inspection. Changes which could have significantly affected expected performance of the on-shift crews were rapidly and effectively communicated to them. Otherwise management deliberately targeted the in-training crews for communication and understanding of the new requirements. Any misconceptions or apprehensions on the part of the on-shift crews as a result of less than full cognizance of new expectations were resolved when they began their training cycle.

The Supply System concurs with your assessment that the current Operator Training Program is satisfactory. We believe the program has been significantly strengthened in the past few months and intend to continue to emphasize the practices which led to our success.

Very truly yours,

G. C. Sorensen, Manager
Regulatory Programs

MPR/bk
Attachments

cc: JB Martin - NRC RV
NS Reynolds - Winston & Strawn
PL Eng - NRC
DL Williams - BPA/399
NRC Site Inspector - 901A

APPENDIX 1

INTRODUCTION

The Inspection Report identified significant concerns regarding the WNP-2 Emergency Operating Procedures. Specifically, five significant deviations were addressed in the body of the report and Attachment A of the Inspection Report identified 12 other specific concerns regarding the adequacy of our deviation justifications. Attachment B identified seven differences between the EOPs and the PSTG. Attachment C also lists NRC concerns with a number of our deviation justifications (many of which are also covered in either the set of five or the set of twelve discussions).

This Appendix responds to these specific concerns and provides clarification for those deviations which we believe are either improperly characterized or will be revised in our Phase II efforts. For those deviations that will remain, our Technical Document will contain improved technical bases consistent with the standards discussed earlier. As noted by the NRC Inspection Report, the NRC inspection team's review was conducted using draft copies rather than final implemented documentation for the WNP-2 EOP Phase I. This contributed to some misunderstanding or inaccurate representation of our EOP configuration or justifications.

This Appendix provides a summary overview of the WNP-2 approach to documenting and justifying its deviations to the Generic BWROG Emergency Procedure Guidelines as well as a detailed discussion and response to the issues raised in the EOP Inspection Report. The discussion and response portion of this Appendix has two parts. Part A deals with the five significant deviations identified in the body of the Inspection Report and Part B provides a summary of all the significant WNP-2 deviations. Part B is cross-referenced to the issues identified in Attachment A and C of the Inspection Report and is intended to respond to those issues. Issues raised in Attachment B will be resolved as part of the Phase II Validation and Verification effort. Four issues noted in the Inspection Report Attachment A are not specifically cross-referenced in Part B. Issues 8 and 11 were withdrawn prior to Phase I implementation. Issues 9 and 10 will be reassessed for deviation status during Phase II.

Included in Part B is a summary of the discussion that took place during the August 28, 1991 meeting with the Staff, a copy of the technical basis documentation presented to the Staff on the WNP-2 deviations and the actions the Supply System intends to implement as a result of those meeting discussions.

OVERVIEW

At the August 28, 1991 meeting with the NRC Staff, the Supply System presented to the Staff all the significant deviations which have been taken at WNP-2. Participants at that discussion are listed in Appendix 2. At the conclusion of the first portion of this meeting, the Staff indicated that the material they saw was much better than that presented about two weeks previously, or even more recently than that. They stated it looked like the Supply System was on the right track and that they would rely on the Supply System's best judgement for issues still before the BWROG. The Staff further stated that the deviations should have broad management buy-in at the Supply System.

The Supply System acknowledges that the original documentation provided for Staff review was inadequate from both clarity of our position as well as depth of the justification. Following our discussions with the Staff, we believe we have a better understanding of the depth and type of justifications required.

As part of our EOP Phase II upgrade effort, WNP-2 will provide enhanced discussion in the technical basis section of our deviation documentation. Specifically, as discussed with the Staff, we intend to include as part of this upgrade the following:

1) Additional pro and con discussions on the impact of the deviation on the overall EPG strategy. Included in this discussion will be both qualitative and quantitative evaluations.

2) To ensure all aspects of the EPG strategy are available for event mitigation, the Supply System will review those deviations which remove mitigation options and consider alternate methods for their implementation, including execution of the strategy via direction from the Technical Support Center (TSC).

PART A - FIVE SIGNIFICANT DEVIATIONS IDENTIFIED IN THE EOP INSPECTION REPORT

1) Prevention of RPV Cooldown with Potential Recriticality

This deviation was revised and removed from the documentation during final verification of Phase I EOP development at WNP-2. The Inspection Report comment is based on the draft deviation document, not the final implemented procedures.

2) Delayed Entry into Power/Level Control if Two Standby Liquid Control (SLC) Pumps are Running

The deviation document added a new step to EPG Step C5-2 (level/power control) to require "Less than two SLC pumps are injecting into the RPV or reactor power is not decreasing" before RPV water level will be lowered to decrease reactor power during an anticipated transient without scram (ATWS). The NRC Inspection Report states "the effect of this deviation was to prevent the operator from lowering RPV water level during an ATWS to reduce reactor power when other actions have not been effective, providing two SLC pumps were running". We have responded to the NRC concern on this deviation on several occasions. The addition of this EOP step delays the lowering of RPV level only if two SLC pumps are injecting and power is decreasing. The Inspection Report incorrectly reflects the EOP logic. Any other condition (i.e., power not decreasing or at least one SLC pump not injecting) results in lowering of RPV level as the EPG strategy specifies.

At the August 28 meeting, the NRC expressed concern that the WNP-2 analysis did not address the instability issue and thus recommended WNP-2 reevaluate their position to delay lowering RPV level in an ATWS. The Supply System responded that an instability situation would satisfy the "reactor power level is not decreasing" criterion and the proper action would be taken. The NRC asked why we continued to maintain this deviation. The Supply System responded that because we do not have throttleable valves for ECCS injection flow, lowering level requires the termination of ECCS injection. The operator must hold pump control switches in the stop position to obtain rapid RPV level lowering until jumpers can be placed on the ECCS injection valves. The NRC appeared to be unaware of the impact (i.e., complete termination of ECCS flow and operator diversion) to implement this EPG strategy. Due to NRC concern on this issue and the lack of WNP-2 resources to provide further analyses sufficient for NRC acceptance, the Supply System will withdraw this deviation as part of the EOP Phase II upgrade.

3) <u>Deletion of High Pressure Core Spray (HPCS) Net Positive Suction Head (NPSH) Limits</u>

The deviation document deleted EPG Caution No. 5 concerning HPCS NPSH limits. The NRC stated that WNP-2 deleted this caution because 1) the criteria were only applicable to EPG step RC/L-2, 2) HPCS operation irrespective of NPSH limits was not yet authorized, 3) suppression pool heatup or suppression pool level reduction would not threaten HPCS NPSH and 4) caution is unnecessary because the HPCS system was designed to prevent cavitation due to pump runout. NPSH is not a concern for any WNP-2 ECCS pump.

At WNP-2, extensive calculations and preoperational testing have shown that the HPCS pump has adequate NPSH over the entire range of possible wetwell water temperatures while at Technical Specification minimum suppression pool levels for any pump flow. Additionally, the NPSH available at Technical Specification minimum water level is adequate for each of the ECCS pumps at any temperature/pressure condition and pump flow. The drawdown of suppression pool water levels (that could induce air-entrainment vortexing concerns) will reduce the available NPSH for the pumps. However, adequate NPSH remains available down to the vortex limits established using the BWROG EPG Appendix C methodology. There are no temperature/pressure conditions in the wetwell that would limit pump operation because of NPSH concerns before the vortex limits are reached. Therefore, an NPSH curve is not necessary for any ECCS pump. This deviation allowed removal of the HPCS NPSH limit curve from the WNP-2 EOPs providing significant human factors improvement through simplification and removal of unnecessary information on the EOP charts.

The Supply System believes the characterization of poor quality justification documentation cited in the Inspection Report for this issue (Attachment C, Design Deviation #1) is not accurate. At the time of the onsite inspection, the NPSH limit curves were in the process of being removed from the EOP charts as part of our Phase I upgrade. The examples cited and criticism leveled are aimed at documentation that had not yet been updated. This explanation, as well as the bases for the removal of the NPSH curves, was provided to the onsite inspector during his review as well as to the NRC Staff during the August 28, 1991 meeting.

4) <u>Deletion of Low Pressure Core Spray (LPCS) and Low Pressure Core Injection (LPCI) NPSH Limits</u>

The WNP-2 deviation document deleted the reference to the LPCI and LPCS NPSH limits and curves. The NRC concluded this deviation was significant because it was not identified as a deviation in the draft deviation document. As identified in item 3 above, the basis for deleting the NPSH limits and curves was evaluated and properly implemented in the WNP-2 EOPs. The criticism of an unidentified deviation is not accurate because the onsite inspection team was reviewing preliminary documentation which was still undergoing update as part of the WNP-2 EOP Phase I upgrade.

5) <u>Incomplete Implementing Procedures for EPGs</u>

The inspection team noted that the licensee had not developed all the implementing procedures for the EPGs, especially those actions that are to be accomplished outside the control room. At WNP-2 such actions are specified through the use of emergency support procedures. The emergency support procedures (ESPs) were all previously developed and implemented in earlier revisions of the WNP-2 EOPs. All of these ESPs were being revised as a result of significant changes in the PSTGs during the inspection period. Consequently, we elected to not provide ESPs to the inspection team that were not yet validated and verified.

The Inspection Report concern that ESPs were not available for operator training is not a complete representation of our Phase I efforts. The Supply System simply did not run scenarios that exercised a path of the EOPs where these preliminary ESP would impact operator actions until the ESPs were verified and validated. WNP-2 operators were properly trained in all ESPs and no training was performed on any EOP steps until the associated ESPs were verified and validated.

PART B - DISCUSSION OF WNP-2 DEVIATIONS

I. DESIGN DEVIATIONS

A. DESIGN DEVIATION #1 (NRC Inspection Report, Attachment C)

A.1 Description of Deviation

Separate pump NPSH limits to prevent pump damage are not applied at WNP-2. The NPSH required (NPSHR) for the WNP-2 ECCS (including RCIC) pumps is always less than the NPSH available (NPSHA) for these pumps at any pump flow or wetwell temperature condition when suppression pool level is at or above the vortex limits of the respective pump. Consequently, vortex limits bound the NPSH limits and would always be invoked before NPSH becomes limiting.

BWROG EPG Steps: Caution #5, RC/L-2 and C5-3

WNP-2 PSTG Step: None

A.2 August 28, NRC Meeting Response

The NRC indicated that the WNP-2 stance appears justified. The NRC asked if any credit was taken for containment pressure in determining the NPSHA. The response was "no". It was then asked if the containment could be negative. The response was "yes" and that was accounted for in the analysis. The NRC commented that this appeared to be related to a Mark I/Mark II difference. The Supply System agreed.

A.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade.

A.4 Reason For The Deviation

At WNP-2, extensive calculations (Burns & Roe Calculation 5.19.10) and preoperational testing have shown that the HPCS pump has adequate NPSH over the entire range of possible wetwell water temperatures while at Technical Specification minimum suppression pool levels. Additionally, the NPSH available at Technical Specification minimum water levels is adequate for each of the ECCS pumps at any temperature/pressure condition. The drawdown of suppression pool water levels (that could induce air-entrainment vortexing concerns) will reduce the available NPSH for the pumps. However, adequate NPSH remains available down to the vortex limits established using the BWROG EPG Appendix C methodology. There

are no temperature/pressure conditions in the wetwell that would limit pump operation because of NPSH concerns before the vortex limits are reached. Therefore, an NPSH curve is not necessary for any ECCS pump. This deviation allowed removal of the NPSH limit curve from the WNP-2 EOPs providing a significant human factors improvement through simplification.

A.5 Technical Basis

Burns & Roe Calculations 5.19.10 "Minimum NPSH for ECCS Pumps"

Supply System Calculation NE-02-89-25, "Vortex Limit of Intake Strainer for HPCS, LPCS, RCIC and RHR Systems".

Technical Memorandum TM-2005 section 3.12

A.6 Impact on BWROG EPG Strategy

Because adequate NPSH is available for WNP-2 ECCS pumps under the conditions specified by Caution #5 and steps RC/L-2 and C5-3 in the EPGs, there is no adverse impact associated with not including this caution and the NPSH curves. There is no change in strategic actions or overall endpoint from taking this deviation.

A.7 Safety Significance

There is no adverse safety significance associated with implementing this deviation at WNP-2 because the ECCS pumps are designed to have adequate NPSH available over the full range of possible pump flows and suppression pool water temperatures as long as levels are maintained at or above the vortex limits of the pumps.

B. DESIGN DEVIATION #2

B.1 Description of Deviation

Simultaneous operation of drywell and suppression pool sprays using the same RHR loop may result in bypassing suppression function of the primary containment.

BWROG EPG Step: None

WNP-2 PSTG Steps: Caution #8, PC/P-1, PC/P-2, PC/P-4, PC/H-3.1, PC/H-3.4, PC/H-4.1

B.2 August 28, NRC Meeting Response

This deviation was not discussed at the August 28, NRC meeting.

B.3 WNP-2 Position

This deviation was previously withdrawn. BWROG Guidelines are implemented in the WNP-2 EOPs for the affected steps. This caution was removed due to a human factors effort to simplify pEOPs.

B.4 Reason For The Deviation

This deviation was identified to alert operators to a potential concern of drywell floor bypass when using the same RHR loop for drywell and wetwell sprays.

C. DESIGN DEVIATION #3

C.1 Description of Deviation

The following caution has been added to all steps which require the use of drywell sprays: "Simultaneous initiation of drywell spray with any other containment spray system may result in exceeding containment design negative pressure and potential loss of primary containment integrity." This caution alerts the operators to the potential adverse consequences of initiating containment sprays simultaneously.

BWROG EPG Step: None

WNP-2 PSTG Steps: Caution #7, PC/P-2, PC/P-5, PC/H-3.4, PC/H-4.2 and DW/T-2

C.2 August 28, NRC Meeting Response

No adverse comments.

C.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade.

C.4 Reason For The Deviation

This deviation is a direct result of WNP-2's unique containment design. WNP-2 is the only domestic BWR whose containment design incorporates a free standing steel shell. WNP-2 specific calculations show that simultaneous initiation of a drywell spray and any other containment spray in conjunction with a single reactor building-to-wetwell vacuum breaker out-of-service has the potential to fail containment due to negative pressurization.

In concrete containment BWR designs, the negative pressurization capability is much greater than at WNP-2. For these plants, failure to shut the sprays off quickly when the pressure falls to the drywell high pressure scram point is not a safety concern because a substantial margin exists before containment failure. At WNP-2, the steel containment shell can withstand a differential negative pressurization of 2 psid. This is 3.68 psi away from the pressure at which the operators are directed to shut the sprays off.

C.5 Technical Basis

The technical basis for WNP-2 negative containment pressurization transient is covered in calculation 5.08.06, titled "Containment Negative Pressure Analysis for WNP-2", and the associated Technical Memorandum No. 1293, titled "Adequacy of the Primary Containment Vacuum Breakers". The results of these analyses are summarized in Chapter 6.2 of the WNP-2 FSAR. In these documents, simultaneous operation of two containment sprays is considered an operator error.

