



Scott L. Batson
Vice President
Oconee Nuclear Station

Duke Energy
ON01VP | 7800 Rochester Hwy
Seneca, SC 29672

o: 864.873.3274
f: 864.873.4208

Scott.Batson@duke-energy.com

ONS-2016-077

10 CFR 50.73

August 26, 2016

Attn: Document Control Desk
U. S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2746

Duke Energy Carolinas, LLC (Duke Energy)
Oconee Nuclear Station Unit 3
Docket No. 50-287
Renewed License Number DPR-55

Subject: Licensee Event Report 287/2016-001, Revision 0 - Reactor Building Cooling Unit
Inoperability Exceeds Technical Specification Completion Time

The enclosed Licensee Event Report (LER) describes the discovery of an inoperable Reactor Building Cooling Unit (RBCU) at Oconee Nuclear Station (ONS), Unit 3. It was determined that the inoperable condition had existed longer than the time allowed by the Technical Specification (TS) applicable to the RBCU. It was also determined that Unit 3 had entered the Modes of applicability while the inoperability existed which is prohibited by TS 3.0.4. These conditions constitute an "operation or condition prohibited by Technical Specifications" as described by 10 CFR 50.73(a)(2)(i)(B), thus requiring an LER to be submitted.

There are no regulatory commitments associated with this LER.

If there are questions, or further information is needed, contact David Haile in ONS Regulatory Affairs at (864) 873-4742.

Sincerely,

Scott L. Batson
Vice President
Oconee Nuclear Site

Enclosure

LER: Unit 3 Reactor Building Cooling Unit Inoperability Exceeds Technical Specification
Completion Time

IF22
NPR

cc :

Ms. Catherine. Haney
Administrator Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

Mr. James R. Hall, Project Manager (ONS)
(by electronic mail only)
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Mail Stop O-8B1
Rockville, MD 20852

Mr. Eddy Crowe
NRC Senior Resident Inspector
Oconee Nuclear Station

INPO (Word File via E-mail)

bx:

ONS Site:

Site PORC Members

Director, Organizational Effectiveness: D.M. Hubbard

RA MGR: C.J. Wasik

RA: Commitment Index/P Metler[#]

LER Book*

ONSCommunications@Duke-Energy.com

EPIX Cord: S.F. Hatley

NSRB/S. Harry/EC06L*

ONS Document Management and Information Services (Master File) *

Site Sections drive: \SA\ONS LERs\2016 (PDF copy)

ELL/EC27F*

GO and other sites:

Nuclear Reg Affairs: M.C. Nolan*

NGO/SAA: B.C. Carroll

NGO/SA: S.B. Thomas

LEGAL: D.A. Cummings*

Site Regulatory Affairs Managers:

C. Fletcher - CNS

J. Robertson - MNS

L. Grzeck - BNP

J. Caves - HNP

A. Pilo - RNP

* Hardcopy (All others by E-Mail Distribution)



LICENSEE EVENT REPORT (LER)

(See Page 2 of form 366 for required number of digits/characters for each block)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2018
 Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME Oconee Nuclear Station, Unit 3	2. DOCKET NUMBER 05000287	3. PAGE 1 of 3
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4. TITLE
Unit 3 Reactor Building Cooling Unit Inoperability Exceeds Technical Specification Completion Time

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
06	28	2016	2016	001	00	08	26	2016	NA	5000
									FACILITY NAME	DOCKET NUMBER
									NA	5000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
10. POWER LEVEL 100	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 50.73(a)(2)(i)(C)				<input type="checkbox"/> OTHER Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT David Haile, Regulatory Affairs Lead Engineer	TELEPHONE NUMBER (Include Area Code) (864) 873-4742
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO ICES	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO ICES
A	BK	CLR	J127	Yes					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE MONTH: DAY: YEAR:
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On June 28, 2016, the 3C Reactor Building Cooling Unit (RBCU) was discovered to be running in reverse when operating in the low speed mode and Technical Specification (TS) 3.6.5, Condition B, was entered (only low speed is applicable to TS operability). The RBCU was restored to operable on June 29, 2016. It was determined that the inoperability was caused by a wiring error (rolled leads) that occurred during the preceding outage. This provides firm evidence that the RBCU was inoperable from the time Mode 2 was entered (May 15, 2016) until RBCU operability was restored on June 29, 2016. This duration exceeds the 7.5 day cumulative Completion Time allowed by TS 3.6.5. During start-up from the outage, the plant entered Modes 2 and 1 with the RBCU inoperable, which is prohibited by TS 3.0.4. These conditions constitute plant operation prohibited by Technical Specifications and are reportable as an LER per 10 CFR 50.73(a)(2)(i)(B).

The cause was determined to be personnel error by the technicians' improper application of the configuration control process. The technicians received remedial training and a procedure change was initiated to enhance configuration control aspects in the maintenance procedure.

