Nuclear Operating Company

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Response to Request for Additional Information

Attached is the response to the NRC staff question included in Request for Additional Information (RAI) letter number 356 related to SRP Section 14 for the South Texas Project Units 3 & 4 Combined License Application. This submittal completes the response to this RAI letter. The attachments address the responses to the RAI questions listed below:

RAI 14.02-15
RAI 14.03.07-4

When a change to the COLA is required, it will be incorporated into the next routine revision of the COLA following NRC acceptance of the RAI response.

There are no commitments in this letter.

If you have any questions, please contact me at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

STI 32748093

DO91
NRO

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 9/16/10

Scott Head
Manager, Regulatory Affairs
South Texas Project Units 3 & 4

gsc

Attachments: 1) RAI 14.02-15 Response
2) RAI 14.03.07-4 Response

cc: w/o attachment except*
(paper copy)

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RAI 14.02-15

QUESTION:

SRP Section 14.2, Item 5 under SRP Acceptance Criteria, specifies that applicants should provide abstracts of planned tests to demonstrate and verify the performance capabilities of SSCs and design features that serve functions that are important to safety. The staff found that the description provided in FSAR Section 10.2 is not properly reflected in Test 14.2.12.1.64. In particular, the test description needs to be revised to replace the designation of combined intermediate valves (CIV) with intermediate stop and intercept valves. This change also needs to be made for Test 14.2.12.1.70.

RESPONSE:

As stated in ABWR DCD Tier 1 Subsection 2.10.7 (2) the, "*combined intermediate valves (CIVs) consist of intercept valves (IVs) and intercept stop valves (ISVs) [IVs trip and modulate/ISVs trip].*" Tier 1 ITAAC in Table 2.10.7 (2) makes reference to the individual IVs and ISVs.

STP DEP 10.2-1 changed Tier 2 references from combined intermediate valves (CIV) to intermediate stop valves and intercept valves. This change was reflected in Subsections 10.2.2.2, 10.2.2.6, 10.2.3.5, and 10.2.3.6. However, the Tier 2 Test Descriptions in Chapter 14 were not revised. Although the test descriptions are consistent with the Tier 1 (ITAAC) Testing Requirements, as defined in Tier 1 Section 2.10.7, because the IVs and ISVs have separate valve disks and operators, the test descriptions will be revised for clarity and consistency with the changes made by departure STP DEP 10.2-1. STP DEP 10.2-1 will be revised to include the description of the relationship between the CIV and the ISV / IV for consistency between Tier 1 and Tier 2.

In addition, STP DEP 10.2-3 replaced the mechanical overspeed trip using electrical overspeed trip devices. Test Description 14.2.12.1.70 (3)(h) will be revised to change the reference from the "mechanical overspeed trip and electrical backup overspeed trip" to the "primary and emergency overspeed protection functions" consistent with the response to RAI 10.02-5. The description for departure STP DEP 10.2-1 in Part 7 will be revised consistent with the Chapter 14 test description changes.

In COLA Part 2, Tier 2, Subsection 10.2.2.2 will be revised as noted below. Changes are indicated by gray shading:

> ***Combined Intermediate*** **~~Stop and Intercept~~** ***Valves*** **(Intermediate Stop Valves and Intercept Valves)** *~~— Two combined intermediate valves (CIVs) are provided for each LP turbine, one in each steam supply line, called the hot reheat line.~~ The* Combined intermediate valves (*CIVs*) *consists of two valves—the intercept valve and the intermediate stop valve, which share a common casing. Although they utilize a common casing, these valves have entirely separate operating mechanisms and controls. ~~The function of the CIVs is to protect the turbine against overspeed from steam and water energy stored between the main stop and control valves and the CIVs. One CIV is located on each side of each LP turbine.~~* Hydraulically operated intermediate stop valves (ISVs) and intercept valves (IVs) are provided in each hot reheat line just upstream of the Low Pressure (LP) inlet. Upon loss of load, the intercept valves first close then throttle steam to the LP turbine, as required to control speed. The intermediate stop valves close on a turbine trip. The intermediate stop valves and intercept valves are designed to rapidly close to control turbine overspeed.

