STATUS OF NSSS RELATED NONCONFORMANCE REPORTS (Revision 1)

by

Bechtel Energy Corporation

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STATUS OF NSSS RELATED NONCONFORMANCE REPORTS

Introduction

In reference to questions resulting from general field observation about the correct location for NSSS components, an optical survey of the Steam Generators and their respective supports was initiated. Initial results indicated that some misalignment and out-of-plumbness exist in the Steam Generators. Based on these results, further surveys were undertaken on the remaining large NSSS related components and their supports. This report summarizes survey findings and the expected disposition of each Nonconformance Report (NCR) generated as a result of the out-of-tolerance situations that were discovered.

STEAM GENERATOR VERTICALITY

Definition of Concern

Surveys have defined that the Steam Generators are out-of-plumb by the following amounts:

Steam Generator #1	.78°
Steam Generator #2	.32°
Steam Generator #3	.24°
Steam Generator #4	.75°

The following NCR's were generated as a result of these findings:

Steam Generator #1	BN-00034
Steam Generator #2	BN-00037
Steam Generator #3	BN-00036
Steam Generator #4	BN-00035

Resolution

The NSSS supplier (Westinghouse) has determined (Reference 1) that the out-of-plumbness associated with the STP Steam Generators is not a concern and will not adversely affect the stress analysis or operability of the system. The Steam Generators will, therefore, be used as-is and the relevant Nonconformance Reports have been dispositioned in this manner. There is no additional work associated with this item and it is considered closed.

STEAM GENERATOR VERTICAL SUPPORTS

Definition of Concern

Detailed surveys indicated the following misalignment items associated with the Steam Generator Vertical Support Columns.

- Column base plates are rotated with respect to the anchor bolt pattern.

- o Columns exhibit lack of parallelism with respect to each other.
- o Columns do not exhibit correct inclination towards the reactor.
- o Columns have transverse inclination with respect to the reactor.
- o Columns are rotated with respect to the bases and S.G adapters.
- o Equipment columns are eccentric to slab support columns in excess of allowable tolerances.

As a result, the following NCR's were generated:

Steam Generator #1	Vertical Supports	BN-00038
Steam Generator #2	Vertical Supports	BN-00040
Steam Generator #3	Vertical Supports	BN-00039
Steam Generator #4	Vertical Supports	BN-00041

Resolution:

Westinghouse analysis indicates that the concerns associated with the first five items above are not significant from a stress analysis or operability standpoint (Reference 2). Preliminary conservative calculations indicate that, for the worst case, stresses will be increased from 35% of allowable to 50% of allowable.

The concerns associated with the eccentricity of the columns (the 6th item) will be resolved by shifting the equipment support base plates to meet the Bechtel tolerance requirements. This work will be done subsequent to detail surveys to determine the precise relative locations of the equipment and structural supports. In those cases where the required tolerances can not be met by shifting the base plates, analyses will be performed to ensure that load limits on both the structural and equipment supports are not exceeded. Detailed procedures will be written to perform the column shifting. Although not specifically required, the concerns associated with the first five items will be corrected as much as possible during the operation. This work is scheduled to be performed during the period of October 83 to February 84.

STEAM GENERATOR UPPER LATERAL RESTRAINTS

Definition of Concern

Because of the inclination associated with the Steam Generators, the Steam Generators are displaced by varying amounts relative to the upper lateral restraints. The following NCR's were issued relative to this problem:

Steam Generator #1	Lateral Restraints	BN-00043
Steam Generator #2	Lateral Restraints	BN-00042
Steam Generator #3	Lateral Restraints	BN-00044
Steam Generator #4	Lateral Restraints	BN-00045

Resolution

Westinghouse has indicated the upper support ring and cross compartment beams of the support structure must be installed to determine the specifics of the displacement (Reference 2). Subsequent to the installation, detailed surveys will be taken to determine the relative locations of the steam generators and associated lateral restraints. Westinghouse is confident that the out-of-plumbness of the steam generator is not severe enough to preclude the use of relatively minor modifications to ensure an adequate support system. The types of modifications contemplated could consist of the following:

- o Modification of wall brackets such as hole slotting to allow for modified placement of snubbers.
- o Rework of support beams.
- o Addition or deletion of custom shims.
- o Adjustment of snubber stroke by addition or deletion of shims.

