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TVA 40183(NP 5/90)

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March 29, 2000

Holders of Browns Ferry Nuclear Plant Unit 2 Technical Requirements Manual

BROWNS FERRY NUCLEAR PLANT (BFN) REVISIONS TO BFN UNIT 2 TECHNICAL REQUIREMENTS MANUAL (TRM)

Attached is Revision 16 to the BFN Unit 2 Technical Requirements Manual which should be inserted into your controlled copy of the Unit 2 TRM in accordance with the attached instruction sheet.

This revision applies to your "controlled" copy(ies) of the TRMs which means that each "controlled" copy must be maintained in an up-to-date condition.

If you have any questions, please call Diana Lee (256)729-7853.

for T. E. Abney
Manager of Licensing and Industry Affairs
PAB 1G-BFN

GMM:BDL
Attachment
cc: EDMS, WT 3B-K

INSTRUCTIONS FOR UPDATING
BROWNS FERRY NUCLEAR PLANT UNIT 2
TECHNICAL REQUIREMENTS MANUAL (REQUIREMENTS AND BASES)
(REVISION 16)

Remove Pages	Insert Pages
TRM REQUIREMENTS	
EPL-1 through EPL-5, TRM Revision 14	EPL-1 through EPL-5, TRM Revision 16
3.3-55	3.3-55
3.3-56	3.3-56
3.4-2	3.4-2
3.4-5	3.4-5
BASES	
EPL-1 through EPL-5, TRM Revision 15	EPL-1 thorugh EPL-5, TRM Revision 16
B 3.3-55	B 3.3-55
B 3.4-3	B 3.4-3
B 3.4-4	B 3.4-4

EFFECTIVE PAGE LISTING — Implementation Date March 31, 2000

Page No.	Revision No.	Effective Date
Title Page	0	Initial
Effective Page Listing	Revision 16	03-31-2000
i	0	Initial
ii	Revision 13	09-17-1999
1.1-1	0	Initial
1.1-2	0	Initial
1.1-3	0	Initial
1.1-4	8	04-13-1999
1.1-5	0	Initial
1.1-6	0	Initial
1.2-1	0	Initial
1.2-2	0	Initial
1.2-3	0	Initial
1.3-1	0	Initial
1.3-2	0	Initial
1.3-3	0	Initial
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1.3-5	0	Initial
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1.3-9	0	Initial
1.3-10	0	Initial
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1.3-12	0	Initial
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1.4-1	0	Initial
1.4-2	0	Initial
1.4-3	0	Initial
1.4-4	0	Initial
1.4-5	0	Initial
3.0-1	0	Initial
3.0-2	0	Initial
3.0-3	0	Initial

(continued)

EFFECTIVE PAGE LISTING (continued)

Page No.	Revision No.	Effective Date
3.0-4	0	Initial
3.1-1	0	Initial
3.3-1	Revision 12	08-17-1999
3.3-2	Revision 12	08-17-1999
3.3-3	0	Initial
3.3-4	0	Initial
3.3-5	Revision 12	08-17-1999
3.3-6	Revision 12	08-17-1999
3.3-7	Revision 12	08-17-1999
3.3-8	Revision 12	08-17-1999
3.3-9	Revision 14	12-15-1999
3.3-10	0	Initial
3.3-11	0	Initial
3.3-12	0	Initial
3.3-13	0	Initial
3.3-14	0	Initial
3.3-15	0	Initial
3.3-16	0	Initial
3.3-17	0	Initial
3.3-18	0	Initial
3.3-19	0	Initial
3.3-20	0	Initial
3.3-21	Revision 12	08-17-1999
3.3-22	8	04-13-1999
3.3-23	0	Initial
3.3-24	8	04-13-1999
3.3-25	0	Initial
3.3-26	0	Initial
3.3-27	0	Initial
3.3-28	0	Initial
3.3-29	0	Initial
3.3-30	0	Initial
3.3-31	0	Initial
3.3-32	0	Initial
3.3-33	0	Initial
3.3-34	8	04-13-1999
3.3-35	0	Initial

(continued)

EFFECTIVE PAGE LISTING (continued)

Page No.	Revision No.	Effective Date
3.3-36	0	Initial
3.3-37	0	Initial
3.3-38	0	Initial
3.3-39	0	Initial
3.3-40	0	Initial
3.3-41	0	Initial
3.3-42	0	Initial
3.3-43	8	04-13-1999
3.3-44	8	04-13-1999
3.3-45	0	Initial
3.3-46	0	Initial
3.3-47	0	Initial
3.3-48	0	Initial
3.3-49	0	Initial
3.3-50	0	Initial
3.3-51	0	Initial
3.3-52	0	Initial
3.3-53	8	04-13-1999
3.3-54	0	Initial
3.3-55	Revision 16	03-31-2000
3.3-56	Revision 16	03-31-2000
3.3-57	0	Initial
3.3-58	0	Initial
3.3-59	0	Initial
3.3-60	0	Initial
3.4-1	0	Initial
3.4-2	Revision 16	03-31-2000
3.4-3	0	Initial
3.4-4	0	Initial
3.4-5	Revision 16	03-31-2000
3.4-6	0	Initial
3.4-7	0	Initial
3.4-8	0	Initial
3.5-1	0	Initial
3.5-2	0	Initial

