

August 20, 2003

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555-0001

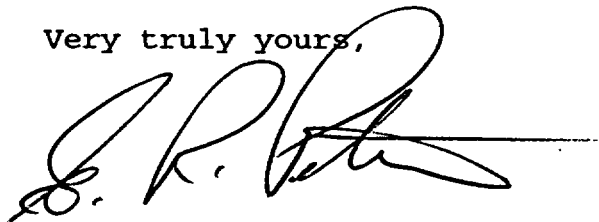
SUBJECT: Duke Energy Corporation
McGuire Nuclear Station Units 1 and 2
Docket Nos. 50-369 and 50-370
Technical Specification Bases Revision

Attached is a revision to the McGuire Technical Specification (TS) Bases. This revision is consistent with TS Amendment No. 214 to Facility Operating License (FOL) NPF-9 and Amendment No. 195 to FOL NPF-17 issued by the NRC on July 3, 2003 for McGuire Nuclear Station, Units 1 and 2. This revision has been processed consistent with the requirements of TS 5.5.14, TS Bases Control Program. In summary, this revision reflects the changes to TS in the aforementioned amendments regarding the reactor vessel pressure-temperature limit curves and low-temperature overpressure protection limits.

Attachment 1 contains the revised TS List of Effective Pages/Sections. Attachment 2 contains revised TS Bases 3.4.3 and 3.4.12.

Please contact P.T. Vu at (704) 875-4302 if you have any questions regarding this submittal.

Very truly yours,



G. R. Peterson

GRP/PTV/s

Attachments

A001

U. S. Nuclear Regulatory Commission
August 20, 2003
Page 2

xc (w/attachments):

L. A. Reyes
U. S. Nuclear Regulatory Commission
Regional Administrator, Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303

R. E. Martin
U. S. Nuclear Regulatory Commission
Mail Stop O-8G9
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

J. B. Brady
Senior Resident Inspector
U. S. Nuclear Regulatory Commission
McGuire Nuclear Station

B. O. Hall, Chief
Division of Radiation Protection
1645 Mail Service Center
Raleigh, NC 27699-1645

ATTACHMENT 1

REVISED TS LIST OF EFFECTIVE PAGES/SECTIONS

McGuire Nuclear Station Technical Specifications
List of Affected Pages / Sections

Page Number	Amendment	Revision Date
i	184/166	9/30/98
ii	184/166	9/30/98
iii	184/166	9/30/98
iv	184/166	9/30/98
1.1-1	184/166	9/30/98
1.1-2	184/166	9/30/98
1.1-3	206/187	8/23/02
1.1-4	194/175	9/18/00
1.1-5	206/187	8/23/02
1.1-6	206/187	8/23/02
1.1-7	194/175	9/18/00
1.2-1	184/166	9/30/98
1.2-2	184/166	9/30/98
1.2-3	184/166	9/30/98
1.3-1	184/166	9/30/98
1.3-2	184/166	9/30/98
1.3-3	184/166	9/30/98
1.3-4	184/166	9/30/98
1.3-5	184/166	9/30/98
1.3-6	184/166	9/30/98
1.3-7	184/166	9/30/98
1.3-8	184/166	9/30/98
1.3-9	184/166	9/30/98
1.3-10	184/166	9/30/98
1.3-11	184/166	9/30/98
1.3-12	184/166	9/30/98
1.3-13	184/166	9/30/98
1.4-1	184/166	9/30/98
1.4-2	184/166	9/30/98
1.4-3	184/166	9/30/98
1.4-4	184/166	9/30/98