The design analysis, therefore, considered one spray operation with a single reactor building-to-wetwell vacuum breaker failure or two spray operation without another failure. The design analysis of WNP-2 did not consider two spray operation (an operator error) and a single reactor building-to-wetwell vacuum breaker failure simultaneously. However, from the results of the studies that were performed it is clear that the negative design capability of the WNP-2 steel containment could be exceeded in the two spray, one reactor building-to-wetwell vacuum breaker failure case.

If simultaneous initiation of two containment sprays is not an operator error but rather part of WNP-2 operating procedures; then WNP-2 can no longer meet single failure criterion. This is clearly unacceptable. However, the problem of rapid negative pressurization only applies when starting two spray systems simultaneously.

The physical processes causing the negative pressure spike consists mainly of evaporative and convective cooling. Evaporative cooling is an extremely rapid effect. Appendix B of the BWROG EPGs (OEI document 8390-4B page B-7-28) states the following with respect to evaporative cooling: "Analytical results indicate drywell pressure drops of up to 12 psi can occur in less than 0.5 seconds after initiation of the sprays." The second major effect is convective cooling which occurs at a slower rate. Appendix B of the BWROG EPGs (OEI document 8390-4B page B-7-29) states the following concerning the mechanism of convective cooling: "...an operator can effectively control the magnitude of the drywell temperature/pressure reduction caused by convective cooling by terminating operation of the sprays." Initiation of the first spray in the drywell will cause a rapid evaporative cooling process to start. The subsequent initiation of a second drywell spray would have a much slower negative pressurization effect. If both sprays were initiated simultaneously, the rapid cooldown could be too fast for the vacuum breakers to respond in time to avoid dropping the pressure below the containment shells failure point.

Technically there is no reason to deviate from the use of multiple sprays; only from simultaneous initiation.

C.6 Impact on BWROG EPG Strategy

This deviation does not affect the BWROG Guideline strategy in any way. The BWROG Guidelines use the containment sprays for H_2 control and to reduce the pressure and temperature in containment. The WNP-2 EOPs utilize the sprays for the same purposes at the same places in the procedure. The caution added by WNP-2 only requests that the sprays be initiated sequentially rather than simultaneously.

In addition, sequential initiation is the most probable method of starting the sprays. That is, it is unlikely that the operator would try to initiate two loops at exactly the same time.

C.7 Safety Significance

By adding PSTG Caution #7, WNP-2 complies with the intent of the BWROG Guidelines. The safety significance of initiating containment sprays sequentially rather than simultaneously is considered to be negligible. Also, there is no indication that this is an invalid or inappropriate method of starting the spray headers.

By contrast, the safety significance of not adding PSTG Caution #7 could be significant. By not implementing this deviation, the literal implementation of the BWROG Guidelines could cause the loss of containment integrity and result in an uncontrolled release of radioactive contaminants to the environment.

D. <u>DESIGN DEVIATION #4</u> (NRC Inspection Report, Attachment A, Item 3 and Attachment C)

D.1 <u>Description of Deviation</u>

When using the turbine bypass valves to depressurize the reactor, WNP-2 does not allow the operators to exceed the Technical Specification cooldown rate until emergency depressurization is required. The generic guidance directs the operator to rapidly depressurize the reactor, exceeding the Technical Specification cooldown rate, if emergency depressurization is anticipated.

BWROG EPG Step: RC/P

WNP-2 PSTG Step: RC/P

D.2 <u>August 28, NRC Meeting Response</u>

There was considerable confusion on the exact nature of this Supply System deviation. The NRC initially thought the Supply System did not use the turbine bypass valves to deposit energy outside containment when in this portion of the EOPs. The Supply System clarified that the bypass valves were preferentially used, only the direction to rapidly depressurize the reactor through the bypass valves was omitted. Implementation of this deviation limits the rate at which RPV depressurization can be achieved to 100°F/Hr.

WNP-2 also noted that other utilities have taken this deviation. The NRC suggested WNP-2 reevaluate this deviation. The NRC stated other utilities have found a way to implement this strategy in their EOPs; some by training. It is important to deposit energy outside of containment when possible via this EPG strategy. WNP-2 committed to reevaluate, but noted WNP-2 will likely need to add two new deviations to allow this BWROG EPG strategy to be implemented. The needed deviations will be to clarify when emergency depressurization is "anticipated" and what constitutes "rapid" depressurization of the RPV when emergency depressurization is anticipated.

The NRC responded that this would be the Supply System's option.

D.3 <u>WNP-2 Position</u>

WNP-2 will withdraw this deviation in EOP Phase II upgrade. WNP-2 continues to agree with the Staff on preferential energy deposition outside of primary containment if possible. Because current EPGs do not address "anticipate" or "rapidly depressurize", WNP-2 is evaluating additional operator guidance that can be provided to successfully implement this deviation. The additional WNP-2 guidance will likely result in two more implementation deviations.

D.4 Reason For The Deviation

Figure B-6.3 of Appendix B of the BWROG EPGs (OEI document 8390-4B) provides the BWROG guidance for non-ATWS reactor pressure control. WNP-2 complies with this guidance with the exception it will not allow the operator to exceed the Technical Specification cooldown rate of 100°F/hr while using the turbine bypass valves for pressure control until emergency depressurization is required. The basis for this deviation lies in the ability to provide clear guidance to the operator as to when "emergency depressurization is anticipated" or what constitutes "rapid depressurization". For example, in the latter case, the WNP-2 bypass valve capacity is 60% of the capacity required to achieve emergency depressurization. Executing rapid depressurization using this full capacity of the bypass valves would result in a thermal/pressure transient as severe as emergency depressurization. The generic guidance is silent as to defining criteria for the operator as to when and within what time frame this action is to be taken. Consequently, without the ability to clearly define these criteria, WNP-2 has elected to omit this override.

From the human factors standpoint, this deviation enables the WNP-2 EOPs to be more repeatably applied and reduces operator stresses that would be imposed if he were required to "anticipate" when emergency depressurization might be required.

D.5 Technical Basis

Omission of this override does not preclude the preferential use of the bypass valves to deposit energy outside containment (see B-6-55). WNP-2 has, in fact, implemented this strategy, only the rate at which depressurization is accomplished is limiting. WNP-2 believes without clear guidance, situations could arise when the reactor could be subjected to unnecessary and severe thermal/pressure fatigue cycles. Note: neither the generic nor the WNP-2 guidance allows pressure control with the turbine bypass valves in this sequence if isolation interlocks must be defeated.

D.6 Impact on BWROG EPG Strategy

As discussed above, WNP-2 has implemented the overall BWR Owners Group strategy except that the allowance to exceed Technical Specification cooldown limits is withheld at this stage of an event. This does not preclude the operator from reducing reactor pressure using the turbine bypass valves. However, if the operator had been able to anticipate the need to emergency depressurize, the amount of energy ultimately deposited in the containment could have been reduced. Events which continue to degrade and are not mitigated by the WNP-2 strategy are addressed by other portions of the EPGs, e.g., using SRVs for pressure control. WNP-2 is in compliance with the generic guidance for these follow-on strategies.

D.7 Safety Significance

Although the generic guidance may appear to provide better strategy on a conceptual basis, the lack of actual criteria for implementation makes it difficult to use in a practical sense.

The safety significance of the omitted override lies in the probability of occurrence of the event sequence postulated. The operator must rapidly depressurize to the main condenser before conditions degrade to a point beyond which the heat capacity of the suppression pool is not adequate to absorb the energy of the reactor and stay within the design limits of containment. Because of the large heat capacity of the WNP-2 suppression pool, the frequency of encountering any such event sequence that also does not provide isolation signals is extremely low. The imposition of our Technical Specification cooldown limit is of no real safety significance. The WNP-2 suppression pool contains a minimum of 840,000 gallons of water (reference FSAR Table 6.2-1) and under bounding LOCA and ATWS conditions, WNP-2 analyses (section 6.3 and 15.8) demonstrate that this volume is adequate for absorbing the stored energy and maintaining the design limits of the primary containment. Therefore, only those events beyond the limits of these analyses would potentially require the above override to insure successful mitigation. Events beyond those described above are, by definition, extremely low probability events and would require multiple failures of redundant systems. Events of such low probability are beyond the licensing envelop for WNP-2 and as such represent a very low level of risk to the primary containment. WNP-2 believes this deviation is consistent with the guidance provided in EPG Rev. 4 SER (page 15) which states:

> "This is not to imply that operation beyond the Technical Specification is recommended in an emergency. Rather, such operation may be required under certain degraded conditions.... Therefore, conformance with the guidelines under degraded conditions does not ensure strict conformance with a plant's Technical Specifications or other licensing bases. The licensing specifications will already have been exceeded in order to get into such a situation in the first place and the safe recovery of the plant becomes the matter of paramount importance."

At the step in the EOPs where this deviation applies, WNP-2 could still be well within its analyzed licensing bases.

E. DESIGN DEVIATION #5 (NRC Inspection Report, Attachment A, Item 1)

E.1 Description of Deviation

This deviation has been combined with Strategy Deviation #1.

Allowing RCIC suction from suppression pool in addition to CST is applied at WNP-2.

BWROG EPG Step: RC/P-2

WNP-2 PSTG Step: RC/P-2

E.2 August 28, NRC Meeting Response

See NRC comments on Strategy Deviation #1.

E.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade. See Strategy Deviation #1.

E.4 Reason For The Deviation

See Strategy Deviation #1.

F. DESIGN DEVIATION #6 (NRC Inspection Report, Attachment A, Item 6 and Attachment C)

F.1 Description of Deviation

In step DW/T-1, that portion of the BWROG Guideline which states "defeating isolation interlocks if necessary" is not included in the WNP-2 procedures. WNP-2 EOPs do not direct the operator to defeat the RPV low level and high drywell pressure interlocks to allow return of drywell cooling capability.

BWROG EPG Step: DW/T-1

WNP-2 PSTG Step: DW/T-1

F.2 August 28, NRC Meeting Response

The NRC appeared to understand the WNP-2 basis and reasons for this deviation as the issues and operator priorities were presented. The potential failure of non-ASME piping was not deemed a significant issue, nor considered an appropriate basis for the deviation by the NRC. The NRC did agree that operator actions to accomplish this strategy may be too distracting when there may be more important actions and agreed that it appears successful implementation of this EPG step may be of limited value at WNP-2. The NRC voiced concern that this deviation is removing an option, but agreed with the Supply System's suggestion to prepare an Emergency Support Procedure to place in the Technical Support Center (TSC) and implement this action (pre-planned) from the TSC, if necessary.

F.3 WNP-2 Position

Due to significant operator burden to implement this step and its limited significant short-term benefit (noted below) this deviation will be maintained in EOP Phase II implementation. However, to ensure no mitigation strategies are eliminated, WNP-2 will develop a pre-planned procedure to be resident in the TSC to allow implementation of this strategy if use for long-term mitigation is deemed appropriate by the TSC.

F.4 Reason For The Deviation

The WNP-2 drywell cooling system containment isolation valves will close on low reactor water level or high drywell pressure signals. These parameters are indications of a potentially significant abnormal plant condition. Symptomatically overriding the interlocks to the containment isolation valves to return to normal drywell cooling does not seem prudent without first understanding the plant condition.

If the isolation signal is due to a primary system break, an RCC pipe may have been broken in the same initiating incident. Overriding the isolation interlock would then result in an unnecessary release path.

F.5 Technical Basis

Symptomatically overriding the isolation interlocks to the drywell cooling system is inappropriate for WNP-2 because it may cause an unnecessary radiation release. In addition, even if the interlocks are defeated the drywell cooling system may not function or, at best, will have a negligible effect on long term heat removal from containment.

At WNP-2, the process for reestablishing drywell cooling following an F (high drywell pressure) or A (low RPV water level) isolation signal is both complicated and time consuming. The ability to reestablish drywell cooling is dependent on the availability of Division 1, 2 and offsite power. Division 1 and 2 power is necessary to reopen the containment isolation valves on the cooling water supply and return lines and offsite power is necessary to operate the required cooling water pumps (both RCC and TSW). The ability to reestablish cooling using the onsite emergency diesel is not considered reasonable due to the difficulty associated with manually shedding emergency loads and manually jumpering power to the required cooling pumps. Therefore, given that the necessary power is available, the trip signal to four valves must be jumpered, two on the cooling water supply and two on the cooling water return. In addition, jumpers to restore the five drywell cooling fans must also be installed. These jumpers can be installed in control panels in the main control room. Jumpers must also be installed to restart the service water pumps(s) (TSW-P-1A/1B) and drywell closed cooling pumps (RCC-P-1A/1B). These jumpers must be installed in local switchgear compartments for the respective pumps. These switchgear compartments are located outside the main control room. The evolution to restore drywell cooling is expected to take greater than 30 minutes and may require two or more operators to install jumpers and reenergize the required pumps and valves. This complicated and time consuming task, as discussed in the technical basis section provides limited benefit. When this benefit is balanced against the required time and manpower to execute, it is not considered an effective use of operator personnel during the short-term response of any significant plant event. Therefore, this strategy will be executed only on direction from the Technical Support Center where pre-planned procedures will be staged and at a time when additional manpower will be available to implement.

In any containment pressurization event which results in a high drywell pressure signal (1.68 psig), the density of the containment atmosphere will be outside the working parameters for the cooling fans. Motor load test data for similar fans operated at elevated pressures show that the drywell cooling fans would overload and trip the motor supply breakers. Therefore, continued operation at containment pressures above the high drywell setpoint may not be possible and defeating this interlock may not provide the intended cooling function.

Also, in WNP-2's Mark II containment, the suppression pool capacity is extremely large in comparison to normal drywell cooling capacity. The heat removal from containment during a full hour of normal drywell cooling equates to only 0.78°F rise in suppression pool temperature. Thus, even if drywell cooling is restored and the pressure in containment is low enough to allow the fans to operate, the effect is negligible.

F.6 Impact on BWROG EPG Strategy

The impact on the BWROG EPG strategy is minimal. If drywell coolers are available they are used. This is in line with the BWROG EPG philosophy that the first step in each emergency procedure be consistent with normal plant recovery procedures.

F.7 Safety Significance

A significant plant event (e.g., LOCA) would cause isolation of the drywell cooling system. Symptomatically unisolating drywell cooling in such an event could cause an unnecessary radiation release. The energy removal capability of the drywell cooling system is insignificant when compared to the total energy that is potentially available in containment. Therefore, reestablishing drywell cooling by defeating the interlocks would not contribute significantly to mitigating the event, while maintaining containment isolation could significantly mitigate offsite dose consequences.

G. DESIGN DEVIATION #7 (NRC Inspection Report, Attachment C)

G.1 Description of Deviation

Direction to vent the primary containment "before wetwell pressure reaches the PCPL" has been modified to assure that venting does not commence while the containment pressure is within analyzed limits (below 39 psig). The direction to spray the primary containment (irrespective of core cooling concerns) is given "when wetwell pressure reaches the PCPL" instead of the BWROG guidance "when the suppression chamber cannot be maintained below the PCPL".

BWROG EPG Steps: PC/P-4 and PC/P-6

WNP-2 PSTG Steps: PC/P-4 and PC/P-5

G.2 August 28, NRC Meeting Response

The NRC asked why the wetwell pressure was not considered. The Supply System's response was that the vacuum breakers assure the pressure difference will not exist. The NRC also asked questions about the time required to vent; on the simulator it appears to take several minutes. Reevaluation of this timing issue will be addressed in the Phase II upgrade to ensure timely execution of venting when called for by the EOPs.