(continued)

EFFECTIVE PAGE LISTING (continued)

Page No.	Revision No.	Effective Date
3.5-3	0	Initial
3.5-4	0	Initial
3.5-5	0	Initial
3.5-6	3	11-05-1998
3.5-7	3	11-05-1998
3.6-1	6	03-12-1999
3.6-2	8	04-13-1999
3.6-3	0	Initial
3.6-4	0	Initial
3.6-5	0	Initial
3.6-6	0	Initial
3.6-7	0	Initial
3.6-8	8	04-13-1999
3.6-9	0	Initial
3.7-1	0	Initial
3.7-2	0	Initial
3.7-3	0	Initial
3.7-4	0	Initial
3.7-5	0	Initial
3.7-6	0	Initial
3.7-7	5	03-11-1999
3.7-8	5	03-11-1999
3.7-9	5	03-11-1999
3.7-10	9	05-07-1999
3.7-11	5	03-11-1999
3.7-12	5	03-11-1999
3.7-13	5	03-11-1999
3.7-14	5	03-11-1999
3.7-15	5	03-11-1999
3.7-16	5	03-11-1999
3.8-1	0	Initial
3.8-2	0	Initial
3.9-1	0	Initial
3.9-2	0	Initial
3.9-3	0	Initial
3.9-4	Revision 11	07-14-1999

(continued)

EFFECTIVE PAGE LISTING (continued)

Page No.	Revision No.	Effective Date
3.9-5	0	Initial
3.9-6	0	Initial
3.9-7	0	Initial
3.9-8	0	Initial
4.0-1	0	Initial
5.0-1	0	Initial
5.0-2	0	Initial
5.0-3	0	Initial
5.0-4	13	09-17-1999
App. A-1	0	Initial
App. B (TVA-COLR-BF2C11) Revision 0, Pages 1-22		04-13-1999

TR 3.3 INSTRUMENTATION

TR 3.3.9 Offgas Hydrogen Analyzer Instrumentation

LCO 3.3.9 There shall be at least one OPERABLE Offgas Hydrogen Analyzer instrument with alarm setpoint set to ensure the limit of TRM LCO 3.7.2 is not exceeded.

APPLICABILITY: During main condenser offgas treatment system operation

---NOTE---
TRM LCO 3.0.3 is not applicable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. No OPERABLE Offgas Hydrogen Analyzer instruments.	A.1 Install a temporary monitor OR	4 hours
	A.2.1 Take grab samples AND	4 hours from discovery of no OPERABLE instrument AND Every 4 hours thereafter
	A.2.2 Analyze the sample for explosive concentration of hydrogen.	4 hours following grab sample

TECHNICAL SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
TSR 3.3.9.1	Perform CHANNEL CHECK.	24 hours
TSR 3.3.9.2	Perform CHANNEL FUNCTIONAL TEST.	92 days
TSR 3.3.9.3	----------NOTE---------- Shall include use of standard gas samples containing a nominal zero volume percent hydrogen (compressed air), and a nominal one volume percent hydrogen, balance nitrogen. ----------	
	Perform CHANNEL CALIBRATION.	92 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Conditions A, B, or C not met. OR Conductivity > 10 µmho/cm at 25°C. OR Chloride concentration > 0.5 ppm. OR Conductivity or chloride concentration limits of Table 3.4.1-1 Column A exceeded.	D.1 Initiate an orderly shutdown. AND D.2 Be in MODE 4.	Immediately As rapidly as cooldown rate permits
E. Coolant chemistry limits of Table 3.4.1-1 Column C or D exceeded.	E.1 Initiate action to restore coolant chemistry within limits.	Immediately

Table 3.4.1-1
Coolant Chemistry Limits[1]

CHEMISTRY PARAMETERS	**COLUMN A** APPLICABLE CONDITION Prior To Startup And At Steaming Rates < 100,000 lb/hr	**COLUMN B** APPLICABLE CONDITION Steaming Rates > 100,000 lb/hr	**COLUMN C** APPLICABLE CONDITION Reactor Not Pressurized With Fuel In Reactor Vessel, Except During Startup Condition	**COLUMN D**[2] APPLICABLE CONDITION Noble Metal Chemical Application and Subsequent Reactor Coolant Cleanup
CHLORIDE (ppm)	≤ 0.1	≤ 0.2	≤ 0.5	≤ 0.1
CONDUCTIVITY (μmho/cm at 25°C)	≤ 2.0	≤ 1.0	≤ 10.0	≤ 20.0
pH	5.6-8.6	5.6-8.6	5.3-8.6	4.3-9.9

(1) When there is no fuel in the reactor vessel, Technical Requirement reactor coolant chemistry limits do not apply.

