

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT

BRUNSWICK RESPONSE TO NUREG 737 SUPPLEMENT 1 -
REGULATORY GUIDE 1.97 - APPLICATION TO EMERGENCY
RESPONSE FACILITIES

DATE:

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LIST OF EFFECTIVE PAGES

Brunswick Response to NUREG 737 Supplement 1 - Regulatory Guide
1.97 - Application to Emergency Response Facilities

<u>Page(s)</u>	<u>Revision</u>
1-iv	1
1-11	1
12	2
13-21	1
22-23	2
24-58	1
59	2
60-61	1
62	2
63-64	1
65-67	2
68-69	1
70-72	2
73	1

VARIABLE B3 - RCS SOLUBLE BORON CONCENTRATION (Sample)

	Recommended By RG 1.97	Provided by Brunswick
(a) Instrument Range	0-1000 ppm	Range exceeds RG 1.97 Recommendation
(b) Environmental Qualification	No specific position	Sampling System will be qualified. Analysis equipment is high quality commercial.
(c) Seismic Qualification	No specific position	Sampling system will be seismically qualified. Analysis equipment has not been qualified.
(d) Quality Assurance	High Quality Commercial Grade	Sampling System has full QA Program commitment. Analysis equipment is high quality commercial grade.
(e) Power Supply	Non-IE	IE for PASS, Conventional for analysis.
(f) Redundance & Sensor Location	No	Redundant Sample Points Only

RCS Samples are taken from the RHR Heat Exchanger A and B shell sides and from the No. 6 and No. 14 jet pumps.

(g) Location of Display

The sample will be analyzed on site in the chemistry lab located in the service building. Back up analysis will be performed by Babcock and Wilcox. Boron concentration is logged by the laboratory technician and phoned in to the TSC.

(h) Schedule

TMI modifications 80-028 and 80-029 have provided this Post Accident Sampling System.

VARIABLE C1 - RADIOACTIVITY CONCENTRATION OR RADIATION LEVEL IN CIRCULATING
PRIMARY COOLANT

	Recommended by RG 1.97	Provided by Brunswick
(a) Instrument Range	1/2 Tech. Spec. Limit to 100 Times Tech Spec. Limit	Brunswick meets required range
(b) Environmental Qualification	Yes	Yes (Sampling System)
(c) Seismic Qualification	Yes	Yes (Sampling System)
(d) Quality Assurance	Yes	Yes (Sampling System)
(e) Power Supply	1E	1E (Sampling System)
(f) Redundance & Sensor Location	Yes	Yes

Primary coolant samples are taken from the Reactor Water Cleanup System during normal operation and analyzed at the counting room by a Gamma Spectroscopy System. During accident situations, Primary Coolant samples are taken by the Post Accident Sampling System located outside the Reactor Building. The sample is analyzed in the counting room. Results are phoned in to the TSC.

(g) Location of Display - Counting Room

(h) Schedule - TMI Plant Modifications 80-028 and 80-029 have provided the POST ACCIDENT SAMPLING SYSTEM for Unit 1 and 2 respectively.

VARIABLE C2 ANALYSIS OF PRIMARY COOLANT (GAMMA SPECTRUM)

	Recommended by RG 1.97	Provided by Brunswick
(a) Instrument Range	10^{-5} Ci/gm to 10 Ci/gm or TID-14844 Source Term in Coolant Volume	Brunswick meets required range
(b) Environmental Qualification	No	Yes (Sampling System)
(c) Seismic Qualification	No	Yes (Sampling System)
(d) Quality Assurance	High Quality Commercial Grade	Yes (Sampling System)
(e) Power Supply	Non-1E	1E (Sampling System)
(f) Redundance & Sensor Location	No	Yes

Primary coolant samples are taken from the Reactor Water Cleanup System during normal operation and analyzed at the Counting Room by a Gamma Spectroscopy System. During accident situations Primary Coolant samples are taken by the Post Accident Sampling System located outside the Reactor Building. The sample is analyzed in the Counting Room. Results are phoned in to the TSG.

- (g) Location of Display - Counting Room
- (h) Schedule - TMI Plant Modifications 80-028 and 80-029 have provided the Post Accident Sampling System for Unit 1 and 2, respectively.

