



Agenda

- Purpose of Meeting
- Background
- Chronology
- Summary
- Proposed Resolution of Generic Letter 88-20 for Unit 1



Purpose of Meeting

 Provide information to NRC Staff showing that all actions required for Generic Letter 88-20 are complete for Unit 1.



Background

- On December 13, 2002, TVA proposed a Regulatory Framework for the Restart of BFN Unit 1.
 - This proposed regulatory framework identified generic communications that require TVA action for BFN Unit 1.
 - Generic Letter 88-20, "Individual Plant Examination For Severe Accident Vulnerabilities," was not listed. (NOTE: Generic Letter 88-20 Supplement 4, "Individual Plant Examination of External Events (IPEE) for Severe Accident Vulnerabilities," was listed as requiring TVA action.



Background (Cont.)

- On August 14, 2003, NRC responded to TVA's proposed Regulatory Framework for the Restart of BFN Unit 1.
 - Under the topic "Generic Communications," the staff stated that it had reviewed the list of Bulletins, Generic Letters, and TMI Action Items and agreed that the list was complete.
 - Under the topic "Special Programs," the staff stated it had previously concluded that the Individual Plant Examinations (IPE) for Units 2 and 3 have met the intent of Generic Letter 88-20. However, a similar conclusion regarding the Unit 1 IPE has not been reached. The NRC and TVA staffs will pursue this issue as a separate action.



Chronology

- November 23, 1988 NRC issued Generic Letter 88-20, Individual Plant Examination for Severe Accident Vulnerabilities, which requested all licensees:
 - Perform a systematic examination to identify any plant specific vulnerabilities to severe accidents, and
 - Identify and review proposed plant improvements (design changes and changes to operating procedures, maintenance, surveillance, training, or staffing).

The stated NRC use of the IPE results was to obtain reasonable assurance that the licensee has adequately analyzed the plant design and operations to discover instances of particular vulnerability to core melt or unusually poor containment performance given a core melt accident.



- August 29, 1989 NRC issued Generic Letter 88-20,
 Supplement 1, which contained NUREG-1335, "Individual Plant Examination: Submittal Guidance"
 - Section 2.1.4, System Analysis, requests licensees to submit "the dependency matrix for all supporting systems and front-line systems ... This also includes dependencies caused by systems that are shared among multi-unit plants."



- October 30, 1989 TVA responded to Generic Letter 88-20 for all three units. TVA committed to complete a Level 1 probabilistic risk assessment and containment analysis for Browns Ferry, satisfying the criteria of Generic Letter 88-20 and NUREG-1335 by September 1, 1992.
- June 6, 1990 NRC requested TVA provide a dependency matrix in order for the staff to better understand the dependencies among loads supplied by the diesel generators and emergency batteries. TVA submitted this information on October 1, 1990. TVA did not identify any dependencies that would compromise the analyzed safety-related systems.



 August 13, 1990 - NRC's letter on the Units 1 and 3 docket noted that the three units at BFN share important safety systems. NRC requested TVA provide expanded PRAs for Units 1 and 3 that evaluate the entire site as a whole, taking into account the risk significant combinations of unit operational status.



- October 12, 1990 TVA declined to pursue the development of PRAs for each unit at that time for the following reasons:
 - BFN does not significantly rely on safety systems which are specific to one unit to achieve and maintain safe shutdown of another unit.

- The Unit 2 dependency matrices did not identify any instances of cross-train dependencies that would compromise the analyzed safety-related systems.
- The subject of unit sharing and interactions was reviewed at the time of the original licensing of BFN.
- Generic Letter 88-20 requested licensees perform a single unit PRA. It did not request licensees of multiple unit sites perform individual PRAs for each plant at a multi-unit site or address the effect of shared systems between units. In response to Generic Letter 88-20, TVA committed to perform a Level 1 PRA and limited containment analysis, which assumed Unit 2 in operation and Units 1 and 3 shutdown.
- TVA will submit dependency matrices prior to the restart of Unit 3 which assumes Units 2 and 3 are operational and dependency matrices prior to the restart of Unit 1 which assumes Units 1, 2, and 3 are operational. (NOTE:

 Both commitments were met as part of TVA's April14, 1995 submittal.)



