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TECHNICAL SPECIFICATIONS (TS)
TECHNICAL SPECIFICATIONS
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Page 2 of 3

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March 8, 2010

MEMORANDUM

To: All McGuire Nuclear Station Technical Specification Bases (TSB) Manual Holders

Subject: McGuire TSB Updates

REMOVE	INSERT
TSB Manual	
TS Bases LOES (entire doc) rev 97	TS Bases LOES (entire doc) rev 98
TSB 3.7.2 (entire doc) rev 102	TSB 3.7.2 (entire doc) rev 105

Revision numbers may skip numbers due to Regulatory Compliance Filing System.

Please call me if you have questions.

Bonnie Beaver

Bonnie Beaver
Regulatory Compliance
875-4180

McGuire Nuclear Station Technical Specification Bases
LOES

TS Bases are revised by section

Page Number	Revision	Revision Date
	BASES	
	(Revised per section)	
i	Revision 87	8/15/07
ii	Revision 87	8/15/07
iii	Revision 87	8/15/07
B 2.1.1	Revision 51	1/14/04
B 2.1.2	Revision 102	8/17/09
B 3.0	Revision 81	3/29/07
B 3.1.1	Revision 73	3/6/06
B 3.1.2	Revision 10	9/22/00
B 3.1.3	Revision 10	9/22/00
B 3.1.4	Revision 0	9/30/98
B 3.1.5	Revision 19	1/10/02
B 3.1.6	Revision 0	9/30/98
B 3.1.7	Revision 58	06/23/04
B 3.1.8	Revision 0	9/30/98
B 3.2.1	Revision 74	5/3/06
B 3.2.2	Revision 10	9/22/00
B 3.2.3	Revision 34	10/1/02
B 3.2.4	Revision 10	9/22/00
B 3.3.1	Revision 99	3/9/09
B 3.3.2	Revision 99	3/9/09
B 3.3.3	Revision 100	4/13/09
B 3.3.4	Revision 57	4/29/04
B 3.3.5	Revision 11	9/18/00
B 3.3.6	Not Used - Revision 87	6/29/06
B 3.4.1	Revision 51	1/14/04
B 3.4.2	Revision 0	9/30/98
B 3.4.3	Revision 44	7/3/03
B 3.4.4	Revision 86	6/25/07
B 3.4.5	Revision 86	6/25/07

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B 3.4.6	Revision 86	6/25/07
B 3.4.7	Revision 86	6/25/07
B 3.4.8	Revision 41	7/29/03
B 3.4.9	Revision 0	9/30/98
B 3.4.10	Revision 102	8/17/09
B 3.4.11	Revision 102	8/17/09
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B 3.4.13	Revision 86	6/25/07
B 3.4.14	Revision 102	8/17/09
B 3.4.15	Revision 82	9/30/06
B 3.4.16	Revision 57	4/29/04
B 3.4.17	Revision 0	9/30/98
B 3.4.18	Revision 86	6/25/07
B 3.5.1	Revision 70	10/5/05
B 3.5.2	Revision 102	8/17/09
B 3.5.3	Revision 57	4/29/04
B 3.5.4	Revision 70	10/5/04
B 3.5.5	Revision 0	9/30/98
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B 3.6.2	Revision 98	3/24/09
B 3.6.3	Revision 87	6/29/06
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B 3.6.5	Revision 0	9/30/98
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B 3.6.6	Revision 102	8/17/09
B 3.6.7	Not Used - Revision 63	4/4/05
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B 3.6.9	Revision 63	4/4/05
B 3.6.10	Revision 43	5/28/03
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B 3.6.14	Revision 64	4/23/05
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B 3.7.13	Revision 85	2/26/07
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B 3.7.15	Revision 66	6/30/05
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B 3.8.1	Revision 92	1/28/08
B 3.8.2	Revision 92	1/28/08
B 3.8.3	Revision 103	12/15/08
B 3.8.4	Revision 100	4/13/09
B 3.8.5	Revision 41	7/29/03
B 3.8.6	Revision 0	9/30/98
B 3.8.7	Revision 20	1/10/02
B 3.8.8	Revision 41	7/29/03
B 3.8.9	Revision 24	2/4/02
B 3.8.10	Revision 41	7/29/03
B 3.9.1	Revision 68	9/1/05
B 3.9.2	Revision 41	7/29/03
B 3.9.3	Revision 91	11/7/07
B 3.9.4	Revision 84	2/20/07
B 3.9.5	Revision 59	7/29/04
B 3.9.6	Revision 41	7/29/03
B 3.9.7	Revision 88	9/5/07

