
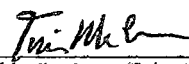
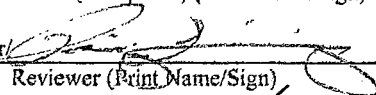
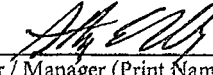



Enclosure 7.a  
of Attachment to  
NLS2016076

	NUCLEAR MANAGEMENT MANUAL	QUALITY RELATED	3-EN-DC-147	REV. 5C1
		INFORMATIONAL USE	PAGE 1 of 4	
Engineering Reports				

ATTACHMENT 9.1  
SHEET 1 OF 2


ENGINEERING REPORT COVER SHEET & INSTRUCTIONS

Engineering Report No. <u>ER 2016-053</u>	Rev <u>0</u>
Page <u>1</u>	of <u>4</u>
<b>Engineering Report Cover Sheet</b>	
<b>Engineering Report Title:</b> Review of SIA Calculation 1601004.301, Cooper High Pressure RHRSW Thinning Evaluation per Code Case N-513-3	
<b>Engineering Report Type:</b>	
New <input checked="" type="checkbox"/>	Revision <input type="checkbox"/>
Cancelled <input type="checkbox"/>	Superseded <input type="checkbox"/>
Superseded by: _____	
ECR No. <u>N/A</u> EC No. <u>N/A</u>	
Report Origin: <input type="checkbox"/> CNS	<input checked="" type="checkbox"/> Vendor
Vendor Document No.: _____	
Quality-Related: <input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Prepared by: <u>Tim McClure</u> 	Date: <u>12-12-16</u>
Responsible Engineer (Print Name/Sign)	
Design Verified: _____	Date: _____
Design Verifier (if required) (Print Name/Sign)	
Reviewed by: <u>Phil Leininger</u> 	Date: <u>12-12-16</u>
Reviewer (Print Name/Sign)	
Approved by: <u>Stan Domikaitis</u> 	Date: <u>12-12-16</u>
Supervisor / Manager (Print Name/Sign)	

 <b>NPPD</b> COOPER NUCLEAR STATION	<b>ENGINEERING REPORT</b>
	ER 2016-053 RHRSW Thinning Evaluation

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 <b>NPPD</b> <b>COOPER NUCLEAR STATION</b>	<b>ENGINEERING REPORT</b>
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## **1.0 INTRODUCTION**

This report is to accept a vendor developed evaluation as a result of multiple thinned locations in the Residual Heat Removal Service Water (RHRSW) system piping. The piping is designated as ASME Section XI Class 3 piping and therefore requires an evaluation under ASME Section XI, 2007 Edition, 2008 Addenda (Current CNS Code or Record). The thinned locations were documented in the CNS Corrective Action Program per CR-CNS-2016-05558 and CR-CNS-2016-05628.

## **2.0 PURPOSE**

The purpose of this report is to review and accept a vendor developed structural evaluation as an alternative to ASME Section XI Acceptance Standards using the ASME Section XI Code Case N-513-3. Code Case N-513-3 is conditionally approved by the NRC for moderate energy systems. Because the scope of N-513-3 is limited to moderate energy systems, and the subject piping is considered high energy (maximum operating pressure greater than 275 psig), this calculation provides the technical justification for an NRC submittal seeking relief from the moderate energy limitation. The RHRSW design pressure is 490 psig.

## **3.0 TECHNICAL APPROACH**


The SIA evaluation uses the methodology in ASME Section XI Code Case N-513-3.

## **4.0 DESIGN INPUTS/ASSUMPTIONS**

Section 3.0 of the SIA evaluation provides a list of design inputs. The design inputs have been reviewed and are considered acceptable. Section 4.0 provides a list of Assumptions that are considered reasonable.

## **5.0 EVALUATION**

Section 5.0 of the SIA evaluation provides the detailed calculations per N-513-3. Review of the calculations as compared to the requirements of N-513-3 are considered acceptable.

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## **6.0 RESULTS/CONCLUSIONS**

Section 6.0 of the SIA evaluation provides the result of the analysis. Table 4 shows the allowable axial and circumferential through-wall flaw lengths. The most limiting allowable flaw length is 2.2 inches in the axial direction and 3.9 inches in the circumferential direction. The conservatively characterized through-wall flaw is 1.5 inches in the axial and circumferential directions. The allowable flaw size is larger than the conservatively characterized flaw, which satisfies the structural evaluation of Code Case N-513-3.

Section 7.0 of the SIA evaluation concludes all the flaws meet the N-513-3 separation requirements and are evaluated independently. The evaluation meets ASME Section XI requirements by demonstrating the allowable through-wall flaw lengths bound the conservatively characterized flaws.

The results and conclusions have been reviewed and are considered acceptable.

## **7.0 REFERENCES**

The references in Section 8.0 of SIA Evaluation 1601004.301 have been reviewed and are considered acceptable. Reference 14 in the SIA evaluation has been formally accepted at CNS per ER2016-054.

## **8.0 ATTACHMENTS**

- 8.1** Structural Integrity Calculation 1601004.301, Rev 0, Cooper High Pressure RHRSW Thinning Evaluation, Dated 12-12-2016
- 8.2** Attachment 9.3, Engineering Report Technical Review Comments and Resolutions Form