- June 28, 1991 NRC letter states:
 - GL 88-20 was written assuming that multiple units on a single site were, in general, physically separated and nearly identical. This assumption may not be valid for some sites, such as BFN. Therefore, the staff is presently evaluating what additional steps may be necessary to ensure that all significant severe accident vulnerabilities are identified at multi-unit sites with shared system designs.
 - TVA committed to provide the staff with unit dependency matrices prior to restart of BFN Units 1 and 3. TVA also committed to summarize the Unit 1 and 3 differences as a companion effort.
 - The staff concludes that the information to be supplied by TVA appears to be in accordance with the information currently requested by GL 88-20 and its supplements.



- February 7, 1992 After meetings with the NRC Staff, TVA submitted the resulting agreements with NRC staff on IPE issues.
 - TVA's previous commitments were in accordance with the information requested by Generic Letter 88-20.
 - TVA would separately address NRC concerns with the potential safety implications of shared systems in the various combinations of units operating.
 - TVA provided:
 - A list of systems shared between the BFN units and a description of their shared functions.
 - A review of the systems, which are shared between the BFN units. TVA identified ten systems whose ability to reliably perform their safety function could be challenged due to the impact of system sharing. The most limiting configuration for the ten shared systems occurs when all three units are in operation.
 - A complete loss of offsite power and loss of plant air are the two initiating events that could directly result in the shutdown of all three units.



- TVA committed to perform a review, considering all three units in operation, to address the impact of the ten critical shared systems during a loss of offsite power and loss of plant air events. TVA stated that it intended to submit a **summary report** to NRC prior to the restart of Unit 3, but it did not consider the submittal to be a restart prerequisite.
- July 22, 1992 NRC responded to TVA's February 7, 1992 proposal.

The Staff agreed that this report <u>was not a prerequisite for the restart of Unit 3</u> and stated that <u>TVA's approach appeared to be responsive to staff concerns</u> raised in previous correspondence, in that inter-unit dependencies through shared systems should be considered in analyzing severe accident sequences.



- September 1, 1992 TVA completed and submitted the single unit
 BFN PRA in response to Generic Letter 88-20 for all three units.
 - No vulnerabilities were identified from the Level 1 analysis. No unique Level 2 severe accident coping features or vulnerabilities were identified.
 - No plant improvements were proposed.



September 28, 1994 - NRC issued the Safety Evaluation closing Generic Letter 88-20 for <u>Unit 2 only</u>. It stated that TVA's IPE submittal addressed only single unit operation of BFN Unit 2. Closure of IPE activities for the Browns Ferry site is dependent on receipt and review of <u>TVA's multiunit PRA</u>. This position expands the scope of NRC required review from the previous June 28, 1991 staff position, which stated the Unit 2 PRA, dependency matrices, and a summary of unit differences was all that was necessary to satisfy Generic Letter 88-20.



- April 14, 1995 TVA submitted the multi-unit PRA for all three units.
 - The analysis considered more than the ten shared systems in the original commitment. The shared systems included in the model were a result of a systematic examination of all shared systems.
 - In addition to including the loss of offsite power and loss of plant air initiating events, TVA went beyond its commitment and also included floods in the turbine building and pumping station, loss of raw cooling water and loss of control bay ventilation.
 - TVA considered the multi-unit PRA to adequately reflect multi-unit operation of the BFN facility.
 - TVA stated the multi-unit PRA would be performed on a one-time basis and would not be maintained as a living document.

No vulnerabilities were identified. No plant improvements were proposed.



- May 10, 1995 An internal memorandum from Joe Williams, Project Manager, to Fred Hebdon, Director of Project Directorate II-3, states that: "The multi-unit PRA submittal of April 14, 1995 goes substantially beyond the scope of TVA's commitment."
- April 14, 1997 NRC conducts Maintenance Rule implementation inspection at the BFN site. A copy of the Units 2 and 3 PRA were obtained by NRC to support this inspection.



