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DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
STARTUP TEST REPORT FOR CYCLE 22

Pursuant to Millstone Power Station Unit 3 Technical Specification 6.9.1.1, Dominion Energy Nuclear Connecticut, Inc. submits the enclosed Startup Test Report for Cycle 22.

If you have any questions or require additional information, please contact Mr. Dean E. Rowe at (860) 444-5292.

Sincerely,

Lori Armstrong
Director, Nuclear Safety and Licensing – Millstone

Enclosure: (1)

Commitments made in this letter: None

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ENCLOSURE

STARTUP TEST REPORT FOR CYCLE 22

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

Dominion Energy®

Engineering Technical Evaluation Cover Sheet and Body

1. Stations:	2. Doc Type:	3. Sub Type:	4. Document Number:	5. Rev.:	6. Add:	7. Decomm?
☒MP ☐NA ☐SU ☐VC	ETE	000	ETE-NAF-2022-0067	0	N/A	☐Yes ☒No

8. Title:
Millstone Unit 3 Cycle 22 Startup Physics Tests Report

9. ETE Level:	10. Unit(s):	11. Quality Classification:	12. FSRC Approval:	13. Risk Assessment:
☒Level 1 ☐Level 2	☐Unit 1 ☐Unit 2 ☒Unit 3 ☐ISFSI	☒SR ☐NS ☐NSQ [1]	☐Yes ☒No	☐Low ☐Medium ☐High ☒ N/A

14. *Preparation, Review, and Approval Signatures (add or delete rows as needed)*

Prepared by/Affiliation: (Print) B. R. Kinney / NEF	Signature: INDEX AUTHENTICATION	Date: INDEX DATE
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Supervisor Approval/Affiliation: (Print) B. J. Vitiello / NEF	Signature: INDEX AUTHENTICATION	Date: INDEX DATE

Standard Attachments	Attachment	# of pages	Reviewed	Not Req.
15. Design Effects and Considerations (DNES-AA-GN-1003) [2]			☐ No impact ☐ Addressed	☒
16. Document Impact Summary (DRUL) (DNES-AA-GN-1002) [3]				☒

17. Considerations and Conditions for Document Updates (check ☒N/A if no document updates are noted on the DRUL)
☐ All Document updates noted on the DRUL can be initiated immediately
☐ Document updates noted on DRUL are delayed until the following documents/actions are completed (e.g., WO, CR, etc.)
(See DRUL Remarks section)

10CFR50.59 Attachments	Attachment	# of pages	Not Req.
18. 10CFR50.59/72.48 applicability review forms (CM AA-400) [4]			☒
19. 10CFR50.59/72.48 screen form (CM-AA-400) [4]			☒
20. 10CFR50.59/72.48 evaluation form (CM-AA-400) [4]			☒

21. *Additional Attachments*

Attachment	# of pages	Description
N/A	N/A	N/A

[1] Or at VC Summer, Quality Related (QR), per ES-0411, if effective
[2] Or at VC Summer, EC-01, if effective
[3] Or at VC Summer, EC-02, Attachment II, if effective
[4] Or at VC Summer, SAP-0107, if effective

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22. *Distribution*			
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Source Document

DNES-AA-NAF-NCD-5007, Rev. 4

Record of Revision

Original Revision

Purpose

This Engineering Technical Evaluation (ETE) documents the Millstone Unit 3 Cycle 22 (M3C22) Startup Physics Tests Report (SPTR) in accordance with the Source Document. It is provided as information only. As such, in accordance with CM-AA-ETE-101, Rev. 14 step 2.4.i, this ETE is classified as a Level 1 ETE and no controlled document, programs, or 10 CFR 50.59/72.48 screening is required. In addition, a risk assessment is not required for a Level 1 ETE per CM-AA-RSK-1001, Rev. 23.

This startup test report is to be submitted to the NRC in accordance with TS 6.9.1.1 due to the implementation of the measurement uncertainty recapture (MUR) power uprate (Reference 8).

Discussion

Introduction and Summary

The Millstone Unit 3 Cycle 22 (M3C22) fuel reload was completed in April 2022 and went critical on May 21, 2022 at 00:03. The core map detailed in Figure 1 at the end of the discussion section shows the final core configuration. Reference 3 documents that Cycle 22 uses a low leakage loading pattern (L3P) consisting of 85 new Region 24 fuel assemblies, 84 Region 23 once-burned fuel assemblies, and 24 Region 22 twice-burned fuel assemblies. All 193 fuel assemblies in the Cycle 22 core are the Westinghouse 17x17 robust fuel assembly (RFA-2) design.