B 3.7 PLANT SYSTEMS

B 3.7.2 Main Steam Isolation Valves (MSIVs)

BASES

BACKGROUND

The MSIVs isolate steam flow from the secondary side of the steam generators following a high energy line break (HELB). MSIV closure terminates flow from the unaffected (intact) steam generators.

One MSIV is located in each main steam line outside, but close to, containment. The MSIVs are downstream from the main steam safety valves (MSSVs) and auxiliary feedwater (AFW) pump turbine steam supply, to prevent MSSV and AFW isolation from the steam generators by MSIV closure. Closing the MSIVs isolates each steam generator from the others, and isolates the turbine, Steam Dump System, and other auxiliary steam supplies from the steam generators.

The MSIVs close on a main steam isolation signal generated by either low steam line pressure, high rate steam line pressure decrease, or high-high containment pressure.

The MSIV control circuits consist of both safety-related and non-safety control power. Non-safety control power is utilized in the manual open/close circuitry associated with each individual valve. The MSIVs will fail closed on a complete loss of A-Train and/or B-Train safety-related control power. Loss of the non-safety control power will not initiate closure of the MSIVs. Manual closure of the MSIVs is still available with a loss of non-safety control power by manually initiating the safety-related main steamline isolation signal.

The MSIVs close with spring force along with motive force provided by Instrument Air (VI). A safety-related VI accumulator for each MSIV will provide motive force and maintain valve control for approximately four hours following a loss of the non-safety instrument air system. The accumulator pressure must be $\geq$ 60 psig to maintain valve operabillity.

Each MSIV has an MSIV bypass valve. Although these bypass valves are normally closed, they receive the same emergency closure signal as do their associated MSIVs. The MSIVs may also be actuated manually.

A description of the MSIVs is found in the UFSAR, Section 10.3 (Ref. 1).

BASES

APPLICABLE SAFETY ANALYSES

The design basis of the MSIVs is established by the containment and core response analyses for the large steam line break (SLB) events, discussed in the UFSAR, Section 6.2 (Ref. 2). The design precludes the blowdown of more than one steam generator.

The limiting case for the containment analysis is the SLB inside containment, with a loss of offsite power following turbine trip. At lower powers, the steam generator inventory and temperature are at their maximum, maximizing the analyzed mass and energy release to the containment. Due to reverse flow and failure of the MSIV to close, the additional mass and energy in the steam headers downstream from the other MSIV contribute to the total release. With the most reactive rod cluster control assembly assumed stuck in the fully withdrawn position, there is an increased possibility that the core will become critical and return to power. The core is ultimately shut down by the boric acid injection delivered by the Emergency Core Cooling System.

The accident analysis compares several different SLB events against different acceptance criteria. The large SLB outside containment upstream of the MSIV is limiting for offsite dose, although a break in this short section of main steam header has a very low probability. The large SLB inside containment at hot zero power is the limiting case for a post trip return to power. The analysis includes scenarios with offsite power available, and with a loss of offsite power following turbine trip. With offsite power available, the reactor coolant pumps continue to circulate coolant through the steam generators, maximizing the Reactor Coolant System cooldown. With a loss of offsite power, the response of mitigating systems is delayed. Significant single failures considered include failure of an MSIV to close.

The MSIVs serve only a safety function and remain open during power operation. These valves operate under the following situations:

a. An HELB inside containment. In order to maximize the mass and energy release into containment, the analysis assumes quick closure of all MSIVs. For this accident scenario, steam is discharged into containment from all steam generators until the MSIVs close. After MSIV closure, steam is discharged into containment only from the affected steam generator and from the residual steam in the main steam header downstream of the closed MSIVs. Closure of the MSIVs isolates the break from the unaffected steam generators.

b. A break outside of containment and upstream from the MSIVs is not a containment pressurization concern. The uncontrolled blowdown of more than one steam generator must be prevented to limit the potential for uncontrolled RCS cooldown and positive

BASES

SAFETY ANALYSES (continued)

reactivity addition. Closure of the MSIVs isolates the break and limits the blowdown to a single steam generator.

c. A break downstream of the MSIVs will be isolated by the closure of the MSIVs.

d. Following a steam generator tube rupture, closure of the MSIVs isolates the ruptured steam generator from the intact steam generators to minimize radiological releases.

e. The MSIVs are also utilized during other events such as a feedwater line break. This event is less limiting so far as MSIV OPERABILITY is concerned.

