Nuclear Operating Company

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Relief Request for Application of an Alternative to the ASME Boiler
and Pressure Vessel Code Section XI Examination Requirements for
Class 1 Socket-Welded Piping and Class 2 Piping Welds (RR-ENG-2-23)

In accordance with the provisions of 10CFR50.55a(a)(3)(i), the South Texas Project requests relief from the ASME Section XI code examination requirements for inservice inspection of Class 1 socket-welded piping (Category B-J) and Class 2 piping welds (Categories C-F-1 and C-F-2). The South Texas Project has an approved ASME Code Class 1 risk-informed inservice inspection program plan for Class 1 piping welds (excluding socket welds). The proposed alternative, as described in the attached report, "Risk-Informed Inservice Inspection Program Plan – South Texas Project, Units 1 and 2," provides an acceptable level of quality and safety as required by 10CFR50.55a(a)(3)(i).

The South Texas Project risk-informed inservice inspection (RI-ISI) program plan has been developed in accordance with the methodology provided in Electric Power Research Institute (EPRI) Topical Report (TR) 112657, "Revised Risk-Informed Inservice Inspection Evaluation Procedure," Revision B-A. The NRC staff has found this Topical Report to be acceptable for referencing in licensing applications to the extent specified and under the limitations delineated in the report and the NRC Safety Evaluation Report, dated October 28, 1999.

The format of the South Texas Project RI-ISI program plan is consistent with the Nuclear Energy Institute (NEI)/industry template developed for applications of the EPRI RI-ISI methodology. Additional supporting documentation is available at the South Texas Project site for your review.

The South Texas Project RI-ISI program plan was developed in conjunction with RI-ISI program plans for the plants operated by Pacific Gas and Electric Company, AmerenUE, Wolf Creek Nuclear Operating Corporation, and TXU Electric. The South Texas Project and these other plants make up an industry consortium of five plants as a result of a mutual agreement known as Strategic Teaming and Resource Sharing (STARS). The other members of the STARS group can also be expected to submit similar plant-specific relief requests. These additional relief requests will be submitted in parallel with this application, in order to reduce the amount of NRC resources required to review and approve the STARS applications. Attachment 2 describes the

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methodology for identifying differences in the STARS RI-ISI applications to assist in the review of the applications.

The recent event at the V.C. Summer facility in which through-wall cracking was discovered in a 34-inch main loop hot leg reactor pressure vessel nozzle has led to an extensive industry effort to determine generic implications and appropriate corrective actions. As discussed in the NEI letter from David Modeen to Dr. Brian Sheron dated December 14, 2000, the EPRI Materials Reliability Project will lead the industry effort to address the generic implications of the V.C. Summer event.

The South Texas Project requests Nuclear Regulatory Commission approval of this relief request by August 2001. The South Texas Project intends to incorporate this risk-based approach for Class 1 socket-welded piping (Category B-J) and Class 2 piping weld (Categories C-F-1 and C-F-2) inspection into the Ten Year Inservice Inspection Plan for the second inspection interval, which began September 25, 2000, for Unit 1 and October 19, 2000, for Unit 2.

If there are any questions, please contact either Mr. M. S. Lashley at (361) 972-7523 or me at (361) 972-7902.

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PLW/
Attachment: 1) Risk-Informed Inservice Inspection Program Plan (for Class 1 Piping Socket Welds and Class 2 Piping Welds)
2) Description of Difference Methodology

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RISK-INFORMED INSERVICE INSPECTION PROGRAM PLAN
(for Class 1 Piping Socket Welds and Class 2 Piping Welds)

SOUTH TEXAS PROJECT

Units 1 and 2

Table of Contents

(Note: Entries in brackets contain information specific to the South Texas Project. Non-bracketed information is applicable in general. Plant-specific information in tables is not bracketed.)

1. INTRODUCTION

[South Texas Project Units 1 and 2 are currently in the second inservice inspection interval as specified in 10CFR50.55a(g)(4). The second inservice inspection interval for South Texas Project commenced on September 25, 2000, for Unit 1, and October 19, 2000, for Unit 2. Pursuant to 10CFR50.55a(g)(4)(ii), the applicable ASME Section XI Code for both units is the 1989 Edition, no Addenda.]

[By letter dated December 30, 1999, as supplemented April 17, 2000, the South Texas Project submitted Relief Request RR-ENG-2-16 to the NRC seeking relief from the ASME Section XI inservice inspection requirements for non-socket welded Class 1 piping. This request was based on the risk-informed process described in EPRI Topical Report TR-112657. The NRC approved RR-ENG-2-16 by letter dated September 11, 2000.]

The objective of this submittal is to request a change to the inservice inspection program for Class 1 socket-welded piping and Class 2 piping through the use of a risk-informed inservice inspection (RI-ISI) program. The RI-ISI process used in this submittal is described in Electric Power Research Institute (EPRI) Topical Report TR-112657 Rev. B-A "Revised Risk-Informed Inservice Inspection Evaluation Procedure." The RI-ISI application was also conducted in a manner consistent with ASME Code Case N-578, "Risk-Informed Requirements for Class 1, 2, and 3 Piping, Method B."

[The current request will work in conjunction with RR-ENG-2-16 to address Class 1 socket-welded and non-socket welded piping, and Class 2 piping.]

1.1 Relation to NRC Regulatory Guides 1.174 and 1.178

As a risk-informed application, this submittal meets the intent and principles of Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis," and Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking Inservice Inspection of Piping." Further information is provided in Section 3.6.2 relative to defense-in-depth.

1.2 PSA Quality

[The South Texas Project probabilistic risk assessment model revision used to evaluate the consequences of pipe rupture for the RI-ISI assessment was the Level 2 Probabilistic Safety Assessment and Individual Plant Examination submittal, dated August 1992, supplemented by the current PRA model, STP_1997.]

[The base core damage frequency (CDF) and base large early release frequency (LERF) from the STP_1997 model are 1.17E-05 per year and 5.50E-07 per year, respectively.]

[Probabilistic risk assessment model updates are performed each refueling cycle. The current model is scheduled to undergo the Westinghouse Certification process in April 2002. Internal self-assessment and quality assurance review is on-going and is part of the model control programs established at the South Texas Project to ensure the quality of the probabilistic risk assessment model.]

[The South Texas Project received a safety evaluation report in 1997 accepting the Graded QA Program. NRC acceptance of this program was based largely on the results of their review of the then-current PRA model (STP_1996) and the programs in place to control the PRA.]

[In addition, the NRC's review of the Individual Plant Examination identified areas for improvement. These areas and their disposition are as follows:

- **NRC Recommendation 1** - Implement the RISKMAN 3.0 system conversions for calculating internally generated initiating events (i.e., loss of ECW, loss of CCW, loss of EAB HVAC, loss of control room HVAC, and loss of DC buses).