(2) During the Noble Metal Chemical Application and subsequent reactor coolant cleanup, CONDITIONS A, B, C, and D (including Required Actions and Completion Times) do not apply.

EFFECTIVE PAGE LISTING

Implementation Date March 31, 2000 |

Page No.	Revision No.	Effective Date
Title Page	0	Initial
Effective Page Listing	Revision 16	03-31-2000
i	0	Initial
ii	0	Initial
B 3.0-1	0	Initial
B 3.0-2	0	Initial
B 3.0-3	0	Initial
B 3.0-4	0	Initial
B 3.0-5	0	Initial
B 3.0-6	0	Initial
B 3.0-7	0	Initial
B 3.0-8	0	Initial
B 3.0-9	0	Initial
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B 3.0-11	0	Initial
B 3.0-12	0	Initial
B 3.0-13	0	Initial
B 3.1-1	0	Initial
B 3.1-2	0	Initial
B 3.1-3	0	Initial
B 3.3-1	0	Initial
B 3.3-2	0	Initial
B 3.3-3	0	Initial
B 3.3-4	0	Initial
B 3.3-5	0	Initial
B 3.3-6	0	Initial
B 3.3-7	0	Initial
B 3.3-8	0	Initial
B 3.3-9	0	Initial
B 3.3-10	0	Initial
B 3.3-11	0	Initial
B 3.3-12	0	Initial
B 3.3-13	0	Initial
B 3.3-14	3	11-05-1998

(continued)

EFFECTIVE PAGE LISTING (continued)

Page No.	Revision No.	Effective Date
B 3.3-15	Revision 14	12-15-1999
B 3.3-16	0	Initial
B 3.3-17	0	Initial
B 3.3-18	0	Initial
B 3.3-19	0	Initial
B 3.3-20	0	Initial
B 3.3-21	0	Initial
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B 3.3-37	0	Initial
B 3.3-38	0	Initial
B 3.3-39	8	04-13-1999
B 3.3-40	0	Initial
B 3.3-41	0	Initial
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B 3.3-44	8	04-13-1999
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B 3.3-48	0	Initial
B 3.3-49	0	Initial
B 3.3-50	0	Initial
	0	Initial

(continued)

EFFECTIVE PAGE LISTING (continued)

Page No.	Revision No.	Effective Date
B 3.3-51	0	Initial
B 3.3-52	0	Initial
B 3.3-53	0	Initial
B 3.3-54	0	Initial
B 3.3-55	Revision 16	03-31-2000
B 3.3-56	0	Initial
B 3.3-57	0	Initial
B 3.3-58	0	Initial
B 3.3-59	0	Initial
B 3.3-60	0	Initial
B 3.4-1	0	Initial
B 3.4-2	0	Initial
B 3.4-3	Revision 16	03-31-2000
B 3.4-4	Revision 16	03-31-2000
B 3.4-5	0	Initial
B 3.4-6	0	Initial
B 3.4-7	0	Initial
B 3.4-8	0	Initial
B 3.4-9	0	Initial
B 3.5-1	0	Initial
B 3.5-2	0	Initial
B 3.5-3	0	Initial
B 3.5-4	0	Initial
B 3.5-5	0	Initial
B 3.5-6	0	Initial
B 3.5-7	0	Initial
B 3.5-8	0	Initial
B 3.5-9	3	11-05-1998
B 3.5-10	3	11-05-1998
B 3.5-11	3	11-05-1998
B 3.6-1	6	03-12-1999
B 3.6-2	6	03-12-1999
B 3.6-3	8	04-13-1999
B 3.6-4	0	Initial
B 3.6-5	0	Initial
B 3.6-6	0	Initial

(continued)

EFFECTIVE PAGE LISTING (continued)

