

The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

June 2, 1997
ST-HL-AE-5652
File No.: G20.01,
G20.02
10CFR50.90

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

South Texas Project
Unit 1 and Unit 2

Docket Nos. STN 50-498 and 50-499

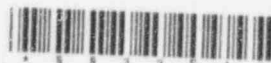
Supplementary Information re South Texas Project Proposed Improved Technical Specifications

- References:
1. Letter dated November 27, 1996 from William D. Beckner (NRC) to William T. Cottle (HL&P) entitled "Staff Comments on the South Texas Application for Conversion to the Improved Standard Technical Specifications (TAC Nos. M95529 and M95530)".
 2. Letter dated February 11, 1997 from Lawrence E. Martin (STP) to Document Control Desk entitled Supplementary Information re South Texas Project Proposed Improved Technical Specifications (ST-HL-AE-5517).

Representatives of the South Texas Project met with the Nuclear Regulatory Commission staff on April 3, 1997 to discuss the review of the South Texas Project proposed Improved Technical Specifications. The meeting provided useful insights to facilitate the review and approval of the STP proposed Improved Technical Specifications by the NRC staff. As discussed in the meeting, STP is providing a clarification of the philosophy for adapting the Standard Westinghouse Improved Specifications (NUREG-1431) to the STP three-train Engineered Safety Feature configuration.

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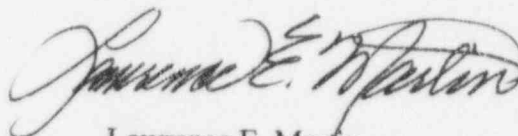
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Project Manager on Behalf of the Participants in the South Texas Project

As discussed in Reference 2 and in the April 3 meeting, the South Texas Project plans to submit a comprehensive supplement to its initial application by June 30, 1997. This comprehensive supplement will address NRC comments and issues identified in Reference 1 and the "pilot" supplement submitted in Reference 2. It will also include the incorporation of amendments to the current Technical Specifications, a Relocation Matrix describing where information relocated from the Technical Specifications was placed, a disposition of proposed generic changes (TSTFs), and a list of pending and planned changes to the STP Technical Specifications.

Following resolution of any remaining NRC comments, STP will submit a certified Proof and Review version of the Improved Technical Specifications targeted to support NRC approval of the proposed amendment by the end of 1997.

If you have any questions, please contact Mr. A. W. Harrison at 512-972-7298 or Mr. M. A. McBurnett at 512-972-7206.



Lawrence E. Martin
General Manager,
Nuclear Assurance and Licensing

JMP/

- Attachments: 1. Clarified South Texas Project Philosophy for Incorporating Three Train Design into Improved Technical Specifications
2. Table 1 - STP Improved Technical Specification Allowed Outage Times

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South Texas Project Electric Generating Station

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Clarified South Texas Project Philosophy for Incorporating Three Train Design into Improved Technical Specifications

This attachment describing the South Texas Project (STP) philosophy for incorporating the STP three train design into the Improved Technical Specifications (ITS) has been revised to address NRC comments provided at the April 3, 1997 meeting. This description was originally attached to STP's letter to the NRC dated February 11, 1997.

The Standard Improved Technical Specifications were written for standard plants with two trains of Engineered Safety Feature (ESF) equipment. For such standard plant designs, the safety functions are degraded (loss of single failure protection) when a single train of an ESF function is inoperable, and there is a loss of safety function when two trains of an ESF function are inoperable. Consequently, there is generally no allowed outage time in the Standard Technical Specifications for situations where two trains of an ESF function are inoperable.

The South Texas Project has three trains of ESF equipment and ESF support equipment. Therefore, when only one of the three ESF trains is inoperable, STP retains a high degree of redundancy, which is substantially greater than for a two-train plant during conditions where one ESF train is inoperable. In addition, unlike a two-train plant, STP does not experience a complete loss of safety function when two of three trains of an ESF function are inoperable. Thus it is appropriate for STP to have extended allowed outage times when one of three trains is inoperable and a reasonable allowed outage time for conditions where two of three trains are inoperable.