  Plant Response - These items were included in the 1994 model update and are maintained and upgraded in accordance with the PRA control program.

- **NRC Recommendation 2** - Revise the system analyses and event tree rules to reflect the present plant practice of operating two ECW trains and one standby train instead of one train on, one train off, and one train in standby.

  Plant Response - This item was revised in 1994 and expanded to include any possible configuration of operating and standby trains in 1996.

- **NRC Recommendation 3** - Incorporate new system analyses and split fraction data for new top events.

  Plant Response - This information was included in the IPE in 1994 and is maintained in accordance with the PRA control program.

- **NRC Recommendation 4** - Consider accident management strategies of intentional primary system depressurization and post-core damage recovery (recovery of AC power and introducing firewater into the secondary of a dry steam generator).

  Plant Response - The Severe Accident Management Guidelines (SAMGs) were adopted at the South Texas Project in June 1997 and are included in the current Level 2 Analyses for PRA model, STP_1997.]

2. PROPOSED ALTERNATIVE TO CURRENT INSERVICE INSPECTION PROGRAM REQUIREMENTS

2.1 ASME Section XI

ASME Section XI Examination Categories B-F, B-J, C-F-1 and C-F-2 currently contain the requirements for nondestructive examination of Class 1 and 2 piping components. The alternative RI-ISI program for piping is described in TR-112657. The RI-ISI program will be substituted for the currently approved program for Class 1 [socket-welded piping (Examination Category B-J) and Class 2 piping (Examination Categories C-F-1 and C-F-2)] in accordance with 10CFR50.55a(a)(3)(i) by alternatively providing an acceptable level of quality and safety. [Examination Category B-F and non-socket welded piping in Examination Category B-J were addressed in previously approved RI-ISI relief request RR-ENG-2-16.] Remaining portions of the ASME Section XI Code will be unaffected. TR-112657 provides the requirements for defining the relationship between the RI-ISI program and the remaining unaffected portions of ASME Section XI.

2.2 Augmented Programs

The following augmented inspection programs were considered during the RI-ISI application:

- The augmented plant inspection program implemented during the first inspection interval in response to NRC IE Bulletin 79-17 has been subsumed into the RI-ISI program because the potential for pipe cracking in stagnant borated water is explicitly considered in the application of the EPRI RI-ISI process.
- [The augmented inspection program for flow accelerated corrosion (FAC) per Generic Letter 89-08 is relied upon to manage this damage mechanism but is not otherwise affected or changed by the RI-ISI program.]
- [Examinations of Main Steam and Feedwater system piping outside containment, defined as the "Break Exclusion Zone," shall be performed in accordance with NUREG-0800, Standard Review Plan 3.6.2, "Determination of Break Locations and Dynamic Effects Associated with the Postulated Rupture of Piping." The augmented inspection program for high energy break exclusion zone piping is not affected by the RI-ISI program.]

3. RISK-INFORMED ISI PROCESS

The process used to develop the RI-ISI program conformed to the methodology described in EPRI TR-112657 and consisted of the following steps:

- Scope Definition
- Consequence Evaluation
- Failure Potential Assessment
- Risk Characterization

- Element and Nondestructive Examination Selection
- Risk Impact Assessment
- Implementation Program
- Feedback Loop

A deviation to the EPRI RI-ISI methodology has been implemented in the failure potential assessment for the South Texas Project. Table 3-16 of EPRI TR-112657 contains criteria for assessing the potential for thermal stratification, cycling, and striping (TASCS). Key attributes for horizontal or slightly sloped piping greater than 1" nominal pipe size (NPS) include:

1. Potential for low flow in a pipe section connected to a component allowing mixing of hot and cold fluids, or
2. Potential for leakage flow past a valve, including in-leakage, out-leakage and cross-leakage allowing mixing of hot and cold fluids, or
3. Potential for convective heating in dead-ended pipe sections connected to a source of hot fluid, or
4. Potential for two phase (steam/water) flow, or
5. Potential for turbulent penetration into a relatively colder branch pipe connected to header piping containing hot fluid with turbulent flow,

   AND

   $\Delta T > 50^{\circ}F$,

   AND

   Richardson Number > 4 (This value predicts the potential buoyancy of stratified flow.)

These criteria, based on meeting a high cycle fatigue endurance limit with the actual ΔT assumed equal to the greatest potential ΔT for the transient, will identify all locations where stratification is likely to occur, but allows for no assessment of severity. As such, many locations will be identified as subject to TASCS where no significant potential for thermal fatigue exists. The critical attribute missing from the existing methodology that would allow consideration of fatigue severity is a criterion that addresses the potential for fluid cycling. The impact of this additional consideration on the existing TASCS criteria is presented below.

➢ **Turbulent penetration TASCS**

Turbulent penetration typically occurs in lines connected to piping containing hot flowing fluid. In the case of downward facing lines, significant top-to-bottom ΔTs can develop in horizontal sections within about 25 pipe diameters, and the conditions can potentially be cyclic. For an upward or horizontal facing branch line connected to the hot fluid source, natural convective effects will fill the line with hot water. In the absence of in-leakage towards the hot fluid source, this will result in a well-mixed fluid condition where significant top-to-bottom ΔTs will not occur. Even in fairly long lines, where some heat loss from the outside of the piping will tend to occur and some fluid stratification may be present, there is no significant potential for cycling. The effect of TASCS will not be significant under these conditions and can be neglected.

- **Low flow TASCS**

  In some situations, the transient startup of a system (e.g., RHR suction piping) creates the potential for fluid stratification as flow is established. In cases where no cold fluid source exists, the hot flowing fluid will fairly rapidly displace the cold fluid in stagnant lines, while fluid mixing will occur in the piping further removed from the hot source and stratified conditions will exist only briefly as the line fills with hot fluid. As such, since the situation is transient in nature, it can be assumed that the criteria for thermal transients (TT) will govern.

- **Valve leakage TASCS**

  Sometimes a very small leakage flow can occur outward past a valve into a line with a significant temperature difference. However, since this is a generally a "steady-state" phenomenon with no potential for cyclic temperature changes, the effect of TASCS is not significant and can be neglected.

- **Convection heating TASCS**

  Similarly, there sometimes exists the potential for heat transfer across a valve to an isolated section beyond the valve, resulting in fluid stratification due to natural convection. However, since there is no potential for cyclic temperature changes in this case, the effect of TASCS is not significant and can be neglected.

These additional considerations for determining the potential for thermal fatigue as a result of the effects of TASCS were applied in the failure potential assessment for South Texas Project. This constitutes a deviation from the requirements of EPRI TR-112657 since the methodology does not presently provide any allowance for the consideration of cycle severity in assessing the potential for TASCS effects. For the reasons discussed above, this approach is considered technically justifiable. Furthermore, EPRI concurs with this position and intends to address this issue in a future revision to the methodology.