VARIABLE E2 - Reactor Building or Secondary
Containment Area Radiation

- High range monitoring of this variable is not required for Brunswick. The Reactor Building vent is closed when the radiation level reaches 11 mr/hr and secondary containment atmosphere is routed through the standby gas treatment system. See Brunswick position paper.

VARIABLE E4, E5

	Recommended by RG 1.97	Provided by Brunswick
(c) Seismic Qualification	No	
(d) Quality Assurance	Not Required	See Note 2
(e) Power Supply	High Reliability	High Reliability
(f) Redundance & Sensor Location	No	Partially as shown below

<u>Sensor</u>	<u>Tag No.</u>	<u>Range</u>	<u>Location</u>	<u>Function</u>
Radiation Detection	D12-RE-4561	High	IR-TB-31	TB Vent Rad Mon
" "	D12-RE-4562	Mid	"	"
" "	D12-RE-4563	Low	"	"
" "	D12-RE-4573	High	"	OG Stack Rad Mon
" "	D12-RE-4574	Mid	"	"
" "	D12-RE-4982	Low	"	"
Flow Transmitter	VA-FT-3358	0-15000 SCFM	Local	Turbine Vent
Flow Transmitter	VA-FT-3359	0-100,000 SCFM	Local	Plant Stack

(g) Location of Display

<u>Display</u>	<u>Tag No.</u>	<u>Range</u>	<u>Location</u>	<u>Service</u>
Recorder	D12-RR-4548-1	10^{-7} to 10^{-1} uCi/cc	XU-75 Control Room	TB Vent Rad Mon
Recorder	D12-RR-4548-2	10^{-4} to 10^{-2} "	XU-75 Control Room	"
Recorder	D12-RR-4548-3	10^{-1} to 10^5 "	"	"
Effluent Recorder	D12-RR-4549	10^{-1} to 10^{13} "	"	"
Radiation Recorder	D12-RR-4599-1	10^{-7} to 10^{-1} "	XX-79 Control Room	OG Stack Rad Mon
Radiation Recorder	D12-RR-4599-2	10^{-4} to 10^{-2} "	"	"
Radiation Recorder	D12-RR-4599-3	10^{-1} to 10^5 "	"	"
Effluent Recorder	D12-RR-4600	10^1 to 10^{13} uCi/Sec	"	"

VARIABLE E7 AIRBORNE RADIOHALOGENS AND PARTICULATES
(Portable Sampling with onsite analysis capability)

	Recommended by RG 1.97	Provided by Brunswick
(a) Instrument Range	10^{-9} Ci/cc to 10^{-3} Ci/cc	10^{-14} Ci/cc to 10^{-2} Ci/cc
(b) Environmental Qualification	No specific provision	No
(c) Seismic Qualification	No specific provision	No
(d) Quality Assurance	High Quality Commercial Grade	High Quality Commercial Grade
(e) Power Supply	No specific provision	-
(f) Redundance & Sensor Location	Not Required	Yes
<u>Item</u>	<u>Range</u>	<u>Location</u>
Gamma Spectroscopy System	10^{-14} Ci/cc to 10^{-2} Ci/cc " " " "	Counting Room Mobile Station (offsite environs analysis)
(g) Location of Display	Counting Room	
(h) Schedule	No changes are required.	

VARIABLE E8 PLANT AND ENVIRONS RADIATION
(PORTABLE INSTRUMENTATION)

	Recommended by RG 1.97	Provided By Brunswick
(a) Instrument Range Photons Beta & low energy photons	10^3 R/hr to 10^4 R/hr " " " " "	
(b) Environmental Qualification	No specific provisions	-
(c) Seismic Qualification	No specific provisions	-
(d) Quality Assurance	High Quality Commercial Grade	High Quality Commercial Grade
(e) Power Supply	No specific provision	Battery Powered
(f) Redundance & Sensor Location	Not Required	Yes - Multiple units provided