Generally, the conversion of a two train Standard Improved Technical Specifications to Improved Technical Specifications suitable for a three train plant involves application of the three concepts described below. These concepts are generally applied throughout the South Texas ITS submittal with some adjustment for specific system designs and redundancies. In each case, the deterministic conclusion has been tested with the Probabilistic Safety Assessment (PSA) to account for integrated effects and to ensure there is appropriate probabilistic justification.

Concepts for Converting Two Train Technical Specifications to Three Train Technical Specifications:

1. Two train specifications have action statements that cover the progression from all trains available to no trains available. To convert from two train specifications to three train specifications, it is necessary to add action statements to cover the progression from three trains available to no trains available.

2. The three train plant has substantially more capability to mitigate design basis events (including single failures) with one train out of service than a two train plant with one train out of service (i.e., no single failure mitigation capability). The allowed outage times (AOTs) associated with the loss of one train are increased based on this additional capability.
3. The three-train plant has capability to mitigate most design basis events without a single failure if two trains are out of service where the two-train plant has no capability with two trains out of service. This additional capability warrants provision of short AOTs in lieu of immediate shutdown requirements. Consequently, AOTs are provided for two trains out of service.

STP has structured its application for Improved Technical Specifications to incorporate the three train design concepts described above. The first entry in Table 1 below outlines a general comparison between the philosophy of a typical two-train plant and a three-train plant. The time allowed to be in a condition with less than three trains operable is based on a reasonable time to restore operability and the capability of the remaining operable equipment. The STP Probabilistic Safety Assessment (PSA) shows that the risks incurred by the proposed allowed outage times are acceptable and consistent with guidance contained in the EPRI PSA Application Guide. It is also important to note that a condition where two of three trains are inoperable would be an unexpected, involuntary condition since STP would not normally plan to remove two trains from service. (A detailed discussion of the application of the STP PSA for establishing a technical basis for extended allowed outage times in the STP Improved Technical Specifications is provided in the Topical Report that accompanied the original STP application for the Improved Technical Specifications.)

Table 1 describes the changes to the allowed outage times that are being proposed in the STP Improved Technical Specification submittal. The values in "***bold italics***" denote proposed changes to the current Technical Specification requirements. The Auxiliary Feedwater System (AFW) is included for completeness, although it is a four-train system at STP. The general philosophy is still applicable since AFW is usually a three-train system at a "standard" plant. It can be seen that the philosophy described in the first "general case" entry has been incorporated in the proposed changes. In some cases, the proposed changes are more restrictive than the current Technical Specifications, which reflects the incorporation of risk informed elements used to develop the technical basis for the proposed allowed outage times. (Note that Table 1 is for illustrative purposes and does not include all the detail of the specification requirements.)

The deterministic bases for the proposed allowed outage times have been described to the NRC staff in STP's application for extended allowed outage times for its standby diesel generators, Essential Cooling Water System, and Chilled Water System. This application was approved in Amendments 85 and 72 to the STP Unit 1 and Unit 2 Operating Licenses, respectively.

In that application and supporting correspondence, STP described the capabilities of a single train of ESF equipment to mitigate design basis accidents. Because the governing event is a condition where only one train of ESF equipment is postulated to be available, the analyses and evaluations performed in support of Amendments 85 and 72 are directly applicable to the evaluations of the changes to the allowed outage times being proposed in the Improved Technical Specifications. The results of the deterministic evaluation done in support of those amendments show that with only one train of ESF equipment available, and allowing for some operator actions, STP can mitigate nearly all design basis events. STP is proposing no configurations in the Improved Technical Specifications that are not bounded by the evaluations for Amendments 85 and 72.

Staggered Testing at the South Texas Project

The South Texas Project will include the definition of staggered test basis in our Improved Technical Specifications. The frequencies will be adjusted to account for the three train design (four Auxiliary Feedwater trains). Variation from the standard is typically only a few days. The proposed alternative for the frequency continues to meet the intent of the definition for staggered testing.

