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**REFERENCE  
MCGUIRE NUCLEAR STATION  
SELECTED LICENSEE COMMITMENTS  
MANUAL (SLC)**

Page 3 of 3

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SELECTED LICENSEE COMMITMENT MANUAL	NA	029 01/20/03	MADM-03A	V1	V1	V1	V1	V1	V1										56
SLC - LIST OF EFFECTIVE PAGES	NA	029 01/20/03																	
SLC 16 9 24	NA	033 12/31/02																	

REMARKS: PLEASE UPDATE YOUR MANUAL ACCORDINGLY

D M JAMIL  
VICE PRESIDENT  
MCGUIRE NUCLEAR STATION

BY:  
B C BEAVER MG01RC      BCB/CMK

*Aeo*

*EB*

January 20, 2003

MEMORANDUM

To: All McGuire Nuclear Station Selected Licensee Commitments (SLC) Manual Holders

Subject: McGuire SLC Manual Update

Please revise your copy of the manual as follows:

REMOVE \_\_\_\_\_ INSERT

List of Effective Sections Rev 28

Entire SLC 16.9.24

List of Effective Sections Rev 29

Entire SLC 16.9.3 (Revision 33)

**Revisions may skip numbers due to Regulatory Compliance Filing System.**

Please call me if you have questions.

Bonnie Beaver  
Regulatory Compliance

## SLC LIST OF EFFECTIVE SECTIONS

SECTION	REVISION NUMBER	DATE
16.1	REVISION 32	12/2/02
16.2	REVISION 0	12/14/99
16.3	REVISION 0	12/14/99
16.4	Not Issued	
16.5.1	REVISION 0	12/14/99
16.5.2	REVISION 0	12/14/99
16.5.3	REVISION 0	12/14/99
16.5.4	REVISION 7	09/14/00
16.5.5	REVISION 0	12/14/99
16.5.6	REVISION 0	12/14/99
16.5.7	REVISION 0	12/14/99
16.5.8	REVISION 0	12/14/99
16.5.9	REVISION 0	12/14/99
16.5.10	REVISION 0	12/14/99
16.6.1	REVISION 0	12/14/99
16.6.2	REVISION 0	12/14/99
16.6.3	REVISION 17	04/08/02
16.6.4	REVISION 27	06/12/02
16.7.1	REVISION 0	12/14/99
16.7.2	REVISION 24	4/29/02
16.7.3	REVISION 0	12/14/99
16.7.4	REVISION 1	4/11/00
16.7.5	REVISION 0	12/14/99
16.7.6	REVISION 0	12/14/99
16.7.7	REVISION 0	12/14/99
16.7.8	REVISION 26	6/3/02
16.7.9	REVISION 0	12/14/99
16.7.10	REVISION 0	12/14/99
16.8.1	REVISION 2	4/11/00
16.8.2	REVISION 0	12/14/99
16.8.3	REVISION 26	6/3/02
16.9.1	REVISION 18	12/4/01
16.9.2	REVISION 5	5/24/00
16.9.3	REVISION 31	12/2/02
16.9.4	REVISION 1	03/02/00
16.9.5	REVISION 0	12/14/99
16.9.6	REVISION 0	12/14/99
16.9.7	REVISION 25	5/14/02
16.9.8	REVISION 0	12/14/99
16.9.9	REVISION 13	2/26/01
16.9.10	REVISION 13	2/26/01
16.9.11	REVISION 22	2/25/02
16.9.12	REVISION 13	2/26/01
16.9.13	REVISION 13	2/26/01
16.9.14	REVISION 22	2/25/02
16.9.15	REVISION 25	5/14/02

## SLC LIST OF EFFECTIVE SECTIONS

SECTION	REVISION NUMBER	DATE
16.9.16	REVISION 19	12/03/01
16.9.17	REVISION 0	12/14/99
16.9.18	REVISION 0	12/14/99
16.9.19	REVISION 0	12/14/99
16.9.20	REVISION 8	11/30/00
16.9.21	REVISION 0	12/14/99
16.9.22	REVISION 29	7/10/02
16.9.23	REVISION 29	7/10/02
16.9.24	REVISION 33	12/31/02
16.10.1	REVISION 0	12/14/99
16.11.1	REVISION 9	2/1/01
16.11.2	REVISION 23	4/4/02
16.11.3	REVISION 0	12/14/99
16.11.4	REVISION 0	12/14/99
16.11.5	REVISION 0	12/14/99
16.11.6	REVISION 0	12/14/99
16.11.7	REVISION 12	3/14/01
16.11.8	REVISION 0	12/14/99
16.11.9	REVISION 0	12/14/99
16.11.10	REVISION 0	12/14/99
16.11.11	REVISION 0	12/14/99
16.11.12	REVISION 0	12/14/99
16.11.13	REVISION 0	12/14/99
16.11.14	REVISION 21	1/17/02
16.11.15	REVISION 21	1/17/02
16.11.16	REVISION 1	4/11/00
16.11.17	REVISION 1	4/11/00
16.11.18	REVISION 0	12/14/99
16.11.19	REVISION 0	12/14/99
16.11.20	REVISION 0	12/14/99
16.12.1	REVISION 0	12/14/99
16.12.2	REVISION 0	12/14/99
16.13.1	REVISION 0	12/14/99
16.13.2	REVISION 24	4/29/02
16.13.3	REVISION 24	4/29/02
16.13.4	REVISION 30	8/29/02
16.14.1	REVISION 0	12/14/99

