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FAULKENBERRY,B. Region 5 (Post 820201)

SUBJECT: Withdraws 890802 commitment to include non-safety related equipment which requires operators to enter into or control within EOP within setpoint methodology program in response to NRC 871208 ltr re Insp Rept 50-397/87-19.

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August 9, 1993
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Docket No. 50-397

Mr. B. H. Faulkenberry
Regional Administrator
U.S. Nuclear Regulatory Commission
Region V
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596

Dear Mr. Faulkenberry

Subject: WNP-2, OPERATING LICENSE NPF-21
WNP-2 SETPOINT METHODOLOGY PROGRAM RELATIVE TO EOP INSTRUMENTS

References:
1) Letter dated December 8, 1987, JB Martin (NRC) to GC Sorensen (SS), "NRC Inspection Report at WNP-2 (50-397/87-19"

2) Letter, G02-89-134, dated August 2, 1989, GC Sorensen (SS) to JB Martin (NRC), "Setpoint Methodology Program Plan"

Reference 1 documents the results of an NRC Safety System Functional Inspection (SSFI) of the WNP-2 AC and DC electrical distribution systems, standby service water system and automatic depressurization system. The SSFI identified that the WNP-2 setpoint methodology did not include consideration of service environment (normal and accident) effects on instrument setpoint accuracies. Subsequent interaction with NRC Region V and Region V utilities resulted in WNP-2 issuing the Reference 2 letter.

This second reference commits that non-safety related equipment which requires operators to enter into or control within an Emergency Operating Procedure (EOP) shall also be included within the setpoint program. After interaction with the BWROG Emergency Procedure Committee (EPC) the Supply System believes that it is appropriate to withdraw the commitment to include such non-safety related equipment within the setpoint methodology program.

WNP-2 SETPOINT PROGRAM METHODOLOGY RELATIVE TO EOP INSTRUMENTS

With a symptom-based approach used for the WNP-2 EOPs, the procedures are not dependent on a predetermined sequence of operator decisions and actions. The EOPs identify procedure entry conditions and action levels by parameter values (e.g., RPV water level, pressure and reactor power) rather than specific instrument readings. The symptom-based approach gives the operator increased latitude in determining the source of information used to determine the status of a key plant parameter. It was a requirement for the development of the EOPs that they be based upon best estimate conditions. Application of instrument setpoint calculation methodology requires conservative assumptions regarding the conditions in which the instruments will be expected to function. Thus, application of the setpoint methodology program to this set of instruments is inconsistent with the basic requirement for the EOP.

The attachment provides more detailed information on the reasons for the withdrawal of the commitment to include in the setpoint methodology program that set of non-safety instruments which require the operators to enter into or control within the EOPs.

Sincerely,

J. V. Parrish (Mail Drop 1023)
Assistant Managing Director, Operations

AGH/LDS/bk
Attachments

cc: Document Control Desk
NS Reynolds - Winston & Strawn
JW Clifford - NRC
DL Williams - BPA/399
NRC Site Inspector - 901A

Attachment

I. Scope of EOP Events

In response to NUREG-0737 Item I.C.1 "Guidance for the Evaluation and Development of Procedures for Transients and Accidents," the NSSS vendors and utilities developed guidelines for operator actions during emergency events and events that could degrade into emergencies. The generic Emergency Procedure Guidelines (EPGs), were then converted into plant specific guidelines and subsequently into plant procedures by incorporating the technical features of the plant and necessary human factors considerations during the procedure development process.

General Electric Company and the BWR Owners Group (BWROG) developed EPGs that are based on the status of key plant parameters and their trends irrespective of the event that may have occurred. This resulted in guidance that relies on the operator's recognition of plant symptoms rather than event diagnosis when responding to off-normal or emergency conditions.

With a symptom-based approach, the BWR EPGs are not dependent on a predetermined sequence of operator decisions and actions. Identification of an initiating event is not required in order to determine which procedure developed from the BWR EPGs should be entered. Likewise, the operator actions specified are appropriate irrespective of the initiating event or the sequence by which subsequent events may occur. Although event diagnosis may enhance emergency response, the symptom-based guidelines make it unnecessary for successful emergency response.

As appropriate, BWR operator actions are keyed to plant parameters or symptoms. Actions are specified to restore these key plant parameters to within limits which define safe plant conditions. Thus, the EOPs identify procedure entry conditions and action levels by parameter values (e.g., RPV water level, pressure and reactor power) rather than specific instrument readings.

The symptom-based approach gives the operator increased latitude for determining the source of information used to determine the status of a key plant parameter. For example, during normal operation, the operator may rely on the Average Power Range Monitors (APRMs) for reactor power indication. During an ATWS event, however, an abnormal control rod insertion pattern may cause the APRMs to be unsuitable for determining reactor power with respect to guideline action levels. Because the EPGs do not specifically identify the use of APRMs, the operator can successfully carry out guideline decisions and action levels through use of alternate instrument systems or other methods for determining reactor power (e.g., steam flow, number of open SRVs, or number of open main turbine bypass valves.) If the EPGs identified reactor power by a specific instrument, response to the broadest spectrum of events would be unnecessarily restricted.

II. EOP Actions Beyond Design Basis

With the symptom-based approach, all mechanistically possible plant conditions for which generic operational guidance can be provided are addressed by the EPGs, irrespective of the probability of event occurrence. Thus, the EPGs address a spectrum of conditions including those more severe as well as those less severe than were considered in the development of the plant design basis. These conditions include multiple equipment failures and operator errors. Although guidance is provided for responding to plant conditions which may extend to and beyond the original design of the plant, there is no intent to extend any design basis beyond that which is currently established.