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
 (Page 1 of 10)

System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
General Case					
All Trains Operable	Unlimited	Unlimited	Unlimited	Two train and three train meet design basis, including single failure criteria.	
1 Train Inoperable	72 hours (typ.)	7 days (typ.)	7 days or greater	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function; meets single failure criteria in most cases.</p>	Capabilities exceed those of a two-train plant. Action times of 7 days (or greater in some cases) are appropriate.
2 Trains Inoperable	T.S. 3.0.3 or equivalent	T.S. 3.0.3 or equivalent (typ.)	24 hours	<p><u>2-train plant</u>: complete loss of safety function and non-accident safe shutdown capability.</p> <p><u>STP (3 trains)</u>: loss of safety function only for specific low probability events; retains safe shutdown capability for non-accident conditions.</p>	STP's capabilities exceed those of a 2-train plant. 24 hour allowed outage time recognizes the capabilities and limitations and provides reasonable time to take corrective actions
3 Trains Inoperable	NA	T.S. 3.0.3 or equivalent	T.S. 3.0.3 or equivalent	Loss of safety function	

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
Safety Injection	(STS 3.5.2)	(CTS 3.5.2)	(ITS 3.5.2)		
All Trains Operable	no action	no action	no action		
1 Train Inoperable	72 hours	7 days	7 days	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function, meets single failure except for specific low probability events.</p>	7 days is unchanged from Current Tech Specs. No new extension is proposed in ITS.
2 Trains Inoperable	T.S. 3.0.3	T.S. 3.0.3	24 hours	<p><u>2-train plant</u>: complete loss of safety function.</p> <p><u>STP (3 trains)</u>: loss of safety function only for specific low probability events.</p>	STP's capabilities exceed those of a 2-train plant. 24 hour allowed outage time recognizes the capabilities and limitations and provides reasonable time to take corrective actions
3 Trains Inoperable	NA	T.S. 3.0.3	T.S. 3.0.3	Loss of safety function	

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
Essential Cooling Water:	(STS 3.7.8)	(CTS 3.7.4)	(ITS 3.7.8)		
All Trains Operable	no action	no action	no action		
1 Train Inoperable	72 hours	7 days	7 days	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function, generally meets single failure for most probable design basis events.</p>	7 days is unchanged from Current Tech Specs. No new extension is proposed in ITS.
2 Trains Inoperable	T.S. 3.0.3	T.S. 3.0.3	24 hours	<p><u>2-train plant</u>: complete loss of safety function and non-accident safe shutdown capability.</p> <p><u>STP (3 trains)</u>: can meet almost all its safety design bases with only one operable train, including all of the more probable accidents and anticipated operational occurrences as defined in Appendix A to 10 CFR Part 50.</p>	STP's capabilities exceed those of a 2-train plant. 24 hour allowed outage time recognizes the capabilities and limitations and provides reasonable time to take corrective actions.
3 Trains Inoperable	NA	T.S. 3.0.3	T.S. 3.0.3	Loss of safety function	

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
Essential Chilled Water	(STS no spec)	(CTS 3.7.14)	(ITS 3.7.10)		
All Trains Operable		no action	no action		
1 Train Inoperable		7 days	7 days	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function, generally meets single failure for most probable design basis events.</p>	7 days is unchanged from Current Tech Specs. No new extension is proposed in ITS
2 Trains Inoperable		T.S. 3.0.3	24 hours	<p><u>2-train plant</u>: complete loss of safety function and non-accident safe shutdown capability.</p> <p><u>STP (3 trains)</u>: can meet almost all its safety design bases with only one operable train, including all of the more probable accidents and anticipated operational occurrences as defined in Appendix A to 10 CFR Part 50.</p>	24 hours is consistent with Essential Cooling Water specification and recognizes reasonable time to take corrective action.
3 Trains Inoperable		T.S. 3.0.3	T.S. 3.0.3	Loss of safety function	