3.1 Scope Definition

The systems included in the RI-ISI program are provided in Tables 3.1-1 and 3.1-2 for Units 1 and 2, respectively. The piping and instrumentation diagrams and additional plant information including the existing plant inservice inspection program were used to define the Class 1 and 2 piping system boundaries.

3.2 Consequence Evaluation

The consequence(s) of pressure boundary failures were evaluated and ranked based on their impact on core damage and containment performance (isolation, bypass, and large, early release). The impact on these measures due to both direct and indirect effects was considered using the guidance provided in EPRI TR-112657. Internal events, internal flooding, containment performance, other modes of operation (e.g., shutdown operation), and external events are evaluated in the analysis.

3.3 Failure Potential Assessment

Failure potential estimates were generated utilizing industry failure history, plant specific failure history and other relevant information. These failure estimates were determined using the guidance provided in EPRI TR-112657.

Tables 3.3-1 and 3.3-2 summarize the failure potential assessment by system for each degradation mechanism that was identified as potentially operative for Units 1 and 2, respectively.

3.4 Risk Characterization

In the preceding steps, each run of piping within the scope of the program was evaluated to determine its impact on core damage and containment performance (isolation, bypass and large, early release) as well as its potential for failure. Given the results of these steps, piping segments are defined as continuous runs of piping potentially susceptible to the same type(s) of degradation and whose failure will result in similar consequence(s). Segments are then ranked based upon their risk significance as defined in EPRI TR-112657.

The results of these calculations are presented in Tables 3.4-1 and 3.4-2 for Units 1 and 2, respectively.

3.5 Element and Nondestructive Examination Selection

In general, EPRI TR-112657 requires that 25% of the locations in the high risk region and 10% of the locations in the medium risk region be selected for inspection using appropriate nondestructive examination methods tailored to the applicable degradation mechanism. In addition, per Section 3.6.4.2 of EPRI TR-112657, if the percentage of Class 1 piping locations selected for examination falls substantially below 10%, then the basis for selection needs to be investigated. [As previously discussed, this submittal addresses socket-welded Class 1 piping and all Class 2 piping, while non-socket welded Class 1 piping is addressed by approved relief request RR-ENG-2-16. As such, this submittal works in conjunction with RR-ENG-2-16 for the RI-ISI application on Class 1 piping welds. Therefore, the percentage of Class 1 locations selected per the RI-ISI process needs to include the results of both applications. As shown below, when the RI-ISI applications are combined, the overall percentage of Class 1 locations selected for RI-ISI examination is 10.1% for Unit 1, and 10.0% for Unit 2. It should be noted that at least 10% of the Class 1 locations selected for examination are non-socket welds that are subject to a volumetric examination rather than just a VT-2 visual examination. Therefore, the criteria of EPRI TR-112657, Section 3.6.4.2, are satisfied.]

A brief summary is provided in the following tables, and the results of the selection process are presented in Tables 3.5-1 and 3.5-2 for Units 1 and 2, respectively. It should be noted that no credit was taken for any FAC or existing high energy break exclusion zone piping augmented inspection program locations in meeting the sampling percentage requirements. Section 4 of EPRI TR-112657 was used as guidance in determining the examination requirements for these locations.

Summary of Welds in This RI-ISI Submittal

Unit	Class 1 Piping Welds(1)		Class 2 Piping Welds(2)		All Piping Welds(3)	
	Total	Selected	Total	Selected	Total	Selected
1	21	1	1746	7	1767	8
2	30	0	1663	7	1693	7

Notes
1. Includes socket welded Category B-J locations.
2. Includes all Category C-F-1 and C-F-2 locations.
3. All in-scope piping components, regardless of risk classification, will continue to receive Code required pressure testing, as part of the current ASME Section XI program. VT-2 visual examinations are scheduled in accordance with the station's pressure test program that remains unaffected by the RI-ISI program.

Summary of Welds in This RI-ISI Submittal and Request No. RR-ENG-2-16

Unit	Class 1 Piping Welds(1)		Class 2 Piping Welds(2)		All Piping Welds(3)	
	Total	Selected	Total	Selected	Total	Selected
1	593	60	1746	7	2339	67
2	588	59	1663	7	2251	66

Notes
1. Includes all Category B-F and B-J locations.
2. Includes all Category C-F-1 and C-F-2 locations.
3. All in-scope piping components, regardless of risk classification, will continue to receive Code required pressure testing, as part of the current ASME Section XI program. VT-2 visual examinations are scheduled in accordance with the station's pressure test program that remains unaffected by the RI-ISI program.

3.5.1 Additional Examinations

The RI-ISI program in all cases will determine through an engineering evaluation the root cause of any unacceptable flaw or relevant condition found during examination. The evaluation will include the applicable service conditions and degradation mechanisms to establish that the element(s) will still perform their intended safety function during subsequent operation. Elements not meeting this requirement will be repaired or replaced.

The evaluation will include whether other elements in the segment or segments are subject to the same root cause conditions. Additional examinations will be performed on these elements up to a number equivalent to the number of elements required to be inspected on the segment or segments initially. If unacceptable flaws or relevant conditions are again found similar to the initial problem, the remaining elements identified as susceptible will be examined. No additional examinations will be performed if there are no additional elements identified as being susceptible to the same root cause conditions.

3.5.2 Program Relief Requests

An attempt has been made to select RI-ISI locations for examination such that >90% coverage (i.e., Code Case N-460 criteria) is attainable. However, some limitations will not be known until the examination is performed, since some locations may be examined for the first time by the specified techniques.

At this time, all the RI-ISI examination locations that have been selected provide >90% coverage. In instances where locations may be found at the time of the examination that do not meet the >90% coverage requirement, the process outlined in EPRI TR-112657 will be followed.

[No existing relief requests are affected by this submittal. Consequently, none of the existing South Texas Project relief requests are being withdrawn.]

3.6 Risk Impact Assessment

The RI-ISI program has been developed in accordance with Regulatory Guide 1.174 and the requirements of EPRI TR-112657. The risk from implementation of this program is expected to remain neutral or decrease when compared to that estimated from current requirements.

This evaluation allocated segments into High, Medium, and Low risk regions of the EPRI TR-112657 and ASME Code Case N-578 risk-ranking matrix, and then determined inspection changes to be applied for each of the locations in each segment. The changes include changing the number and location of inspections within the segment, in many cases improving the effectiveness of the inspection to account for the findings of the RI-ISI degradation mechanism assessment. For example, for locations subject to thermal fatigue, examinations will be conducted on an expanded volume and will be focused to enhance the probability of detection (POD) during the inspection process.

3.6.1 Quantitative Analysis

Limits are imposed by the EPRI methodology to ensure that the change in risk resulting from implementation of the RI-ISI program meets the requirements of Regulatory Guides 1.174 and 1.178. The EPRI criterion requires that the cumulative change in core damage frequency (CDF) and large early release frequency (LERF) be less than 1E-07 and 1E-08 per year per system, respectively.