M3C22 will be the first cycle to operate at 3709 MWt due the implementation of the Measurement Uncertainty Recapture (MUR) power uprate.

The 85 new Region 24 fuel assemblies are comprised of 57 fuel assemblies (designated Region 24A) enriched to 4.00 weight percent Uranium-235 (w/o U^{235}), 28 fuel assemblies (designated Region 24B) enriched to 4.80 w/o U^{235}. The top and bottom regions of all fuel assemblies in the Cycle 22 core are comprised of a 6-inch annular blanket region enriched to 2.6 w/o U^{235} (Region 24 and 22) or 2.4 w/o U^{235} (Region 23).

The 108 re-inserted fuel assemblies were ultrasonically cleaned during the refueling outage. The purpose of the ultrasonic fuel cleaning was to remove adhered crud (primarily nickel and iron-based deposits) from the surface of fuel rods that have previous core exposure in order to reduce the probability of occurrence of crud-induced power shift (CIPS).

Every fuel assembly in Cycle 22 contains an insert. The inserts consist of 61 rod cluster control assemblies (RCCAs), 130 thimble plugs, and 2 secondary source assemblies.

Subsequent operational and testing milestones were completed as follows:

Hot Rod Drops	May 20, 2022
Initial Criticality	May 21, 2022
Low Power Physics Testing completed	May 21, 2022
Main Turbine Online	June 4, 2022
Less than 50% Power Testing completed	June 4, 2022
Less than 75% Power Testing completed	June 5, 2022
100% Power Testing completed	June 13, 2022

Fuel Design

All of the 193 assemblies in the Cycle 22 core are of the RFA-2 design. This fuel design is the same as that used in Cycle 21.

Control Rod Drop Time Measurements

As directed in Reference 7, the drop time of each control rod was measured as hot shutdown (HSD) at hot full-flow reactor coolant system (RCS) conditions before criticality in order to verify that the time to the entry of the rod into the dashpot was less than or equal to, 2.7 seconds, the maximum allowed by Technical Specification 3.1.3.4. All the rods dropped as predicted and the times satisfied the Technical Specifications.

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Hot Rod Drop Time Summary

Slowest Rod (sec)		Fastest Rod (sec)		Average Time (sec)
M-14, P-04, P-12, G-15	2.07	H-10	1.92	2.00

Low Power Physics Testing

The low power physics testing program for Cycle 22 is defined in Reference 5 and completed using the procedure in Reference 1. The program defined in Reference 5 consisted of the following: total core reactivity check, moderator/isothermal temperature coefficient measurements, and a conditional requirement for control and shutdown bank worth measurements. Low power physics testing was performed at a power level below the point of nuclear heat to avoid nuclear heating reactivity feedback effects.

As discussed in Reference 6 rod worth measurements were not required for Cycle 22. Specifically, the MUR was considered a Significant Design Change, however, the conditions (e.g., zero power average moderator temperature) during Reload Physics Testing remained the same as prior cycles. For M3C22, the overall core reactivity conditions at zero power were the same as previous cycles, there is no reason to suspect degradation of RCCA neutron absorption properties, and the capability of the core design methods to predict RCCA worth are unchanged. Core reactivity changes measured during physics testing for M3C22 are within normal cycle-to-cycle variation in core designs.

The total core reactivity check verifies critical boron concentration with control bank D inserted at least 400 pcm of predicted rod worth. The measured values include corrections to account for differences between the measured critical configuration and the expected configuration. The review and acceptance criteria of ±300 and ±1000 percent milliRho (pcm), respectively, were met.

Summary of Total Core Reactivity Check Results

Control Bank D Position (Steps)	Measured (ppm)	Predicted (ppm)	M-P (ppm)	M-P (pcm)	Acceptance Criteria (pcm)
97	1977.7	1999	-21.3	138.4	± 1000

The Isothermal Temperature Coefficient (ITC) data was measured with Control Bank D at 97 steps withdrawn. The review criteria of ±2 pcm/degrees Fahrenheit (°F) to the predictions were met. The TS limit of Moderator Temperature Coefficient (MTC) < +5.0 pcm/°F at ARO hot zero power (HZP) was met.

Isothermal/Moderator Temperature Coefficient Results

Measured ITC (pcm/°F)	Predicted ITC (pcm/°F)	M-P (pcm/°F)	DTC (pcm/°F)	Measured MTC [ITC-DTC] (pcm/°F)	Measured MTC Adjusted to All rods out (pcm/°F)	Acceptance Criteria (pcm/°F)
-1.825	-2.430	0.605	-1.76	-0.065	0.745	MTC < 5.0

Power Ascension Testing / Power Distribution Measurements

The core power distribution was measured through the performance of a series of flux maps during the power ascension, as specified in Reference 2. The results from the flux maps were used to verify compliance with the power distribution Technical Specifications.

A low power flux map at approximately 32.50% RTP was performed to determine if any gross neutron flux abnormalities existed. The 73.86% and 99.91% RTP plateau flux map were performed to support TS Surveillance requirements and to verify that core power distributions were within the design limits.

A summary of the measured axial offset (AO) and incore tilt for the flux maps performed during the power ascension is provided below. Additional tables provide comparisons of the most limiting measured heat flux hot channel factor (F_Q) and nuclear enthalpy rise hot channel factor ($F_{\Delta}h$), including uncertainties, to their respective limits from each of the flux maps performed during the power ascension. The most limiting F_Q reported is based on minimum margin to the limit that varies as a function of core height.

As shown below, all TS limits were met and no abnormalities in core power distribution were observed during power ascension.

Summary of Measured Axial Offset and Incore Tilt

Power (%RTP)	Burnup (MWD/MTU)	D-Bank Position (steps)	AO (%)	Incore Tilt
32.50	14.0	213	15.865	1.0054
73.86	41.0	216	5.879	1.0030
99.91	353	216	1.400	1.0022

Comparison of Measured F_Q to F_Q^{RTP} Limit

Power (%RTP)	Burnup (MWD/MTU)	Measured F_Q	F_Q^{RTP} steady state limit	Measured Transient F_Q	Transient F_Q Limit
32.50	14.0	2.123	4.984	2.119	2.530
73.86	41.0	1.878	3.402	1.878	2.286
99.91	353.0	1.819	2.548	1.846	2.182

Comparison of Measured $F_{\Delta}h$ to $F_{\Delta}h$ Limit

Power (%RTP)	Burnup (MWD/MTU)	$F_{\Delta}h$	$F_{\Delta}h$ Limit
32.50	14.0	1.487	1.907
73.86	41.0	1.457	1.710
99.91	353.0	1.435	1.586

Presented at the end of the discussion section, Figures 2, 3, and 4 are measured power distribution maps showing percent difference from the predicted power for approximately 32.50%, 73.86% and 99.91% RTP plateaus. These figures show there is good agreement between the measured and predicted assembly powers.

Per TS Surveillance 4.2.3.1.3, the RCS flow was measured within 7 days after exceeding 90% RTP using Reference 4. The measured flow at 100% RTP was 404,795 gallons per minute (gpm) with a minimum required flow of 379,200 gpm. All TS limits were met.

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Figure 1

Core Loading Pattern

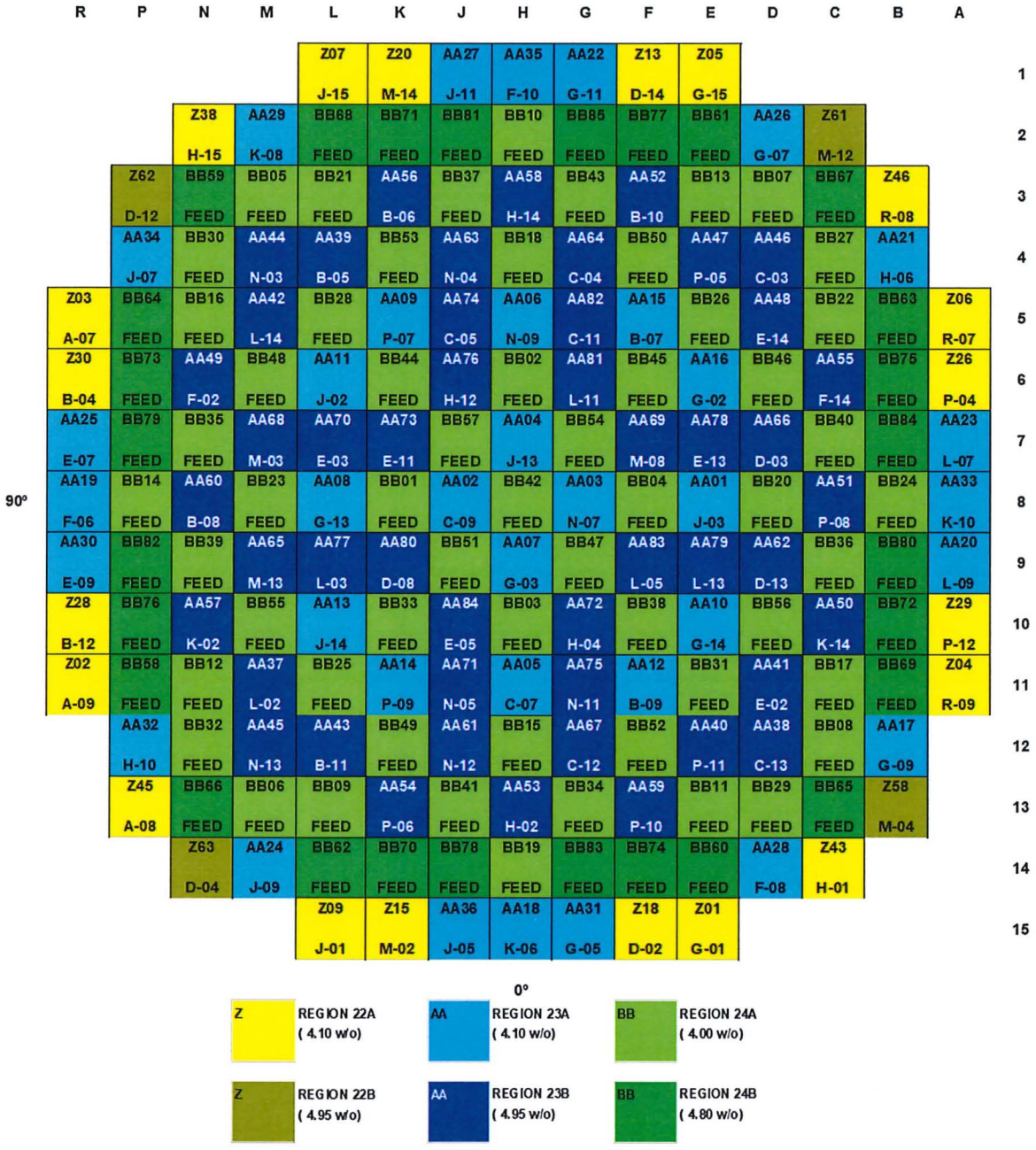

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Figure 2

Power Distribution – 32.50%

ASSEMBLY RELATIVE POWER FRACTIONS
Top value = Measured, middle value = Analytical, bottom value = % Delta
% Delta = (M - A)x100/A