Application of instrument setpoint calculation methodology requires an assumption regarding the conditions in which the instruments will be expected to function. Anticipated initial conditions and the subsequent event sequence would need to be defined for EPG instrumentation setpoints in order to successfully implement the methodology. However, the analyzed accident conditions are not appropriate for those events that progress beyond the design basis. Conversely, application of beyond design basis conditions (assuming such a set of bounding conditions could be defined) are not appropriate for those events which remain within the plant design basis.

Adoption of either approach creates an inconsistency with the basis for the EPGs. BWR operator decisions, limits, and action levels are based on realistically bounding best-estimate engineering calculations as opposed to traditional licensing or design basis analytical methods and assumptions. The EPGs identify plant systems which can be effectively used to respond to plant emergency conditions, irrespective of the safety classification or equipment qualification of the system and its components. As a result, the EPG symptom-based approach provides the best possible operational guidance, irrespective of licensing or design basis assumptions and commitments.

III. Consequences of EOP Action Level Bias, if Adopted

Given that it could be possible to define the appropriate initial conditions and event sequence for the spectrum of events addressed by the EPGs and that the setpoint calculation methodology could thus be performed, the application of any resultant instrument setpoint bias could not be made without compromising the correctness and effectiveness of the symptom-based procedure. The following examples illustrate this point:

- One important EPG action level is the Minimum Zero-Injection RPV Water Level (MZIRWL). The MZIRWL is defined to be the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1800°F. The MZIRWL is utilized to preclude significant fuel damage and hydrogen generation for as long as possible, thus providing the operator with the maximum amount of time to make available RPV injection sources and restore RPV water level. Typically, this water level is three feet below the top of the

active fuel. On the surface it would appear to be conservative to apply an instrument setpoint bias such that the MZIRWL were closer to the top of the active fuel since core submergence is the preferred mechanism for assuring adequate core cooling. For events in which sufficient RPV injection capacity is available, this would be true. However, for other events where the maximum amount of time would be desirable for restoration of RPV injection sources, needed operating margin would be removed by applying an instrument setpoint bias in the direction that raises the MZIRWL.

An unnecessary and undesirable requirement to emergency depressurize the RPV may occur when the setpoint bias is applied such that the indicated MZIRWL is reached before the RPV water level drops to the actual MZIRWL.

- If the APRM downscale trip setpoint (typically 5%) were biased to a lower value, the operator could be required to reduce reactor power by lowering RPV water level in an ATWS event. Such action may unnecessarily cause RPV water level to approach the top of the active fuel without achieving any benefit in containment heat load reduction.

  If the APRM downscale trip setpoint were biased to a higher value, the guideline may not direct the operator to lower RPV water level for an ATWS event in which heatup of the primary containment is unacceptable. Failure to lower RPV water level may unnecessarily cause an increase in containment heat load when it could have otherwise been avoided.

- If drywell temperature instrumentation were biased such that indicated temperature were below actual drywell temperature for events less severe than the events assumed by the setpoint calculation methodology, the operator may be prohibited from initiating drywell sprays for containment pressurization events where the EPG Drywell Spray Initiation Limit would have otherwise permitted their initiation. As a result, termination of the containment pressurization event may not occur without venting the primary containment irrespective of the offsite radioactivity release.

  If the drywell temperature instrument bias caused indicated temperature to read above the actual drywell temperature, the Drywell Spray Initiation Limit may permit the initiation of drywell sprays when actual plant conditions would have otherwise restricted their initiation. Inappropriate initiation of drywell sprays could cause rapid and uncontrollable pressure reduction that breaches the primary containment boundary or compromises the pressure suppression capability of the containment. Either failure could lead to an offsite radioactivity release that could have been avoided.

IV. Conclusions

The issue of instrument uncertainty has been raised in the past by members of the BWROG. It has been addressed and resolved by the BWROG Emergency Procedures Committee-II. In the unlikely event that instrument redundancy and diversity were unavailable and the value of a parameter was not satisfactorily inferred from equipment operation, adjustment of an EPG limit or action level to compensate for the instrument setpoint bias would not be a viable consideration. Virtually every key BWR EPG limit and action level can be shown to produce an undesirable consequence when an instrument setpoint bias is applied in one direction or the other. The instrument setpoint bias is itself an event specific value. To satisfy the broad spectrum of events addressed by the symptom-based EPGs, an optimized response for one event cannot be accepted at the expense of an unsatisfactory response in other events. This conclusion has been reached by members of the BWROG. It is the Supply System's belief that, even if a bounding bias could be defined for all mechanistically possible events, application of the instrument setpoint calculation methodology to EPG limits and action levels unnecessarily removes operating margin that could be beneficial if the event that is occurring is not the one assumed in developing the setpoint bias.

Routinely, the control room crews are faced with the prospect (though unlikely) that any one of a number of emergency events could occur - events that may not conform to the expected sequence of events predicted by the plant design basis. Irrespective of probabilistic risk assessment predictions, we have the core damaging accidents at TMI-2 and Chernobyl as evidence of this fact. The BWR Owners believe that the symptom-based approach to emergency response provides operators with the best procedural tools needed to successfully combat the broadest spectrum of events. The NRC has supported the symptom-based approach to EOP development with their safety evaluation of the BWR EPGs. Therefore, the Supply System believes it unnecessary and unwise to apply instrument setpoint methodology to EPG related instrumentation when a clear benefit may not be achieved while, on the other hand, a strong likelihood of reducing the margin of safety provided by the symptom-based EPGs could exist.