[The South Texas Project] conducted a risk impact analysis per the requirements of Section 3.7 of EPRI TR-112657. The analysis estimates the net change in risk due to the positive and negative influence of adding and removing locations from the inspection program. A risk quantification was performed using the "Simplified Risk Quantification Method" described in

Section 3.7 of EPRI TR-112657. For medium consequence category segments, bounding estimates of 1E-04 and 1E-05 were used for conditional core damage probability (CCDP) and conditional large early release probability (CLERP), respectively. The likelihood of pressure boundary failure (PBF) is determined by the presence of different degradation mechanisms and the rank is based on the relative failure probability. The basic likelihood of PBF for a piping location with no degradation mechanism present is given as x_o and is expected to have a value less than 1E-08. Piping locations identified as having a medium failure potential have a likelihood of $20x_o$. These PBF likelihoods are consistent with those used in the approved RI-ISI pilot applications at Arkansas Nuclear One, Unit 2, and Vermont Yankee, as documented in References 9 and 14 of EPRI TR-112657. In addition, the analysis was performed both with and without taking credit for enhanced inspection effectiveness due to an increased probability of detection from application of the RI-ISI approach.

Tables 3.6-1 and 3.6-2 present summaries of the RI-ISI program versus [1989] ASME Section XI Code Edition program requirements and identifies on a per system basis each applicable risk category for Units 1 and 2, respectively. Adjustment for the presence of FAC was made in the performance of the quantitative analysis by excluding its impact on the risk ranking. However, in an effort to be as informative as possible for those systems where FAC is present, the information in Tables 3.6-1 and 3.6-2 is presented in such a manner as to depict what the resultant risk categorization is both with and without consideration of FAC. This is accomplished by enclosing the FAC damage mechanism, as well as all other resultant corresponding changes (failure potential rank, risk category and risk rank) in parentheses. Again, this has only been done for information purposes, and has no impact on the assessment itself. Use of this approach to depict the impact of degradation mechanisms managed by augmented inspection programs on the risk categorization is consistent with that used in the delta risk assessment for the Arkansas Nuclear One, Unit 2 pilot application. An example is provided below:

System	Risk		Consequence Rank	Failure Potential	
	Category	Rank[1]		DMs	Rank
FWS	5 (3)	Medium (High)	Medium	TASCS, TT, (FAC)	Medium (High)

In this example if FAC is not considered, the failure potential rank is "medium" instead of "high" based on the TASCS and TT damage mechanisms. When a "medium" failure potential rank is combined with a "medium" consequence rank, it results in risk category 5 ("medium" risk) being assigned instead of risk category 3 ("high" risk).

In this example if FAC were considered, the failure potential rank would be "high" instead of "medium". If a "high" failure potential rank were combined with a "medium" consequence rank, it would result in risk category 3 ("high" risk) being assigned instead of risk category 5 ("medium" risk).

Note

1. The risk rank is not included in Tables 3.6-1 or 3.6-2 but it is included in Tables 5-2-1 and 5-2-2.

As indicated in the following tables, this evaluation has demonstrated that unacceptable risk impacts will not occur from implementation of the RI-ISI program, and satisfies the acceptance criteria of Regulatory Guide 1.174 and EPRI TR-112657.

Unit 1 Risk Impact Results

System[1]	ΔRisk$_{CDF}$		ΔRisk$_{LERF}$	
	w/ POD	w/o POD	w/ POD	w/o POD
RCS	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
SIS	negligible	negligible	negligible	negligible
RHRS	-1.80E-11	1.00E-11	-1.80E-12	1.00E-12
CSS	negligible	negligible	negligible	negligible
AFW	-4.80E-11	-2.00E-11	-4.80E-12	-2.00E-12
FWS	-3.60E-11	-2.00E-11	-3.60E-12	-2.00E-12
MSS	negligible	negligible	negligible	negligible
SLS	no change	no change	no change	no change
Total	**-1.20E-10**	**-4.00E-11**	**-1.20E-11**	**-4.00E-12**

Note

1. Systems are described in Table 3.1-1.

Unit 2 Risk Impact Results

System[1]	$\Delta Risk_{CDF}$		$\Delta Risk_{LERF}$	
	w/ POD	w/o POD	w/ POD	w/o POD
RCS	no change	no change	no change	no change
SIS	negligible	negligible	negligible	negligible
RHRS	-1.80E-11	1.00E-11	-1.80E-12	1.00E-12
CSS	negligible	negligible	negligible	negligible
AFW	-4.20E-11	-1.00E-11	-4.20E-12	-1.00E-12
FWS	-3.00E-11	-1.00E-11	-3.00E-12	-1.00E-12
MSS	negligible	negligible	negligible	negligible
SLS	no change	no change	no change	no change
Total	**-9.00E-11**	**-1.00E-11**	**-9.00E-12**	**-1.00E-12**

Note

1. Systems are described in Table 3.1-2.

3.6.2 Defense-in-Depth

The intent of the inspections mandated by ASME Section XI for piping welds is to identify conditions such as flaws or indications that may be precursors to leaks or ruptures in a system's pressure boundary. Currently, the process for picking inspection locations is based upon structural discontinuity and stress analysis results. As depicted in ASME White Paper 92-01-01 Rev. 1, "Evaluation of Inservice Inspection Requirements for Class 1, Category B-J Pressure Retaining Welds," this method has been ineffective in identifying leaks or failures. EPRI TR-112657 and Code Case N-578 provide a more robust selection process founded on actual service experience with nuclear plant piping failure data.

This process has two key independent ingredients; that is, a determination of each location's susceptibility to degradation and secondly, an independent assessment of the consequence of the piping failure. These two ingredients assure defense-in-depth is maintained. First, by evaluating a location's susceptibility to degradation, the likelihood of finding flaws or indications that may be precursors to leaks or ruptures is increased. Secondly, the consequence assessment effort has a single failure criterion. As such, no matter how unlikely a failure scenario is, it is ranked High in the consequence assessment, and at worst Medium in the risk assessment (i.e., Risk Category 4) if, as a result of the failure, there is no mitigative equipment available to respond to the event. In addition, the consequence assessment takes into account equipment reliability, and less credit is given to less reliable equipment.

All locations within the Class 1 and 2 pressure boundaries will continue to receive a system pressure test and visual VT-2 examination as currently required by the Code regardless of its risk classification.

4. IMPLEMENTATION AND MONITORING PROGRAM

Following approval of the RI-ISI program, procedures complying with the guidelines described in EPRI TR-112657 will implement and monitor the program. The new program will be integrated into [the second inservice inspection interval for Units 1 and 2]. No change to the [Updated Final Safety Analysis Report] is necessary for program implementation.

The applicable aspects of the ASME Code not affected by this change would be retained, such as inspection methods, acceptance guidelines, pressure testing, corrective measures, documentation requirements, and quality control requirements. Existing ASME Section XI program implementing procedures will be retained and modified to address the RI-ISI process, as appropriate.

The monitoring and corrective action program will contain the following elements:

A. Identify
B. Characterize
C. (1) Evaluate, determine the cause and extent of the condition identified
   (2) Evaluate, develop a corrective action plan or plans
D. Decide
E. Implement
F. Monitor
G. Trend

The RI-ISI program is a living program requiring feedback of new relevant information to ensure the appropriate identification of high safety significant piping locations. As a minimum, risk ranking of piping segments will be reviewed and adjusted on an ASME period basis. In addition, significant changes may require more frequent adjustment as directed by NRC Bulletin or Generic Letter requirements, or by industry and plant-specific feedback.

5. PROPOSED ISI PROGRAM PLAN CHANGE

A comparison between the RI-ISI program and ASME Section XI Code program requirements for in-scope piping is provided in Tables 5-1-1 and 5-2-1 for Unit 1 and Tables 5-1-2 and 5-2-2 for Unit 2. Tables 5-1-1 and 5-1-2 provide summary comparisons by risk region. Tables 5-2-1 and 5-2-2 provide the same comparison information, but in a more detailed manner by risk category, similar to the format used in Tables 3.6-1 and 3.6-2.

[South Texas Project Units 1 and 2 are currently at the start of the first period of their second inservice inspection interval. As such, 100% of the required RI-ISI program inspections will be completed in the second interval. Examinations shall be performed during the interval such that the period examination percentage requirements of ASME Section XI, paragraphs IWB-2412 and IWC-2412, are met.]

Subsequent ISI intervals will implement 100% of the examination locations selected per the RI-ISI program. These examinations will be distributed between periods such that the period percentage requirements of ASME Section XI, paragraphs IWB-2412 and IWC-2412 are met.

6. REFERENCES/DOCUMENTATION

6.1 EPRI TR-112657, "Revised Risk-Informed Inservice Inspection Evaluation Procedure", Rev. B-A

6.2 ASME Code Case N-578, "Risk-Informed Requirements for Class 1, 2, and 3 Piping, Method B, Section XI, Division 1"

6.3 Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis"

6.4 Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking Inservice Inspection of Piping"

7. SUPPORTING ONSITE DOCUMENTATION

7.1 "Consequence Evaluation of Class 1 (socket welded) and Class 2 Piping in Support of ASME Code Case N-578," South Texas Project Electric Generating Station (STPEGS), Units 1 and 2, PSA-01-0002, Rev. 0

7.2 "Degradation Mechanism Evaluation for the South Texas Project Electric Generating Station (STPEGS) – Units 1 and 2," Rev. 0, dated February 6, 2001

7.3 "Service History and Susceptibility Review for STPEGS Units 1 and 2," Rev. 0, dated June, 2000

7.4 "STPEGS Units 1 and 2 Risk Ranking Summary, Matrix and Report," Rev. 0, dated December 18, 2000

7.5 Record of Conversation No. ROC-003, "Minutes of the Element Selection Meeting for the Risk-Informed ISI Project at the South Texas Project Electric Generating Station," dated August 21, 2000

7.6 "Risk Impact Analysis for STPEGS Units 1 and 2," Rev. 0

Table 3.1-1 Unit 1 - System Selection and Segment / Element Definition			
System Description	**ASME Code Class**	**Number of Segments**	**Number of Elements**
RCS – Reactor Coolant System	Class 1	13	21
SIS – Safety Injection System	Class 2	56	736
RHRS – Residual Heat Removal System	Class 2	29	364
CSS – Containment Spray System	Class 2	9	126
AFW – Auxiliary Feedwater System	Class 2	23	167
FWS – Feedwater System	Class 2	20	144
MSS – Main Steam System	Class 2	40	197
SLS – Sludge Lancing System	Class 2	1	12
Totals		**191**	**1767**

Table 3.1-2

Unit 2 - System Selection and Segment / Element Definition

System Description	ASME Code Class	Number of Segments	Number of Elements
RCS – Reactor Coolant System	Class 1	11	30
SIS – Safety Injection System	Class 2	55	693
RHRS – Residual Heat Removal System	Class 2	28	361
CSS – Containment Spray System	Class 2	9	118
AFW – Auxiliary Feedwater System	Class 2	24	162
FWS – Feedwater System	Class 2	20	120
MSS – Main Steam System	Class 2	40	201
SLS – Sludge Lancing System	Class 2	1	8
Totals		**188**	1693

Table 3.3-1

Unit 1 - Failure Potential Assessment Summary

System[1]	Thermal Fatigue		Stress Corrosion Cracking				Localized Corrosion			Flow Sensitive	
	TASCS	TT	IGSCC	TGSCC	ECSCC	PWSCC	MIC	PIT	CC	E-C	FAC
RCS		X									
SIS											
RHRS		X									
CSS											
AFW	X	X									X
FWS	X										X
MSS											
SLS											

Note

1. Systems are described in Table 3.1-1.

Table 3.3-2

Unit 2 - Failure Potential Assessment Summary

System[1]	Thermal Fatigue		Stress Corrosion Cracking				Localized Corrosion			Flow Sensitive	
	TASCS	TT	IGSCC	TGSCC	ECSCC	PWSCC	MIC	PIT	CC	E-C	FAC
RCS											
SIS											
RHRS		X									
CSS											
AFW	X	X									X
FWS	X										X
MSS											
SLS											

Note

1. Systems are described in Table 3.1-2.

Table 3.4-1

Unit 1 - Number of Segments by Risk Category With and Without Impact of FAC

System[1]	High Risk Region						Medium Risk Region				Low Risk Region			
	Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7	
	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without
RCS									1	1	8	8	4	4
SIS											47	47	9	9
RHRS									6	6	16	16	7	7
CSS											9	9		
AFW					23[2]	0			0	12	0	11		
FWS					20[3]	0			0	4	0	16		
MSS											40	40		
SLS													1	1
Total					43	0			7	23	120	147	21	21

Notes

1. Systems are described in Table 3.1-1.
2. Of these 23 segments, 12 segments become Category 5 after FAC is removed from consideration due to the presence of another “medium” failure potential damage mechanism, and 11 segments become Category 6 after FAC is removed from consideration due to no other damage mechanisms being present.
3. Of these 20 segments, 4 segments become Category 5 after FAC is removed from consideration due to the presence of another “medium” failure potential damage mechanism, and 16 segments become Category 6 after FAC is removed from consideration due to no other damage mechanisms being present.