<u>Item</u>	<u>Quantity</u>	<u>Range</u>	<u>Measurement</u>	<u>Location</u>
E-520	50	0 R/hr 2 R/hr	Photons	Service Bldg.
E-400	6	0 200 mr/hr	Photons	" "
Minirad	28	0 5 R/hr	Photons	" "
PIC-6A	30	0 1000 R/hr	Photons	" "
PRM7	6	10^{-5} R/hr - 5×10^{-3} R/hr	Photons	" "
Ro-7	2	0 - 20,000 R/hr	Photons, beta & low energy photons	" "
Ro-2	20	0 - 5 R/hr	Beta & low energy photons	" "
Teletektor	35	0 - 1000 R/hr	Photons	" "
Ro-2A	15	0- 50 R/hr	Beta & low energy photons	" "

- (g) Location of Display - Display is integral part of portable instrument.
- (h) Schedule - No changes required.

VARIABLE E9 Plant and Environs Radioactivity (Portable Instrumentation)

	Recommended by RG 1.97	Provided by Brunswick
a) Instrument Range	Multichannel Gamma Ray Spectrometer	Multichannel Gamma Ray Spectrometer
b) Environmental Qualification	No specific provision	-
c) Seismic Qualification	No specific provision	-
d) Quality Assurance	High Quality Commercial Grade	High Quality Commercial Grade
e) Power Supply	No specific provision	-
f) Redundance & Sensor Location	Not Required	Yes
Multichannel Gamma Spectrometer located in Counting Room and Mobile Lab.		
g) Location of Display - Display is integral part of portable instrument.		
h) Schedule - No changes are required		

VARIABLE E13 Primary Coolant and Sump (ANALYSIS CAPABILITY ON SITE)

	<u>Recommended by RG 1.9</u>	<u>Provided by Brunswick</u>
a) Instrument Range		
Gross Activity	10 uCi/ml to 10 Ci/ml	1 uCi/ml to 10 uCi/ml
Gamma Spectrum	Isotopic Analysis	Isotopic Analysis
Boron Content	0 to 1000 ppm	20 to 6000 ppm
Chloride Content	0 to 20 ppm	0.5 to 20 ppm
Dissolved Hydrogen or Total Gas	0 to 2000 cc (STP)/Kg	Open item awaiting
Dissolved Oxygen	0 to 20 ppm	resolution by GE
pH	1 to 13	1 to 14
b) Environmental Qualification	No specific provision	Sampling System will be qualified. Analysis equipment is high quality commercial.
c) Seismic Qualification	No specific provision	Sampling System will be seismically qualified. Analysis equipment has not been qualified.
d) Quality Assurance	High Quality Commercial Grade	Sampling System has full QA Program commitment. Analysis equipment is high quality commercial grade.

VARIABLE E13 (Continued)

	<u>Recommended by RG 1.97</u>	<u>Provided by Brunswick</u>
(e) Power Supply	No specific provision	Sampling System will be 1E power. Analysis equipment is powered from conventional sources:
(f) Redundance & Sensor Location	Redundancy not required	-

The Post Accident Sampling System allows samples of primary coolant to be taken from a remote station in the Turbine Building breezeway. Analyzing equipment is located as follows:

Gross Activity and Gamma Spectrum Counting Room.

Chemical Analysis Chemistry Lab

(f) Location of Display

The chemistry analysis is made in the Chemistry Lab and the results logged. Gross activity and gamma spectrum displays are available in the Counting Room.

- (h) Schedule: TMI Plant Modifications 80028 and 80029 have provided the Post Accident Sampling System for Unit 1 and 2, respectively.

VARIABLE E14 - Containment Air

	<u>Recommended by RG 1.97</u>	<u>Provided by Brunswick</u>
(a) Instrument Range		
Hydrogen Content	0 to 30%	1 to 30%
Oxygen Content	0 to 30%	1 to 30%
Gamma Spectrum	(Isotopic Analysis)	Isotopic Analysis
(b) Environmental Qualification	No specific provision	Sampling System will be environmentally qualified. Analysis equipment is high quality commercial.
(c) Seismic Qualification	No specific provision	Sampling System will be seismically qualified. Analysis equipment has not been qualified.
(d) Quality Assurance	High Quality Commercial Grade	Brunswick QA program applies to the sampling system. Analysis equipment is high quality commercial grade.
(e) Power Supply	No specific provision	Sampling System will be 1E power. Analysis equipment is powered from conventional sources.