DUKE ENERGY®

Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461

January 19, 2017

Serial: BSEP 17-0006

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

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Renewed Facility Operating License Nos. DPR-71 and DPR-62
Docket Nos. 50-325 and 50-324
Information Transmittal for NRC Model Development

References:

1. Letter from William R. Gideon (Duke Energy) to the U.S. Nuclear Regulatory Commission Document Control Desk, *Request for License Amendment Regarding Core Flow Operating Range Expansion*, dated September 6, 2016, ADAMS Accession Number ML16257A418.

2. Letter from William R. Gideon (Duke Energy) to the U.S. Nuclear Regulatory Commission Document Control Desk, *Response to Request for Supplemental Information for License Amendment Regarding Core Flow Operating Range Expansion*, dated November 9, 2016, ADAMS Accession Number ML16330A504.

3. NRC E-mail Capture, *Regulatory Audit Plan for Brunswick Steam Electric Plant Unit Nos. 1 and 2 to Support Review of the License Amendment Request Regarding Core Flow Operating Range Expansion Maximum Extended Load Line Limit Analysis Plus, Docket Nos. 50-325 and 50-324*, dated October 19, 2016, ADAMS Accession Number ML16294A273.

4. Letter from Annette H. Pope (Duke Energy) to the U.S. Nuclear Regulatory Commission Document Control Desk, *Information Transmittal for NRC Model Development*, dated October 27, 2016, ADAMS Accession Number ML16320A177.

5. Letter from Annette H. Pope (Duke Energy) to the U.S. Nuclear Regulatory Commission Document Control Desk, *Information Transmittal for NRC Model Development*, dated November 17, 2016, ADAMS Accession Number ML16330A012.

Ladies and Gentlemen:

By letter dated September 6, 2016 (i.e., Reference 1), as supplemented by letter dated November 9, 2016 (i.e., Reference 2), Duke Energy Progress, LLC (Duke Energy), submitted a license amendment request (LAR) for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2, to support an expansion of the core power-flow operating range (i.e., Maximum Extended

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Load Line Limit Analysis Plus (MELLLA+)). By Reference 3, the NRC initiated an audit to support their review of the LAR by conducting confirmatory calculations using the TRACE computer code.

Prior to issuance of the NRC audit plan, a telephone call was held on September 20, 2016, to discuss the feasibility of Duke Energy providing certain BSEP core-modelling information to support NRC development of a TRACE computer model. During the call, Duke Energy identified two items that may be used to support the NRC's model development efforts. The first item was AREVA Document Number 51-9173927-000, *ATRIUM™ 10XM Data for Brunswick MELLLA+ LAR Support.* Duke Energy provided this information by letter dated October 27, 2016 (i.e., Reference 4). The second item was the General Electric Hitachi (GEH) TRACG computer code base deck that supports the BSEP MELLLA+ license amendment request, and the associated TRACG User's Manual. Duke Energy provided this information by letter dated November 17, 2016 (i.e., Reference 5).

On December 8, 2016, via a telephone conference call, the NRC identified the need for certain control blade information to support the NRC modelling effort. The information enclosed was provided to the NRC via electronic mail on December 13, 2016, in response to the request. The information is identical to that submitted via email.

No regulatory commitments are contained in this letter.

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager – Regulatory Affairs, at (910) 457-2487.

Sincerely,

Annette H. Pope
Director – Organizational Effectiveness
Brunswick Steam Electric Plant

WRM/wrm

Enclosure: Control Blade Information

cc:

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Chair - North Carolina Utilities Commission **(Electronic Copy Only)**
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Control Blade Information

Information on Control Blade Notch Size:

Control blade insertion is calibrated in notches, where one notch equals 3 inches. Position of the control blade is described by the number of notches withdrawn. Thus, 00 notch is full insertion and 48 notches is full withdrawal. Total travel of the control blade is 144 inches while the active fuel length is 150 inches. At full blade insertion (i.e., 00 notch), the top of the control material is 7 inches below top of the active fuel. Since the physical notches in the control rod drive are 6 inches apart, the control blade notch position is always even.