- June 19, 1997 NRC requested significant additional information:
 - The degree to which Unit 2 system dependencies and operational characteristics are identical to Unit 3;
 - Differences in location of Units 2 and 3 equipment and components, instrumentation, alarms and controls, procedures, plant upgrades, maintenance and test activities, containment design and performance;
 - Information on non-limiting configurations;
 - All initiating event trees, support system event trees, front line and support system electrical diagrams, generic and plant specific common cause and human failure data, etc.;
 - Plant specific human reliability analysis; and
 - A sensitivity reanalysis of dominant accident sequences to account for various combinations of non-credited systems.

TVA was not previously requested, nor agreed to provide this information. In summary, NRC requested the multi-unit PRA be resubmitted to include much of the format and content of NUREG-1335, "Individual Plant Examination Submittal Guidance," plus additional analyses not specified in the guidance. This position conflicts with the previous June 28, 1991 and July 22, 1992 staff positions.



- July 7, 1997 TVA stated that the NRC's June 19, 1997 letter reflects changes in previous staff positions regarding the necessity to perform a PRA for each unit to satisfy Generic Letter 88-20; and/or the scope of work TVA needs to perform in order to address NRC concerns with the potential safety implications of shared systems. Prior to expending substantial TVA resources in this area, TVA requested:
 - A systematic and documented analysis of the generic applicability of the staff's position to other multi-unit facilities with shared systems;
 - The determination that there is a substantial increase in the overall protection of the public health and safety or the common defense and security to be derived from these changes in staff positions; and
 - The determination that the direct and indirect costs of implementation will be justified in view of this increased protection.



- August 6, 1997 As documented in an NRC internal memorandum from Joe Williams, NRR Project Manager, to file, NRC obtained a copy of the current Units 2 and 3 PRAs while they were performing a Maintenance Rule inspection at the Browns Ferry site. The copies were placed in the Public Document Room.
- May 20, 1998 Rather than perform the analysis requested by TVA on July 7, 1997, the staff terminated its review of TVA's responses to Generic Letter 88-20 for Unit 3.



- August 10, 1998
 - TVA accepted a request to meet with representatives of the NRC staff and management to discuss the approach for resolution of outstanding issues relating to the Generic Letter 88-20 activities. TVA explained the history of Generic Letter 88-20, including the prior agreements regarding the limited scope multi-unit PRA and how all commitments had been met.
 - TVA realized that NRC had reviewed the Unit 3 PRA for conformance with Generic Letter 88-20, without TVA's prior knowledge.
 - After considerable discussion, the staff stated that considerable time had been invested in the review of the Unit 3 PRA. The staff requested TVA provide answers to a significantly reduced scope of questions from the June 19, 1997 request for additional information. NRC stated that the staff would issue a Safety Evaluation Report that would allow the Unit 3 PRA to be used for risk-informed licensing actions without further reviews.



- August 10, 1998 (Cont.)
 - TVA agreed to provide the requested limited amount of additional information in order to allow NRC to formally close Generic Letter 88-20 and to gain approval of the Unit 3 PRA as stated by the NRC staff.
 - No NRC meeting summary was issued to document TVA/NRC agreements.



 November 2, 1998 - TVA submitted the agreed information regarding residual heat removal system modeling, applicability of the Unit 2 containment model to Unit 3, verification of design and operating similarities between Units 2 and 3, and verification that the containment performance improvements have been implemented and are applicable to Unit 3.



- May 4, 1999 NRC issued a <u>Staff Evaluation</u> documenting the completion of Generic Letter 88-20 for Unit 3.
 - The Staff Evaluation states TVA docketed the Unit 3 PRA and implies it was in response to an NRC Request for Additional Information. <u>This</u> is factually incorrect.
 - NRC cited weaknesses in: the front-end analysis in terms of the lack of discussion of the PRA inputs as requested in NUREG-1335, the lack of a back-end analysis despite a significantly different core damage profile as compared to BFN Unit 2, and the lack of a discussion of the insights gained in the IPE process for BFN Unit 3. IVA was not previously requested, nor agreed to provide this information, and IVA was explicitly told in the August 10, 1998 meeting that this information would not be required.