Current schedule calls for the installation of the upper support ring by August 83. Westinghouse has indicated that proposed changes to the support system based on the as-built layout, will be provided by approximately two to three months after installation of the upper support ring and the cross compartment beam.

Update No. 1

Cross Compartment beam and upper support ring installation is scheduled to begin on August 15 and is expected to take approximately six weeks.

LOWER LATERAL RESTRAINTS

Definition of Problem

This problem is similar to that associated with the upper lateral restraints. The Steam Generator inclination has resulted in displacements of the steam generator relative to the lower lateral restraints. The NCR's associated with the upper lateral restraints cover these items.

Resolution:

Since the lower lateral restraints have been installed, Westinghouse has determined that the Steam Generators can be adequately supported by the use of special shims (Reference 2). These shims will be installed during the hot-functional test. The lower lateral restraints will be used as installed with the associated NCR's resolved use-as-is.

REACTOR COOLANT PUMP

Definition of Problem:

Surveys indicate that the Reactor Coolant Pumps deviate from the design cold position by small amounts.

Reactor Coolant Pump #1	1.312 inches
Reactor Coolant Pump #2	.812 inches
Reactor Coolant Pump #3	1.593 inches
Reactor Coolant Pump #4	.218 inches

No NCR's have been issued on this item.

Resolution

Westinghouse does not specify design tolerances for the Reactor Coolant Pump centerline displacements. Proper fit-up is assumed to occur by the cold-leg fit-up to the pump discharge nozzle (Reference 3). As-built stress analysis verifies the acceptability of the system. Westinghouse does not consider this situation to constitute a problem (Reference 2). No NCR's are anticipated on this item and it is considered closed.

REACTOR COOLANT PUMP VERTICAL SUPPORTS

Definition of Concern

A similar situation to the Steam Generator Vertical Restraints exists for Reactor Coolant Pump Vertical Restraints. The following NCR's were generated:

Reactor Coolant Pump #1	Vertical Restraints	BN000 50
Reactor Coolant Pump #2	Vertical Restraints	BN000 47
Reactor Coolant Pump #3	Vertical Restraints	BN000 48
Reactor Coolant Pump #4	Vertical Restraints	BN000 49

Resolution

(See the discussion on the Steam Generator Vertical Supports for details concerning the manner in which the NCR's associated with the situation will be resolved.)

REACTOR VESSEL

Definition of Problem

Recent surveys indicate that the Reactor Vessel core support ledge is unlevel by an amount greater than the allowed tolerances. The surveys indicate the slope (.0016 inch per foot of flange diameter, 180^{o} axis) exceeds the Westinghouse acceptance criteria (.0005 inch per foot) as restated in the Brown & Root Quality Construction Procedure #A040K PMCP-10 (Setting the Reactor Vessel). A review of the original survey records indicates that the worst condition was acceptable (.0002 inch per foot).

The tolerance requirements specified by Westinghouse are identical to those specified for other plants. The tolerance requirements for the ledge ensures that the core barrel retains its verticality by a specified amount, thus facilitating linearity and proper fit-up of all reactor components.

Resolution

Additional optical surveys will be taken to verify the slope of the core support ledge. Depending on the magnitude of slope, the following options are available:

- Analysis of the as-installed condition- Westinghouse has indicated that it may be possible to perform an analysis of the as-installed configuration of the reactor vessel to determine if the current condition is acceptable.

- Special machining of the clevis - Machining of the clevis inserts to compensate for the slope can be utilized if the magnitude is relatively small. Westinghouse will determine at what point this option is no longer viable.