G.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade. Additional evaluation and justification will be developed to respond to NRC concerns relative to the deviation.

G.4 Reason For The Deviation

To get to this pressure in the primary containment pressure control procedure, all the normal means of decreasing the containment pressure have been attempted or are in progress, the PSP has been exceeded and emergency RPV depressurization has commenced. Per the BWROG Guidelines, the operator may vent any time after the PSP has been exceeded as long as it is before the PCPL is reached. This point could be one psi above the PSP or one psi below PCPL, at the operating crew's discretion. This means that waiting, even until the last tenth of a psi before exceeding PCPL, is not forbidden; in fact, it is expressly allowed.

WNP-2 was designed specifically to handle several accident scenarios in which the pressure rises above the PSP but does not exceed the PCPL. One such accident is a small break LOCA with the maximum allowable drywell-to-wetwell bypass leakage. In the analysis of this particular accident scenario the drywell pressure reaches a peak pressure of 39 psig before it is turned downward. This accident scenario is well within the design capability of WNP-2 and the transient is concluded without exceeding offsite dose limits. If the operator chooses to vent the containment shortly after the pressure reaches the PSP (about 18.2 psig in this case) significant offsite doses would occur unnecessarily.

Appendix B of the BWROG EPGs (OEI document 8390-4B page B7-67) states the following with respect to this step: "Note that primary containment venting is performed only as necessary to restore and then maintain pressure below the limit." It is clear that the BWROG Guidelines intend for the operator to vent as little as possible by maintaining the containment pressure near the PCPL. WNP-2 strategy is totally consistent with the concept of minimizing offsite consequences by minimizing early or unnecessary venting.

Therefore, instructing the operator to wait until the containment pressure is beyond the design envelop maintains the intended containment pressure control of the guideline step and serves the purpose of eliminating unnecessary offsite releases. The BWROG EPG guidance implies that venting should be limited to pressures near the PCPL.

G.5 Technical Basis

Section 6.2 of the WNP-2 FSAR describes several bounding accident scenarios which WNP-2 was designed to handle without exceeding offsite dose limits. These include:

- An instantaneous guillotine rupture of a recirculation line, section 6.2.1.1.3.3.1.
- An instantaneous guillotine rupture of a main steam line, section 6.2.1.1.3.3.2.
- An intermediate size primary system rupture, section 6.2.1.1.3.3.4.
- A small to intermediate size primary system break with the maximum allowable drywell-to-wetwell leakage assumed, section 6.2.1.1.3.3.5.

In the analysis of all four of the scenarios listed above, suppression chamber pressure rises above the PSP. But, all four scenarios are brought to successful conclusions without exceeding offsite dose limits, and without venting containment. FSAR Figures 6.2-2, 6.2-11, 6.2-14 and 6.2-17b show the containment pressure responses respectively.

The highest containment pressure analyzed in any of the design basis accident scenarios is 39 psig (Figure 6.2-17b). This pressure occurs approximately an hour into the fourth scenario. If the drywell pressure exceeds 39 psig, then the accident has progressed past the design basis of the plant and venting the plant becomes the best and safest action to take.

G.6 Impact on BWROG EPG Strategy

No direction has been given which would cause the operator to vent containment when the BWROG Guidelines would not have the operator vent. No direction has been given which would cause the operator not to vent when the BWROG Guidelines explicitly instruct the operator to do so. The region defined by the WNP-2 EOPs in which the operator is instructed to vent is completely enveloped by the BWROG Guideline region. The region between PSP and 39 psig has been taken out of the realm of operator discretion. However, the EPG guidelines never actually direct the operator to act at those pressures, only to initiate venting prior to PCPL.

This deviation is not contrary to any direction given in the BWROG Guidelines but allows WNP-2 to implement these guideline steps consistently without unnecessarily challenging primary containment integrity.

G.7 Safety Significance

This deviation is in line with the current BWROG strategy, preserves the WNP-2 design basis, and reduces the impact on public health and safety by insuring direct containment venting occurs for only those events well beyond the analyzed design envelope of WNP-2. This approach is consistent with the guidance taken by WNP-2 from the EPG Rev. 4 SER (page 25), which states:

"The staff's stated goal is to limit containment venting to a "last resort" action. The major staff concern has centered on the appropriate containment pressure for venting. As a result, the venting pressure should be established to as high as reasonably achievable. If PCPL is less than the design pressure, the licensee must submit justification and the staff will evaluate on a case by case basis. Accordingly, a reasonable effort should be made by each licensee to increase the primary containment pressure limit as high as practical, e.g., perform adjustments to the pneumatic operating pressure of the SRVs and consider improving vent valve operability."

H. DESIGN BASIS DEVIATION #8

H.1 Description of Deviation

The BWROG EPG steps, for initial hydrogen control, to vent and purge the drywell to maintain combustible gas concentrations below minimum detectable levels is not given in the WNP-2 PSTG. Instead WNP-2 uses the installed hydrogen recombiner system, to avoid potentially contaminated releases from primary containment.

BWROG EPG Steps: PC/H-1, PC/H-1.1, PC/H-1.2 and PC/H-1.3

WNP-2 PSTG Step: None

H.2 August 28, NRC Meeting Response

No adverse comments.

H.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade.

H.4 Reason For The Deviation

The discussion in Appendix B of the BWROG EPGs (OEI document 8390-4B) for step PC/H-1 (page B-7-115 and -116) states:

> "The existence of a detectable amount of hydrogen in either the drywell or the suppression chamber warrants corrective action irrespective of the condition which required entry into this guideline. Venting and purging is the method normally used to control primary containment atmosphere conditions, and it is therefore the first method employed to reduce hydrogen concentration at this point. Although continued increases in hydrogen concentration will directly threaten containment integrity, hydrogen concentrations near the minimum detectable are not by themselves containment threatening and therefore venting and purging at this point is permitted only if it can be done within the limits prescribed for normal (non-emergency) plant operation.

Consistent with plant-specific procedures it is appropriate to wait for the results of an analysis of a primary containment air sample before commencing the vent and purge procedure. If existing plant conditions and the most recently obtained air sample results suggest that the release to areas outside of containment will remain within Technical Specification requirements, the vent and purge may be initiated."

At WNP-2, the "normal" procedural means of dealing with hydrogen in the primary containment atmosphere is through initiation of the containment atmospheric control (CAC) system, which contains divisionally redundant hydrogen recombiners designed in accordance with Regulatory Guide 1.7, Rev. 1 and General Design Criteria 41, 42 and 43. The recombiners can operate safely down to 0% hydrogen concentration. Hydrogen control design basis calculations performed by Burns and Roe (5.34.10) indicate that although inefficient recombination occurs at low hydrogen concentrations, the resultant temperature rise is also less than experienced with higher concentrations (and efficiencies), resulting in more favorable equipment operating conditions. In addition, WNP-2 has a divisionally redundant state-of-the-art hydrogen-oxygen analyzer system that continuously monitors hydrogen and oxygen concentrations in the drywell and suppression chamber airspace. Initiation of the CAC system on the low limit of detection (defined to be 0.5% hydrogen for reliability), will consistently provide combustible gas control as rapidly as a controlled purge and vent scenario would.

The WNP-2 design basis for hydrogen control in primary containment is described in the FSAR (primarily section 6.2.5). Extensive analysis of the two redundant recombiner systems were performed and are reported in the FSAR. These analyses were reviewed by the NRC and several question/answer issues resolved. Section 15.6.5.5.1.2 states that no containment purge is necessary, nor was it evaluated for offsite consequences for hydrogen control, because the redundant recombiners can effectively process the full spectrum of anticipated hydrogen concentrations. Therefore, purging of containment for hydrogen control was specifically excluded in WNP-2's licensing and design basis. A containment purge system is available, see sections 6.2.1.1.8.3 and 6.2.5.2.4 to meet Regulatory Guide 1.7 guidance, should higher than anticipated hydrogen concentrations be present.

The WNP-2 position is that two 100% capacity hydrogen recombiner systems will be used for hydrogen control consistent with the plant licensing basis as opposed to containment vent and purge. The main impact of this deviation is to potentially start the recombiners earlier than prescribed in the EPGs.

Finally, WNP-2 does not implement hydrogen water chemistry and has not experienced any detectable hydrogen levels during normal plant operation. Thus, operational sources of hydrogen are not anticipated.

H.5 Technical Basis

WNP-2 FSAR sections 6.2.5, 6.2.1.1.8.3, 9.4.11.3 and 15.6.5.5.1.2

WNP-2 SER section 9.4

Regulatory Guide 1.7, Rev. 1

10 CFR 50 Appendix A, General Design Criteria 41, 42 and 43

NRC Questions 022 series, 281.009, 312.016 and 423.041

Burns & Roe Calculation 5.34.10

H.6 Impact on BWROG EPG Strategy

At WNP-2, each of the two 100% capacity hydrogen recombiners are designed to control the full spectrum of anticipated hydrogen concentrations in the primary containment, and are qualified to operate for at least six months in a post-LOCA environment. Their use in the manner prescribed in the WNP-2 EOPs is consistent with minimizing doses to the public. Using the recombiners is the next step following purging and venting prescribed by the BWROG EPGs as hydrogen concentrations increase. Therefore, the WNP-2 strategy will not result in a different endpoint than the EPG approach, but will only eliminate a period of containment purge and vent of potentially radioactive gases. No adverse impact on our recombiner equipment is anticipated. This deviation is consistent with the EPG philosophy of using the "normal" mitigation systems first in accident control.

H.7 Safety Significance

There is no safety significance associated with this deviation. The endpoint of the WNP-2 EOPs is the same as the EPGs. WNP-2 is designed and licensed to control hydrogen consistent with our EOP strategy. Finally, this deviation is consistent with the guidance taken by WNP-2 from the EPG Rev. 4 SER (pages 30-31) which states:

> "The staff had requested the BWROG to provide additional clarification on the need for this step since it would appear that a minimal detectable hydrogen concentration condition and the offsite radioactivity release rate below the LCO to be an unlikely combination. This comment was predicated on hydrogen generation from the zirconium (cladding) metal water reaction being the dominant contributor. Further, the staff believes that venting may not be necessary based solely upon hydrogen concentrations above the minimal detectable level and below the flammability levels. The staff believes the use of recombiners is valuable and should be utilized where appropriate."

Thus, WNP-2 is consistent with Staff direction in the SER to utilize recombiner as initial response for hydrogen control when hydrogen is below the flammability levels.

I. DESIGN BASIS DEVIATION #9

I.1 Description of Deviation

Drywell suction for the H_2 recombiner was not explicitly specified in the WNP-2 PSTG because this is the normal system alignment.

BWROG EPG Step: PC/H-2.1

WNP-2 PSTG Step: PC/H-1.1

I.2 August 28, NRC Meeting Response

The NRC questioned if the wetwell-to-drywell vent flow path will always be available (i.e., vacuum breakers always open). The Supply System replied that there are nine wetwell-to-drywell vacuum breakers to provide this path and simultaneous loss of all these vacuum breakers was not considered credible. Any single vacuum breaker is adequate to pass the required recombiner flow.

The NRC then questioned if drywell alignment is always available. WNP-2 noted that the recombiners can take suction from either the wetwell or drywell, but the system is normally aligned to the drywell. The recombiner piping connected to and from containment is designed as ASME III, Class 2, tested as an extension of primary containment and never isolates. The NRC questioned the recombiner fan capacity. WNP-2 responded that the recombiner fans can inject at pressures up to 18 psig which is well above the maximum vacuum breaker opening pressure of 1/2 psi which limits the maximum pressure the wetwell can be above the drywell. The NRC asked the Supply System to quantify the time for the recombiners to equalize the 5 psi downcomer submergence pressure differential between the drywell and wetwell in its assessment of safety significance; i.e., the time elapsed before our alignment will begin to have an effect on drywell hydrogen concentrations.

I.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade. The simplification of operator actions and mitigation strategy coupled with existing WNP-2 analysis of recombiner effectiveness in this normal alignment provides the best mitigation strategy. WNP-2 will evaluate the need for any additional guidance (e.g., TSC procedures) necessary for hydrogen mitigation if for some reason both suction paths from drywell are not available. WNP-2 will evaluate the time required for recombiners to equalize the 5 psi downcomer submergence and address it in the EOP Phase II upgrade.

I.4 Reason For The Deviation

Because the system is normally aligned with suction from the drywell, incorporation of instructions to achieve this is not required. At WNP-2, considerable effort and analyses were expended to simplify required operator actions including use of the hydrogen recombiner system, as described in the FSAR (see section 6.2.5). One result of this effort was the conclusion that the system could reliably control anticipated hydrogen concentrations in the entire primary containment with a fixed system lineup and configuration. That is, with the recombiner suction drawn from the drywell, exhausting to the wetwell air space, with the recycle rate set at 55%, the system will effectively handle the full spectrum of anticipated hydrogen concentrations. This simplification in operating the system and the EOPs frees the control room operators for other mitigation actions and relieves some of the decisions they could be required to make to deal with an accident situation. The installed on-line hydrogen-oxygen analysis system at WNP-2 provides reliable input to the operators at WNP-2 on drywell and wetwell airspace hydrogen and oxygen concentrations.

I.5 Technical Basis

WNP-2 FSAR sections 6.2.5, 6.2.1.1.8.3, 9.4.11.3 and 15.6.5.5.1.2

WNP-2 SER section 9.4

Regulatory Guide 1.7, Rev. 1

10 CFR 50 Appendix A, General Design Criteria 41, 42 and 43

NRC Questions 022 series, 281.009, 312.016 and 423.041

Burns & Roe Calculation 5.34.10

I.6 Impact on BWROG EPG Strategy

No impact on the EPG strategy is postulated. The normal alignment of the recombiner system is with suction from the drywell as specified by EPGs. No changes in EPG strategy is involved.

I.7 Safety Significance

There is no safety significance of this deviation.

J. <u>DESIGN BASIS DEVIATIONS #10, 11 & 12</u> (NRC Inspection Report, Attachment C)

J.1 <u>Description of Deviation</u>

Wetwell suction is not specified for WNP-2. (Instead hydrogen recombiners are operated with suction from the drywell while discharging into the wetwell.)

Hydrogen recombiner system operable range is based on "drywell" hydrogen/oxygen concentration rather than "wetwell" hydrogen/oxygen concentration.

Direction to operate the drywell hydrogen mixing system is given.

BWROG EPG Step: PC/H-3.1

WNP-2 PSTG Step: PC/H-2.1

J.2 <u>August 28, NRC Meeting Response</u>

Same as Design Deviation #9. Also, the NRC identified that the PSTG says to start the recombiners on high H_2 indication in the suppression pool whereas the flow chart is based upon primary containment (i.e., either W-W or D-W).

J.3 <u>WNP-2 Position</u>

WNP-2 intends to maintain this deviation in the EOP Phase II upgrade. The significant simplification of operator actions and mitigation strategy coupled with existing WNP-2 analysis of recombiner effectiveness in this normal alignment provides the best mitigation strategy. WNP-2 will evaluate the need for any additional guidance (e.g., TSC) necessary for hydrogen mitigation if for some reason both suction paths from drywell are not available. All PSTG/EOP differences will be evaluated during EOP Phase II upgrade.