In COLA Part 2, Tier 2, Subsections 14.2.12.1.64 (1) and (3) will be revised as noted below. Changes are indicated by gray shading:

> *(1) Purpose*
>
> *To verify proper operation of the TCS, which operates the turbine stop valves, control valves, ~~combined intermediate valves (CIV)~~* intercept valves (IVs), and intermediate stop valves (ISVs) *through their associated actuators and hydraulic control.*
>
> *(3) General Test Methods and Acceptance Criteria*
>
> *(a) Proper functioning of instrumentation and system controls, including operating and trip devices for main stop and control valves ~~and combined intermediate valves (CIV)~~* , intercept valves (IVs), and intermediate stop valves (ISVs)
>
> *(c) Correct operation of main stop and control valves ~~and combined intermediate valves~~* , IVs, and ISVs *in response to simulated signals related to turbine speed, load, and reactor pressure as specified in Subsection 10.2.2*
>
> *(e) Proper operation of main stop and control valves ~~and CIVs~~* , IVs, and ISVs *upon loss of control system electrical power or hydraulic system pressure*
>
> *(f) Capability of manual operation of main stop and control valves ~~and CIVs~~* , IVs, and ISVs, *including verification of position indications and stroke rate adjustments*

In COLA Part 2, Tier 2, Subsection 14.2.12.1.70 (3), paragraphs (g) and (h) will be revised as noted below. Changes are indicated by gray shading:

> *(3) General Test Methods and Acceptance Criteria*
>
> *(g) Proper performance capability of the Emergency Trip System (ETS) in shutting down the turbine and closing the main stop and control valves ~~and~~*

~~CIVs~~ , IVs, and ISVs. *This test shall also verify the instrumentation associated with the ETS for correct functions and setpoints.*

(h) Proper operation of the turbine overspeed protection system to provide ~~*mechanical overspeed trip and electrical backup overspeed trip*~~ primary and emergency overspeed trip *as specified by Subsection 10.2.2.4 and the manufacturer's technical instruction manual. This test can be performed in the startup test stage in conjunction with the major transient testing.*

In COLA Part 7 Departures Report, Section 3.0, STP DEP 10.2-1 will be revised to add reference to subsections 14.2.12.1.64 and 14.2.12.1.70 as noted below. Changes are indicated by gray shading:

STP DEP 10.2-1, Turbine Design

Description

Compared to the product that formed the basis of the reference ABWR DCD, the following are the significant technical differences in the latest turbine design:

- *Two stages of reheat in the steam cycle instead of the single stage utilized in the reference ABWR DCD, to improve turbine steam cycle efficiency*
- *Replacing the separate reheater shells with symmetrically combined reheater shells of two stages of four U-tube bundles, reducing the number of moisture separator reheaters (MSRs) from four to two.*
- Revised the description of the Combined Intermediate Valves (CIVs) to discuss that each CIV consists of two valves: an Intermediate Stop Valve (ISV) and an Intercept Valve (IV), each with its own valve disk and actuator contained in a common valve body ~~*Separate Intermediate Stop and Intercept Valves are applied instead of the Combined Intermediate Valves described in the DCD*~~*, to provide for enhanced performance, reliability, and maintainability.*

Additionally, the following subsections are revised to provide clarification and changes based on the design, procedures, and vendor/manufacturer recommendations:

- *Subsection 10.2.2.2-Component Descriptions, including the MSRs, Intermediate Stop* Valves *and Intercept Valves, Low Pressure Turbines, Extraction Non-Return Valves, and the Generator*
- *Subsection 10.2.2.6-Turbine Protection System to describe main turbine trip logic as well as trip signals and trip response*
- *Subsection 10.2.3.5-Preservice Inspection Procedures and Acceptance Criteria*
- *Subsection 10.2.3.6-Inservice Inspection Requirements for Turbine Generator components and Turbine Steam Valves*
- Subsection 14.2.12.1.64 - Main Turbine Control System Preoperational Test
- Subsection 14.2.12.1.70 - Main Turbine and Auxiliaries Preoperational Test

Evaluation Summary

The changes do not result in any functional departure from the referenced DCD. The Turbine Main Steam System is classified nonsafety-related. All the changes associated with this departure are to SSCs that are not important to safety, and do not alter the

function of SSC important to safety as described in the DCD. Therefore, the changes have no impact on the probability or consequences of an accident or malfunction of SCC important to safety. Therefore these changes do not affect the safety or transient analysis assumptions.