Page Number	Amendment	Revision Date
2.0-1	184/166	9/30/98
2.0-2	191/172	3/20/00
3.0-1	184/166	9/30/98
3.0-2	184/166	9/30/98
3.0-3	184/166	9/30/98
3.0-4	205/186	8/12/02
3.0-5	184/166	9/30/98
3.1.1-1	184/166	9/30/98
3.1.2-1	184/166	9/30/98
3.1.2-2	184/166	9/30/98
3.1.3-1	184/166	9/30/98
3.1.3-2	184/166	9/30/98
3.1.3-3	184/166	9/30/98
3.1.4-1	184/166	9/30/98
3.1.4-2	184/166	9/30/98
3.1.4-3	184/166	9/30/98
3.1.4-4	186/167	9/8/99
3.1.5-1	184/166	9/30/98
3.1.5-2	184/166	9/30/98
3.1.6-1	184/166	9/30/98
3.1.6-2	184/166	9/30/98
3.1.6-3	184/166	9/30/98
3.1.7-1	184/166	9/30/98
3.1.7-2	184/166	9/30/98
3.1.8-1	184/166	9/30/98
3.1.8-2	184/166	9/30/98
3.2.1-1	184/166	9/30/98
3.2.1-2	184/166	9/30/98
3.2.1-3	184/166	9/30/98
3.2.1-4	188/169	9/22/99
3.2.1-5	188/169	9/22/99
3.2.2-1	184/166	9/30/98
3.2.2-2	184/166	9/30/98

Page Number	Amendment	Revision Date
3.2.2-3	184/166	9/30/98
3.2.2-4	188/169	9/22/99
3.2.3-1	184/166	9/30/98
3.2.4-1	184/166	9/30/98
3.2.4-2	184/166	9/30/98
3.2.4-3	184/166	9/30/98
3.2.4-4	184/166	9/30/98
3.3.1-1	184/166	9/30/98
3.3.1-2	184/166	9/30/98
3.3.1-3	184/166	9/30/98
3.3.1-4	184/166	9/30/98
3.3.1-5	184/166	9/30/98
3.3.1-6	184/166	9/30/98
3.3.1-7	184/166	9/30/98
3.3.1-8	184/166	9/30/98
3.3.1-9	184/166	9/30/98
3.3.1-10	184/166	9/30/98
3.3.1-11	184/166	9/30/98
3.3.1-12	184/166	9/30/98
3.3.1-13	184/166	9/30/98
3.3.1-14	194/175	9/18/00
3.3.1-15	194/175	9/18/00
3.3.1-16	194/175	9/18/00
3.3.1-17	194/175	9/18/00
3.3.1-18	202/183	5/23/02
3.3.1-19	202/183	5/23/02
3.3.1-20	184/166	9/30/98
3.3.2-1	184/166	9/30/98
3.3.2-2	184/166	9/30/98
3.3.2-3	184/166	9/30/98
3.3.2-4	184/166	9/30/98
3.3.2-5	184/166	9/30/98
3.3.2-6	198/179	4/12/01

Page Number	Amendment	Revision Date
3.3.2-7	198/179	4/12/01
3.3.2-8	184/166	9/30/98
3.3.2-9	184/166	9/30/98
3.3.2-10	194/175	9/18/00
3.3.2-11	194/175	9/18/00
3.3.2-12	194/175	9/18/00
3.3.2-13	198/179	4/12/01
3.3.2-14	194/175	9/18/00
3.3.2-15	184/166	9/30/98
3.3.3-1	184/166	9/30/98
3.3.3-2	184/166	9/30/98
3.3.3-3	184/166	9/30/98
3.3.3-4	184/166	9/30/98
3.3.4-1	184/166	9/30/98
3.3.4-2	184/166	9/30/98
3.3.4-3	184/166	9/30/98
3.3.5-1	184/166	9/30/98
3.3.5-2	194/175	9/18/00
3.3.6-1	184/166	9/30/98
3.3.6-2	184/166	9/30/98
3.3.6-3	194/175	9/18/00
3.4.1-1	191/172	3/20/00
3.4.1-2	191/172	3/20/00
3.4.1-3	184/166	9/30/98
3.4.1-4	191/172	3/20/00
3.4.2-1	184/166	9/30/98
3.4.3-1	214/195	7/3/03
3.4.3-2	184/166	9/30/98
3.4.3-3	214/195	7/3/03
3.4.3-4	214/195	7/3/03
3.4.3-5	214/195	7/3/03
3.4.3-6	214/195	7/3/03
3.4.3-7	214/195	7/3/03