J.4 <u>Reason For The Deviation</u>

The ability of the WNP-2 hydrogen recombiner systems to effectively treat the primary containment as a "single" volume has been demonstrated by tests and parametric calculations. Calculation 5.34.10 shows that suction from the drywell with discharge to the wetwell will control accumulation of combustible mixtures in either the drywell or wetwell airspace, even if the wetwell airspace is the source of hydrogen concentrations. The wetwell-to-drywell vacuum breakers will function to effectively vent any hydrogen from the wetwell to the drywell with the CAC operating in its normal alignment. (See FSAR sections listed below in Paragraph J.5.) The WNP-2 continuous on-line hydrogen-oxygen analyzer system provides reliable operator input on drywell and wetwell concentrations. Because the drywell is the source for the hydrogen recombiner

suction it is appropriate that the operable range be based on the hydrogen concentrations in the volume being processed. Use of the drywell hydrogen mixing system will help ensure that a well-mixed containment atmosphere exists and is processed, preventing buildup of pockets of higher concentrations of gases. Drywell hydrogen mixing system operation is specified (consistent with BWROG EPG) when the CAC suction is from the drywell.

J.5 Technical Basis

WNP-2 FSAR sections 6.2.5, 6.2.1.1.8.3, 9.4.11.3 and 15.6.5.5.1.2

WNP-2 SER section 9.4

Regulatory Guide 1.7, Rev. 1

10 CFR 50 Appendix A, General Design Criteria 41, 42 and 43

NRC Questions 022 series, 281.009, 312.016 and 423.041

Burns & Roe Calculation 5.34.10

J.6 Impact on BWROG EPG Strategy

Because the hydrogen recombiner system has been designed and analyzed to effectively handle combustible gas buildup in both the drywell and wetwell air spaces with its suction aligned to the drywell and discharge to the wetwell air space, there is no adverse impact on the overall EPG strategy. The control room operators are relieved of some system alignment decisions and actions, avoiding operator errors and making them more available for other mitigation efforts.

J.7 Safety Significance

Because the actual endpoint of these modified steps are the same as those anticipated in the EPG strategy, and because subsequent EPG strategy steps are followed, there is no safety significance to this deviation.

K. DESIGN DEVIATION #13

K.1 Description of Deviation

Defeating isolation interlocks to allow restart of the reactor building HVAC is not specified in the override which precedes SC/T. WNP-2 EOPs do not direct the operator to bypass the RPV level and high drywell pressure interlocks to return the reactor building HVAC to operation.

BWROG EPG Step: Override prior to SC/T

WNP-2 PSTG Step: None

K.2 August 28, NRC Meeting Response

The NRC asked how the required differential pressure would be maintained. The Supply System response was that it was maintained by the standby gas treatment system.

No adverse comments; the NRC seemed to view this as a fairly straight forward issue.

K.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II implementation.

K.4 Reason For The Deviation

The WNP-2 design provides for a secondary containment isolation on low RPV water level, high drywell pressure and high secondary containment radiation level. To direct the operator to bypass the low RPV water level and high drywell pressure interlock whenever isolation is caused by these signals is contrary to defense in depth concepts. The intent of this override in Appendix B of the BWROG EPGs (OEI document 8390-4B page B-8-25) is to reestablish the normal means of cooling secondary containment to control critical equipment area temperatures. At WNP-2, the temperature of critical areas in secondary containment is adequately controlled by separate safety grade room coolers which are initiated upon isolation of secondary containment. Upon initiation, the areas cooled by these emergency coolers are automatically isolated from the normal reactor building HVAC. Consequently, reestablishing the normal reactor building HVAC will not provide or enhance cooling in these areas.

K.5 Technical Basis

WNP-2 plant design provides for isolation of secondary containment in anticipation of a potential release to the environment. Safety grade area and room coolers are provided to maintain these critical equipment areas within acceptable limits. If isolation is caused by an abnormal event and recovery is achieved prior to attempting HVAC restart, the interlocks may be reset and HVAC restarted as appropriate. If restart of the reactor building HVAC is completed and then later isolation delayed until the high radiation setpoint is reached, some release would occur as radioactivity concentrations in secondary containment increase to the high level isolation setpoint.

K.6 Impact on BWROG EPG Strategy

Many BWRs do not have safety grade cooling systems in critical areas of secondary containment. WNP-2 utilizes safety grade room and area coolers which maintain the environment within acceptable limits. Therefore, the objectives of the strategy are implemented by utilizing these safety grade coolers.

K.7 Safety Significance

Implementation of this deviation will not significantly impact safe plant operation. The primary reason is that the safety grade area and room coolers will maintain the secondary environment within acceptable limits. Removal of the interlocks will not provide any additional cooling to WNP-2 critical areas.

L. DESIGN DEVIATION #14

L.1 Description of Deviation

If core damage is indicated, isolate feedwater lines (valves RFW-V-65A, 65B) within 20 minutes after feedwater flow stops, and initiate MSLC if RPV pressure is below 35 psig.

BWROG EPG Steps: None

WNP-2 PSTG Steps: Formerly Steps C1-1 and C1-2

L.2 August 28, NRC Meeting Response

There was no discussion because this deviation did not exist in EOPs after Phase I implementation.

L.3 WNP-2 Position

This deviation was withdrawn in EOP Phase I implementation. BWROG Guidelines are implemented in the WNP-2 EOPs for the affected steps. These WNP-2 FSAR commitments are incorporated in WNP-2 abnormal procedures.

L.4 Reason For The Deviation

These actions are WNP-2 FSAR post-accident commitments that were included in WNP-2 Emergency Procedures.

M. DESIGN DEVIATION #15 (NRC Inspection Report, Attachment A, Item 2 and Attachment C)

M.1 Description of Deviation

Prior to the step defined by the generic EPG strategy as the "last measure" to regain adequate core cooling via containment flooding for non-ATWS events, WNP-2 has inserted the plant specific analyzed condition for adequate core cooling of 2/3 core submergence with core spray(s) injecting at 6000 gpm. The generic strategy defines core submergence as the only acceptable core cooling method.

BWROG EPG Step: C1-4.2

WNP-2 PSTG Steps: C1-5 and C1-6

M.2 August 28, NRC Meeting Response

Even though WNP-2 is analyzed to this 2/3 RPV level and 6000 gpm core spray criteria, which can be achieved with one pump, the NRC stated that there is still a concern on long-term reliability. Therefore, the NRC stated that WNP-2's position to delay containment flooding would be acceptable if both core spray pumps were operable. WNP-2 agreed to consider the NRC's recommendation as part of our EOP Phase II upgrade.

M.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II implementation, but will include the additional criterion that two core spray pumps (LPCS and HPCS) be operable. WNP-2 will add this criterion based on NRC recommendation. We do point out that the guidance is not consistent with the generic EPG guidance. Specifically, current EPG strategy does not require a plant to have more than <u>one</u> pump available when level is being maintained at top of active fuel. That is, one pump available and injecting with level at or above top of active fuel is considered adequate and proceeding to containment flooding is not required.

M.4 Reason For The Deviation

This deviation is taken to provide the operators the maximum amount of time possible before going to the step of last resort, containment flooding. This delay strategy provides some additional time for radioactive source term decay and plateout prior to initiating the large release associated with venting PC and the RPV and, if sufficiently long, would allow restoration of other mitigation measures that may prevent the offsite release.

M.5 Technical Basis

EPG Rev. 4 Contingency #1, Step C1-4.2 directs emergency RPV depressurization followed by primary containment flooding if water level cannot be restored and maintained above top of active fuel (TAF). The WNP-2 licensed design basis for LOCA recognizes that at the top of the jet pumps (two thirds core height) adequate core cooling is achieved by a combination of steam cooling and spray cooling. The WNP-2 FSAR (page 6.3-24) states that the core remains covered to at least the jet pump suction elevation, and that the uncovered region is cooled by spray cooling as calculated by GE generic analysis (NEDO 20566P). This 10CFR50.46 existing analysis establishes that peak clad temperatures (PCT) will not exceed 2200°F.

WNP-2's strategy is not in conflict with the intent of the generic EPGs, which, as pointed out in Appendix B of the BWROG EPGs (OEI document 8390-4B page B-15-1) is attempting at this stage to restore adequate core cooling. The generic EPGs identify adequate core cooling as core submergence and only core submergence. The above cited analysis demonstrates that for WNP-2, adequate core cooling can also be achieved by 2/3 core water level with core spray(s) at 6000 gpm. The generic strategy further goes on to state that containment flooding is "a measure of last resort" (reference Appendix B of the BWROG EPGs, OEI document 8390-4B page B-10-34) to reestablish core submergence. Flooding too early in an event sequence can in itself challenge the integrity of containment. Under these conditions, a loss of containment integrity due to flooding to regain core submergence would suggest that the core was being prioritized over containment integrity. This prioritization is opposite to the stated overall strategy of the Rev. 4 EPGs, which is to preserve the containment over the core. Note: at WNP-2, flooding containment results in a loss of the pressure suppression function, loss of ability to spray the drywell, loss of vacuum breakers, loss of reactor relief valves and submergence of all RPV vent paths required to vent the reactor (such as MSIV and MS drains). The valves required to re-isolate the vent lines are not designed to operate under submerged water conditions. Inability to reclose containment vents may result in permanent loss of containment integrity if outboard isolation valves cannot be closed. Therefore, the action to flood could prioritize the core rather than the containment during a condition where adequate core cooling is being maintained.

M.6 Impact on BWROG EPG Strategy

WNP-2 views the 2/3 core coverage with core spray(s) at 6000 gpm as an extension of the generic strategy. It allows the delay of containment flooding, thereby either eliminating or reducing radiological releases. This strategy would then allow containment flooding to be accomplished through a very slow process with controlled filtration of the vented containment atmosphere.

If 2/3 core height with core spray cannot be maintained, WNP-2 will immediately flood containment in accordance with the BWROG EPG strategy.

M.7 Safety Significance

For cases where the delay results in avoiding containment flooding by successfully restoring alternate mitigation measures, there is no adverse safety significance. For the cases where only a delay in flooding results, the radioactive source term released would be reduced, with a consequent reduction in offsite doses.

N. <u>DESIGN DEVIATION #16</u> (NRC Inspection Report, Attachment A, Item 4 and Attachment C)

N.1 <u>Description of Deviation</u>

HPCS, which injects inside the shroud, is allowed as an RPV injection source to flood or refill the RPV during an ATWS, provided that boron is being injected via the SLC system. As recommended by the BWROG Guidelines, if boron is not being injected, use of the HPCS system would not be allowed.

BWROG EPG Steps: C4-1.3, C5-3 and C5-3.2

WNP-2 PSTG Steps: C4-1.3, C5-3 and C5-3.2

N.2 <u>August 28, NRC Meeting Response</u>

The NRC stated that it was not acceptable to allow HPCS injection during an ATWS due to boron dilution and core instability concerns. WNP-2 responded that due to the significant analysis capability necessary to justify this deviation to the NRC, we intend to withdraw this deviation. This deviation had been identified to be withdrawn prior to the August 28, 1991 meeting. The NRC concurred with WNP-2's response to withdraw this deviation.

N.3 <u>WNP-2 Position</u>

WNP-2 will withdraw this deviation in the EOP Phase II implementation.

N.4 <u>Reason For The Deviation</u>

WNP-2 is designed and analyzed to use the HPCS spray header as the method for introducing SLC sodium pentaborate into the RPV. Operation of the HPCS system decreases the transport time for the boron to reach the core and is therefore desirable for those events when the plant is not shutdown, i.e., ATWS.

N.5 Technical Basis

The BWROG Guidelines discuss the reasons for using the injection systems specified at this step. The main theme noted for C4-1.3 is as follows:

> "The systems identified for use here are those utilizing motor-driven pumps and injecting outside the shroud. These systems are used preferentially in order to mix cold, unborated water injected into the RPV with warm, borated water prior to it reaching the core.
>
> The applicability of Caution #6 is identified at this step to highlight the concern regarding a reactor power excursion occurring if injection is performed too rapidly."

This discussion is directed at that category of plants which inject boron into the lower plenum via the SLC standpipe. For these plants it is important to refill the RPV from systems which fill from outside the shroud to prevent displacement of boron from the core. WNP-2 utilizes the HPCS sparger to inject boron into the RPV. With this method of boron injection, the water injected by the HPCS would be borated and it is unnecessary to circulate the borated water from the lower plenum to maintain borated water in the core. In addition, since the water is introduced as a spray in the upper plenum, near thermal equilibrium with the mixture in the plenum is achieved before the water enters the core. A plant specific best estimate analysis for WNP-2 (FSAR section 15.8) shows that good mixing of boron will occur between the lower plenum, core, upper plenum and shroud areas.

N.6 Impact on BWROG EPG Strategy

Use of the HPCS system is allowed only if boron is being injected into the RPV. Because the HPCS is borated, the concern for power excursions due to injection of unborated water is significantly reduced. This direction therefore preserves the BWROG strategy.

N.7 Safety Significance

There is little safety significance associated with implementing this deviation. Because the HPCS injection is borated to greater than shutdown boron concentrations, any power excursions caused by the injection of the cool borated water would be minimal.

Further evaluations of the substantial uncertainties that exist in strategy analyses for all possible scenarios and difficulties in determining that this deviation is the optimum strategy for all SLC injection events have lead WNP-2 to the decision to withdraw this deviation as part of our EOP Phase II revision. As noted above, there is little marginal risk associated with not implementing this withdrawal until the Phase II revision because the HPCS injection is adequately borated. Possible events for which HPCS injection would not provide effective mitigation are of extremely low probability.

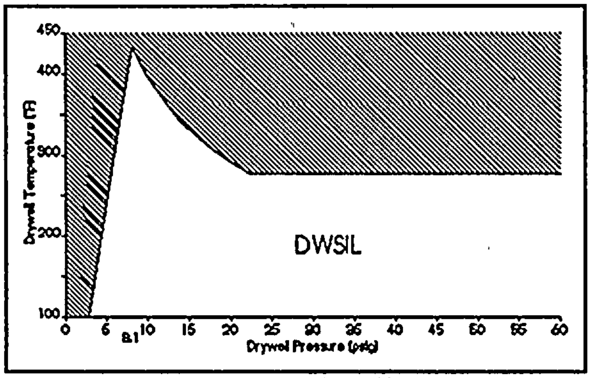
O. DESIGN DEVIATION #17

O.1 Description of Deviation

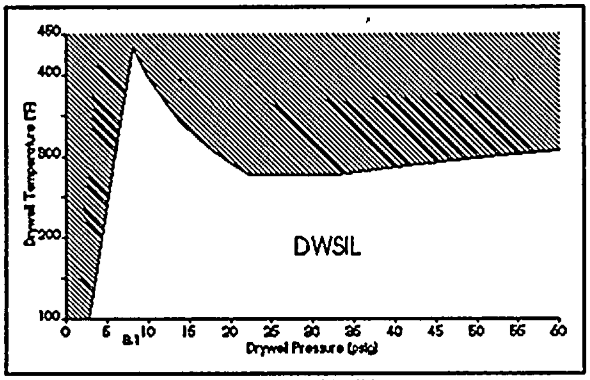
The BWROG EPG Appendix C Drywell Spray Initiation Limit worksheet (WS-3) resulted in a curve for WNP-2 which prevents the use of drywell sprays when the WNP-2 licensing basis assumes they will be used. The DWSIL calculation was slightly modified to allow the use of drywell sprays in saturated drywell atmosphere conditions at high pressures.