The safety function associated with TS 3.6.5 was available during the inoperability of the 3C RBCU.

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Narrative

Background

TS 3.6.5, "Reactor Building Spray and Cooling Systems" credits a combination of Reactor Building Cooling Units (RBCUs) and Reactor Building Spray (RBS) to ensure the reactor building remains below its design pressure and temperature in post-accident conditions. This event is reportable because the discovered rolled leads provides firm evidence that the 3C RBCU was inoperable for a duration that exceeded the TS allowed Completion Time. The inoperability also existed during plant start-up such that the plant entered the TS 3.6.5 modes of applicability without meeting the Limiting Condition for Operation (LCO). These conditions constitute operation prohibited by TS and are reportable per 10 CFR 50.73(a)(2)(i)(B).

The RBCU and RBS systems [BK] are Engineered Safeguards systems. They are designed to ensure that post-accident heat removal capability can be attained to limit and maintain the post-accident conditions to less than the containment design values.

The RBS system consists of two separate trains of equal capacity, each capable of meeting the design basis.

The RBCU system consists of three RBCU trains. Each cooling train is equipped with cooling coils, and a fan driven by a two-speed electric motor. During normal unit operation, typically two reactor building cooling trains operating at low or high speed cool the containment atmosphere. The third train is usually on standby. Upon receipt of an emergency signal, any operating trains will automatically trip, then all trains will start in low speed after a 3 minute delay. Low speed operation during post-accident conditions prevents motor overload from the higher density atmosphere. Analysis results of RBCU train performance for post-accident conditions supports that any combination of two trains can provide 100% of the required cooling capacity during the post-accident conditions.

EVENT DESCRIPTION

On June 28, 2016, a Unit 3 Reactor Building entry was made to investigate anomalies in the RBCU inlet temperature readings. Specifically, the inlet temperature to the 3C RBCU were reading low. Maintenance and Engineering determined that the 3C RBCU fan was running in the reverse direction in low speed. Based on this discovery, the 3C RBCU was declared inoperable and Condition B of TS 3.6.5 was entered (a 7 day Completion Time).

An onsite investigation team determined that, during the preceding outage, the RBCU motor control center (MCC) contactor leads were inadvertently "rolled" during routine maintenance. The rolled leads created an incorrect order of the electrical phase connections to the motor, which changed the rotational direction of the motor. The terminations were corrected and the fan was observed and tested to verify proper operation. TS 3.6.5 was exited on June 29, 2016.

The determination that the error (rolled leads) occurred during the outage constitutes firm evidence that the RBCU was inoperable while the plant was operating in Mode 2 or higher for approximately 45 days before the condition was corrected. The maximum Completion Time allowed by TS 3.6.5 for one inoperable RBCU is 7 days, after which Condition D would be entered. Condition D allows an additional 12 hours to be in Mode 3.

Also, because TS 3.0.4 is applicable to TS 3.6.5 for Unit 3, entry into a Mode of applicability for TS 3.6.5 without meeting the LCO is prohibited.

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Narrative

Therefore, entering a Mode of applicability (Modes 2 and 1) with the 3C RBCU inoperable is prohibited by TS 3.0.4, and the span of a 45 day inoperability is prohibited by TS 3.6.5.

During the 45 day span, the other two RBCU trains remained operable. Also both RBS trains remained operable, except for two occasions when a RBS train was declared inoperable to facilitate pump and valve testing. The duration of each RBS inoperability was less than the 24-hr Completion Time allowed by TS 3.6.5, Condition C which applies to the inoperability of one RBS train and one RBCU train.

CAUSAL FACTORS

The cause is attributed to human error in the technician's improper application of the configuration control process.

A contributing factor was that a recent change to the maintenance procedure for this activity did not integrate the maintenance standard for configuration control.

CORRECTIVE ACTIONS

Immediate

The 3C RBCU terminations were restored and returned to service.

Result of Cause Analysis

1. The technicians involved received remedial training/counseling from supervision.
2. A procedure change has been initiated to enhance configuration control for the lifted lead aspects in the maintenance procedure for this activity.

SAFETY ANALYSIS

A probabilistic risk assessment (PRA) evaluation was conducted for the period of RBCU inoperability to determine the significance of this event. The Oconee PRA model credits the 3A, 3B and 3C RBCUs to operate on low speed for containment heat removal. The analysis considered internal events, high winds, flood and fire risk. Due to the multiple failures of other equipment that must occur in order for an 3C RBCU failure to be of any consequence, the PRA analysis determined that the increase in core damage and large early release frequencies due to a failure of 3C RBCU are negligible. Therefore, the risk impact associated with this event report is well below any risk significance threshold.

ADDITIONAL INFORMATION

Similar events for the preceding three year period:

LER 270/2015-001, reported a valid Emergency Feedwater actuation, due to a personnel error with the improper positioning of an electrical sliding link. No other LERs were found to be caused by similar personnel errors.

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].