Page Number	Amendment	Revision Date
3.4.3-8	214/195	7/3/03
3.4.4-1	184/166	9/30/98
3.4.5-1	184/166	9/30/98
3.4.5-2	184/166	9/30/98
3.4.5-3	184/166	9/30/98
3.4.6-1	184/166	9/30/98
3.4.6-2	184/166	9/30/98
3.4.7-1	184/166	9/30/98
3.4.7-2	184/166	9/30/98
3.4.8-1	184/166	9/30/98
3.4.8-2	184/166	9/30/98
3.4.9-1	184/166	9/30/98
3.4.9-2	184/166	9/30/98
3.4.10-1	184/166	9/30/98
3.4.10-2	184/166	9/30/98
3.4.11-1	184/166	9/30/98
3.4.11-2	184/166	9/30/98
3.4.11-3	184/166	9/30/98
3.4.11-4	184/166	9/30/98
3.4.12-1	184/166	9/30/98
3.4.12-2	214/195	7/3/03
3.4.12-3	214/195	7/3/03
3.4.12-4	214/195	7/3/03
3.4.12-5	184/166	9/30/98
3.4.12-6	184/166	9/30/98
3.4.13-1	184/166	9/30/98
3.4.13-2	184/166	9/30/98
3.4.14-1	184/166	9/30/98
3.4.14-2	184/166	9/30/98
3.4.14-3	184/166	9/30/98
3.4.14-4	184/166	9/30/98
3.4.15-1	184/166	9/30/98
3.4.15-2	184/166	9/30/98

Page Number	Amendment	Revision Date
3.4.15-3	184/166	9/30/98
3.4.16-1	184/166	9/30/98
3.4.16-2	184/166	9/30/98
3.4.16-3	184/166	9/30/98
3.4.16-4	184/166	9/30/98
3.4.17-1	184/166	9/30/98
3.5.1-1	184/166	9/30/98
3.5.1-2	184/166	9/30/98
3.5.2-1	184/166	9/30/98
3.5.2-2	184/166	9/30/98
3.5.2-3	184/166	9/30/98
3.5.3-1	184/166	9/30/98
3.5.3-2	184/166	9/30/98
3.5.4-1	184/166	9/30/98
3.5.4-2	184/166	9/30/98
3.5.5-1	184/166	9/30/98
3.5.5-2	184/166	9/30/98
3.6.1-1	207/188	9/4/02
3.6.1-2	207/188	9/4/02
3.6.2-1	184/166	9/30/98
3.6.2-2	184/166	9/30/98
3.6.2-3	184/166	9/30/98
3.6.2-4	184/166	9/30/98
3.6.2-5	207/188	9/4/02
3.6.3-1	184/166	9/30/98
3.6.3-2	184/166	9/30/98
3.6.3-3	184/166	9/30/98
3.6.3-4	184/166	9/30/98
3.6.3-5	184/166	9/30/98
3.6.3-6	207/188	9/4/02
3.6.3-7	207/188	9/4/02
3.6.4-1	184/166	9/30/98
3.6.5-1	184/166	9/30/98

Page Number	Amendment	Revision Date
3.6.5-2	184/166	9/30/98
3.6.6-1	184/166	9/30/98
3.6.6-2	184/166	9/30/98
3.6.7-1	184/166	9/30/98
3.6.7-2	184/166	9/30/98
3.6.8-1	184/166	9/30/98
3.6.8-2	184/166	9/30/98
3.6.9-1	184/166	9/30/98
3.6.9-2	184/166	9/30/98
3.6.10-1	184/166	9/30/98
3.6.10-2	184/166	9/30/98
3.6.11-1	184/166	9/30/98
3.6.11-2	184/166	9/30/98
3.6.12-1	184/166	9/30/98
3.6.12-2	201/182	3/13/02
3.6.12-3	201/182	3/13/02
3.6.13-1	184/166	9/30/98
3.6.13-2	184/166	9/30/98
3.6.13-3	184/166	9/30/98
3.6.14-1	184/166	9/30/98
3.6.14-2	184/166	9/30/98
3.6.14-3	184/166	9/30/98
3.6.15-1	184/166	9/30/98
3.6.15-2	184/166	9/30/98
3.6.16-1	212/193	5/8/03
3.6.16-2	212/193	5/8/03
3.7.1-1	184/166	9/30/98
3.7.1-2	184/166	9/30/98
3.7.1-3	184/166	9/30/98
3.7.2-1	184/166	9/30/98
3.7.2-2	184/166	9/30/98
3.7.3-1	184/166	9/30/98
3.7.3-2	184/166	9/30/98

Page Number	Amendment	Revision Date
3.7.4-1	184/166	9/30/98
3.7.4-2	184/166	9/30/98
3.7.5-1	184/166	9/30/98
3.7.5-2	184/166	9/30/98
3.7.5-3	184/166	9/30/98
3.7.5-4	184/166	9/30/98
3.7.6-1	184/166	9/30/98
3.7.6-2	184/166	9/30/98
3.7.7-1	184/166	9/30/98
3.7.7-2	184/166	9/30/98
3.7.8-1	184/166	9/30/98
3.7.8-2	184/166	9/30/98
3.7.9-1	187/168	9/22/99
3.7.9-2	187/168	9/22/99
3.7.9-3	184/166	9/30/98
3.7.10-1	184/166	9/30/98
3.7.10-2	184/166	9/30/98
3.7.11-1	184/166	9/30/98
3.7.11-2	184/166	9/30/98
3.7.12-1	184/166	9/30/98
3.7.12-2	184/166	9/30/98
3.7.13-1	184/166	9/30/98
3.7.14-1	184/166	9/30/98
3.7.15-1	197/178	11/27/00
3.7.15-2	197/178	11/27/00
3.7.15-3	197/178	11/27/00
3.7.15-4	197/178	11/27/00
3.7.15-5	197/178	11/27/00
3.7.15-6	197/178	11/27/00
3.7.15-7	197/178	11/27/00
3.7.15-8	197/178	11/27/00
3.7.15-9	210/191	2/4/03
3.7.15-10	210/191	2/4/03

Page Number	Amendment	Revision Date
3.7.15-11	210/191	2/4/03
3.7.15-12	197/178	11/27/00
3.7.15-13	197/178	11/27/00
3.7.15-14	197/178	11/27/00
3.7.15-15	197/178	11/27/00
3.7.15-16	210/191	2/4/03
3.7.15-17	210/191	2/4/03
3.7.15-18	210/191	2/4/03
3.7.15-19	210/191	2/4/03
3.7.15-20	197/178	11/27/00
3.7.15-21	197/178	11/27/00
3.7.16-1	184/166	9/30/98
3.8.1-1	184/166	9/30/98
3.8.1-2	184/166	9/30/98
3.8.1-3	184/166	9/30/98
3.8.1-4	184/166	9/30/98
3.8.1-5	184/166	9/30/98
3.8.1-6	184/166	9/30/98
3.8.1-7	184/166	9/30/98
3.8.1-8	192/173	3/15/00
3.8.1-9	184/166	9/30/98
3.8.1-10	184/166	9/30/98
3.8.1-11	192/173	3/15/00
3.8.1-12	184/166	9/30/98
3.8.1-13	184/166	9/30/98
3.8.1-14	184/166	9/30/98
3.8.1-15	184/166	9/30/98
3.8.2-1	184/166	9/30/98
3.8.2-2	184/166	9/30/98
3.8.2-3	184/166	9/30/98
3.8.3-1	184/166	9/30/98
3.8.3-2	184/166	9/30/98
3.8.3-3	184/166	9/30/98

Page Number	Amendment	Revision Date
3.8.4-1	184/166	9/30/98
3.8.4-2	184/166	9/30/98
3.8.4-3	209/190	12/17/02
3.8.5-1	184/166	9/30/98
3.8.5-2	184/166	9/30/98
3.8.6-1	184/166	9/30/98
3.8.6-2	184/166	9/30/98
3.8.6-3	184/166	9/30/98
3.8.6-4	184/166	9/30/98
3.8.7-1	184/166	9/30/98
3.8.8-1	184/166	9/30/98
3.8.8-2	184/166	9/30/98
3.8.9-1	184/166	9/30/98
3.8.9-2	184/166	9/30/98
3.8.10-1	184/166	9/30/98
3.8.10-2	184/166	9/30/98
3.9.1-1	184/166	9/30/98
3.9.2-1	184/166	9/30/98
3.9.3-1	184/166	9/30/98
3.9.3-2	184/166	9/30/98
3.9.4-1	184/166	9/30/98
3.9.4-2	184/166	9/30/98
3.9.5-1	184/166	9/30/98
3.9.5-2	184/166	9/30/98
3.9.6-1	184/166	9/30/98
3.9.6-2	184/166	9/30/98
3.9.7-1	184/166	9/30/98
4.0.1	210/191	2/4/03
4.0.2	197/178	11/27/00
5.1-1	213/194	6/6/03
5.2-1	184/166	9/30/98
5.2-2	184/166	9/30/98
5.2-3	213/194	6/6/03