This departure has been evaluated pursuant to with the requirements in 10 CFR 52, Appendix A, Section VIII.B.5. There is no impact on any Tier 1 and Tier 2 DCD information, Technical Specifications, Bases for Technical Specifications, or operational requirements as a result of these changes. Therefore, this departure has no adverse impact and does not require prior NRC approval.*

In COLA Part 7 Departures Report, Section 5.0, tables 5.0-1 and 5.0-2 will be revised to add reference to Tier 2 Section 14.2 as noted below. Changes are indicated by gray shading:

TABLE 5.0-1 **Tier 2 Departures and All Affected Sections**

Departure Numbers	*Sections*
STP DEP 10.2-1	Tier 2 Section 14.2

TABLE 5.0-2 **Tier 2 Sections and All Affected Departure Numbers**

Sections	*Departure Numbers*
Tier 2 Section 14.2	STP DEP 10.2-1

RAI 14.03.07-4

QUESTION:

The review procedures in SRP Section 14.3.7 provide guidance for determining the acceptability of proposed inspections, tests, analyses, and acceptance criteria (ITAAC). The SRP guidance specifies in part that all Tier 1 information must be consistent with Tier 2 information. Tier 1 Section 2.10 provides ITAAC for power cycle systems (which include the main turbine and turbine control system). Although Tier 1 Section 2.10 of the STP COL application indicates that this section is incorporated by reference with no departures or supplements, the staff found that the following items need to be addressed:

1) A figure is included in Tier 1 Section 2.10 of the STP COL application that has no title but appears to show changes to gland sealing steam for the high-pressure and low-pressure turbines. Consequently, the STP COL application needs to be revised to resolve this inconsistency.

2) The information in Tier 1 Section 2.10.7, "Main Turbine," that is incorporated by reference from the ABWR DCD is not fully applicable to STP Units 3 and 4. For example, the Tier 1 information indicates that intermediate stage turbines and combined intermediate valves are included in the design, but this is not the case for STP Units 3 and 4 based on the description provided in FSAR Section 10.2. Consequently, the STP COL application needs to be revised to resolve this inconsistency.

RESPONSE:

1. The unlabeled figure that currently is shown in STP 3&4 COLA Revision 3, Tier 1, Section 2.10 will be removed from the COLA to be consistent with the statement that the information in the DCD is incorporated by reference.

2. There are two clarifications necessary for a proper understanding of DCD Tier 1 Section 2.10.7:

   First, the DCD states:

   The major turbine components are:
   (1) A high pressure section.
   (2) An intermediate section (between high pressure and low pressure sections)
   (3) Low pressure sections.

   This is correct as (2) above is not meant to refer to an intermediate turbine but rather to the moisture separator reheaters (MSRs). They are located between the high pressure turbine and the three low pressure turbines. In this intermediate section, the

two MSRs reheat the HP Turbine exhaust using HP Extraction Steam and Main Steam.

Second, the DCD states:

Combined intermediate valves (CIVs) consist of intercept valves (IVs) and intercept stop valves (ISVs) [IVs trip and modulate/ISVs trip].

STP DEP 10.2-1 revised the description of the Combined Intermediate Valves (CIVs) to discuss that each CIV consists of two valves (an intermediate stop valve and an intercept valve), each with its own valve disk and actuator contained in a common valve body. This is discussed further in response to RAI 10.02-8 (11). Each valve can be tested individually; but should maintenance be necessary requiring removal of the valve from the piping, the Combined Intermediate Valve body would have to be removed.

The change to delete the figure from the COLA, Part 2, Tier 1, Page 2.10-2 is shown below: