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FUEL ASSEMBLY (ISOMETRIC)





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TYPICAL GE BWR FUEL ASSEMBLY



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SCHEMATIC CROSS SECTION OF LOWER TIE PLATE SHOWING CHANNEL/LOWER TIE PLATE (FINGER SPRING) FLOW PATH





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TYPICAL CORE CELL





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CHANNEL FASTENER ASSEMBLY





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UNIT 2 INITIAL CORE - CORE LOADING MAP



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FUEL ASSEMBLY ROD ENRICHMENTS



2.1 2 0/0 19		
PLANK = 1.	15 w/o	BLANK + 1.15 0/0
MH = 1.	80 6/0	2
H + 2	AT 10/0	

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7x7 FUEL ASSEMBLY



- APPROX. WEIGHT - 615 L85

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CALCULATED RANGE OF HOT UNCONTROLLED MAXIMUM LOCAL PEAKING VERSUS EXPOSURE

1.25 MAXIMUM LOCAL PEAKING 1.18 ESION OF CALCULATED Aximum Local Peaking 1.10 1.05 1.00 L 25 30 35 10 15 20 5

EXPOSURE (GW 4/1)



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DOPPLER COEFFICIENT OF REACTIVITY





DOPPLER COEFFICIENT AS FUNCTION OF FUEL EXPOSURE





CORE AVERAGE DOPPLER DEFECT VERSUS CORE POWER LEVEL





DOPPLER DEFECT VERSUS FUEL TEMPERATURE





DOPPLER COEFFICIENT OF REACTIVITY VERSUS MODERATOR CONDITION OF

AVERAGE FUEL TEMPERATURE AT BOL





DOPPLER REACTIVITY COEFFICIENT AS A FUNCTION OF FUEL EXPOSURE AND AVERAGE FUEL TEMPERATURE AT AN AVERAGE VOID CONTENT OF 40%



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DOPPLER REACTIVITY AS A FUNCTION OF CORE AVERAGE VOID FRACTION AND AVERAGE FUEL TEMPERATURE AT BOL AND EOC



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Void Coefficients at Beginning of Cycle 1 and at a Core Average Exposure of 7000 MWD/T





MODERATOR VOID REACTIVITY COEFFICIENT AT BOL AND AT A CORE AVERAGE EXPOSURE OF 10 GWD/T



CORE AVERAGE VOIDS, (Percent)



BRUNSWICK UNIT 1 COLD SHUTDOWN REACTIVITY





FRACTIONAL CONTROL ROD DENSITY VERSUS CORE AVERAGE MODERATOR

DENSITY FOR A CRITICAL REACTOR AT BOL





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MAXIMUM ROD WORTH VERSUS MODERATOR DENSITY





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MAXIMUM ROD WORTH VERSUS POWER LEVEL



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EFFECTIVE CORE EIGENVALUE AS A FUNCTION OF AVERAGE CORE EXPOSURE (MOST **REACTIVE ROD WITHDRAWN)**



Average Core Exposure, (GWD/T)



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SCRAM REACTIVITY BEGINNING AND END OF FIRST CYCLE

FOR HOT OPERATING CONDITIONS



*Measured from time of de-energization of scram solenoid



XENON REACTIVITY BUILDUP AFTER SHUTDOWN AND BURNOUT ON RETURN TO FULL POWER FROM MAXIMUM SHUTDOWN XENON BUILDUP AT BEGINNING OF



LIFE

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RELATIVE XENON STABILITY WITH NO FLUX FLATTENING



LENGTH/DIAMETER RATIO THE L/D RATIO FOR THIS PLANT IS 0.899 AS SHOWN BY THE DASHED LINE



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EFFECT OF POWER DENSITY ON

AXIAL XENON STABILITY INCLUDING VOID TRANSPORT





AZIMUTHAL XENON STABILITY



PERCENT OF RADIAL FLUX FLATTENED

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POWER/FLOW OPERATING MAP FOR POWER UPRATE





FUEL TEMPERATURE VERSUS HEAT FLUX - BOL 3 W/O GD₂O₃





FUEL TEMPERATURE VERSUS HEAT FLUX - 5 YEARS 3 W/O GD₂O₃





CLAD TEMPERATURE VERSUS HEAT FLUX - BOL 3 W/O GD₂O₃





CLAD TEMPERATURE VERSUS HEAT FLUX - 5 YEARS 3 W/O GD₂O₃

















CLAD TEMPERATURE VERSUS HEAT FLUX - BOL UO2





CLAD TEMPERATURE VERSUS HEAT FLUX - 5 YEARS UO2





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GAP

FUEL ASSEMBLY INITIAL ENRICHMENT

DISTRIBUTION 2.1 AVERAGE ENRICHMENT

WIDE-WIDE GAP

	Contraction of the local division of the loc							
4	3	3	2	2	2	3	3	
3	2	2	1	1	1	1	2	
3.1	2	1	1	1	1	1	2	
2	1	1	1	1	1	1	1	
2	1	1	1	Water Rođ	1	1	1	
2	1	1	1	1	1	1	1	
3	1	1	1	1	1	1	2	
3	2	2	1	1	1	2	3	
NARROW-NARROW								
ROD TYPE NO. wt%								

OD TYPE	NO.	<u>wt%</u>
1	38	2.35
2	15	1.90
3	9	1.49
-4	1	1.18
	1	Water Tube



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LOCAL POWER FACTORS 0 MWD/T 40% VOIDS

	1	2	3	4	5	6	7	8
1	1,101	1.148	1.037	1.175	1.135	1.150	1.002	1.124
2	1.148	1.153	1.011	1.087	1.029	1.029	1.141	1.136
3	1.037	1.011	1.007	0.886	0.833	0.407	0.9 67	1.010
4	1.175	1.087	0.886	0.393	0.803	0.825	0.933	1.127
5	1.135	1.029	0.833	0.803	0.	0,894	0.953	1.120
6	1.150	1.029	0.407	0.825	0,894	0.926	0.995	1.162
7	1.002	1.141	0.967	0_933	0.953	0.996	1.075	1.056
8	1.124	1.136	1.010	1.127	1.120	1.162	1.056	0.988

PEAK = 1.175 ROD (1,4)



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LOCAL POWER FACTORS 10,000 MWD/T 40% VOIDS

	1	2	3	4	5	6	7	8
1	1.091	1.092	0.992	1.088	1.064	1.0 60	1.013	1.088
2	1.092	1.073	0.953	1.027	1.001	1.019	1.085	1.097
3	0.992	0.953	1.017	0.948	0.927	0.933	1.007	0,977
4	1.088	1.027	0.948	0.907	0.905	0.896	0.943	1.050
5	1.064	1.001	0.927	0.905	0.	0.900	0,927	1.028
6	1.080	1.019	0.933	0.896	0.900	0.897	0.944	1.051
7	1.013	1.085	1.007	0.943	0.927	0.944	1.009	0.977
8	1.088	1.097	0.977	1.050	1.028	1.051	0.977	0.990

PEAK = 1.097 ROD (2, 8)



GROSS PEAKING FACTOR AS A FUNCTION OF EXPOSURE BRUNSWICK 1





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DURALIFE - 230 CONTROL ROD





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ABB CR82M-1 CONTROL ROD





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WESTINGHOUSE ABB CR99 CONTROL ROD

