

# The Light company

Houston Lighting & Power

South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

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

## South Texas Project Electric Generating Station Unit 2

Docket No. 50-499

### Request to Extend the Duration of a Waiver of Compliance for Technical Specification 3.7.1.2 Action b

- Reference: 1) HL&P Request for Waiver of Compliance for Technical Specification 3.7.1.2 Action b dated February 25, 1993 (ST-HL-AE-4336)
- 2) NRC Approval of Ref. 1, Letter dated February 26, 1993

Houston Lighting & Power (HL&P) requests an extension of 72 hours to a Waiver of Compliance from the requirements of Technical Specification 3.7.1.2 Action b as it applies to the turbine driven (TD) Auxiliary Feedwater (AFW) pump, which was granted by the NRC on February 25, 1993. HL&P proposes that the Allowed Outage Time (AOT) in Mode 3 for the Train D, TD AFW pump be increased by an additional 72 hours to facilitate an augmented test program. This extension will allow HL&P adequate time to complete an extensive testing and evaluation of the TD AFW pump in Unit 2 at the South Texas Project. This waiver will allow testing, evaluation and corrective maintenance, if required, of the pump at a secondary steam supply pressure greater than 1000 psig in Mode 3, as specified by Surveillance Requirement 4.7.1.2.1.a.2.

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The following information is required pursuant to NRC correspondence dated February 22, 1990, to support a Waiver of Compliance.

(1) Discussion of the Requirements for which a Waiver is requested

TECHNICAL SPECIFICATION 3/4.7.1.2 Action b

Technical Specification 3.7.1.2 requires that the TD AFW pump be operable. If the TD AFW pump is inoperable, a 72 hour Allowed Outage Time (AOT) is applicable or the unit is required to be in Mode 3 within the next 6 hours and in Mode 4 within the following 6 hours.

The NRC previously approved a Temporary Waiver of Compliance to extend the allowed outage time by 72 hours (Ref. 2). Reasonable allowances were made for troubleshooting in the original waiver request; however, the original waiver will expire before the Mode 3 testing can be completed.

This proposed Waiver of Compliance extension would extend the time allowed in Mode 3 by an additional 72 hours to 144 hours, total time.

(2) Discussion of the Circumstance Surrounding this Request

At 1000 hours on February 1, 1993, with Unit 1 in Mode 1, the TD AFW pump tripped on overspeed when started for a test run. The pump was declared inoperable. On February 4, 1993, at 1514, Unit 1 entered Mode 3 on completion of a normal shutdown to address TD AFW pump operability concerns.

A reactor trip occurred on Unit 2 at 1526 on February 3, 1993, during which the TD AFW pump also tripped on overspeed.

Units 1 and 2 were subsequently placed in Mode 5 and Mode 4, respectively.

Since these occurrences, significant resources have been directed at restoring confidence in the capability of the TD AFW pumps to respond as described in the design basis. The resolutions to problems associated with the functional capabilities of the TD AFW pumps at STPEGS were provided to the NRC Augmented Inspection Team that was present during these efforts (AIT 93-007).

Discussion of the Circumstance Surrounding this Request  
(Con't)

The program for which this waiver is requested is intended to test the TD AFW pumps' ability to perform at the design basis and verify adequacy of surveillance testing procedures. Therefore, the extensive nature of testing scheduled at Mode 3 conditions may result in the need for an additional heat-up and cool-down cycle on the units, unless a temporary waiver of compliance is approved for Technical Specification 3.7.1.2, Action Statement b.

Unit 2 entered Mode 3 at 2248 on February 22, 1993, to support TD AFW pump testing and a Temporary Waiver of Compliance was granted by the NRC to allow Mode 3 testing through 2248 hours on February 28, 1993. Currently, testing is in progress on the Unit 2 TD AFW Pump. Problems identified and corrected during testing delayed the test program so that additional time is required beyond expiration of the original waiver.

(3) Compensatory Actions

The Standby Diesel Generators (DG) will not be taken out of service during the extended AOT to ensure availability of the ESF DG's as an emergency power source to the three motor-driven AFW pumps. Technical Specification required surveillance testing on DG's is not scheduled during the requested period of the Waiver of Compliance.

Switchyard work will be suspended during the extended AOT to ensure availability of redundant power supplies.

During periods of this waiver when the TD AFW pump is functional, an operator will be available to perform manual startup of the TD AFW pump within 15 minutes in the unlikely event of a station blackout.

(4) Safety Significance and Potential Consequences of the Proposed Request

The function of the AFW system is to provide a source of feedwater to the steam generators (SG's) when the Main Feedwater (MFW) system or the Residual Heat Removal (RHR) system is not available. Major components of the AFW system include a storage tank, three motor-driven pumps, one TD AFW pump, piping, valves, instruments and

Safety Significance and Potential Consequences of the  
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controls. Water is drawn from the AFW storage tank through underground piping to the AFW pumps. The pumps discharge to supply the SG's with feedwater. Separate Engineered Safety Features (ESF) buses power the 800 hp motors of the three motor-driven pumps, while steam from SG "D" provides power to the TD AFW pump. During plant heatup and startup the AFW system may be used in manual to maintain SG water level until the Main Feedwater system is available. To mitigate the consequences of a trip or accident, two of the four AFW pumps are adequate. Therefore, three operable motor-driven AFW pumps provide substantial margin in the AFW system without the automatic start capability of the TD AFW pump.