The MSIVs satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

LCO

This LCO requires that four MSIVs in the steam lines be OPERABLE. The MSIVs are considered OPERABLE when the isolation times are within limits, and they close on an isolation actuation signal. The accumulator air pressure must also be $\geq$ 60 psig.

This LCO provides assurance that the MSIVs will perform their design safety function to mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR 100 (Ref. 4) limits or the NRC staff approved licensing basis.

APPLICABILITY

The MSIVs must be OPERABLE in MODE 1, and in MODES 2 and 3 except when closed and de-activated, when there is significant mass and energy in the RCS and steam generators. When the MSIVs are closed, they are already performing the safety function.

In MODE 4, normally most of the MSIVs are closed, and the steam generator energy is low.

In MODE 5 or 6, the steam generators do not contain much energy because their temperature is below the boiling point of water; therefore, the MSIVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES.

ACTIONS

A.1

With one MSIV inoperable in MODE 1, action must be taken to restore OPERABLE status within 8 hours. Some repairs to the MSIV can be made with the unit hot. The 8 hour Completion Time is reasonable,

BASES

ACTIONS (contd)

considering the low probability of an accident occurring during this time period that would require a closure of the MSIVs.

The 8 hour Completion Time is greater than that normally allowed for containment isolation valves because the MSIVs are valves that isolate a closed system penetrating containment. These valves differ from other containment isolation valves in that the closed system provides an additional means for containment isolation.

B.1

If the MSIV cannot be restored to OPERABLE status within 8 hours, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in MODE 2 within 6 hours and Condition C would be entered. The Completion Times are reasonable, based on operating experience, to reach MODE 2 and to close the MSIVs in an orderly manner and without challenging unit systems.

C.1 and C.2

Condition C is modified by a Note indicating that separate Condition entry is allowed for each MSIV.

Since the MSIVs are required to be OPERABLE in MODES 2 and 3, the inoperable MSIVs may either be restored to OPERABLE status or closed. When closed, the MSIVs are already in the position required by the assumptions in the safety analysis.

The 8 hour Completion Time is consistent with that allowed in Condition A.

For inoperable MSIVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, the inoperable MSIVs must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of MSIV status indications available in the control room, and other administrative controls, to ensure that these valves are in the closed position.

BASES

ACTIONS (contd)

D.1 and D.2

If the MSIVs cannot be restored to OPERABLE status or are not closed within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that MSIV closure time is ≤ 8.0 seconds on an actual or simulated actuation signal. The MSIV closure time is assumed in the accident and containment analyses. This Surveillance is normally performed during a refueling outage. The MSIVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power. An IST program Justification For Deferral documents the basis for performing the stroke time testing during cold shutdown instead of at power. This alternative is acceptable in accordance with the Inservice Testing Program and the ASME OM Code (Ref. 5).

The Frequency is in accordance with the Inservice Testing Program.

Separate A and B train tests are conducted at cold condition to meet the requirements of the ASME OM Code. These tests shall be performed with both spring force and the motive force provided by Instrument Air (VI) simultaneously. Leak-rate testing of the MSIV air control system shall be performed prior to returning the unit to operation following a refueling outage.

A final test is conducted in MODE 3 with the unit at operating temperature and pressure (ref. NRC Information Notice 94-44). This test also shall be performed with both spring force and the motive force provided by the Instrument Air (VI) simultaneously. This final test verifies MSIV closure time remains acceptable at system conditions consistent with those under which the MSIV is required to operate. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing this final test.

REFERENCES

1. UFSAR, Section 10.3.
2. UFSAR, Section 6.2.

3. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

4. 10 CFR 100.11.

5. ASME Code for Operation and Maintenance of Nuclear Power Plants.

6. NRC Information Notice 94-44.