BWROG EPG Step: None

WNP-2 PSTG Step: None



Generic DWSIL



WNP-2 DWSIL

O.2 August 28, NRC Meeting Response

No adverse comments. There was considerable discussion with the NRC on this topic. The primary thrust of the discussion was to clarify both the EPG basis for the curve as well as the Supply System's deviation to the curve to accommodate its drywell-to-wetwell bypass leakage event. The NRC indicated they would contact the Supply System if they had further questions on this deviation. No such contact has been made.

O.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II implementation.

0.4 Reason For The Deviation

The purpose of the DWSIL curve is to guide the operator in the decision as to when it is safe to use the drywell sprays. The generic guidelines are concerned with the extremely rapid effects of evaporative cooling. Appendix B of the BWROG EPGs (OEI document 8390-4B page B-7-28) states the following with regard to evaporative cooling:

> "In the drywell with typical drywell spray flow-rate, this cooling process results in an immediate, rapid, large reduction in pressure which occurs at a rate much faster than can be compensated for by the primary containment vacuum relief system. Analytical results indicate drywell pressure drops of up to 12 psi can occur in less than 0.5 seconds after initiation of the sprays."

Appendix B of the BWROG EPGs also discusses convective cooling and states that the DWSIL is not concerned with those effects. On page B-7-29, Appendix B states the following concerning convective cooling:

> "...an operator can effectively control the magnitude of the drywell temperature/ pressure reduction caused by convective cooling by terminating operation of the sprays."

Thus, the DWSIL is not concerned with convective cooling effects, only the very rapid evaporative cooling effects.

At WNP-2, the plant specific version of the DWSIL (developed using the BWROG calculation guidelines) results in a curve which would prohibit the use of the containment sprays by the operators at a point when the design basis analysis assumes the sprays are used. This led to a closer review of the DWSIL curve to resolve this conflict with the WNP-2 design basis.

0.5 Technical Basis

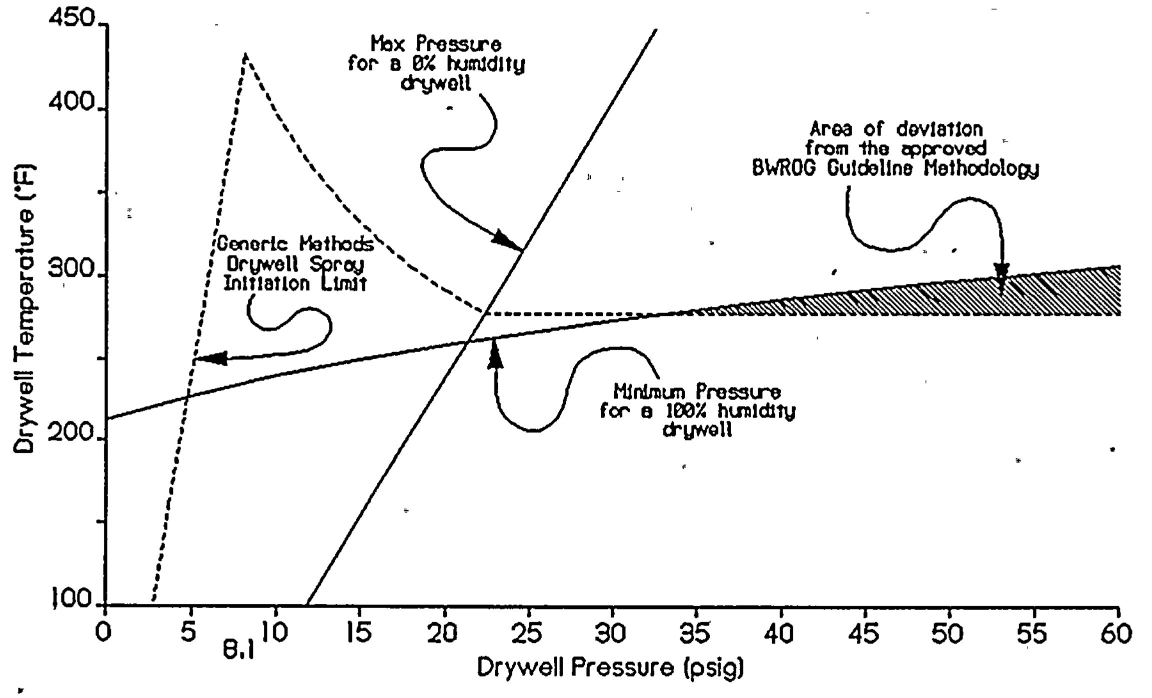
The design basis scenario which conflicts with the BWROG version of the curve is found in section 6.2.1.1.3.3.5 of the WNP-2 FSAR. The scenario is a small to intermediate size (less than 0.4 ft^2) primary system break coupled with the maximum allowable drywell-to-wetwell bypass leakage. This scenario produces a containment atmosphere condition widely different than the conditions assumed in the generic DWSIL calculation. Evaporative cooling produces large effects in hot dry atmospheres, while the atmosphere in a LOCA scenario is hot and saturated.

It is possible to show that, for high temperatures or pressures the region of all possible dry containment states and the region of all possible saturated containment states are mutually exclusive. That is, given a set of initial masses, there are pressures and temperatures at which a dry containment may exist that a saturated containment cannot and vice versa.

The BWROG methodology defines a variable "Tdw-min(Pdw)" which is a line describing the drywell temperature as a function of pressure assuming that all the nitrogen originally in the containment has been transferred to the drywell and is at 0.0% humidity. This line provides an upper bound to the pressure in the drywell for all isolated containment situations if the drywell is completely dry.

For cases in which the humidity is 100%, a line may be drawn on the same graph which defines the minimum possible pressure in the containment as a function of temperature, by assuming that all of the nitrogen has instead been transferred to the wetwell. This line is simply the saturation line for water vapor.

The figure below shows these two curves as well as the DWSIL which is developed from the generic guidelines. On the right side of the curve is an area where the water vapor saturation line is above the DWSIL. This is also the region where WNP-2 licensing basis calculations have assumed that the containment sprays would be used in a LOCA type accident.



Because this region is outside of the confines of the assumptions in the generic methodology, there is no conflict with the guidelines in adding this region to the DWSIL. Additional operating margin is gained and the original function of the drywell spray header is maintained.

0.6 Impact on BWROG EPG Strategy

This deviation has no impact on BWROG EPG strategy. The DWSIL curve is in place in the WNP-2 EOPs and is referenced and used exactly as described in the BWROG Guidelines.

0.7 Safety Significance

By expanding the useable region of the DWSIL curve for drywell sprays without violating the basis assumptions for the curve, the functionality of the drywell sprays has been improved. By allowing the use of the sprays in this small additional region of the pressure-temperature map, some LOCA heating scenarios can be mitigated to a greater extent than would otherwise have been possible. No adverse safety consequences have been identified as a result of this deviation.

II. STRATEGY DEVIATIONS

A. STRATEGY DEVIATION #1 (NRC Inspection Report, Attachment A, Item 1 and Attachment C)

A.1 Description of Deviation

In the event the non-seismic CSTs, which are designated as the preferred RCIC suction source, are lost during use of the RCIC system, continued RCIC operation with suction from the suppression pool would be allowed. Caution for high turbine lube oil and bearing temperatures is also included to alert the operator to the potential for these conditions when suction is from the suppression pool.

BWROG EPG Steps: RC/L-2, RC/P-2, C5-3 and C5-3.2 (C6-2)*

WNP-2 PSTG Steps: Caution #2, RC/L-2, RC/P-2, C5-3 and C5-3.2 (C6-2)*

A.2 August 28, NRC Meeting Response

The NRC stated this was an example of where additional data could have prevented this from becoming a concern by the NRC. Early documentation did not define the sources and later documentation did not define the cases for which CST is acceptable (i.e., we referenced three places where the deviation applied; it should have been addressed at these locations).

A.3 WNP-2 Position

In order to maximize operator options and accommodate WNP-2 design (non-seismic CSTs), WNP-2 intends to maintain this previously approved BWROG deviation in EOP Phase II implementation.

A.4 Reason For The Deviation

Due to the non-seismic design of the CST's and the associated suction piping, WNP-2's RCIC may not be available for all the conditions assumed or intended by the generic guidance. Preferentially allowing RCIC to take suction from the suppression pool upon loss of CST suction would increase the availability of the RCIC system for those events where suppression pool temperature and level may restrict RCIC system operation.

*RCIC suction will always be from the CST for step C6-2 if the CST is available. RCIC suction from suppression pool would only be allowed in step C6-2 if CST is not available.

A.5 Technical Basis

WNP-2 will preferentially align the RCIC to the CSTs whenever they are available. However, because the tanks and the suction piping from these tanks to the RCIC system are not designed for an SSE they may not be available during seismic events. (Reference FSAR sections 3.8.4.1.7, 5.4.6.2.1.1 and 9.2.6.3.) Upon loss of the CSTs, the RCIC suction will automatically transfer to the suppression pool. The transfer control logic and valving are powered by plant 1E batteries independent of AC power sources (i.e., RCIC system operation is totally powered from battery backed sources and will operate under SBO conditions). If this occurs, WNP-2 has elected to allow the continued use of the RCIC system and will not terminate its use. To alert the operators to temperature concerns related to the use of RCIC with suction from the suppression pool, Caution #2 has been added to the list of cautions and referenced at the applicable EOP steps.

Finally, WNP-2 is consistent with the current BWROG EPG Committee position on this issue. Approved EPG issue number 8905 preferentially recommends RCIC suction from CSTs, if available, but allows suction from the suppression pool. When suction is from the suppression pool, the BWROG has added a caution on observing temperature limitations on the RCIC pump.

A.6 Impact on BWROG EPG Strategy

No impact - WNP-2 strategy is consistent with current BWROG position; reference approved EPG issue number 8905.

The BWROG EPG strategy (reference Appendix B of the BWROG EPGs OEI document 8390-4B page B-6-27) directs that suction for RCIC always be aligned to the condensate storage tank (CST). The automatic suction transfer from high suppression pool water level logic must be defeated when necessary, because the CST water is of higher quality and is not subject to the temperature increase that exist for the suppression pool.

WNP-2 maintains this strategy to the extent allowed by its plant unique design. Allowing the continued use of RCIC with suppression pool suction in the event the CSTs are unavailable is an accommodation of the non-seismic CST design at WNP-2. Continued RCIC use with suction from the suppression pool does not reduce the effectiveness of the EPG strategy. As noted above, WNP-2 operators will preferentially align to the CSTs due to the likelihood that the CSTs will be of a higher water quality and at a lower water temperature.

A.7 Safety Significance

Allowing the use of RCIC with suction from the suppression pool is viewed as an extension of the original strategy because RCIC would continue to be available for reactor vessel makeup in the event CST suction is unavailable. Recent approval of EPG issue 8905, which allows suppression pool suction for RCIC, supports this position. Finally, WNP-2 maintains its suppression pool at or near CST water quality and the significant heat capacity of the WNP-2 suppression pool should insure continued availability of the RCIC system for the majority of credible plant events. In fact, under some conditions such as station blackout, RCIC suction from the suppression pool may improve RCIC reliability. Under these conditions, RCIC suction from the suppression pool would prevent an increase in suppression pool level thereby minimizing the potential for increased RCIC turbine back pressure and inadvertent turbine trip and loss of the RCIC system.

B. STRATEGY DEVIATION #2 (NRC Inspection Report, Attachment A, Item 3)

B.1 Description of Deviation

RPV cooldown is not initiated until the reactor is shut down and will remain so with rods or boron.

BWROG EPG Steps: Override following steps RC/P-2, RC/P-3, RC/P-5, C2-2 and RC/Q-1.

WNP-2 PSTG Step: Override following steps RC/P-2, RC/P-3, RC/P-5, C2-2 and RC/Q-1.

B.2 August 28, NRC Meeting Response

There was no NRC discussion of this deviation because it was withdrawn prior to EOP Phase I implementation.

B.3 WNP-2 Position

This deviation was withdrawn prior to EOP Phase I implementation. BWROG Guidelines are implemented in the current WNP-2 EOPs for the affected steps.

B.4 Reason For The Deviation

WNP-2 identified this deviation because there is no urgency to achieve RPV cooldown until the reactor can be assured to remain shutdown. It is not a prudent action to start RPV cooldown if the reactor may become critical during the cooldown.

C. . STRATEGY DEVIATION #3 (NRC Inspection Report, Attachment C)

C.1 Description of Deviation

WNP-2 designates purging of the primary containment with nitrogen instead of with nitrogen or air when a flammable mixture of H_2 and O_2 exists in primary containment.

BWROG EPG Step: PC/H-4.3

WNP-2 PSTG Step: PC/H-3.3

C.2 August 28, NRC Meeting Response

The NRC had no adverse comments on the WNP-2 basis for this deviation, but did voice concern about WNP-2 removing an option from the EPG strategy; i.e., why not put it in "just-in-case". WNP-2 responded that we could write an emergency support procedure (pre-planned) to accomplish this action and place it in the TSC to provide direction to implement if the situation was appropriate. This seemed agreeable to the NRC; but the NRC also stated that if we never see this strategy as being effective, then even this activity may be unnecessary. Rather justification should be developed to back up the existing position.

C.3 WNP-2 Position

WNP-2 intends to maintain this deviation for EOP Phase II implementation, but will provide a pre-planned procedure in the TSC so an air purge of containment can be directed if deemed appropriate. This additional procedure ensures that this accident mitigation strategy remains available to the plant even though it may be of limited benefit.

C.4 Reason For The Deviation

The normal method for combustible gas control at WNP-2, as described in the FSAR (see sections 6.2.5, 6.2.1.1.8.3 and 15.6.5.5.1.2) is based on recombination of hydrogen by use of the redundant 100% capacity recombiners in the containment atmosphere control (CAC) system and control of oxygen concentrations in the inerted containment atmosphere. These recombiners, which are sized to reverse the hydrogen concentration buildup in design basis accidents before reaching combustible levels will be the first method of combustible gas

control employed. In the event the two 100% CAC systems are unavailable or unable to control the combustible gas buildup, WNP-2 will utilize its installed nitrogen inerting system to purge containment. The capacity of this installed system is over one million standard cubic feet and is designed to deliver nitrogen at pressures up to and beyond the ultimate containment rupture point (~130 psi) even under loss of offsite power conditions. Use of the available nitrogen sources for purging would not introduce additional oxygen into the containment as would purging with air. Even if the containment were deinerted, adding nitrogen would be preferable to adding air, as it would both dilute the hydrogen and reduce the severity of any deflagration that could occur.

Finally, the WNP-2 reactor building HVAC fans that could be used for an air purge have a maximum discharge pressure of 0.5 psi. Because accidents at WNP-2 that could generate significant quantities of combustible gases will also pressurize primary containment above 0.5 psi, use of the air purge fans is believed to be of limited use.