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
Control Room Envelope HVAC (MODE 1-4)	(STS 3.7.10)	(CTS 3.7.7)	(ITS 3.7.11)		
All Trains Operable	no action	no action	no action		
1 Train Inoperable	7 days	7 days	7 days	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function, generally meets single failure although system may not be able to maintain 1/8" positive pressure in all areas with a single train</p>	7 days unchanged from Current Tech Specs
2 Trains Inoperable	TS 3.0.3	72 hours	24 hours	<p><u>2-train plant</u>: complete loss of safety function.</p> <p><u>STP (3 trains)</u>: system is functional although it may not be able to maintain 1/8" positive pressure in all areas.</p>	24 hours reflects a reduction of allowed time based on risk insights from the STP PSA and is consistent with the general case.
3 Trains Inoperable	NA	TS 3.0.3	TS 3.0.3	Loss of safety function	

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
Component Cooling Water:	(STS 3.7.7)	(CTS 3.7.3)	(ITS 3.7.7)		
All Trains Operable	no action	no action	no action		
1 Train Inoperable	72 hours	7 days	<i>14 days</i>	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function and generally meets single failure with appropriate operator action.</p>	STP proposes to increase the allowed outage time from 7 days to 14 days since only one train of CCW is necessary to fulfill the safety function.
2 Trains Inoperable	T.S. 3.0.3	T.S. 3.0.3	<i>24 hours</i>	<p><u>2-train plant</u>: complete loss of safety function and non-accident safe shutdown capability.</p> <p><u>STP (3 trains)</u>: can meet almost all its safety design bases with only one operable train assuming appropriate operator action.</p>	STP's capabilities exceed those of a 2-train plant. 24 hour allowed outage time recognizes the capabilities and limitations and provides reasonable time to take corrective actions.
3 Trains Inoperable	NA	T.S. 3.0.3	T.S. 3.0.3	Loss of safety function	

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
Residual Heat Removal	(STS 3.5.2, treated as ECCS)	(CTS 3.5.6)	(ITS 3.5.2)		
All Trains Operable	No action	No action	No action		
1 Train Inoperable	72 hours	7 days	<i>14 days</i>	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function; generally meets single failure and Low Head Safety Injection provides functional redundancy.</p>	STP proposes to extend the allowed outage time to 14 days based on the redundancy of the 3 trains of RHR and the functional redundancy of the Low Head Safety Injection (LHSI). RHR at STP is not an ECCS injection system. It functions solely for the long-term removal of decay heat after the RCS is depressurized for both normal operation and post-accident conditions. LHSI is capable of performing the long-term cooling under post-accident conditions.
2 Trains Inoperable	TS 3.0.3	24 hours	24 hours	<p><u>2-train plant</u>: complete loss of safety function and non-accident safe shutdown capability.</p> <p><u>STP (3 trains)</u>: can meet almost all its safety design bases with only one operable train.</p>	STP's capabilities exceed those of a 2-train plant. 24 hour allowed outage time recognizes the capabilities and limitations and provides reasonable time to take corrective actions
3 Trains Inoperable	NA	Immediately take action to restore	Immediately take action to restore		Reflects Current Tech Specs. Appropriate action is to take action to restore since a shutdown would place the plant in a condition where the inoperable system would be needed.