- Machining of the vessel ledge - Machining of the vessel ledge will be undertaken if the magnitude of the slope is greater than can be made acceptable by analysis or machining of the clevis inserts. Westinghouse will determine the amount of machining required and will be responsible for ensuring that the results are adequate.

Included in this evaluation will be an assessment of the impact of the differential settlement of Reactor Containment Building (RCB). At the present time the RCB has a one quarter of an inch differential settlement from North to South. This settlement could be responsible for all or a portion of the slope of the reactor vessel core support ledge. The present differential settlement is not in itself a concern since its effects can be mitigated by one of the options indicated above. However, the possibility of further differential settlement must be assessed to minimize the possibility of future rework. A schedule for resolution of the reactor levelness concerns will be available after the aforementioned surveys are completed and evaluated. These surveys are scheduled to be completed by the end of June, 1983.

Update No. 1

Westinghouse has received data from the recent optical survey of the vessel support ledge and flange (Reference 4). Preliminary evaluation indicates that two separate but related concerns exist. First, there apparently is a tilt of the vessel that may be associated with the differential settlement of the Reactor Containment Building. Westinghouse has requested additional information to complete their evaluation. This information will be provided by August 1. The second concern is associated with the waviness of the core support ledge. The current configuration (maximum amplitude -0.0325 inches) may exceed Westinghouse flatness criteria. Westinghouse has stated that an assessment of these concerns and resolution schedule will be provided in early August.

PRESSURIZER SEISMIC LUG

Definition of Concern

Surveys indicate that one seismic lug on the pressurizer is out of manufacturers tolerance.

Resolution

A review of all survey data is currently taking place. Determination of the need for an NCR will be made after completion of this review. It is possible that only minor adjustments will be necessary during erection of the seismic restraints.

Update No. 1

A review of the survey data and equipment as-builts indicates that the seismic lug in question is within stipulated tolerances.

This item is considered closed.

STEAM GENERATOR RELATED PIPING

Definition of Concern

Since the Steam Generator nozzles are displaced laterally by the lean of Steam Generators, some length increase or decrease in the piping that attaches to the steam generator will be necessary.

Resolution

Detailed surveys have/will be undertaken to determine the required layout for the main-steam, feedwater, and auxiliary feedwater lines. NCR's will be issued for those lines that will not fit up properly with their respective nozzles. Affected piping will be modified in the field or in the shop as necessary to provide proper fit-up. It is possible that some modification of steam or feedwater supports and restraints will be required.

Update No. 1

All surveys are complete. NCR's will be generated which indicate dispositions for piping rework by August 12.

Summary

Each of the NSSS installation related concerns identified in this report are expected to be resolved by relatively minor corrective modifications or by analytically proving that the as-built conditions are adequate. Westinghouse concurs that the concerns identified herein, either individually or collectively, subject to the required corrections, will not alter the safety, operability, or maintainability of the Reactor Coolant System.

Attachments:

Attachment A - NSSS Nonconformance Reports Related Documentation
Attachment B - NCR Status