16.9 AUXILIARY SYSTEMS

16.9.24 Spent Fuel Pool Storage Rack Poison Material

COMMITMENT a. The Region 1 panel average storage rack poison material Boron 10 areal density shall be greater than or equal to:

0.005 gm B<sub>10</sub>/cm<sup>2</sup> for Region 1A  
0 gm B<sub>10</sub>/cm<sup>2</sup> for Region 1B

b. The Region 2 panel average storage rack poison material Boron 10 areal density shall be greater than or equal to:

0.003 gm B<sub>10</sub>/cm<sup>2</sup> for Region 2A  
0 gm B<sub>10</sub>/cm<sup>2</sup> for Region 2B

APPLICABILITY When a fuel assembly is stored in a spent fuel rack cell location.

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Panel average storage rack poison material Boron 10 areal density not within limits.	A.1 Perform ITS SR 3.7.14.1	1 hour  <u>AND</u>  Every 24 hours thereafter until the affected fuel assembly is moved.
	<u>AND</u> A.2.1 Verify that the fuel assembly in the affected location meets the requirements of ITS LCO 3.7.15(b) for Region 1.  <u>OR</u>	1 hour

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued).	A.2.2 Verify that the fuel assembly in the affected location meets the requirements of ITS LCO 3.7.15(d) for Region 2.	1 hour
	<u>OR</u> A.2.3 Initiate actions to move the affected fuel assembly to an acceptable location.	Immediately

TESTING REQUIREMENTS

TEST	FREQUENCY
TR 16.9.24.1 Verify that the panel average spent fuel pool storage rack poison material is within limits.	3 years

BASES

The McGuire spent fuel storage racks contain Boraflex neutron-absorbing panels that surround each storage cell on all four sides (except for peripheral sides). The function of these Boraflex panels is to ensure that reactivity of the stored fuel assemblies is maintained within required limits. Boraflex, as manufactured, is a silicon rubber material that retains a powder of boron carbide (B<sub>4</sub>C) neutron absorbing material. The Boraflex panels are enclosed in a formed stainless steel wrapper sheet that is spot-welded to the storage tube. The wrapper sheet is bent at each end to complete the enclosure of the Boraflex panel. The Boraflex panel is contained in the plenum area between the storage tube and the wrapper plate. Since the wrapper plate enclosure is not sealed, spent fuel pool water is free to circulate through the plenum.

It has been observed that after Boraflex receives a high gamma dose from the stored irradiated fuel (>10<sup>10</sup> rads) it can begin to degrade and dissolve in the wet environment. The potential degradation mechanisms with respect to boraflex in spent fuel storage racks include:

- (1) gamma radiation-induced shrinkage of boraflex and the potential for developing tears or gaps in the material, and
- (2) gradual long-term boraflex degradation over the intended service life of the racks as a result of gamma irradiation and exposure to the spent fuel pool environment.

BASES (continued)

Thus, the B4C poison material can be removed, thereby reducing the poison worth of the Boraflex sheets. This phenomenon is documented in NRC Generic Letter 96-04, "Boraflex Degradation in Spent Fuel Pool Storage Racks". To address this degradation, the spent fuel racks have been analyzed taking credit for soluble boron as allowed in WCAP-14416-NP-A, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology," Revision 1, November 1996. This methodology ensures that the spent fuel rack multiplication factor,  $k_{eff}$  is less than or equal to 0.95. Codes, methods and techniques used in the McGuire criticality analysis are used to satisfy this  $k_{eff}$  criterion. The spent fuel storage racks are analyzed to allow storage of fuel assemblies with enrichments up to a maximum of 4.75 weight percent Uranium-235 while maintaining  $k_{eff} \leq 0.95$  including uncertainties, tolerances, bias, and credit for soluble boron. Soluble boron credit is used to offset uncertainties, tolerances, and off-normal conditions and to provide subcritical margin such that the spent fuel pool  $k_{eff}$  is maintained less than or equal to 0.95. The soluble boron concentration required to maintain  $k_{eff}$  less than or equal to 0.95 under normal conditions is 730 ppm. In addition, sub-criticality of the pool ( $k_{eff} < 1.0$ ) is assured on a 95/95 basis without the presence of the soluble boron in the pool. Credit is taken for reactivity depletion due to fuel burnup and reduced credit for the Boraflex neutron absorber panels.