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
Reactor Containment Fan Coolers	(STS 3.6.6A)	(CTS 3.6.2.3)	(ITS 3.6.6)		STP PSA analysis shows that RCFCs and Containment Spray are not risk-significant systems.
All Trains Operable	No action	No action	No action		
1 Train Inoperable	72 hours	7 days	28 days	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function; generally meets single failure criteria.</p>	28 days is proposed for one train out of service based on STP analysis that shows that the system has substantial redundancy.
2 Trains Inoperable	7 days	TS 3.0.3	24 hours	<p><u>2-train plant</u>: complete loss of safety function.</p> <p><u>STP (3 trains)</u>: one train maintains the function although Control Room and Technical Support Center doses will increase under design basis accident conditions.</p>	24 hours is a reasonable time for corrective action for conditions with two trains of RCFCs inoperable.
3 Trains Inoperable	NA	TS 3.0.3	TS 3.0.3	Loss of safety function	

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Safety Comparison	Three Train Comments
Containment Spray	(STS 3.6.6A)	(CTS 3.6.2)	(ITS 3.6.6)		STP PSA analysis shows that RCFCs and Containment Spray are not risk-significant systems.
All Trains Operable	No action	No action	No action		
1 Train Inoperable	72 hours	7 days	<i>28 days</i>	<p><u>2-train plant</u>: no loss of safety function, but does not meet single failure criteria.</p> <p><u>STP (3 trains)</u>: no loss of safety function; generally meets single failure criteria.</p>	28 days is proposed for one train out of service based on STP analysis that shows that the containment retains substantial margin for design basis events where one or more trains of containment spray are postulated to fail.
2 Trains Inoperable	TS 3.0.3	TS 3.0.3	<i>24 hours</i>	<p><u>2-train plant</u>: complete loss of safety function.</p> <p><u>STP (3 trains)</u>: one train maintains the function although Control Room and Technical Support Center doses will increase under design basis accident conditions.</p>	24 hours is a reasonable time for corrective action for conditions with two trains of containment spray inoperable
3 Trains Inoperable	NA	TS 3.0.3	TS 3.0.3		

TABLE 1
STP IMPROVED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIMES
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System/Condition	Standard Two Train Specification	Current STP Three Train Specification	Proposed STP Three Train Specification	Comments	Three Train Comments
Auxiliary Feedwater	(STS 3.7.5)	(CTS 3.7.1.2)	(ITS 3.7.5)		STP has 3 motor driven trains of AFW and 1 turbine driven AFW train. **
All Trains Operable	No action	No action	No action		
1 Train Inoperable	72 hours* * 7 days if the steam supply to the turbine driven train is inoperable	72 hours	28 days (no distinction between motor driven and turbine driven trains)	<u>Standard Plant:</u> no loss of safety function, but consideration of single failure results in increased dependency on the turbine-driven train. <u>STP:</u> no loss of safety function. Single failure does not result in increased dependence on the turbine-driven train because of the third motor-driven train.	STP's Auxiliary Feedwater design is essentially the "standard plant" with an extra motor driven train of Auxiliary Feedwater. STP proposes that 28 days be allowed for the "extra" train to be inoperable. One of four AFW trains must operate and deliver flow to its respective Steam Generator for success. **
2 Trains Inoperable	6 hours	6 hours* * 72 hours if the combination includes the A train motor driven AFW	72 hours (no distinction between motor driven and turbine driven trains)	<u>Standard Plant:</u> function may be lost if loss of off-site power is the initiating event. <u>STP:</u> STP still has two trains of Auxiliary Feedwater operable, either of which is capable of removing decay heat.	STP has substantially greater capability than the Standard Plant. The 72-hour proposed allowed outage time is consistent with the allowed outage time of a Standard Plant with the same number of operable trains (2). For an ATWS event two of four AFW trains are required for success. **
3 Trains Inoperable	Immediately take action to restore	6 hours	6 hours	<u>Standard Plant:</u> function is lost. <u>STP:</u> function is not lost. One train is still operable and capable of removing decay heat.	STP has substantially greater capability than the Standard Plant. The 6 hour proposed allowed outage time is consistent with the allowed outage time of a Standard Plant with the same number of operable trains (1).
4 Trains Inoperable	NA	Immediately take action to restore	Immediately take action to restore	Function is lost.	

** - STP analysis shows that there is no significant difference between a motor-driven train being out of service or the turbine-driven train being out of service. STP has a unique Westinghouse design, in that, each AFW has a 100% capability to their respective Steam Generator.