Page Number	Amendment	Revision Date
5.3-1	213/194	6/6/03
5.4-1	184/166	9/30/98
5.5-1	212/193	5/8/03
5.5-2	212/193	5/8/03
5.5-3	184/166	9/30/98
5.5-4	184/166	9/30/98
5.5-5	190/171	12/21/99
5.5-6	184/166	9/30/98
5.5-7	184/166	9/30/98
5.5-8	184/166	9/30/98
5.5-9	184/166	9/30/98
5.5-10	184/166	9/30/98
5.5-11	184/166	9/30/98
5.5-12	184/166	9/30/98
5.5-13	184/166	9/30/98
5.5-14	196/177	11/2/00
5.5-15	184/166	9/30/98
5.5-16	184/166	9/30/98
5.5-17	204/185	7/17/02
5.5-18	184/166	9/30/98
5.6-1	184/166	9/30/98
5.6-2	208/189	10/1/02
5.6-3	208/189	10/1/02
5.6-4	203/184	7/10/02
5.6-5	184/166	9/30/98
5.7-1	213/194	6/6/03
5.7-2	184/166	9/30/98

BASES

(Revised per section)

i	Revision 0	9/30/98
ii	Revision 0	9/30/98
iii	Revision 0	9/30/98

Page Number	Amendment	Revision Date
B 2.1.1	Revision 0	9/30/98
B 2.1.2	Revision 0	9/30/98
B 3.0	Revision 35	8/12/02
B 3.1.1	Revision 0	9/30/98
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 15	01/04/01
B 3.1.8	Revision 0	9/30/98
B 3.2.1	Revision 34	10/1/02
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 31	9/17/02
B 3.3.2	Revision 38	1/30/03
B 3.3.3	Revision 26	1/15/02
B 3.3.4	Revision 0	9/30/98
B 3.3.5	Revision 11	9/18/00
B 3.3.6	Revision 0	9/30/98
B 3.4.1	Revision 8	3/20/00
B 3.4.2	Revision 0	9/30/98
B 3.4.3	Revision 44	7/3/03
B 3.4.4	Revision 0	9/30/98
B 3.4.5	Revision 0	9/30/98
B 3.4.6	Revision 0	9/30/98
B 3.4.7	Revision 0	9/30/98
B 3.4.8	Revision 0	9/30/98
B 3.4.9	Revision 0	9/30/98
B 3.4.10	Revision 0	9/30/98
B 3.4.11	Revision 0	9/30/98
B 3.4.12	Revision 44	7/3/03

ATTACHMENT 2

REVISED TS BASES 3.4.3 and 3.4.12

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.3 RCS Pressure and Temperature (P/T) Limits

BASES

BACKGROUND

All components of the RCS are designed to withstand effects of cyclic loads due to system pressure and temperature changes. These loads are introduced by startup (heatup) and shutdown (cooldown) operations, power transients, and reactor trips. This LCO limits the pressure and temperature changes during RCS heatup and cooldown, within the design assumptions and the stress limits for cyclic operation.

This Specification contains P/T limit curves for heatup, cooldown, inservice leak and hydrostatic (ISLH) testing, and data for the maximum rate of change of reactor coolant temperature.

Each P/T limit curve defines an acceptable region for normal operation. The usual use of the curves is operational guidance during heatup or cooldown maneuvering, when pressure and temperature indications are monitored and compared to the applicable curve to determine that operation is within the allowable region.

The LCO establishes operating limits that provide a margin to brittle failure of the reactor vessel and piping of the reactor coolant pressure boundary (RCPB). The vessel is the component most subject to brittle failure, and the LCO limits apply mainly to the vessel. The limits do not apply to the pressurizer, which has different design characteristics and operating functions.