The WNP-2 air purge fans are also electrically shed in the event of an accident and cannot be restored unless offsite power is available. The nitrogen purge system remains available in post-accident situations. Therefore, designation and preferential use of the nitrogen purge in the WNP-2 EOPs adequately cover the anticipated span of design basis and severe accidents. Should the nitrogen sources not be available, or should other emergency conditions warrant different actions, the decision to purge the containment with air could be made by the emergency organization at the time.

C.5 Technical Basis

WNP-2 FSAR sections 6.2.5, 6.2.1.1.8.3, 9.4.11.3 and 15.6.5.5.1.2

WNP-2 SER section 9.4

Regulatory Guide 1.7, Rev. 1

10 CFR 50 Appendix A, General Design Criteria 41, 42 and 43

NRC Questions 022 series, 281.009, 312.016 and 423.041

Burns & Roe Calculation 5.34.10

C.6 Impact on BWROG EPG Strategy

The BWROG EPG strategy to purge containment to reduce the concentration of hydrogen below flammable limits is implemented at WNP-2. The strategy has been changed only in that the air purge system is not explicitly listed in the WNP-2 EOP step. If nitrogen is not available, and it is possible to lower containment pressure below 0.5 psig and all required support systems are available or recoverable, air purge can be directed from the TSC.

C.7 Safety Significance

No adverse safety significance is involved in implementing this deviation because the objective of purging and venting is met by preferentially using a nitrogen source. This action is not inconsistent with the EPG strategy and if successful, results in dilution of hydrogen in containment using nitrogen to diminish the effects of any deflagration. At WNP-2, the nitrogen purge, unlike the air purge option, is available for containment pressures greater than 0.5 psi and for loss of offsite power events.

D. STRATEGY DEVIATION #4

D.1 Description of Deviation

When isolating primary systems that are discharging into a secondary containment area or outside the plant, the BWROG Rev. 4 guidelines exclude all systems required to shut down the reactor, assure adequate core cooling, or suppress a fire. In keeping with the latest BWROG EPG Committee position, WNP-2 will also exclude systems required to vent the containment in this step.

BWROG EPG Steps: SC/T-3, SC/R-1, SC/L-1 and RR-1

WNP-2 PSTG Steps: SC/T-3, SC/R-1, SC/L-1 and RR-1

D.2 August 28, NRC Meeting Response

No adverse comments.

D.3 WNP-2 Position

WNP-2 intends to maintain this previously approved BWROG deviation in EOP Phase II implementation.

D.4 Reason For The Deviation

By requiring the isolation of only those systems not required to assure adequate core cooling, regardless of their current effect on the secondary containment, the BWROG EPG has set the protection of the core ahead of secondary containment.

Appendix B of the BWROG EPGs (OEI document 8390-4B page B-7-71) states: "When a decision between the possible loss of adequate core cooling and a loss of primary containment integrity must be made, the EPGs preferentially choose to maintain primary containment integrity...." Therefore, it directly follows that the primary containment takes precedence over the secondary containment.

Thus, the primary containment vent path must be maintained even if a system required for venting is discharging into an area. Similarly, the change is applicable to Step RR-1 because the steps necessary to protect primary containment integrity already specify that the venting is to take place "irrespective of the offsite radioactivity release rate".

D.5 Technical Basis

This issue resulted from questions raised by the NRC about isolating a PC vent because it is the source of high radiation/temperature in the secondary containment. The issue was resolved by adding PC vents to the criteria for systems not to isolate; reference BWROG issue number 8902.

D.6 Impact on BWROG EPG Strategy

This deviation is a direct result of applying the EOP strategy and underlying philosophy to these steps. This issue has been discussed and the position taken by WNP-2 is in line with the approved BWROG position as of June 1, 1989; reference approved BWROG EPG issue number 8902.

D.7 Safety Significance

This deviation correctly prioritizes primary containment over secondary containment consistent with EPG intent. The WNP-2 position is in compliance with the latest BWROG resolution.

E. STRATEGY DEVIATION #5

E.1 Description of Deviation

The same guidance given in the BWROG EPG for restart of the turbine building HVAC system is also given in the WNP-2 PSTG for restart of the radwaste building HVAC system.

BWROG EPG Step: None

WNP-2 PSTG Step: Override prior to step RR-1

E.2 August 28, Meeting Response

No adverse comments.

E.3 WNP-2 Position

WNP-2 intends to maintain this previously approved BWROG deviation in EOP Phase II implementation.

E.4 Reason For The Deviation

The EPGs do not direct restart of the radwaste building HVAC system. However, at WNP-2, there are potential release paths that terminate in the radwaste building (such as the RWCU, EDR and FDR systems), and personnel access to this building (which houses the main and radwaste control rooms) is also desirable. Therefore, for the same reason as listed in Appendix B of the BWROG EPGs (OEI document 8390-4B page B-9-8) the WNP-2 strategy also instructs the control room operators to restart the radwaste building HVAC system.

E.5 Technical Basis

This deviation is taken to ensure any radioactive releases is both monitored and elevated. Also, it improves personnel access to and habitability of the WNP-2 radwaste building.

E.6 Impact on BWROG EPG Strategy

There is no adverse impact from this action on the overall EPG strategy. This is an additional precautionary step added to improve personnel access to the radwaste building, and while not absolutely essential to the safe operation of WNP-2, it is in accordance with ALARA principles. No negative impact on electrical power sources nor supplies is involved. No change in overall strategy endpoint results from implementation of this deviation.

This deviation strategy supports EPG intent. Restart of "other" HVAC was considered by the BWROG in 1984 - 1985 when the Emergency Procedure Committee addressed the MSIV Leakage Control Committee's report on suggested EPG actions. EPG strategy did not address any building other than the turbine building because it was certain that all BWR's have a turbine building. Other ventilated buildings may exist but their accessibility to perform EOP actions was believed to be too plant specific to identify in a generic guideline. Resolution of EPG issue #53 contains the following quote concerning "other" building HVAC restart: "If a utility believes ventilation systems in other areas fall into the same category as turbine building HVAC, they too could be included in this step."

E.7 Safety Significance

There is no adverse safety significance associated with implementing this deviation. This is merely an added step that will not adversely affect any other mitigating action or equipment, and insures that any release from the radwaste building is elevated and monitored.

F. <u>STRATEGY DEVIATION #6</u> (NRC Inspection Report, Attachment A, Item 2 and Attachment C)

F.1 <u>Description of Deviation</u>

Under conditions where no injection systems, injection subsystems or alternate injection systems are available, WNP-2 will not execute the generic EPG low pressure override (OR/6), which results in early termination of steam cooling. WNP-2 will continue in steam cooling, irrespective of reactor pressure until either any injection system becomes available or the RPV level drops to the minimum zero injection water level.

BWROG EPG Step: C1-3

WNP-2 PSTG Step: C1-3

F.2 <u>August 28, NRC Meeting Response</u>

The NRC asked if other utilities had taken this deviation. WNP-2 responded that others had taken this deviation. WNP-2 stated that this was an open BWROG item identified and recommended for EPG revision. WNP-2 expects BWROG approval on this deviation. The NRC voiced concern that impact on EPG strategy for this deviation was not adequately evaluated. WNP-2 maintains the impact has been evaluated and there is no adverse impact to EPG strategy. The NRC stated that WNP-2 documentation is inadequate and needs to be increased. WNP-2 concurred to improve deviation justification.

F.3 <u>WNP-2 Position</u>

WNP-2 intends to maintain this deviation in EOP Phase II implementation and provide additional justification.

F.4 <u>Reason For The Deviation</u>

The literal execution of the generic guidance would require the operator to exit the high pressure logic sequence and enter the low pressure sequence irrespective of whether any RPV injection or alternate injection sources are available. Exiting to the low pressure sequence based solely on the highest discharge pressure of a plant's alternate injection leads to premature termination of steam cooling when no injection systems are available. Consequently, the generic guidance has made an arbitrary tie between the discharge head of the alternate injection systems (irrespective of whether they are operating) and the point at which steam cooling becomes ineffective. Termination of steam cooling under these conditions would preclude the plant from taking advantage of steam cooling when it is still effective, reducing the time available to the operators to recover RPV injection systems.

F.5 Technical Basis

The logic sequence for this portion of the EPG strategy is depicted in Figure B-10.1 of Appendix B of the BWROG EPGs (OEI document 8390-4B page B-10-3). This logic sequence has a branch point based on either low or high reactor pressure. Low RPV pressure here is defined as that pressure at or below which the highest discharge head alternate injection system can inject into the reactor vessel (reference Appendix B of the BWROG EPGs, OEI document 8390-4B page B-10-31). For WNP-2, this pressure is approximately 350 psig, for other plants this pressure ranges from 80 psig up to 900 psig. High pressure is defined as any pressure above this low pressure point. In addition, whenever reactor pressure drops to or below this low pressure limit, override (OR/6) is invoked in the high pressure sequence. Invoking this override causes the operator to proceed directly to the low reactor pressure strategy (reference Appendix B of the BWROG EPGs, OEI document 8390-4B page B-10-5). Some additional discussion here is appropriate on why these two paths are provided. The criterion for establishing low and high reactor pressure paths is based on the desire to give preferential direction to use normal high quality water injection systems to restore RPV level rather than the use of low water quality, alternate injection systems, such as sea water, river water etc. (reference Appendix B of the BWROG EPGs, OEI document 8390-4B page B-10-34).

There is no tie in the generic EPG strategy relating this low pressure limit to the pressure condition where the effectiveness of steam cooling becomes diminished or is lost. Studies conducted by Nirmal Jain of NUSCO and presented to the BWROG have demonstrated that steam cooling remains effective even at low reactor pressures.

When reviewing Appendix B of the BWROG EPGs (OEI document 8390-4B) it appears the BWROG EPG strategy assumes that, when executing the low pressure override (OR/6) (i.e., a "low" reactor pressure condition exists), an alternate injection system is assumed to be available for injection.

For this sequence, WNP-2 has maintained the generic strategy with the exception that we continue to allow steam cooling during the low pressure sequence until either an injection system actually becomes available or the minimum zero injection water level is reached.

F.6 Impact on BWROG EPG Strategy

This exception is intended only to allow the operators more time to line-up or recover an injection system. All other aspects of the strategy are preserved. Even the original intent is served by this approach because the generic strategy appears to assume that some system is available for injection during the low pressure logic sequence. WNP-2 compliance is maintained for both sequences in that when or if any system becomes available we will immediately emergency depressurize the RPV.

F.7 Safety Significance

As noted above, the NUSCO analysis has demonstrated that steam cooling remains effective down to very low reactor pressures, precluding the need to exit steam cooling on any pressure criteria. This approach of extending the use of steam cooling to low reactor pressures, coupled with executing emergency depressurization should an RPV injection source be recovered, maintains the overall intent of the generic EPG strategy while providing the operator the maximum time to recover an injection system.

Finally, any impact to the EPG strategy sequence would only be applicable for an event where multiple unrelated plant equipment failures have occurred resulting in the loss of all RPV injection and alternate injection sources. WNP-2 design, through the application of redundancy, electrically separated divisional power sources, fire protection measures and equipment qualification testing and certification make these multiple failures an extremely low probability. There are no adverse safety consequences associated with implementing this deviation because the overall intent of the EPG strategy is maintained.

G. STRATEGY DEVIATION #7 (NRC Inspection Report, Attachment A, Item 5)

G.1 Description of Deviation

RPV head vents are not used as an alternate depressurization system for the RPV depressurizing.

BWROG EPG Step: C2-1.4

WNP-2 PSTG Step: C2-1.3

G.2 August 28, NRC Meeting Response

This deviation was not discussed because it was withdrawn prior to EOP Phase I implementation.

G.3 WNP-2 Position

This deviation was withdrawn prior to EOP Phase I implementation. BWROG Guidelines are implemented in the current WNP-2 EOPs for the affected steps.

G.4 Reason For The Deviation

RPV head vents were not identified as alternate an depressurization system for RPV depressurizing because there is no priority of vent paths and using this vent path could have negative consequences. Specifically, pressurization of drywell which could affect SRV operability due to accumulator back pressure.

H. STRATEGY DEVIATION #8 (NRC Inspection Report, Attachment C)

H.1 Description of Deviation

WNP-2 EOPs have included additional conditional criteria for determining if RPV water level should be lowered during an ATWS. These additional criteria require the operator to confirm that one or more SLC pumps are not running or that reactor power is not decreasing prior to initiating action to intentionally reduce RPV water level.

BWROG EPG Step: C5-2

WNP-2 PSTG Step: C5-2

H.2 August 28, NRC Meeting Response

The NRC was concerned that WNP-2 analysis does not include the instability issue and thus recommended that WNP-2 reevaluate its position to delay lowering RPV water level in an ATWS. The Supply System responded that an instability situation would satisfy the "reactor power level is not decreasing" criterion and the proper action would be taken. The NRC asked why we wanted this deviation. WNP-2 responded that because we do not have the capability to throttle ECCS injection flow, lowering level requires the "termination of ECCS injection" to obtain rapid lowering until jumpers can be placed on the ECCS injection valves. These jumpers are necessary to allow the ECCS pump discharge valves to be throttled. Their installation requires approximately 10 minutes, provided operators can be spared from immediate plant response duties to install them in the back control room panels. The WNP-2 adopted strategy was intended to minimize operator actions and the complications associated with terminating vessel injection (especially if the only injection source is an ECCS pump). WNP-2 stated that this hands off approach allowed the operators to monitor and trend, taking additional actions as necessary. In addition, WNP-2 pointed out that our ATWS analysis indicates power is reduced below 5% within 12 minutes with SLC. If power does not trend down, our operators are trained to immediately lower vessel level. The NRC was not aware of the inability to throttle the ECCS injection valves and made a note to discuss this issue with the BWROG Stability Committee.

Based on WNP-2 design, we believe it is more prudent for the operators to monitor plant conditions initially rather than actively take control. Due to NRC concern on instability and the effect of not lowering RPV level, WNP-2 committed to reevaluate this deviation in Phase II of the EOP revision.

H.3 WNP-2 Position

Although WNP-2 believes this deviation is valid, it will be withdrawn during EOP Phase II implementation. WNP-2 does not have the resources or capability to resolve NRC concerns on this issue and will withdraw it based on NRC recommendation.

H.4 Reason For The Deviation

The deviation described above was added for the following reasons. A best estimate ATWS analysis for WNP-2 indicates that reactor power is rapidly reduced when sodium pentaborate is injected via the HPCS spray header into the core. Control of reactor power by this method is preferred to a reduction in RPV water level which requires the operator to use the fuel zone level instrumentation to monitor RPV level.

H.5 Technical Basis

The Supply System has performed a best estimate analysis (Reference 1) to confirm the plant specific response to ATWS meets the requirement of 10CFR50.62. This analysis was performed using the RETRAN-03 computer code. The RETRAN-03 results were benchmarked against RETRAN-02, Mod 4 to validate code performance. Based on a bounding analysis of MSIV closure with failure of alternate rod insertion, it was shown that the plant could be adequately brought to a shutdown condition via SLC injection without challenging primary containment integrity. The analysis assumed no direct operator actions are initiated to lower RPV water level. For WNP-2, the SLC system injects the sodium pentaborate into the vessel via the HPCS sparger. HPCS injection water flow rates determined from the analyses range between 2000 and 3500 gpm. The concentration of boron in the injected water will range from about 1200 ppm to 600 ppm, assuming the sodium pentaborate in the SLC tanks is at the WNP-2 Technical Specification lower limit and both SLC pumps are operating. Injection via the sparger provides a direct path for boron to enter the reactor core. The analysis shows that with initiation of the SLC pumps at the SPTL, 110°F, the core fission power will be less than 5% within about 12 minutes following event initiation. The analysis shows that if operator action is taken to isolate HPCS and RCIC, the fission power will be less than 5% within about 8 minutes following initiation.