Summary

- Generic Letter 88-20 requested licensees perform a single unit PRA. It did not request licensees of multiple unit sites perform individual PRAs for each plant at a multi-unit site or address the effect of shared systems between units. TVA docketed this position on October 12, 1990 and NRC concurred on June 28, 1991.
- TVA responded to Generic Letter 88-20 on the docket for all three units on September 1, 1992. No vulnerabilities were identified from the Level 1 analysis. No unique Level 2 severe accident coping features or vulnerabilities were identified. No plant improvements were proposed.



Summary (Cont.)

- Consistent with agreements reached with the Staff, TVA responded to NRC concerns regarding multi-unit shared systems with the multi-unit PRA, which was docketed for all three units on April 14, 1995. No vulnerabilities were identified. No plant improvements were proposed. NRC's July 22, 1992 letter had stated that TVA's approach appeared responsive to NRC's concerns. NRC internal memorandum of May 10, 1995 states the multi-unit PRA went substantially beyond the scope of TVA's commitments.
- No response from the NRC has been issued on the Unit 1 docket since the submittal of the multi-unit PRA.
- Resolution of Generic Letter 88-20 was not considered a prerequisite for Unit 3 restart and no basis exists for requiring resolution prior to Unit 1 restart.



Summary (Cont.)

• TVA considers both the formal request and intent of Generic Letter 88-20 to have been satisfied by TVA's prior submittals. The stated NRC use of the IPE results was to obtain reasonable assurance that the licensee has adequately analyzed the plant design and operations to discover instances of particular vulnerability to core melt or unusually poor containment performance given a core melt accident. TVA has provided the staff with more than reasonable assurance that TVA has adequately analyzed the plant design and operations.



Summary (Cont.)

- The potential implications of shared systems have been more than adequately addressed. This issue was resolved with the staff as part of the original licensing, revisited prior to Unit 3 restart, and neither the multi-unit PRA, nor the subsequently performed individual Unit 2 and Unit 3 PRAs have identified plant vulnerabilities when single or multiple units are in operation.
- Additional reviews are unlikely to result in plant improvements (design changes and changes to operating procedures, maintenance, surveillance, training, or staffing).

Proposed Resolution of Generic Letter 88-20 for Unit 1

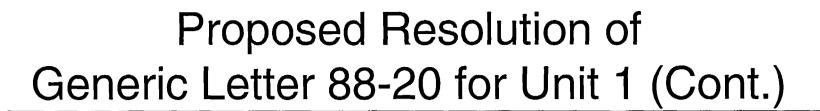


Option 1 – No NRC action required.

As previously stated by the staff, GL 88-20 did not require unit specific PRAs and TVA's proposal regarding the single unit PRA was in accordance with the information requested by GL88-20.

Resolution of the Generic Letter was not a prerequisite for Unit 3 restart. There is no basis for requiring action prior to Unit 1 restart.

Generic Letter 88-20 is 15 years old and no longer represents current utility / NRC policy. Absent the need for any regulatory decision, there is no compelling justification for the further expenditure of agency or TVA resources on this issue.





Option 2 – Close Generic Letter 88-20 based previously submitted information.

In the Commission's 1995 PRA policy statement, the Commission said it expected implementation of the policy statement would improve the regulatory process in three ways: by incorporating PRA insights in regulatory decisions, by conserving agency resources, and by reducing unnecessary burden on licensees.

NRC previously accepted TVA's response to the Generic Letter.

Multi-unit concerns have been addressed and need not be considered within the format or review framework of NUREG-1335.

Generic Letter 88-20 can be closed based on information provided by the Unit 2 PRA and the multi-unit PRA.