Table 3.4-2

Unit 2 - Number of Segments by Risk Category With and Without Impact of FAC

System[1]	High Risk Region						Medium Risk Region				Low Risk Region			
	Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7	
	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without
RCS											7	7	4	4
SIS											46	46	9	9
RHRS									6	6	15	15	7	7
CSS											9	9		
AFW					24[2]	0			0	12	0	12		
FWS					20[3]	0			0	4	0	16		
MSS											40	40		
SLS													1	1
Total					44	0			6	22	117	145	21	21

Notes

1. Systems are described in Table 3.1-2.
2. Of these 24 segments, 12 segments become Category 5 after FAC is removed from consideration due to the presence of another "medium" failure potential damage mechanism, and 12 segments become Category 6 after FAC is removed from consideration due to no other damage mechanisms being present.
3. Of these 20 segments, 4 segments become Category 5 after FAC is removed from consideration due to the presence of another "medium" failure potential damage mechanism, and 16 segments become Category 6 after FAC is removed from consideration due to no other damage mechanisms being present.

Table 3.5-1

Unit 1 - Number of Elements Selected for Inspection by Risk Category Excluding Impact of FAC

System[1]	High Risk Region						Medium Risk Region				Low Risk Region			
	Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7	
	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected
RCS									1	1	12	0	8	0
SIS											681	0	55	0
RHRS									12	2	332	0	20	0
CSS											126	0		
AFW									26	3	141	0		
FWS									16	2	128	0		
MSS											197	0		
SLS													12	0
Total									55	8	1617	0	95	0

Notes

1. Systems are described in Table 3.1-1.

Table 3.5-2

Unit 2 - Number of Elements Selected for Inspection by Risk Category Excluding Impact of FAC

System[1]	High Risk Region						Medium Risk Region				Low Risk Region			
	Category 1		Category 2		Category 3		Category 4		Category 5		Category 6		Category 7	
	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected	Total	Selected
RCS											20	0	10	0
SIS											553	0	140	0
RHRS									12	2	328	0	21	0
CSS											118	0		
AFW									29	3	133	0		
FWS									13	2	107	0		
MSS											201	0		
SLS													8	0
Total									54	7	1460	0	179	0

Notes

1. Systems are described in Table 3.1-2.

Table 3.6-1

Unit 1 - Risk Impact Analysis Results

System[1]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[3]		LERF Impact[3]	
			DMs	Rank	Section XI[2]	RI-ISI	Delta	w/ POD	w/o POD	w/ POD	w/o POD
RCS	5	Medium	TT	Medium	0	1	1	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
RCS	6	Medium	None	Low	0	0	0	no change	no change	no change	no change
RCS	7	Low	None	Low	0	0	0	no change	no change	no change	no change
RCS Total								**-1.80E-11**	**-1.00E-11**	**-1.80E-12**	**-1.00E-12**
SIS	6	Medium	None	Low	40	0	-40	negligible	negligible	negligible	negligible
SIS	7	Low	None	Low	8	0	-8	negligible	negligible	negligible	negligible
SIS Total								**negligible**	**negligible**	**negligible**	**negligible**
RHRS	5	Medium	TT	Medium	3	2	-1	-1.80E-11	1.00E-11	-1.80E-12	1.00E-12
RHRS	6	Medium	None	Low	20	0	-20	negligible	negligible	negligible	negligible
RHRS	7	Low	None	Low	4	0	-4	negligible	negligible	negligible	negligible
RHRS Total								**-1.80E-11**	**1.00E-11**	**-1.80E-12**	**1.00E-12**
CSS	6	Medium	None	Low	9	0	-9	negligible	negligible	negligible	negligible
CSS Total								**negligible**	**negligible**	**negligible**	**negligible**
AFW	5 (3)	Medium	TASCS, TT, (FAC)	Medium (High)	0	1	1	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
AFW	5 (3)	Medium	TASCS, (FAC)	Medium (High)	1	1	0	-1.20E-11	no change	-1.20E-12	no change
AFW	5 (3)	Medium	TT, (FAC)	Medium (High)	0	1	1	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
AFW	6 (3)	Medium	None (FAC)	Low (High)	11	0	-11	negligible	negligible	negligible	negligible
AFW Total								**-4.80E-11**	**-2.00E-11**	**-4.80E-12**	**-2.00E-12**
FWS	5 (3)	Medium	TASCS, (FAC)	Medium (High)	0	2	2	-3.60E-11	-2.00E-11	-3.60E-12	-2.00E-12
FWS	6 (3)	Medium	None (FAC)	Low (High)	42	0	-42	negligible	negligible	negligible	negligible
FWS Total								**-3.60E-11**	**-2.00E-11**	**-3.60E-12**	**-2.00E-12**
MSS	6	Medium	None	Low	73	0	-73	negligible	negligible	negligible	negligible
MSS Total								**negligible**	**negligible**	**negligible**	**negligible**

Table 3.6-1

Unit 1 - Risk Impact Analysis Results

System(1)	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact(3)		LERF Impact(3)	
			DMs	Rank	Section XI(2)	RI-ISI	Delta	w/ POD	w/o POD	w/ POD	w/o POD
SLS	7	None	None	Low	0	0	0	no change	no change	no change	no change
SLS Total								**no change**	**no change**	**no change**	**no change**
Grand Total								**-1.20E-10**	**-4.00E-11**	**-1.20E-11**	**-4.00E-12**

Notes

1. Systems are described in Table 3.1-1.
2. Only those ASME Section XI Code inspection locations that received a volumetric examination in addition to a surface examination are included in this count. Inspection locations previously subjected to a surface examination only are not considered in accordance with Section 3.7.1 of EPRI TR-112657.
3. Per Section 3.7.1 of EPRI TR-112657, the contribution of low risk categories 6 and 7 need not be considered in assessing the change in risk. Hence, the word "negligible" is given in these cases in lieu of values for CDF and LERF Impact. In those cases where no inspections were being performed previously via Section XI, and none are planned for RI-ISI purposes, "no change" is listed instead of "negligible".