The RETRAN model of the reactor vessel includes a core bypass region, i.e., that region between the fuel assemblies. The model results show that the borated water enters the bypass region at the top of the core and, because of natural circulation flows downward into the core, mixing with the upward flow through the fuel assembly. Therefore, the mixing problem in the lower vessel head experienced by a lower head boron injection location is eliminated and the reactor power is immediately influenced by the boron as it is injected. This mechanism for coolant flow into the core after being sprayed onto the top of the core has recently been confirmed by testing and analysis performed by GE to support the SAFER/PERFORM program.

Lowering of RPV water level is recognized as a means of reducing reactor power level during an ATWS. However, the studies (References 2 and 3) that were performed to develop the strategy were based on a BWR4 configuration and did not consider the injection of boron directly into the core. The studies were performed to show that a method of reducing reactor power was possible during the time required for SLC injection of boron via the standpipe in the lower head to be completed. Sodium pentaborate injected into the lower head was hypothesized to stratify (cold SLC) in the lower head and remain or mix very slowly until core flow could be increased to provide a thorough mixing. Injection via the HPCS sparger (recommended by the NRC during ATWS rulemaking) eliminates the mixing delay.

Finally, parametric studies indicate that delaying SLC injection for 5 minutes does not significantly increase the challenge to the design limits of the WNP-2 containment. The base case analysis, which assumes initiation of SLC at 110°F wetwell temperature and no operator action to lower reactor water level results in a peak containment pressure of approximately 3 psig (<< 45 psig design pressure) and a peak wetwell temperature of 123°F. (<< 275°F design temperature). A 5 minute delay in initiating SLC results in only a 1 psi increase in peak containment and a 15°F increase in wetwell temperature. During an ATWS, the WNP-2 EOPs direct the operators to reduce reactor water level if power is not decreasing irrespective of whether the SLC pumps are injecting. The above cited parametric study indicates a delay in operator actions of 5 minutes has very little impact and remains well below the containment design limits. Consequently, the WNP-2 step allowing a delay in reducing water level is not expected to have any adverse consequences and avoids the complications (terminating injection sources, reducing vessel inventory) associated with reducing reactor water level.

References

1) FSAR Section 15.8

2) NSAC 69, "Reducing BWR Power by Water Level Control During an ATWS, A Quasi-Static Analysis", May 1984.

3) NSAC 70, "Reducing BWR Power by Water Level Control During an ATWS, A Transient Analysis", August 1984.

H.6 Impact on BWROG EPG Strategy

Introduction of the statement regarding SLC pump operation and reactor power as a condition to reducing RPV water level does not preclude the guideline action from occurring if necessary. If either of the added conditions fail, the action to reduce level would be initiated. The WNP-2 specific ATWS analyses show that containment integrity would not be challenged.

H.7 Safety Significance

NSAC analyses (References 2 and 3) that have been performed to demonstrate the benefit of lowering vessel water level to reduce power did not consider the effectiveness of boron injection via the HPCS sparger. In the event of an ATWS at WNP-2, plant specific analyses show an acceptable consequence if operator action to lower vessel level is delayed to determine the effectiveness of boron injection.

The analyses show that a 5 minute delay in initiating SLC represents only a nominal increase in event consequences, which are still well within WNP-2 containment design limits. The analyses also demonstrate that for even the most bounding ATWS sequence, WNP-2 has significant margin between the event consequences and the design limits of the containment.

I. STRATEGY DEVIATION #9

I.1 Description of Deviation

RPV venting is secured at 192" (minimum steam cooling water level) instead of 161" (TAF) during primary containment flooding.

BWROG EPG Step: C6-3

WNP-2 PSTG Step: C6-3

I.2 August 28, NRC Meeting Response

There was no discussion of this deviation because it was withdrawn prior to EOP Phase I implementation.

I.3 WNP-2 Position

This deviation was withdrawn prior to EOP Phase I implementation. BWROG Guidelines are implemented in the current WNP-2 EOPs for the affected steps.

I.4 Reason For The Deviation

The EPGs identify adequate core cooling at the minimum steam cooling water level (192") as acceptable. Thus, it is appropriate to secure RPV venting at 192" level to prevent unnecessary radioactivity release to the environment during primary containment flooding actions.

III. IMPLEMENTATION DEVIATIONS

A. IMPLEMENTATION DEVIATION #2

A.1 Description of Deviation

Caution #1, reactor building instrument line maximum run temperature and RPV saturation limit near reactor building instrument line runs implemented via abnormal condition procedures.

BWROG EPG Steps: Caution #1 and C4-4

WNP-2 PSTG Steps: Caution #1 and C4-4

A.2 August 28, NRC Meeting Response

The NRC asked if the abnormal procedures were reviewed and verified as emergency support procedures. The Supply System said "yes". The NRC asked if WNP-2 had completed review of all events that could cause a high temperature in the reactor building. The Supply System said "yes".

A.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade.

A.4 Reason For The Deviation

No instrumentation exists at WNP-2 to specifically monitor the temperature near individual instrument runs in the reactor building. To implement Caution #1 for temperature concerns in the reactor building two abnormal procedures were written. These abnormal procedures allow WNP-2 to implement the intent of the EPG Caution #1.

B. IMPLEMENTATION DEVIATION #4 (NRC Inspection Report, Attachment C)

B.1 Description of Deviation

In Caution #1, drywell temperature (average), not drywell temperature near the instrument runs is specified.

BWROG EPG Step: Caution #1

WNP-2 PSTG Step: Caution #1

B.2 August 28, NRC Meeting Response

The NRC noted that WNP-2 uses average drywell temperature that was specifically excluded by the EPG. The NRC asked if WNP-2 had added margin to our calculations to account for the use of average drywell temperature. WNP-2 said that we would review the calculations and determine if we had added margin. The NRC stated that they want WNP-2 to justify the average drywell temperature as a conservative temperature if WNP-2 did not add margin to the calculations. The NRC asked us if other utilities had used average drywell temperature and WNP-2 stated that we had not asked other utilities.

B.3 WNP-2 Position

WNP-2 will evaluate this deviation to determine if it will be maintained during EOP Phase II upgrade. If maintained, additional justification will be provided to address the concern about average drywell temperature and the need, if required, for adding margin.

B.4 Reason For The Deviation

No instrumentation exists at WNP-2 to specifically monitor the temperature near individual instrument runs in the drywell. To implement Caution #1, the best option available is to use the average drywell temperature. This is consistent with the way this caution has been implemented in most domestic BWRs.

C. IMPLEMENTATION DEVIATION #9

C.1 Description of Deviation

To prevent loss of an operating reactor feed pump during an ATWS when the main turbine is not on-line, WNP-2 directs recirculation flow runback before recirculation pump trip.

BWROG EPG Step: RC/Q-3

WNP-2 PSTG Step: RC/Q-3

C.2 August 28, NRC Meeting Response

There was no NRC discussion on this deviation.

C.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade.

C.4 Reason For The Deviation

The purpose of Step RC/Q-3 in the generic guidance is to prevent the loss of an on-line main turbine when the recirculation pumps are tripped in the subsequent step. Appendix B of the BWROG EPGs (OEI document 8390-4B page B-6-105) states: "...if the pump trip is initiated from a high power level the resulting plant transient may cause a turbine trip due to rapid changes in steam flow, RPV pressure, and RPV water level." Simulator training at WNP-2 has shown similar problems occur with our steam driven reactor feedpumps when the main turbine is not on-line.

If the turbine is not on-line but a reactor feedpump is providing makeup to the RPV, a recirculation pump trip from high power causes feedpump trip when the RPV level goes high. This preventable loss of the high head, high flow reactor feedwater pumps greatly complicates recovery actions during the ATWS. As with the turbine trip problem in the BWROG Guidelines, the loss of a reactor feedpump at WNP-2 can be avoided if the recirculation system is run back before the recirculation pumps are tripped.

Thus, WNP-2 performs Step RC/Q-3 if the turbine is on-line or if a reactor feedpump is operating. For WNP-2 this provides a significant improvement in RPV level control during ATWS events while accomplishing the EPG objective of reducing power level without causing the loss of the only RPV injection system capable of maintaining RPV level during a high power ATWS with the reactor at pressure.

D. <u>IMPLEMENTING DEVIATION #13</u> (NRC Inspection Report, Attachment C)

D.1 Description of Deviation

Suppression pool spray initiation limit is at top of suppression pool level instrument range (51′) vice elevation of suppression pool spray nozzles (53′).

BWROG EPG Steps: PC/P-1, PC/H-4.1 and PC/H-5.1

WNP-2 PSTG Steps: PC/P-1, PC/H-3.1 and PC/H-4.1

D.2 August 28, NRC Meeting Response

The NRC requested that WNP-2 evaluate the safety significance of the difference of taking spray action at 51′ versus 53′. The NRC requested the deviation justification to include an assessment of the impact of this deviation to EPG strategy; i.e., what is being lost? The Supply System responded that this will be considered during the upgrading of the deviation documentation.

D.3 WNP-2 Position

WNP-2 will evaluate this deviation and its associated justification as part of the WNP-2 EOP Phase II upgrade.

D.4 Reason For The Deviation

WNP-2 implemented this deviation since suppression pool level instrumentation stops at 51′ elevation. The BWROG recommends action at suppression pool spray nozzles (53′ elevation). It is improper to credit operator action at a level beyond available instruction.

E. IMPLEMENTATION DEVIATION #14 (NRC Inspection Report, Attachment C)

E.1 Description of Deviation

Drywell spray initiation limit at top of suppression pool level instrument range (51') versus "Elevation of bottom of internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water."

BWROG EPG Steps: PC/P-2, SP/L-3.2, PC/H-4.4 and PC/H-5.2

WNP-2 PSTG Steps: PC/P-2, SP/L-3.2, PC/H-3.4 and PC/H-4.2

E.2 August 28, NRC Meeting Response

Same as Implementation Deviation #13.

E.3 WNP-2 Position

WNP-2 will evaluate this deviation and its associated justification as part of the WNP-2 EOP Phase II upgrade.

E.4 Reason For The Deviation

WNP-2 implemented this deviation since suppression pool level instrumentation stops at an elevation below the bottom of internal suppression chamber to drywell vacuum breakers. It is improper to credit operator action at a level beyond available instrumentation. WNP-2 action is at an elevation ~2'-3' below EPG recommendation.

F. IMPLEMENTATION DEVIATION #15

F.1 Description of Deviation

Sampling of suppression pool water prior to its discharge is only specified "if core damage is suspected".

BWROG EPG Step: SP/L-1

WNP-2 PSTG Step: SP/L-1

F.2 August 28, NRC Meeting Response

The NRC asked how WNP-2 determined if "core damage is suspected". WNP-2 responded that core damage is suspected if the core is uncovered due to low RPV water level, high hydrogen monitor readings, high LOCA-radiation response in drywell, or power oscillations have occurred. The NRC asked WNP-2 to better document its deviation justification position.

F.3 WNP-2 Position

WNP-2 intends to maintain this deviation and will provide additional justification as part of the WNP-2 EOP Phase II upgrade.

F.4 Reason For The Deviation

WNP-2 has a very high water quality suppression pool such that sampling prior to drainage is not necessary unless a contamination source is introduced (i.e. core damage). The conditions that result in core damage (e.g. low RPV level) are symptomatically recognizable. It is reasonable to assume that core damage is not suspected unless such a condition occurs. Therefore, a mandate that the suppression pool be sampled is not given, and allowance is given for judgement on the part of the operator before unnecessarily applying the restriction of suppression pool sampling. This meets EPG intent by alerting the operator to the potential need to sample the suppression pool prior to discharge.

G. IMPLEMENTATION DEVIATION #16

G.1 Description of Deviation

SPMS step not applied. WNP-2 does not have an SPMS.

BWROG EPG Steps: SP/L-1 and C6-1

WNP-2 PSTG Steps: SP/L-1 and C6-1

G.2 August 28, NRC Meeting Response

The NRC stated that the WNP-2 deviation justification is inadequate as it implies no makeup is available. Rather than just say "WNP-2 does not have a suppression pool makeup system (SPMS)", WNP-2 must identify the system that is used to accomplish this function

G.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade.

G.4 Reason For The Deviation

Suppression pool makeup system (SPMS) is a unique feature of a BWR Mark III containment system that is not applicable for BWR Mark II containment emergency procedures. SPMS function is to ensure sufficient heat capacity for long-term decay heat removal for Mark III containments. This function is met at WNP-2 without any suppression pool makeup post accident.

H. <u>IMPLEMENTATION DEVIATION #18</u> (NRC Inspection Report, Attachment C)

H.1 <u>Description of Deviation</u>

Wetwell vent initiation limit at top of the suppression pool level instrument range (51′) vice elevation of wetwell vent line (which is above the instrument range).

BWROG EPG Step: PC/H-4.2

WNP-2 PSTG Step: PC/H-3.2

H.2 <u>August 28, NRC Meeting Response</u>

Same as Implementation Deviation #13

H.3 <u>WNP-2 Position</u>

WNP-2 will evaluate this deviation and its associated justification as part of the WNP-2 EOP Phase II upgrade implementation.

H.4 <u>Reason For The Deviation</u>

WNP-2 implemented this deviation since suppression pool level instrumentation stops at an elevation below the wetwell vent line. It is improper to credit operator action at a level beyond available instrumentation. WNP-2 action is at an elevation ~2′-3′ below EPG recommendation.

I. IMPLEMENTATION DEVIATION #19 (NRC Inspection Report, Attachment C)

I.1 Description of Deviation

Guidance to operate secondary containment HVAC if radiation level clears is not given.

BWROG EPG Step: SC/T-2

WNP-2 PSTG Step: None

I.2 August 28, NRC Meeting Response

The NRC asked about the case for which the HVAC system is not operating. The Supply System indicated the same question had been raised during procedure review; a response would need to be provided later.

I.3 WNP-2 Position

WNP-2 will evaluate this deviation in Phase II EOP implementation. Until EOP Phase II implementation, any reactor building pressure problem would be addressed by annunciator alarms and associated response procedures such as reactor building ventilation failure, PPM 4.10.1.1. The plant does not operate nor combat problems on emergency procedures alone. Operator crew performance coupled with training has shown appropriate response with this deviation, but the deviation will be evaluated to ensure concise guidance is given. WNP-2 will likely add a step similar to SC/T-2 prior to SC/T-1 or when HVAC restart is given, even if it is not isolated and not operating, during EOP Phase II implementation.

I.4 Reason For The Deviation

The guidance to "operate secondary containment HVAC if the Z signal clears" duplicates the EPG action specified in the overrides at the beginning of the secondary containment control. This deviation was taken for human factors reasons. When executing the procedures, it was confusing to come to guidance which was already in effect.