References

1. ST-WY-YS-00022 dated 3-7-83

2. Meeting Notes FE-066 notes of meeting between Bechtel and Westinghouse at STP on May 11, 1983.

3. ST-WY-YS-00028 dated 3-31-83.

4. ST-YB-WN-0304 dated 6-28-83.

Attachment A
NSSS Nonconformances Reports Related Documentation

References

Steam Generator Verticality

NCR-BN-00034	3-2-83	SG #1 out of plumbness
NCR-BN-00035	3-2-83	SG #4 out of plumbness
ST-YS-WY-00025	3-3-83	Bechtel request Steam Generator plumbness tolerance
ST-YS-WY-00027	3-4-83	Provides S.G. plumbness information. Request tolerance information.
ST-YS-EY-01447	3-4-83	Bechtel states that survey of S.G. #4 is correct. Request surveys of remaining S.G.
ST-EY-YS-01556	3-3-83	Ebasco transmits S.G #4 survey data.
ST-YS-WY-00026	3-4-83	Request W to stop work on all cross-over leg spools pending analysis of survey data.
ST-WY-YS-00022	3-7-83	W states that SG #2 and #3 verticality acceptable.
ST-WY-YS-00023	3-7-83	W states that SG #1 and 4 out-of-verticality acceptable.
NCR-BN-00036	3-9-83	SG #3 out of plumbness
NCR-BN-00037	3-9-83	SG #2 out of plumbness
ST-YS-WY-00030	3-14-83	BEC request clarification on acceptability of stress analysis and level taps.
ST-WY-YS-00026	3-14-83	W reverifies acceptability of SG #1 and #4.

Steam Generator Vertical Supports

NCR-BN-00038	3-9-83	SG #1 Vertical Supports
NCR-BN-00039	3-9-83	SG #3 Vertical Supports
NCR-BN-00040	3-9-83	SG #2 Vertical Supports
NCR-BN-00041	3-9-83	SG #4 Vertical Supports
ST-YS-WY-00034	3-31-83	Informs W of nonparallelism of vertical support columns. Request tolerance information.

Steam Generator Lateral Restraints

NCR-BN-00042	3-9-83	SG #2 Lateral Restraints
NCR-BN-00043	3-9-83	SG #1 Lateral Restraints
NCR-BN-00044	3-9-83	SG #3 Lateral Restraints
NCR-BN-00045	3-9-83	SG #4 Lateral Restraints

Reactor Coolant Pumps

ST-YS-WY-00032	3-24-83	BEC request W to supply pump tolerance information.
ST-WY-YS-00028	3-31-83	W responds to pump tolerance request.

Pump Vertical Supports

NCR-BN-00047	3-9-83	RCP #2 Vertical Supports
NCR-BN-00048	3-9-83	RCP #3 Vertical Supports
NCR-BN-00049	3-9-83	RCP #4 Vertical Supports
NCR-BN-00050	3-9-83	RCP #1 Vertical Supports
ST-YS-WY-00034	3-31-83	Request W to provide tolerance information.

Reactor Vessel

NCR-BN-0046	3-24-83	Reactor Vessel
ST-YS-WY-00036	3-24-83	Request W to provide tolerance information.
ST-EY-YS-001687	3-23-83	Ebasco states concern that there may be relationship between RCB differential settlement and leveliness of reactor vessel support flange.
H&CK-L-S-261	5-9-83	BC&M evaluation of RCB differential settlement.

Attachment B

Nonconformance Reports - Status

Item	Status
Steam Generator Verticality	
NCR-BN-00034	Closed. Use as-is
NCR-BN-00035	Closed. Use as-is
NCR-BN-00036	Closed. Use as-is
NCR-BN-00037	Closed. Use as-is
Steam Generator Vertical Supports	
NCR-BN-00038	Open. Will be closed by repositioning base plates to align column or reanalysis
NCR-BN-00039	
NCR-BN-00040	
NCR-BN-00041	
Steam Generator Upper Lateral Supports	
NCR-BN-00042	Open. Will be closed after installation of upper lateral supports. Some rework may be necessary.
NCR-BN-00043	
NCR-BN-00044	
NCR-BN-00045	
Steam Generator Lower Lateral Supports	
NCR-BN-00042	These supports will be used as-is.
NCR-BN-00043	
NCR-BN-00044	
NCR-BN-00045	

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Reactor Coolant Pumps	No NCR's have been issued or are anticipated.
Reactor Coolant Pumps Vertical Supports	Open. Dispositioning will be same
NCR-BN-00047	as for Steam Generator Vertical
NCR-BN-00048	supports.
NCR-BN-00049	
NCR-BN-00050	
Reactor Vessel NCR-BN-00046	Open
Pressurizer Seismic Lug	No NCR will be issued. This item is considered closed.
Steam Generator Related Piping	NCR's will be issued for affected piping. Will be resolved by performing required rework.

2690N/0147N