Table 3.6-2

Unit 2 - Risk Impact Analysis Results

System(1)	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact(3)		LERF Impact(3)	
			DMs	Rank	Section XI(2)	RI-ISI	Delta	w/ POD	w/o POD	w/ POD	w/o POD
RCS	6	Medium	None	Low	0	0	0	no change	no change	no change	no change
RCS	7	Low	None	Low	0	0	0	no change	no change	no change	no change
RCS Total								**no change**	**no change**	**no change**	**no change**
SIS	6	Medium	None	Low	39	0	-39	negligible	negligible	negligible	negligible
SIS	7	Low	None	Low	7	0	-7	negligible	negligible	negligible	negligible
SIS Total								**negligible**	**negligible**	**negligible**	**negligible**
RHRS	5	Medium	TT	Medium	3	2	-1	-1.80E-11	1.00E-11	-1.80E-12	1.00E-12
RHRS	6	Medium	None	Low	20	0	-20	negligible	negligible	negligible	negligible
RHRS	7	Low	None	Low	4	0	-4	negligible	negligible	negligible	negligible
RHRS Total								**-1.80E-11**	**1.00E-11**	**-1.80E-12**	**1.00E-12**
CSS	6	Medium	None	Low	9	0	-9	negligible	negligible	negligible	negligible
CSS Total								**negligible**	**negligible**	**negligible**	**negligible**
AFW	5 (3)	Medium	TASCS, TT, (FAC)	Medium (High)	1	1	0	-1.20E-11	no change	-1.20E-12	no change
AFW	5 (3)	Medium	TASCS, (FAC)	Medium (High)	1	1	0	-1.20E-11	no change	-1.20E-12	no change
AFW	5 (3)	Medium	TT, (FAC)	Medium (High)	0	1	1	-1.80E-11	-1.00E-11	-1.80E-12	-1.00E-12
AFW	6 (3)	Medium	None (FAC)	Low (High)	12	0	-12	negligible	negligible	negligible	negligible
AFW Total								**-4.20E-11**	**-1.00E-11**	**-4.20E-12**	**-1.00E-12**
FWS	5 (3)	Medium	TASCS, (FAC)	Medium (High)	1	2	1	-3.00E-11	-1.00E-11	-3.00E-12	-1.00E-12
FWS	6 (3)	Medium	None (FAC)	Low (High)	41	0	-41	negligible	negligible	negligible	negligible
FWS Total								**-3.00E-11**	**-1.00E-11**	**-3.00E-12**	**-1.00E-12**
MSS	6	Medium	None	Low	73	0	-73	negligible	negligible	negligible	negligible
MSS Total								**negligible**	**negligible**	**negligible**	**negligible**

Table 3.6-2

Unit 2 - Risk Impact Analysis Results

System[(1)]	Category	Consequence Rank	Failure Potential		Inspections			CDF Impact[(3)]		LERF Impact[(3)]	
			DMs	Rank	Section XI[(2)]	RI-ISI	Delta	w/ POD	w/o POD	w/ POD	w/o POD
SLS	7	None	None	Low	0	0	0	no change	no change	no change	no change
SLS Total								**no change**	**no change**	**no change**	**no change**
Grand Total								**-9.00E-11**	**-1.00E-11**	**-9.00E-12**	**-1.00E-12**

Notes

1. Systems are described in Table 3.1-2.
2. Only those ASME Section XI Code inspection locations that received a volumetric examination in addition to a surface examination are included in this count. Inspection locations previously subjected to a surface examination only are not considered in accordance with Section 3.7.1 of EPRI TR-112657.
3. Per Section 3.7.1 of EPRI TR-112657, the contribution of low risk categories 6 and 7 need not be considered in assessing the change in risk. Hence, the word "negligible" is given in these cases in lieu of values for CDF and LERF Impact. In those cases where no inspections were being performed previously via Section XI, and none are planned for RI-ISI purposes, "no change" is listed instead of "negligible".

Table 5-1-1

Unit 1 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Region

System[1]	Code Category[2]	High Risk Region					Medium Risk Region					Low Risk Region				
		Weld Count	1989 Section XI		EPRI TR-112657		Weld Count	1989 Section XI		EPRI TR-112657		Weld Count	1989 Section XI		EPRI TR-112657	
			Vol/Sur	Sur Only	RI-ISI	Other[3]		Vol/Sur	Sur Only	RI-ISI	Other[3]		Vol/Sur	Sur Only	RI-ISI	Other[3]
RCS	B-J						1	0	0	1		20	0	6	0	
SIS	C-F-1											736	48	8	0	
RHRS	C-F-1						12	3	0	2		352	24	0	0	
CSS	C-F-1											126	9	0	0	
AFW	C-F-2						26	1	0	3		141	11	0	0	
FWS	C-F-2						16	0	0	2		128	42	0	0	
MSS	C-F-2											197	73	0	0	
SLS	C-F-1											12	0	0	0	
Total	B-J						1	0	0	1		20	0	6	0	
	C-F-1						12	3	0	2		1226	81	8	0	
	C-F-2						42	1	0	5		466	126	0	0	

Notes

1. Systems are described in Table 3.1-1.
2. The ASME Code Category is based on the 1989 Edition of the ASME Section XI Code.
3. The column labeled "Other" is generally used to identify augmented inspection program locations credited per Section 3.6.5 of EPRI TR-112657. This option was not used for the South Texas Project RI-ISI application. The "Other" column has been retained in this table solely for uniformity purposes with other RI-ISI application template submittals.

Table 5-1-2

Unit 2 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Region

System[1]	Code Category[2]	High Risk Region					Medium Risk Region					Low Risk Region				
		Weld Count	1989 Section XI		EPRI TR-112657		Weld Count	1989 Section XI		EPRI TR-112657		Weld Count	1989 Section XI		EPRI TR-112657	
			Vol/Sur	Sur Only	RI-ISI	Other[3]		Vol/Sur	Sur Only	RI-ISI	Other[3]		Vol/Sur	Sur Only	RI-ISI	Other[3]
RCS	B-J											30	0	7	0	
SIS	C-F-1											693	46	8	0	
RHRS	C-F-1						12	3	0	2		349	24	0	0	
CSS	C-F-1											118	9	0	0	
AFW	C-F-2						29	2	0	3		133	12	0	0	
FWS	C-F-2						13	1	0	2		107	41	0	0	
MSS	C-F-2											201	73	0	0	
SLS	C-F-1											8	0	0	0	
Total	B-J											30	0	7	0	
	C-F-1						12	3	0	2		1168	79	8	0	
	C-F-2						42	3	0	5		441	126	0	0	

Notes

1. Systems are described in Table 3.1-2.
2. The ASME Code Category is based on the 1989 Edition of the ASME Section XI Code.
3. The column labeled "Other" is generally used to identify augmented inspection program locations credited per Section 3.6.5 of EPRI TR-112657. This option was not used for the South Texas Project RI-ISI application. The "Other" column has been retained in this table solely for uniformity purposes with other RI-ISI application template submittals.

Table 5-2-1

Unit 1 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Category

System[1]	Risk		Consequence Rank	Failure Potential		Code Category	Weld Count	1989 Section XI		EPRI TR-112657	
	Category	Rank		DMs	Rank			Vol/Sur	Sur Only	RI-ISI	Other[2]
RCS	5	Medium	Medium	TT	Medium	B-J	1	0	0	1	
RHRS	5	Medium	Medium	TT	Medium	C-F-1	12	3	0	2	
AFW	5 (3)	Medium (High)	Medium	TASCS, TT, (FAC)	Medium (High)	C-F-2	4	0	0	1	
AFW	5 (3)	Medium (High)	Medium	TASCS, (FAC)	Medium (High)	C-F-2	14	1	0	1	
AFW	5 (3)	Medium (High)	Medium	TT, (FAC)	Medium (High)	C-F-2	8	0	0	1	
FWS	5 (3)	Medium (High)	Medium	TASCS, (FAC)	Medium (High)	C-F-2	16	0	0	2	
RCS	6	Low	Medium	None	Low	B-J	12	0	6	0	
SIS	6	Low	Medium	None	Low	C-F-1	681	40	8	0	
RHRS	6	Low	Medium	None	Low	C-F-1	332	20	0	0	
CSS	6	Low	Medium	None	Low	C-F-1	126	9	0	0	
AFW	6 (3)	Low (High)	Medium	None (FAC)	Low (High)	C-F-2	141	11	0	0	
FWS	6 (3)	Low (High)	Medium	None (FAC)	Low (High)	C-F-2	128	42	0	0	
MSS	6	Low	Medium	None	Low	C-F-2	197	73	0	0	
RCS	7	Low	Low	None	Low	B-J	8	0	0	0	
SIS	7	Low	Low	None	Low	C-F-1	55	8	0	0	
RHRS	7	Low	Low	None	Low	C-F-1	20	4	0	0	
SLS	7	Low	None	None	Low	C-F-1	12	0	0	0	

Notes

1. Systems are described in Table 3.1-1.
2. The column labeled "Other" is generally used to identify augmented inspection program locations credited per Section 3.6.5 of EPRI TR-112657. This option was not used for the South Texas Project RI-ISI application. The "Other" column has been retained in this table solely for uniformity purposes with other RI-ISI application template submittals.

Table 5-2-2

Unit 2 - Inspection Location Selection Comparison Between ASME Section XI Code and EPRI TR-112657 by Risk Category

System[1]	Risk		Consequence Rank	Failure Potential		Code Category	Weld Count	1989 Section XI		EPRI TR-112657	
	Category	Rank		DMs	Rank			Vol/Sur	Sur Only	RI-ISI	Other[2]
RHRS	5	Medium	Medium	TT	Medium	C-F-1	12	3	0	2	
AFW	5 (3)	Medium (High)	Medium	TASCS, TT, (FAC)	Medium (High)	C-F-2	4	1	0	1	
AFW	5 (3)	Medium (High)	Medium	TASCS, (FAC)	Medium (High)	C-F-2	17	1	0	1	
AFW	5 (3)	Medium (High)	Medium	TT, (FAC)	Medium (High)	C-F-2	8	0	0	1	
FWS	5 (3)	Medium (High)	Medium	TASCS, (FAC)	Medium (High)	C-F-2	13	1	0	2	
RCS	6	Low	Medium	None	Low	B-J	20	0	7	0	
SIS	6	Low	Medium	None	Low	C-F-1	553	39	8	0	
RHRS	6	Low	Medium	None	Low	C-F-1	328	20	0	0	
CSS	6	Low	Medium	None	Low	C-F-1	118	9	0	0	
AFW	6 (3)	Low (High)	Medium	None (FAC)	Low (High)	C-F-2	133	12	0	0	
FWS	6 (3)	Low (High)	Medium	None (FAC)	Low (High)	C-F-2	107	41	0	0	
MSS	6	Low	Medium	None	Low	C-F-2	201	73	0	0	
RCS	7	Low	Low	None	Low	B-J	10	0	0	0	
SIS	7	Low	Low	None	Low	C-F-1	140	7	0	0	
RHRS	7	Low	Low	None	Low	C-F-1	21	4	0	0	
SLS	7	Low	None	None	Low	C-F-1	8	0	0	0	

Notes

1. Systems are described in Table 3.1-2.
2. The column labeled "Other" is generally used to identify augmented inspection program locations credited per Section 3.6.5 of EPRI TR-112657. This option was not used for the South Texas Project RI-ISI application. The "Other" column has been retained in this table solely for uniformity purposes with other RI-ISI application template submittals.

Description of Difference Methodology

1. As discussed in the cover letter, members of the STARS group developed their respective risk-informed inservice inspection (RI-ISI) program plans (referred to as templates from here on) collaboratively (see Note 6).

2. The templates are similar. Significant differences are bracketed [ ].

3. Information contained in tables and notes is plant-specific and will not be bracketed.

4. To allow for comparison of the templates, below is a table correlating plant-specific system nomenclature.

System	CPSES	STP	Callaway	WCGS	DCPP
Reactor Coolant System	RCS	RCS	BB	BB	RCS
Chemical and Volume Control System	CVCS	CVCS	BG, BN	BG, BN	CVCS
Safety Injection System	SIS	SIS	EM, EP	EM, EP	SIS
Residual Heat Removal System	RHRS	RHRS	EJ	EJ	RHRS
Feedwater System	FWS	FW & AFW	AE	AE	FWS
Main Steam System	MSS	MSS	AB	AB	MSS
Containment Spray System	CSS	CSS	EN	EN	CSS
Sludge Lancing System	--	SLS	--	--	--
Essential Service Water System	--	--	EF	EF	--
Containment Hydrogen Control System	--	--	--	GS	--

CPSES	Comanche Peak Steam Electric Station
STP	South Texas Project
Callaway	Callaway Plant
WCGS	Wolf Creek Generating Plant
DCPP	Diablo Canyon Power Plant

5. The South Texas Project has an approved ASME Code Class 1 RI-ISI program plan for Class 1 piping welds (non-socket welds). This application is for ASME Code Class 1 piping socket welds and Class 2 piping welds.

Description of Difference Methodology (continued)

6. The following is a discussion on the process used to develop the template:

   The STARS group contracted with Structural Integrity Associates (SIA) to support the development of the RI-ISI templates. SIA was selected based on their previous work in developing the STP Nuclear Operating Company ASME Code Class 1 template and their team of subcontractors. SIA had teamed with Inservice Engineering and Duke Engineering Services Inc. (DESI). Both subcontractors have experience in developing RI-ISI program plans.

   In order to facilitate technology transfer, the STARS group developed the Degradation Mechanism Evaluation and the Consequence Evaluation. The contractor team provided training, oversight, and technical support in the development of the evaluations.

   In order to maximize the synergies of these common plants, technical representatives from each of the plants met for three weeks at Comanche Peak to develop these evaluations. Inservice Inspection engineers from each plant met together and developed the plant specific Degradation Mechanism Evaluation. This effort was lead by SIA. Each plant's drawings, history, and other applicable data were reviewed by the entire team. Commonalties and differences were discussed; technical issues were resolved and each pipe segment for each plant was subsequently evaluated for potential degradation mechanisms.

   Similarly, probabilistic risk assessment engineers from each plant met together and developed their plant-specific Consequence Evaluation. This effort was lead by DESI. Again, engineers had their plant-specific information, which was reviewed by the entire team. Commonalties and differences were discussed; technical issues were resolved and each event was evaluated for potential consequences.

   Inservice Engineering then combined the work of the two groups to develop the template and perform the delta risk calculation.