Control Blade Material:

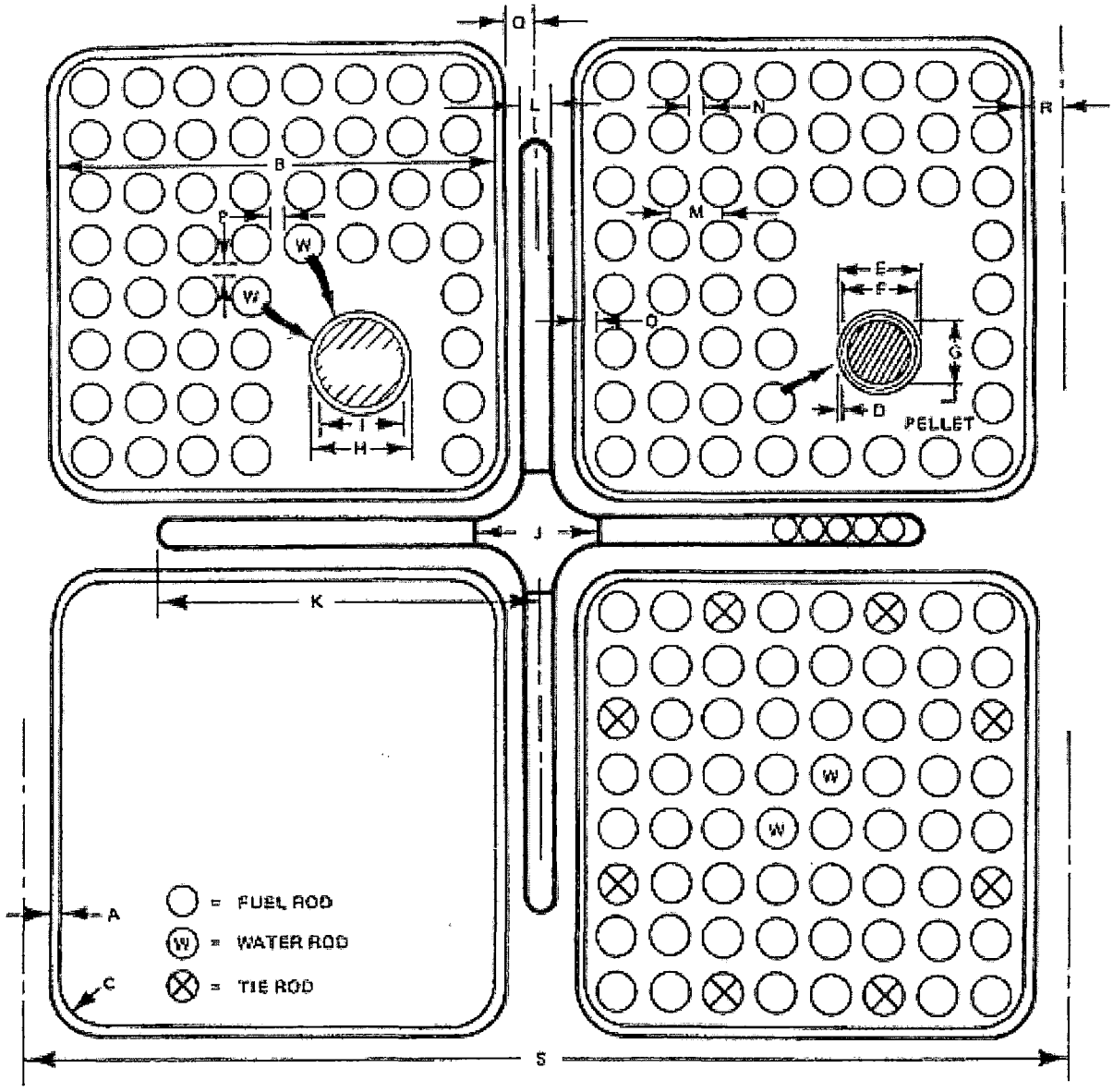
Type-304 stainless steel tubes for both the B_4C tubes and sheath.

Schematic:

The following table contains associated parameters of interest. A schematic is provided below.

BWR4 D-Lattice Original Equipment Blade Data

Parameter	inches	cm	Schematic Dimension
Central Support Span	1.58	4.0132	J
Blade Span (Maximum)	9.88	25.0952	2*K
Blade Thickness (Nominal)	0.312	0.7925	L
Blade Sheath Thickness	0.056	0.1422	
Poison Tube Wall Thickness	0.025	0.0635	
Poison Tube OD	0.188	0.4775	
Control Blade Tip Radius	0.156	0.3962	
Absorber Zone Axial Length	143	363.22	
Roller Diameter (Nominal)	0.520	1.32	
Velocity Limiter Diameter (Maximum)	9.265	23.533	
Number of B_4C Tubes (Per Wing)	21	21	
B_4C Density (g/cm^3)		1.76	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