	R	P	N	M	L	K	J	H	G	F	E	D	C	B	A
					0.259	0.352	0.405	0.405	0.410	0.333	0.256				
1					0.260	0.355	0.416	0.415	0.420	0.352	0.261				
					-0.21	-0.95	-2.65	-2.46	-2.38	-5.31	-2.01				
				0.236	0.488	0.944	1.115	1.052	0.932	1.044	1.105	0.943	0.491	0.244	
2				0.238	0.488	0.945	1.123	1.065	0.955	1.061	1.122	0.952	0.493	0.245	
				-0.93	0.09	-0.08	-0.72	-1.19	-2.41	-1.59	-1.50	-0.94	-0.48	-0.35	
			0.245	0.777	0.984	1.186	1.291	1.265	1.257	1.249	1.281	1.189	0.980	0.772	0.233
3			0.245	0.774	0.978	1.180	1.291	1.269	1.263	1.258	1.291	1.192	0.981	0.772	0.237
			-0.17	0.36	0.63	0.54	0.00	-0.30	-0.48	-0.70	-0.80	-0.26	-0.08	-0.02	-1.54
			0.488	0.988	1.281	1.380	1.302	1.320	1.314	1.308	1.293	1.373	1.269	0.980	0.488
4			0.494	0.983	1.268	1.362	1.293	1.318	1.311	1.312	1.294	1.367	1.264	0.974	0.485
			-1.18	0.55	1.03	1.30	0.67	0.14	0.27	-0.31	-0.05	0.44	0.40	0.64	0.52
	0.263	0.959	1.309	1.393	1.390	1.244	1.259	1.174	1.252	1.235	1.369	1.369	1.189	0.947	0.260
5	0.261	0.952	1.193	1.369	1.351	1.234	1.258	1.174	1.258	1.233	1.346	1.356	1.174	0.939	0.258
	0.48	0.72	1.31	1.72	2.87	0.85	0.11	-0.01	-0.49	0.13	1.72	0.93	1.24	0.82	0.91
	0.350	1.132	1.313	1.316	1.250	1.291	1.249	1.319	1.250	1.282	1.227	1.290	1.290	1.131	0.351
6	0.351	1.120	1.290	1.294	1.234	1.294	1.254	1.318	1.257	1.288	1.223	1.284	1.283	1.115	0.350
	-0.38	1.08	1.77	1.66	1.31	-0.24	-0.43	0.11	-0.56	-0.49	0.31	0.49	0.51	0.55	0.39
	0.419	1.068	1.272	1.331	1.265	1.252	1.166	1.079	1.168	1.219	1.218	1.306	1.262	1.062	0.415
7	0.419	1.057	1.254	1.308	1.255	1.257	1.184	1.091	1.182	1.245	1.226	1.306	1.260	1.059	0.414
	0.01	1.04	1.47	1.79	0.79	-0.42	-1.49	-1.08	-1.17	-2.11	-0.63	-0.01	0.15	0.24	0.12
	0.404	0.958	1.268	1.317	1.169	1.305	1.067	1.116	1.075	1.303	1.158	1.305	1.262	0.952	0.412
8	0.413	0.950	1.256	1.302	1.165	1.312	1.089	1.133	1.089	1.312	1.165	1.302	1.256	0.950	0.413
	-2.23	0.80	0.99	1.16	0.38	-0.50	-2.04	-1.50	-1.29	-0.66	-0.56	0.24	0.45	0.20	-0.15
	0.416	1.073	1.276	1.320	1.235	1.241	1.166	1.074	1.163	1.244	1.243	1.313	1.261	1.060	0.412
9	0.414	1.059	1.260	1.306	1.226	1.245	1.182	1.091	1.184	1.257	1.255	1.308	1.254	1.057	0.419
	0.36	1.35	1.27	1.09	0.76	-0.30	-1.34	-1.57	-1.74	-1.01	-0.98	0.40	0.57	0.24	-1.60
	0.353	1.130	1.300	1.303	1.248	1.289	1.233	1.300	1.241	1.288	1.238	1.319	1.302	1.126	0.350
10	0.350	1.115	1.283	1.284	1.223	1.288	1.257	1.318	1.254	1.294	1.234	1.294	1.290	1.120	0.351
	0.85	1.31	1.29	1.50	2.02	0.09	-1.89	-1.33	-1.08	-0.45	0.29	1.95	0.96	0.52	-0.16
	0.260	0.951	1.190	1.376	1.375	1.237	1.247	1.162	1.251	1.232	1.358	1.384	1.204	0.957	0.259
11	0.258	0.939	1.174	1.356	1.346	1.233	1.258	1.174	1.258	1.234	1.351	1.369	1.193	0.952	0.261
	0.60	1.27	1.38	1.49	2.15	0.32	-0.86	-1.03	-0.55	-0.15	0.49	1.11	0.90	0.48	-0.69
			0.492	0.987	1.277	1.378	1.294	1.301	1.300	1.319	1.293	1.367	1.283	0.991	0.495
12			0.485	0.974	1.264	1.367	1.294	1.312	1.311	1.318	1.293	1.362	1.268	0.983	0.494
			1.35	1.31	1.00	0.83	0.03	-0.82	-0.85	0.08	-0.01	0.35	1.20	0.80	0.29
			0.240	0.784	0.989	1.194	1.283	1.241	1.240	1.257	1.282	1.177	0.978	0.774	0.241
13			0.237	0.772	0.981	1.192	1.291	1.258	1.263	1.269	1.291	1.180	0.978	0.774	0.245
			1.40	1.54	0.78	0.18	-0.66	-1.33	-1.83	-0.92	-0.68	-0.28	0.02	0.04	-1.75
				0.243	0.492	0.944	1.106	1.034	0.933	1.049	1.108	0.934	0.476	0.235	
14				0.245	0.493	0.952	1.122	1.061	0.955	1.065	1.122	0.945	0.488	0.238	
				-0.93	-0.12	-0.87	-1.41	-2.50	-2.34	-1.55	-1.36	-1.11	-2.45	-1.10	
					0.250	0.344	0.407	0.391	0.406	0.350	0.257				
15					0.261	0.352	0.420	0.415	0.416	0.355	0.260				
					-4.25	-2.34	-3.08	-5.71	-2.45	-1.45	-1.11				