The limits specified for the panel average storage rack poison material Boron 10 areal density ensures the  $k_{eff}$  of the spent fuel pool will always remain  $< 1.00$ , assuming the pool to be flooded with unborated water. The specified limit of Boron 10 areal density in boraflex preserves the assumptions used in the analyses of the potential criticality accident scenarios. These limits are the minimum required concentration for fuel assembly storage. The criticality analysis performed shows that the acceptance criteria for criticality is met for the storage of fuel assemblies with soluble boron credit, reduced credit for the Boraflex panels and the storage configurations and enrichment limits Specified by ITS LCO 3.7.15. The storage configuration requirements specified by ITS LCO 3.7.15 establish four regions within the spent fuel pool storage racks. Figure 16.9.24-1 illustrates the four regions for the Unit 1 spent fuel pool and Figure 16.9.24-2 illustrates the four regions for the Unit 2 pool. The limits specified are not applicable if a storage cell location does not contain a fuel assembly.

The REQUIRED ACTIONS associated with this Selected Licensee Commitment (SLC) are designed to ensure that an unplanned criticality event cannot occur as a result of degraded boraflex conditions. REQUIRED ACTION A.1 verifies the Spent Fuel Pool boron concentration to be within Technical Specification 3.7.14 limits. These limits are based on the cycle-specific Core Operating Limits Requirements (COLR) document. The COLR Spent Fuel Pool boron concentration cannot be less than 2675 ppm soluble boron for any specific cycle (note that the initial boron concentration used in the Spent Fuel Pool boron dilution analysis is 2475 ppm soluble boron). If ITS SR 3.7.14.1 indicates boron concentrations less than the acceptable level, the associated REQUIRED ACTIONS are to immediately suspend movement of fuel assemblies in the pool area and to immediately initiate boron additions to raise the boron concentration to acceptable levels. REQUIRED ACTIONS A.2.1 and A.2.2 associated with this SLC determine if the assembly can be qualified for storage in Region 1B or Region 2B. If the assembly cannot be stored in one of these regions, REQUIRED ACTION A.2.3 requires that actions be initiated immediately to move the affected fuel assembly to an acceptable location. There may be circumstances that will prevent the movement of the affected assembly in a reasonable time period. For example, if the pool is nearly full, there may not be enough spaces available to meet the required storage

BASES (continued)

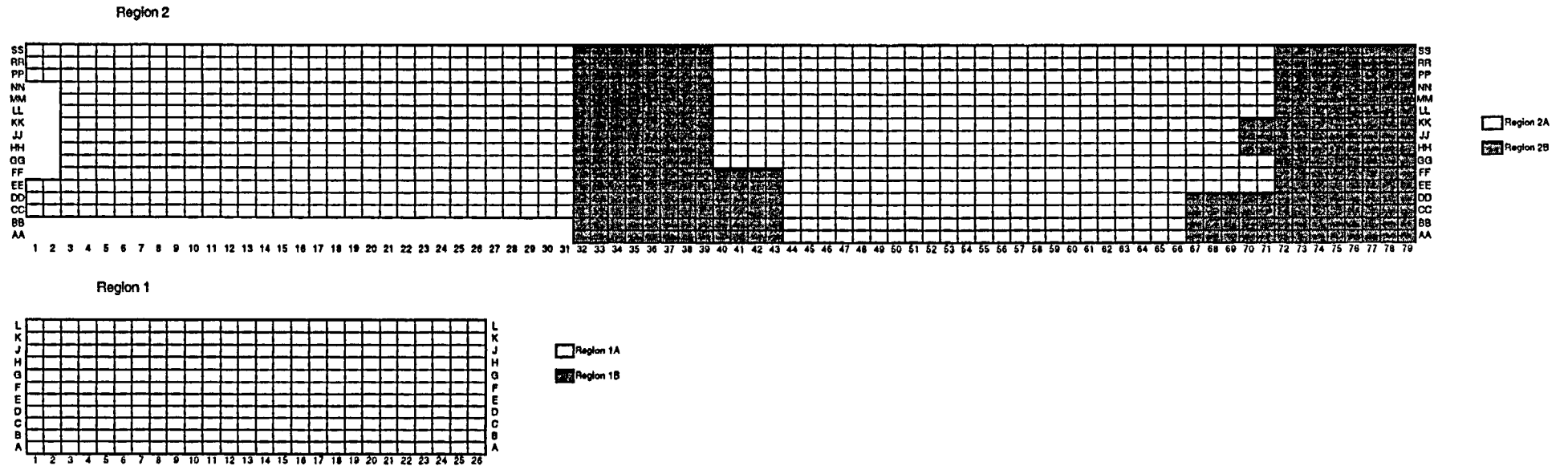
configurations of ITS LCO 3.7.15. In this case, it is acceptable to continue REQUIRED ACTION A.1 until the affected fuel assembly can be moved to an acceptable location. The daily verification of boron concentration per ITS SR 3.7.14.1 ensures the assumptions used in the associated criticality analyses are maintained. There is a large amount of margin between the COLR boron concentration and the boron concentration needed to maintain subcritical conditions in the Spent Fuel Pool. Daily verifications are considered to be adequate to ensure that no dilution evolution could go undetected for an extended period resulting in boron concentrations less than the minimum amounts necessary for maintaining subcritical conditions.