J. <u>IMPLEMENTATION DEVIATION #23</u> (NRC Inspection Report, Attachment C, Strategy Deviation #8)

J.1 Description of Deviation

Specific direction to override ECCS valve logic is given to implement EPG strategy for throttling RPV injection.

BWROG EPG Step: C4-1.3, C4-3.2, C5-2 and C5-3.2

WNP-2 PSTG Step: C4-1.3, C4-3.2, C5-2 and C5-3.2

J.2 August 28, NRC Meeting Response

The NRC discussion on this deviation and on Strategy Deviation #8 indicated that the NRC concurred with WNP-2 action to override ECCS valve logic so that ECCS injection could effectively be throttled in lieu of "terminate and prevent", especially for lowering RPV water level for ATWS. The NRC concern was that the time to implement this action to override ECCS valve logic be evaluated in the justification for any documentation on Strategy Deviation #8 (i.e., time delay in lowering RPV level for ATWS mitigation).

J.3 WNP-2 Position

WNP-2 will maintain these deviations as part of the EOP Phase II upgrade. Additional discussion has been provided under Strategy Deviation #8 on the time to install the throttle jumpers and the operator actions that will be taken if water level must be lowered before the jumpers are in place.

J.4 Reason For The Deviation

Step C4-3.2 which addresses reflooding allows the use of ECCS systems. Appendix B of the BWROG EPGs describes throttling injection flow to as low as practical yet maintaining the required RPV pressure. Overriding the ECCS logic of those systems described in C4-3.1 is necessary to allow these injection systems to perform as intended by the BWROG EPG. (WNP-2 emergency core cooling systems are not designed with the throttle capability assumed in the BWROG EPGs.)

Step C4-1.3 addresses reflooding of the RPV and C5-3.2 addresses reestablishing injection into the vessel to maintain adequate core cooling. The BWROG prescribed that the injection be slowly increased to preclude the possibility of large power excursions due to the injection of relatively cold, unborated water. In order to allow throttling and provide the means to implement the BWROG EPG intent, WNP-2 must override the ECCS valve logic.

K. <u>IMPLEMENTATION DEVIATION #26</u> (NRC Inspection Report, Attachment A, Item 7 and Attachment C)

K.1 Description of Deviation

Multiple RPV level instruments are specified when action is being taken to exit RPV flooding contingency by draining water out of the reactor vessel.

BWROG EPG Step: C4-4

WNP-2 PSTG Step: C4-4

K.2 August 28, NRC Meeting Response

The NRC asked why WNP-2 should use two RPV level instruments when EPG just uses one. WNP-2 responded that in all other situations in EPGs, an operator takes conservative action by responding to only one RPV level instrument. WNP-2 maintains it is more conservative action to stay flooded than to exit RPV flooding based on one RPV level instrument. The NRC understood the issue, but stated Appendix B of the BWROG EPGs does allow for use of one instrument when it is trending. The NRC asked that WNP-2 provide better documentation in the deviation document and address the downside of using two instruments.

K.3 WNP-2 Position

WNP-2 will evaluate this deviation and associated issues as part of the WNP-2 EOP Phase II upgrade.

K.4 Reason For The Deviation

At the end of the RPV flooding contingency, direction is given to terminate all injection into the RPV and reduce RPV water level when RPV pressure has remained at least 60 psig (Minimum RPV Flooding Pressure) above wetwell for at least the Minimum Core Flooding Interval and when multiple RPV water level instruments are available. The decision to drain the RPV down is contingent upon the ability to determine that water level instrumentation is available. This action is especially critical because the BWROG EPG is directing the operator to move from a configuration that is known to be safe (flooded RPV), to a less safe configuration (lowering RPV level). In addition, one of the entry conditions to this contingency is the inability to determine RPV level. For these reasons, WNP-2 trains their operators that "restoration of RPV level indication is achieved when a consistent change in an RPV water level instrument reading is observed or a trend between

RPV water level instruments is established". As was learned in the TMI accident, dependence on a single instrument for critical parameters can cause wrong actions to be performed. Thus, WNP-2 has inserted the word "multiple" in the RPV water level instrument availability permissive as a reminder that the best way to determine whether an RPV level instrument is available is to observe a trend between two or more instruments.

The only impact of this deviation is the possibility that the vessel may remain in a fully flooded state for a longer period of time.

L. IMPLEMENTATION DEVIATION #28 (NRC Inspection Report, Attachment A, Item 5 and Attachment C)

L.1 Description of Deviation

WNP-2 restricts the RPV vent path during containment flooding to a main steam line, defeating MSIV isolation interlocks if necessary.

BWROG EPG Step: C6-2

WNP-2 PSTG Step: C6-2

L.2 August 28, NRC Meeting Response

This deviation was briefly discussed and the Supply System acknowledged that following our in-house review, we had determined that limiting RPV venting to this path was not appropriate.

L.3 WNP-2 Position

WNP-2 will withdraw this deviation and revise the appropriate Emergency Support Procedure prior to EOP Phase II upgrade.

L.4 Reason For The Deviation

The erroneous restriction to a main steam line was caused by improper interpretation of the vent path requirements. The list of possible RPV vent paths will be expanded to all useable vent paths available at WNP-2. The main steam lines are the largest vents available at WNP-2 and were originally chosen because a main steam line is the only vent path capable of handling 10 minute decay heat. It is now recognized that this criterion is not applicable to all conditions that may require RPV venting.

M. IMPLEMENTATION DEVIATION #29

M.1 Description of Deviation

Defeating "Main Steam Line" isolation interlocks is specified for venting during primary containment flooding.

BWROG EPG Step: C6-2

WNP-2 PSTG Step: C6-2

M.2 August 28, NRC Meeting Response

Same as Implementation Deviation #28.

M.3 WNP-2 Position

WNP-2 will withdraw this deviation and revise the appropriate Emergency Support Procedure prior to EOP Phase II upgrade.

M.4 Reason For The Deviation

The erroneous restriction to a main steam line was caused by improper interpretation of the vent path requirements. The list of possible RPV vent paths will be expanded to all useable vent paths available at WNP-2. The main steam lines are the largest vents available at WNP-2 and were originally chosen because a main steam line is the only vent path capable of handling 10 minute decay heat. It is now recognized that this criterion is not applicable to all conditions that may require RPV venting.

N. <u>IMPLEMENTATION DEVIATION #32</u> (NRC Inspection Report, Attachment C)

N.1 <u>Description of Deviation</u>

The WNP-2 calculation to determine the PCPL is based on the pressure at which PC vent valves will open, rather than the pressure at which they will open and close.

BWROG EPG Appendix C Worksheet: WS-9

WNP-2 Calculation: NE-02-89-27

N.2 <u>August 28, NRC Meeting Response</u>

The NRC stated a concern that due to this deviation, the PC vent valves may be damaged when WNP-2 tries to close these valves at higher PC pressures and thus the capability to close the valves and isolate containment may be lost. The NRC requested WNP-2 to evaluate impact of continuing to vent PC down to the pressure where PC vent valves can be closed. The current value is based on vendor recommendations. The NRC indicated that WNP-2 should either pursue continuing to vent to lower PC pressures or provide justification that the PC vent valves will not be damaged if closed at PC pressures higher than vendor recommendations. WNP-2 agreed to evaluate and provide better justification.

N.3 <u>WNP-2 Position</u>

WNP-2 will evaluate NRC concern and associated justification as part of the WNP-2 EOP Phase II upgrade.

N.4 <u>Reason For The Deviation</u>

To initiate venting based on valve closure pressure may result in premature and unnecessary releases to the environment. Defining PCPL by other parameters may alleviate the need to vent. If venting were required, this deviation would tend to minimize the duration of the release.

O. IMPLEMENTATION DEVIATION #35

O.1 Description of Deviation

WNP-2 adds specific direction to bypass the high steam tunnel temperature isolation interlock to prevent closure of an open MSIV to allow implementation of the EPG strategy to lower RPV level when the primary containment is being heated up during an ATWS.

BWROG EPG Step: C5-2

WNP-2 PSTG Step: C5-2

O.2 August 28, NRC Meeting Response

NRC stated that overriding this interlock is specifically excluded by EPGs. WNP-2 responded that this deviation is required to meet EPG strategy intent, and that it is a specific design issue for WNP-2. Verbatim compliance in this instance would actually prevent compliance with EPG strategy. WNP-2 noted that this is an open item with the BWROG. The Supply System stated that additional information on the justification would be provided.

O.3 WNP-2 Position

NRC position that overriding the main steam high temperature isolation interlock is specifically excluded by EPGs is correct. However at WNP-2, RPV low level signal (-50") will shed cooling in the main steam tunnel and eventually result in MSIV closure on high tunnel temperature (loss of main condenser as a heat sink). Closure of MSIVs is counter to the EPG strategy for depositing energy outside of primary containment. WNP-2 will continue to evaluate this during EOP Phase II upgrade but to date no totally acceptable solution has been identified.

O.4 Reason For The Deviation

At WNP-2, main steam tunnel cooling fans lose power (are load shed) on an F (high drywell pressure) or an A (low RPV water level) signal. Thus, when the RPV water level is lowered to reduce power, steam tunnel cooling will be lost. The BWROG EPG specifies that the low RPV water level isolation interlock for the MSIVs be bypassed to prevent loss of the main condenser when it is most desirable to maintain this heat sink. Simulator experience at WNP-2 shows that only minutes after low RPV water level (A signal) is reached the MSIVs shut on high main steam tunnel temperature. Therefore, for WNP-2 to meet the intent of this BWROG EPG step, the main steam high temperature isolation interlock must be overridden.

P. IMPLEMENTATION DEVIATION #36

P.1 Description of Deviation

WNP-2 has added the words "to determine no core damage exists" as an exclusion for allowing RWCU blowdown to clarify EPG intent.

BWROG EPG Step: RC/P-2

WNP-2 PSTG Step: RC/P-2

P.2 August 28, NRC Meeting Response

There was no NRC discussion of this deviation.

P.3 WNP-2 Position

WNP-2 intends to maintain this deviation in EOP Phase II upgrade.

P.4 Reason For The Deviation

In this step, the operator is directed to control RPV pressure below the lowest SRV setpoint and is given a list of possible systems to use to accomplish this task. One of the systems listed is the RWCU system. If no boron has been injected into the RPV, RWCU is used in the blowdown mode to provide a depressurization path for the RPV. Appendix B of the BWROG EPGs (OEI document 8390-4B page B-6-82) states with regard to RWCU blowdown: "Reactor coolant must be sampled and analyzed for activity as prescribed by existing plant sampling procedures. Failure to determine coolant activity might result in discharge of radioactivity to the environment beyond allowable limits." WNP-2 has added the words "to determine no core damage exists" to specify the type and purpose of the sampling the operator is directed to perform. These words only serve to more clearly specify the intent or strategy of the emergency operating procedures.

APPENDIX 2

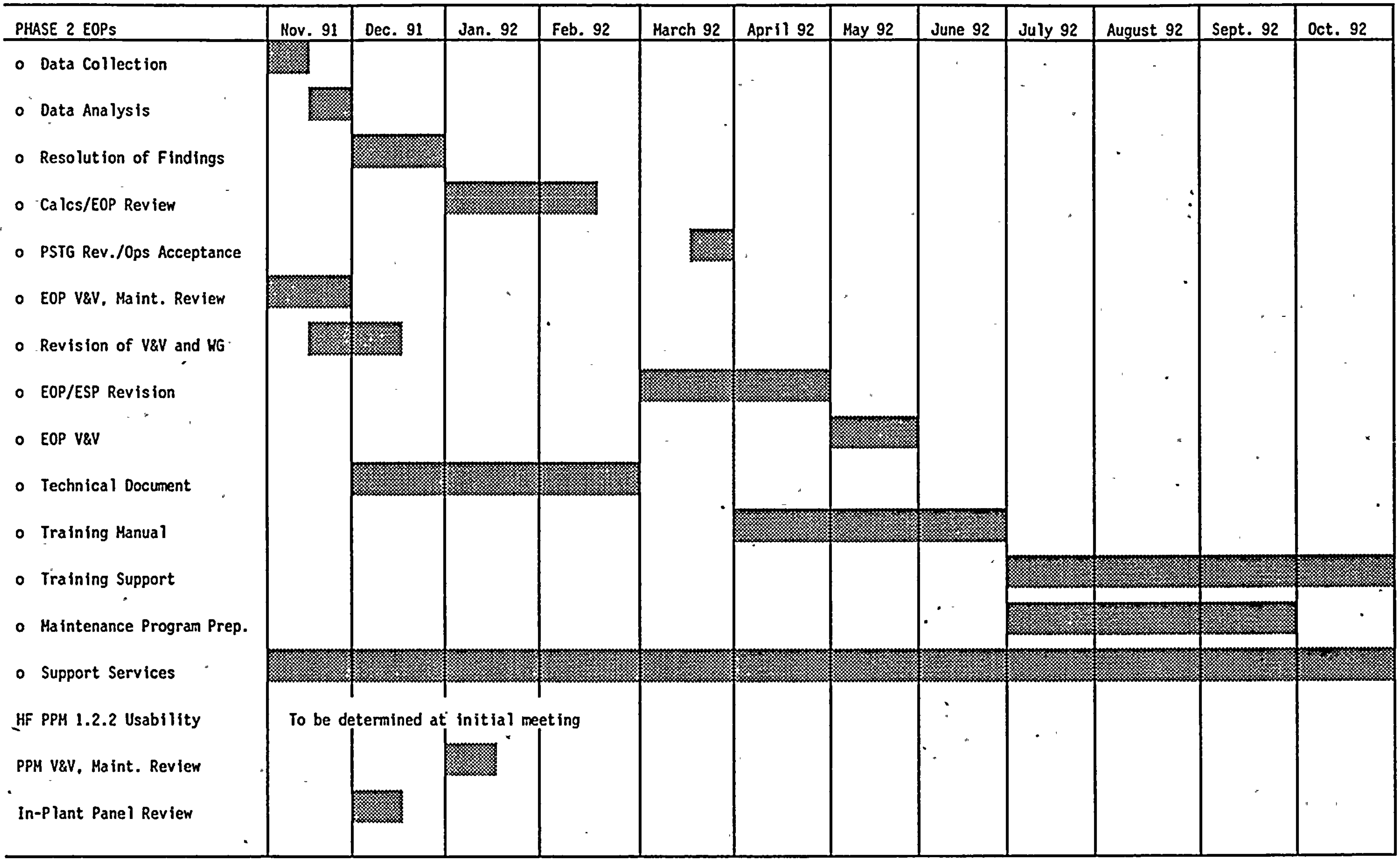
Nuclear Regulatory Commission

BA Boger
AE Cubbage
PL Eng
CM Holohan
RC Jones, Jr.
LF Miller
JD Monninger
JF Munuro
TR Quay
RK Rahmisr
WT Russel
T Sundsmo
AC Thadani
CA Vanderburgh
TE Walker

Supply System

RW Conserriere
AG Hosler
SR Kirkendall
AL Oxsen
CM Powers
LD Sharp

PHASE 2 PROCEDURE IMPROVEMENT PROGRAM



APPENDIX 3