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Figure 3

Power Distribution – 73.86%

ASSEMBLY RELATIVE POWER FRACTIONS
Top value = Measured, middle value = Analytical, bottom value = % Delta
% Delta = (M - A)x100/A

	R	P	N	M	L	K	J	H	G	F	E	D	C	B	A
					0.267	0.360	0.415	0.419	0.424	0.344	0.266				
1					0.271	0.368	0.431	0.432	0.436	0.364	0.272				
					-1.31	-2.23	-3.70	-2.99	-2.75	-5.50	-2.32				
				0.245	0.500	0.943	1.100	1.050	0.940	1.048	1.103	0.949	0.505	0.255	
2				0.250	0.504	0.952	1.120	1.069	0.965	1.064	1.119	0.959	0.509	0.257	
				-2.05	-0.74	-0.91	-1.78	-1.81	-2.57	-1.51	-1.43	-1.04	-0.88	-0.74	
		0.254	0.787	0.987	1.176	1.269	1.252	1.246	1.243	1.269	1.185	0.984	0.786	0.244	
3		0.257	0.792	0.988	1.177	1.275	1.259	1.251	1.249	1.276	1.189	0.992	0.790	0.250	
		-1.22	-0.68	-0.07	-0.07	-0.50	-0.52	-0.39	-0.50	-0.58	-0.37	-0.81	-0.55	-2.59	
		0.497	0.988	1.264	1.353	1.287	1.303	1.310	1.296	1.285	1.354	1.259	0.988	0.502	
4		0.510	0.994	1.260	1.343	1.282	1.300	1.298	1.294	1.283	1.347	1.256	0.985	0.502	
		-2.47	-0.61	0.34	0.74	0.36	0.22	0.90	0.13	0.18	0.53	0.25	0.32	0.01	
	0.271	0.960	1.199	1.365	1.370	1.236	1.250	1.175	1.246	1.233	1.359	1.250	1.183	0.951	0.270
5	0.272	0.959	1.189	1.349	1.338	1.227	1.245	1.169	1.245	1.226	1.333	1.237	1.172	0.948	0.270
	-0.27	0.11	0.81	1.22	2.38	0.76	0.39	0.49	0.06	0.55	1.95	0.98	0.93	0.32	0.12
	0.360	1.126	1.296	1.300	1.242	1.289	1.250	1.327	1.254	1.287	1.226	1.284	1.277	1.115	0.363
6	0.363	1.118	1.274	1.282	1.227	1.289	1.249	1.317	1.252	1.284	1.217	1.273	1.268	1.114	0.362
	-0.88	0.70	1.72	1.42	1.20	-0.00	0.11	0.74	0.16	0.20	0.75	0.85	0.70	0.06	0.20
	0.432	1.068	1.261	1.309	1.355	1.254	1.189	1.105	1.190	1.230	1.215	1.297	1.265	1.068	0.430
7	0.434	1.062	1.246	1.291	1.343	1.252	1.195	1.106	1.192	1.240	1.213	1.288	1.252	1.063	0.429
	-0.39	0.60	1.18	1.37	0.96	0.13	-0.50	-0.08	-0.25	-0.79	0.18	0.72	1.00	0.48	0.23
	0.418	0.962	1.256	1.306	1.175	1.315	1.096	1.154	1.101	1.314	1.163	1.302	1.259	0.964	0.429
8	0.430	0.961	1.245	1.290	1.160	1.311	1.105	1.160	1.105	1.311	1.160	1.290	1.245	0.961	0.430
	-2.75	0.26	0.86	1.21	1.28	0.30	-0.80	-0.51	-0.32	0.20	0.22	0.95	1.15	0.32	-0.20
	0.427	1.067	1.262	1.302	1.226	1.244	1.188	1.100	1.186	1.249	1.240	1.300	1.256	1.065	0.428
9	0.429	1.063	1.252	1.288	1.213	1.240	1.193	1.106	1.195	1.252	1.243	1.291	1.246	1.062	0.434
	-0.41	0.40	0.82	1.06	1.08	0.36	-0.41	-0.54	-0.74	-0.23	-0.28	0.72	0.82	0.33	-1.45
	0.363	1.121	1.279	1.289	1.239	1.290	1.242	1.309	1.244	1.290	1.234	1.303	1.287	1.124	0.363
10	0.362	1.114	1.268	1.273	1.217	1.284	1.252	1.317	1.249	1.289	1.227	1.282	1.274	1.118	0.363
	0.31	0.62	0.88	1.27	1.85	0.47	-0.76	-0.60	-0.42	0.09	0.61	1.60	0.98	0.53	-0.05
	0.269	0.953	1.182	1.352	1.357	1.230	1.239	1.160	1.242	1.229	1.351	1.364	1.300	0.963	0.269
11	0.270	0.948	1.172	1.337	1.333	1.226	1.245	1.169	1.245	1.227	1.338	1.349	1.189	0.959	0.272
	-0.33	0.57	0.88	1.09	1.80	0.31	-0.50	-0.77	-0.21	0.20	0.97	1.14	0.91	0.46	-0.95
		0.505	0.991	1.262	1.352	1.279	1.284	1.289	1.301	1.283	1.349	1.275	1.001	0.511	
12		0.502	0.985	1.256	1.347	1.283	1.294	1.298	1.300	1.282	1.343	1.260	0.994	0.510	
		0.56	0.62	0.48	0.38	-0.33	-0.80	-0.70	0.10	0.06	0.45	1.20	0.66	0.16	
		0.250	0.792	0.992	1.183	1.262	1.230	1.231	1.247	1.266	1.173	0.987	0.790	0.251	
13		0.250	0.790	0.992	1.189	1.276	1.249	1.251	1.259	1.275	1.177	0.988	0.792	0.257	
		0.14	0.27	-0.00	-0.51	-1.10	-1.52	-1.58	-0.92	-0.74	-0.34	-0.09	-0.22	-2.43	
			0.255	0.505	0.945	1.098	1.031	0.941	1.050	1.100	0.939	0.488	0.247		
14			0.257	0.509	0.959	1.119	1.064	0.965	1.069	1.120	0.952	0.504	0.250		
			-0.94	-0.70	-1.43	-1.88	-3.06	-2.49	-1.80	-1.76	-1.41	-3.09	-1.24		
					0.260	0.354	0.420	0.408	0.420	0.361	0.267				
15					0.272	0.364	0.436	0.432	0.431	0.368	0.271				
					-4.56	-2.71	-3.70	-5.61	-2.64	-2.02	-1.62				