Page No.	Revision No.	Effective Date
B 3.6-7	0	Initial
B 3.6-8	0	Initial
B 3.6-9	8	04-13-1999
B 3.6-10	0	Initial
B 3.6-11	0	Initial
B 3.6-12	Revision 14	12-15-1999
B 3.6-13	Revision 14	12-15-1999
B 3.6-14	0	Initial
B 3.6-15	0	Initial
B 3.6-16	0	Initial
B 3.6-17	8	04-13-1999
B 3.7-1	Revision 15	02-08-2000
B 3.7-2	Revision 15	02-08-2000
B 3.7-3	0	Initial
B 3.7-4	0	Initial
B 3.7-5	0	Initial
B 3.7-6	0	Initial
B 3.7-7	0	Initial
B 3.7-8	5	03-11-1999
B 3.7-9	5	03-11-1999
B 3.7-10	5	03-11-1999
B 3.7-11	8	04-13-1999
B 3.7-12	5	03-11-1999
B 3.7-13	5	03-11-1999
B 3.7-14	5	03-11-1999
B 3.7-15	5	03-11-1999
B 3.7-16	5	03-11-1999
B 3.7-17	5	03-11-1999
B 3.7-18	5	03-11-1999
B 3.7-19	5	03-11-1999
B 3.7-20	5	03-11-1999
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B 3.9-1	0	Initial
B 3.9-2	0	Initial
B 3.9-3	0	Initial

(continued)

EFFECTIVE PAGE LISTING (continued)

Page No.	Revision No.	Effective Date
B 3.9-4	0	Initial
B 3.9-5	0	Initial
B 3.9-6	Revision 11	07-14-1999
B 3.9-7	0	Initial
B 3.9-8	0	Initial
B 3.9-9	0	Initial
B 3.9-10	0	Initial
B 3.9-11	0	Initial
B 3.9-12	0	Initial
B 3.9-13	0	Initial

APPLICABLE SAFETY ANALYSIS

The hydrogen concentration of the gases from the air ejector is maintained below the flammable limit by maintaining adequate steam flow for dilution at all times. The pressure of the steam supplied to the first and third stage steam jet air ejectors is monitored. The steam jet air ejector inlet and effluent are automatically isolated on low steam supply pressure. The preheaters are heated with steam, rather than electrically, to eliminate presence of potential ignition sources and to limit the temperature of the gases in the event of cessation of gas flow. The recombiner temperatures are monitored and an alarm is actuated to indicate any deterioration of performance. A hydrogen analyzer downstream of the recombiners provides an additional check on recombiner performance.

LCO 3.3.9

These instruments are required to alert the operator of explosive conditions within the offgas system, and prompt the operator to comply with Technical Requirements 3.7.2

APPLICABILITY

The hydrogen buildup in the offgas system will stop when the main condenser offgas system is removed from service. Hence, this requirement is only applicable during main condenser offgas treatment system operation.

The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 63 of Appendix A to 10 CFR 50.

ACTIONS

A.1 and A.2

Continued operation of the main condenser offgas treatment system is allowed provided adequate backup information is obtained from grab samples or a temporary monitor as required by ACTION A.

LCO 3.4.1 (continued)

Since oxygen may be at higher concentrations at low steaming rates, the chloride concentration limit is lower than at higher steaming rates when the oxygen content is lower.

However, the conductivity is allowed to be at a higher level provided it is not caused from chloride ions due to the fact that the dissolved gases may result in higher conductivity. During startup or hot standby conditions, the reactor water cleanup system may be more efficient since the makeup from feedwater is very low.

Steaming Rates > 100,000 lb/hr

At steaming rates greater than 100,000 lb/hr, the boiling rates are significant enough to strip away dissolved oxygen, but high enough to start concentrating dissolved ions.

Because the dissolved oxygen is being effectively removed, the chloride ion limits are relaxed.

However, because the reactor is now acting as a concentrator for ionic impurities and particulates, the conductivity limits are made more stringent.

Reactor Not Pressurized With Fuel In Reactor Vessel, Except During Startup

These are the baseline chemistry limits for water in contact with fuel. They are the same as the spent fuel pool with the extra limitation of pH.

Noble Metal Chemical Application (NMCA) and Subsequent Reactor Coolant Cleanup

During NMCA, the chemicals added to the reactor coolant (which contain the noble metals) will increase conductivity and affect pH. Therefore, special chemistry parameter limits are used for the NMCA process and subsequent reactor coolant cleanup. The chloride limits for this condition are unchanged from the 'Steaming Rates < 100,000 lb/hr' condition.

APPLICABILITY

These limits are applicable, as specified, at all times when fuel is in the reactor vessel.

ACTIONS

A.1 and B.1

A two week per year allowance for exceeding the normal chemistry limits is allowed to give the opportunity for the reactor water cleanup system to return the water chemistry to normal after a transient chemical intrusion.

C.1

These chemistry limits take into account factors of corrosion that may not be affected by the amount of chloride ion.

D.1 and D.2

The major benefit of Cold Shutdown is to reduce the temperature dependent corrosion rates and provide time for the cleanup system to reestablish the purity of the reactor coolant.

E.1

Immediate ACTIONS are taken to bring coolant chemistry within limits.