In Mode 3, sufficient steam pressure is available to operate the TD AFW pump at required surveillance conditions. With the compensatory measures provided, the TD AFW pump is capable of performing its decay heat removal safety function. In Mode 4, insufficient steam pressure is available to meet TD AFW pump surveillance conditions required by Technical Specification 4.7.1.2.1.a.2. In Mode 4, both RHR and AFW are available for decay heat removal. However, near the low temperature region of Mode 4, the TD AFW pump is essentially unavailable due to low steam pressure. In Mode 3 the TD AFW pump provides an additional source of decay heat removal.

During those periods that the TD AFW Pump is functional, operator action using current plant procedures can reasonably place the TD AFW Pump in service within 15 minutes. This compares favorably with a worst case (loss MFW/AFW Full Power, Max. Burnup) anticipated SG dryout time of 47 minutes. For current Unit 2 conditions, SG dryout time is estimated at approximately 9 hours.

The Start-up Feedwater Pump is available to provide an additional source of feedwater. However, availability of the Start-up Feedwater Pump does not affect the risk analysis utilized in this Waiver of Compliance request.

Corrective maintenance is currently in progress on the Unit 2 TD AFW Pump governor. This results in a reduction of availability of a functional TD AFW Pump during the test period in the event of a station blackout. However, this risk is bounded by an analysis performed to assess

Safety Significance and Potential Consequences of the  
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the impact of complete unavailability of a Unit's TD AFW Pump past the LCO AOT, with the Unit at full power. On a once in the life of the Unit basis the incremental changes in core damage frequency is negligible.

(5) Justification for the Duration of the Request

AFW system unavailability is modeled in the STPEGS Individual Plant Examination (IPE) (Letter dated August 28, 1992, (ST-HL-AE-4193)). Testing of the TD AFW pumps during the current trouble-shooting and evaluation has shown that, although the pump may trip upon actuation, restart of the pump has been successful. In consideration of the compensatory actions delineated above, manual start of the pump should be successful for periods when the TD AFW Pump is functional. This case is considered in the IPE and no increase in risk is associated with this condition.

According to the IPE, should the TD AFW pump be unavailable due to maintenance at some time during the period of a one-time Waiver of Compliance, the incremental risk due to this condition is negligible or zero. Using the IPE to bound the risk which may result from a one time Waiver of Compliance of, for example, three days, **during power operation**, results in an annual increase in core damage frequency of 0.21%, or an increase of  $9.0 \times 10^{-8}$  per year from the baseline value of  $4.44 \times 10^{-5}$ /year. That is, a 24 hour unavailability of the TD AFW pump due to maintenance is estimated to be  $3 \times 10^{-8}$ /year, or a 0.07% increase in core damage frequency. Extending the total duration of the waiver from three days to six would, therefore, conservatively increase the core damage frequency by an additional 0.21%.

However, when the TD AFW pump is available for manual start, there is no incremental risk associated with this condition even though the TD AFW pump is, technically, considered inoperable in accordance with a Technical Specification Action Statement. Only if maintenance is commenced to correct the cause of a problem and if the duration of maintenance exceeds IPE assumptions, would the risk indicated above apply (note that the risk is calculated at power and Unit 2 has been subcritical since Feb. 3<sup>rd</sup>). Plant conditions (Mode 1) of the IPE analysis

Justification for the Duration of the Request (Con't)

for unavailability of the TD AFW pump bounds the plant conditions (Mode 3) during the period of the proposed Waiver of Compliance.

(6) No Significant Hazards Consideration

- a. The proposed Waiver of Compliance extension does not involve a significant increase in the probability of a previously evaluated accident (loss of normal secondary decay heat removal capacity) because the motor-driven AFW pumps will still mitigate this condition.

One AFW pump will remove decay heat from the primary system, but will not necessarily prevent the pressurizer from going water solid. However, in the accident analysis, two AFW pumps are required for initial decay heat removal in order to prevent the pressurizer from going water solid under various accident scenarios, and three motor-driven pumps would be available. This allows for the single failure of one motor-driven AFW pump. Therefore, the consequences of a loss of normal secondary decay heat removal are unchanged.

- b. The proposed Waiver of Compliance extension does not create the possibility of a new or different accident from any previously evaluated since there is no new design or operation of the AFW system and consequently there are no new accident initiators.
- c. The proposed change does not involve a significant reduction in the margin of safety. The margin of safety does not significantly change since the change in core damage frequency is negligible.




(7) Irreversible Environmental Consequences

HL&P has reviewed the proposed Waiver of Compliance extension and the NRC Final Environmental Assessment for STPEGS Units 1 and 2 and has concluded that pursuant to 10CFR51, there are no significant radiological or non-radiological impacts associated with the proposed Waiver of Compliance.

Houston Lighting & Power requests the extension of the previously approved Waiver of Compliance for Technical Specification 3.7.1.2 Action b to apply to Unit 2 at the South Texas Project to facilitate individual Unit testing. Unit 2 entered Mode 3 and the LCO Action of Technical Specification 3/4.7.1.2 Action b at 2248 hours on February 22, 1993, for TD AFW Pump testing. The effective time period of the Waiver of Compliance extension is requested to commence at 2248 hours on February 28, 1993 (the time at which the original waiver expires), and expire at 2248 hours on March 3, 1993. The STP Plant Operations Review Committee (PORC) has reviewed the proposed Waiver of Compliance extension and concurs with the content of this request.

If you should have any questions concerning this matter please contact either Mr. S. M. Head at (512) 972-7136 or me at (512) 972-7921.

  
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