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Figure 4

Power Distribution – 99.91%

ASSEMBLY RELATIVE POWER FRACTIONS
Top value = Measured, middle value = Analytical, bottom value = % Delta
% Delta = (M - A)x100/A

	R	P	N	M	L	K	J	H	G	F	E	D	C	B	A
					0.275	0.368	0.422	0.432	0.436	0.353	0.273				
1					0.279	0.378	0.445	0.447	0.450	0.374	0.280				
					-1.53	-2.74	-5.06	-3.38	-3.02	-5.49	-2.60				
				0.251	0.510	0.945	1.095	1.054	0.951	1.053	1.096	0.948	0.513	0.263	
2				0.260	0.517	0.957	1.119	1.077	0.979	1.073	1.118	0.963	0.522	0.267	
				-3.58	-1.29	-1.28	-2.12	-2.14	-2.88	-1.87	-1.95	-1.57	-1.65	-1.60	
		0.261	0.791	0.991	1.174	1.255	1.252	1.243	1.241	1.249	1.178	0.983	0.791	0.250	
3		0.267	0.803	0.997	1.178	1.263	1.258	1.243	1.249	1.263	1.189	1.001	0.803	0.259	
		-2.09	-1.44	-0.61	-0.37	-0.63	-0.50	0.02	-0.63	-1.13	-0.91	-1.78	-1.33	-3.49	
		0.506	0.986	1.244	1.332	1.285	1.290	1.305	1.284	1.283	1.333	1.241	0.993	0.512	
4		0.522	1.002	1.245	1.324	1.280	1.284	1.292	1.279	1.280	1.328	1.242	0.995	0.515	
		-3.05	-1.57	-0.05	0.64	0.38	0.44	1.03	0.36	0.20	0.40	-0.16	-0.24	-0.52	
	0.278	0.958	1.192	1.343	1.362	1.231	1.241	1.171	1.242	1.229	1.356	1.332	1.180	0.952	0.278
5	0.280	0.963	1.190	1.330	1.331	1.217	1.230	1.159	1.230	1.216	1.327	1.319	1.174	0.953	0.278
	-0.86	-0.52	0.14	0.96	2.40	1.18	0.87	1.04	0.94	1.10	2.20	0.95	0.55	-0.11	-0.15
	0.367	1.118	1.277	1.297	1.236	1.299	1.249	1.330	1.255	1.295	1.224	1.284	1.263	1.108	0.371
6	0.373	1.117	1.262	1.280	1.217	1.286	1.239	1.313	1.242	1.281	1.207	1.272	1.257	1.113	0.372
	-1.65	0.08	1.23	1.31	1.58	1.00	0.83	1.37	1.03	1.08	1.39	0.95	0.45	-0.46	-0.18
	0.443	1.072	1.257	1.296	1.245	1.252	1.206	1.121	1.213	1.240	1.212	1.288	1.261	1.074	0.443
7	0.449	1.070	1.246	1.276	1.228	1.242	1.205	1.114	1.204	1.231	1.198	1.273	1.252	1.072	0.443
	-1.25	0.15	0.92	1.53	1.38	0.79	0.05	0.67	0.72	0.73	1.15	1.18	0.72	0.20	0.02
	0.429	0.973	1.247	1.301	1.170	1.318	1.114	1.182	1.120	1.319	1.164	1.308	1.249	0.980	0.444
8	0.446	0.976	1.238	1.285	1.150	1.307	1.113	1.178	1.113	1.307	1.150	1.285	1.238	0.976	0.446