The testing requirements will verify that the Boron 10 areal density is within acceptable limits. The preferred method for verifying the Boron 10 areal density would be in-situ testing at least every three years. Testing may be performed more frequently based on engineering judgment, spent fuel pool water chemistry, and modeling projections of boraflex degradation.



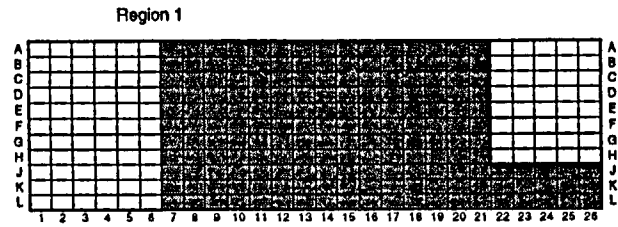
UNIT 1 SPENT FUEL POOL SUB-REGION MAP

←-----North

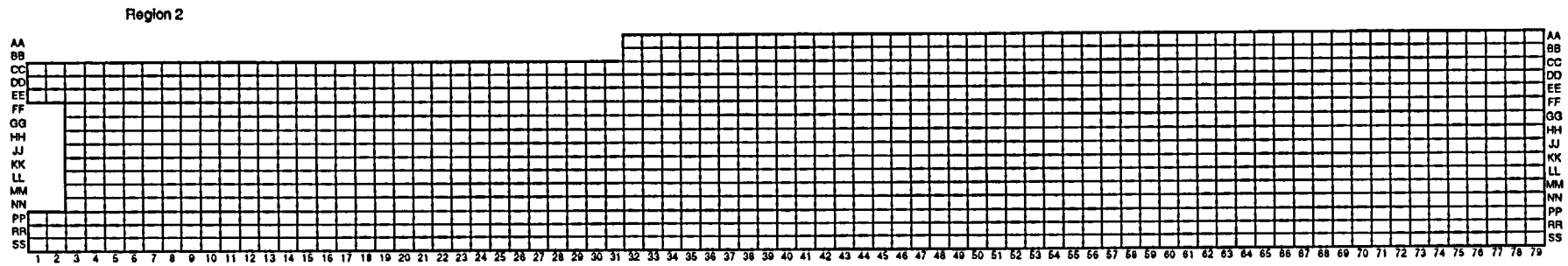


UNIT 2 SPENT FUEL POOL SUB-REGION MAP

←-----North



Region 1A  
Region 1B



Region 2A  
Region 2B

BASES (continued)

REFERENCES

1. UFSAR, Section 9.1.2.
2. Issuance of Amendments, McGuire Nuclear Station, Units 1 and 2 (TAC NOS. M89744 and M89745), November 6, 1995.
3. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).
4. UFSAR, Section 15.7.4.
5. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
6. NRC Generic Letter 96-04: Boraflex Degradation in Spent Fuel Pool Storage Racks, June 26, 1996.
7. WCAP-14416-NP-A, Westinghouse Spent Fuel Rack Criticality Analysis Methodology, Revision 1, November 1996.
8. Issuance of Amendments, McGuire Nuclear Station, Units 1 and 2 (TAC NOS. MA9730 and MA9731), November 27, 2000.
9. MCEI-0400-128, "McGuire Nuclear Station Spent Fuel Pool Storage Rack Region Designations for Individual Cells", Rev. 004, December 26, 2002.