DUKE ENERGY®

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CNS-15-021

March 9, 2015

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC
             Catawba Nuclear Station, Units 1 and 2
             Docket Nos. 50-413 and 50-414
             Technical Specification Bases Changes

Pursuant to 10CFR 50.4, please find attached changes to the Catawba Nuclear Station
Technical Specification Bases. These Bases changes were made according to the provisions
of Technical Specification 5.5.14, "Technical Specifications (TS) Bases Control Program."

Any questions regarding this information should be directed to Larry Rudy, Regulatory Affairs, at
(803) 701-3084.

I certify that I am a duly authorized officer of Duke Energy Carolinas, LLC, and that the
information contained herein accurately represents changes made to the Technical
Specification Bases since the previous submittal.

Kelvin Henderson
Vice President, Catawba Nuclear Station

Attachment

A. obl
nicr

xc: V. M. McCree, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, GA 30303-1257

Mr. G.E. Miller
NRC Project Manager (CNS)
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop O-8G9A
11555 Rockville Pike
Rockville, MD 20852-2746

G. A. Hutto, Senior Resident Inspector
Catawba Nuclear Station

March 9, 2015

Re: Catawba Nuclear Station
     Technical Specifications Bases

Please replace the corresponding pages in your copy of the Catawba Technical
Specifications Manual as follows:

REMOVE THESE PAGES	INSERT THESE PAGES

LIST OF EFFECTIVE PAGES

Entire Bases Section (pages 13 - 19)	Entire Bases Section (pages 13 - 19)

TAB 3.4.7

B 3.4.7-1 thru **B** 3.4.7-5 Revision 5	**B** 3.4.7-1 thru **B** 3.4.7-5 Revision 6

If you have any questions concerning the contents of this Technical Specification
update, contact Kristi Byers at (803)701-3758.

Bentley Jones
Interim Regulatory Affairs Manager

BASES

i	Revision 1	4/08/99
ii	Revision 2	3/01/05
iii	Revision 1	6/21/04
B 2.1.1-1	Revision 0	9/30/98
B 2.1.1-2	Revision 1	12/19/03
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B 2.1.2-3	Revision 0	9/30/98
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B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.7 RCS Loops—MODE 5, Loops Filled

BASES

BACKGROUND	In MODE 5 with the RCS loops filled, the primary function of the reactor coolant is the removal of decay heat and transfer this heat either to the steam generator (SG) secondary side coolant or the component cooling water via the residual heat removal (RHR) heat exchangers. While the principal means for decay heat removal is via the RHR System, the SGs are specified as a backup means for redundancy. Even though the SGs cannot produce steam in this MODE, they are capable of being a heat sink due to their large contained volume of secondary water. As long as the SG secondary side water is at a lower temperature than the reactor coolant, heat transfer will occur. The rate of heat transfer is directly proportional to the temperature difference. The secondary function of the reactor coolant is to act as a carrier for soluble neutron poison, boric acid.

In MODE 5 with RCS loops filled, the reactor coolant is circulated by means of two RHR loops connected to the RCS, each loop containing an RHR heat exchanger, an RHR pump, and appropriate flow and temperature instrumentation for control, protection, and indication. One RHR pump circulates the water through the RCS at a sufficient rate to prevent boric acid stratification.

The number of loops in operation can vary to suit the operational needs. The intent of this LCO is to provide forced flow from at least one RHR loop for decay heat removal and transport. The flow provided by one RHR loop is adequate for decay heat removal. The other intent of this LCO is to require that a second path be available to provide redundancy for heat removal.

The LCO provides for redundant paths of decay heat removal capability. The first path can be an RHR loop that must be OPERABLE and in operation. The second path can be another OPERABLE RHR loop or maintaining two SGs with secondary side narrow range water levels ≥ 12% to provide an alternate method for decay heat removal.

APPLICABLE SAFETY ANALYSES	In MODE 5, RCS circulation is considered in the determination of the time available for mitigation of the accidental boron dilution event. The RHR loops provide this circulation.

RCS Loops—MODE 5 (Loops Filled) satisfy Criterion 4 of 10 CFR 50.36 (Ref. 1).

BASES

LCO (continued)

the test, and operating experience has shown that boron stratification is not likely during this short period with no forced flow.

Utilization of Note 1 is permitted provided the following conditions are met, along with any other conditions imposed by initial startup test procedures:

a.   No operations are permitted that would dilute the RCS boron concentration with coolant with boron concentrations less than required to meet SDM of LCO 3.1.1, therefore maintaining an adequate margin to criticality. Boron reduction with coolant at boron concentrations less than required to assure SDM is maintained is prohibited because a uniform concentration distribution throughout the RCS cannot be ensured when in natural circulation; and

b.   Core outlet temperature is maintained at least 10°F below saturation temperature, so that no vapor bubble may form and possibly cause a natural circulation flow obstruction.

Note 2 allows one RHR loop to be inoperable for a period of up to 2 hours, provided that the other RHR loop is OPERABLE and in operation. This permits periodic surveillance tests to be performed on the inoperable loop during the only time when such testing is safe and possible.

Note 3 requires that the secondary side water temperature of each SG be ≤ 50°F above each of the RCS cold leg temperatures before the start of an RCP with an RCS cold leg temperature ≤ 210°F. This restriction is to |
prevent a low temperature overpressure event due to a thermal transient when an RCP is started.

Note 4 provides for an orderly transition from MODE 5 to MODE 4 during a planned heatup by permitting removal of RHR loops from operation when at least one RCS loop is in operation. This Note provides for the transition to MODE 4 where an RCS loop is permitted to be in operation and replaces the RCS circulation function provided by the RHR loops.

An OPERABLE RHR loop is comprised of an OPERABLE RHR pump capable of providing forced flow to an OPERABLE RHR heat exchanger. If not in its normal RHR alignment from the RCS hot leg and returning to the RCS cold legs, the required RHR loop is OPERABLE provided the system may be placed in service from the control room, or may be placed in service in a short period of time by actions outside the control room and there are no restraints to placing the equipment in service. RHR pumps are OPERABLE if they are capable of being powered and are able to provide flow if required. SGs A or D can perform as OPERABLE heat |
sinks with adequate water level; SGs B or C can perform as OPERABLE |
heat sinks with adequate water level and at least one RCP in operation. |

BASES

SURVEILLANCE REQUIREMENTS	**SR 3.4.7.1**

This SR requires verification that the required loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.7.2

Verifying that at least two SGs are OPERABLE by ensuring their secondary side narrow range water levels are ≥ 12% ensures an alternate decay heat removal method in the event that the second RHR loop is not OPERABLE. The A and D SGs are OPERABLE with ≥ 12% narrow range level. The B and C SGs are OPERABLE if narrow range levels are ≥ 12% and at least one RCP is in operation. If both RHR loops are OPERABLE, this Surveillance is not needed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.7.3

Verification that a second RHR pump is OPERABLE ensures that an additional pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the RHR pump. If secondary side narrow range water level is ≥ 12% in at least two SGs, this Surveillance is not needed. The A and D SGs are OPERABLE with ≥ 12% narrow range level. The B and C SGs are OPERABLE if narrow range levels are ≥ 12% and at least one RCP is in operation. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES	1.	10 CFR 50.36, Technical Specifications, (c)(2)(ii).
	2.	Problem Investigation Process M-00-02276.