	-3.86	-0.31	0.72	1.25	1.72	0.83	0.05	0.32	0.61	0.91	1.22	1.79	0.90	0.38	-0.40
	0.438	1.068	1.258	1.287	1.215	1.241	1.206	1.118	1.209	1.251	1.240	1.292	1.256	1.072	0.438
9	0.443	1.072	1.252	1.273	1.198	1.231	1.204	1.114	1.205	1.242	1.228	1.276	1.246	1.070	0.449
	-1.20	-0.42	0.48	1.06	1.40	0.82	0.21	0.33	0.31	0.72	0.97	1.33	0.83	0.19	-2.52
	0.371	1.114	1.262	1.286	1.231	1.292	1.240	1.316	1.245	1.296	1.232	1.302	1.273	1.120	0.371
10	0.372	1.113	1.257	1.272	1.207	1.281	1.242	1.312	1.239	1.286	1.217	1.280	1.262	1.117	0.373
	-0.28	0.05	0.51	1.06	1.98	0.82	-0.19	0.32	0.45	0.75	1.21	1.71	0.87	0.23	-0.54
	0.276	0.954	1.179	1.331	1.351	1.224	1.232	1.167	1.235	1.224	1.347	1.342	1.196	0.964	0.275
11	0.278	0.953	1.174	1.319	1.327	1.216	1.230	1.159	1.230	1.217	1.331	1.330	1.190	0.963	0.280
	-0.72	0.07	0.41	0.92	1.79	0.64	0.17	0.72	0.44	0.59	1.19	0.94	0.51	0.08	-1.67
		0.515	0.995	1.245	1.333	1.277	1.272	1.287	1.284	1.278	1.326	1.249	1.003	0.521	
12		0.515	0.995	1.243	1.328	1.280	1.279	1.292	1.284	1.280	1.324	1.245	1.002	0.522	
		0.01	-0.04	0.15	0.36	-0.21	-0.54	-0.37	0.03	-0.12	0.18	0.35	0.06	-0.22	
		0.258	0.794	0.996	1.183	1.249	1.229	1.222	1.243	1.249	1.168	0.988	0.796	0.258	
13		0.259	0.803	1.001	1.189	1.263	1.249	1.243	1.258	1.263	1.178	0.997	0.803	0.267	
		-0.49	-0.96	-0.48	-0.49	-1.09	-1.64	-1.70	-1.20	-1.13	-0.86	-0.86	-0.86	-3.23	
			0.258	0.515	0.948	1.094	1.036	0.952	1.053	1.092	0.937	0.497	0.255		
14			0.267	0.522	0.963	1.118	1.073	0.979	1.077	1.119	0.957	0.517	0.260		
			-3.21	-1.26	-1.60	-2.14	-3.45	-2.76	-2.20	-2.43	-2.05	-3.81	-2.07		
					0.267	0.363	0.432	0.422	0.432	0.369	0.273				
15					0.280	0.374	0.450	0.447	0.445	0.378	0.279				
					-4.64	-2.91	-3.92	-5.54	-3.00	-2.51	-2.02				

Conclusions

All results associated with M3C22 BOC zero power physics testing and power ascension flux mapping were acceptable and within associated design tolerances, Technical Specification limits, and Core Operating Limits Report (COLR) limits.

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