10 CFR 50, Appendix G (Ref. 1), requires the establishment of P/T limits for specific material fracture toughness requirements of the RCPB materials. Reference 1 requires an adequate margin to brittle failure during normal operation, anticipated operational occurrences, and system hydrostatic tests. It mandates the use of the American Society of Mechanical Engineers (ASME) Code, Section III, Appendix G (Ref. 2).

The neutron embrittlement effect on the material toughness is reflected by increasing the nil ductility reference temperature (RT_{NDT}) as exposure to neutron fluence increases.

The actual shift in the RT_{NDT} of the vessel material will be established periodically by removing and evaluating the irradiated reactor vessel material specimens, in accordance with ASTM E 185 (Ref. 3) and

BASES

BACKGROUND (continued)

Appendix H of 10 CFR 50 (Ref. 4). The operating P/T limit curves will be adjusted, as necessary, based on the evaluation findings and the recommendations of Regulatory Guide 1.99 (Ref. 5).

A second program that employs excore cavity dosimetry to monitor the reactor vessel neutron fluence has been installed in both units. This program meets the requirements of 10 CFR 50 Appendix H (Ref. 4).

The P/T limit curves are composite curves established by superimposing limits derived from stress analyses of those portions of the reactor vessel and head that are the most restrictive. At any specific pressure, temperature, and temperature rate of change, one location within the reactor vessel will dictate the most restrictive limit. Across the span of the P/T limit curves, different locations are more restrictive, and, thus, the curves are composites of the most restrictive regions.

The heatup curve represents a different set of restrictions than the cooldown curve because the directions of the thermal gradients through the vessel wall are reversed. The thermal gradient reversal alters the location of the tensile stress between the outer and inner walls.

The criticality limit curve includes the Reference 1 requirement that it be $\geq 40^{\circ}\text{F}$ above the heatup curve or the cooldown curve, and not less than the minimum permissible temperature for ISLH testing. However, the criticality curve is not operationally limiting; a more restrictive limit exists in LCO 3.4.2, "RCS Minimum Temperature for Criticality."

The consequence of violating the LCO limits is that the RCS has been operated under conditions that can result in brittle failure of the RCPB, possibly leading to a nonisolable leak or loss of coolant accident. In the event these limits are exceeded, an evaluation must be performed to determine the effect on the structural integrity of the RCPB components. The ASME Code, Section XI, Appendix E (Ref. 6), provides a recommended methodology for evaluating an operating event that causes an excursion outside the limits.

**APPLICABLE
SAFETY ANALYSES**

The P/T limits are not derived from Design Basis Accident (DBA) analyses. They are prescribed during normal operation to avoid encountering pressure, temperature, and temperature rate of change conditions that might cause undetected flaws to propagate and cause nonductile failure of the RCPB, an unanalyzed condition. Although the P/T limits are not derived from any DBA, the P/T limits are acceptance limits since they preclude operation in an unanalyzed condition.

RCS P/T limits satisfy Criterion 2 of 10 CFR 50.36 (Ref. 7).

BASES

LCO

The two elements of this LCO are:

- a. The limit curves for heatup, cooldown, and ISLH testing; and
- b. Limits on the rate of change of temperature.

The LCO limits apply to all components of the RCS, except the pressurizer. These limits define allowable operating regions and permit a large number of operating cycles while providing a wide margin to nonductile failure.

The limits for the rate of change of temperature control the thermal gradient through the vessel wall and are used as inputs for calculating the heatup, cooldown, and ISLH testing P/T limit curves. Thus, the LCO for the rate of change of temperature restricts stresses caused by thermal gradients and also ensures the validity of the P/T limit curves.

Violating the LCO limits places the reactor vessel outside of the bounds of the stress analyses and can increase stresses in other RCPB components. The consequences depend on several factors, as follows:

- a. The severity of the departure from the allowable operating P/T regime or the severity of the rate of change of temperature;
- b. The length of time the limits were violated (longer violations allow the temperature gradient in the thick vessel walls to become more pronounced); and
- c. The existences, sizes, and orientations of flaws in the vessel material.

APPLICABILITY

The RCS P/T limits LCO provides a definition of acceptable operation for prevention of nonductile failure in accordance with 10 CFR 50, Appendix G (Ref. 1). Although the P/T limits were developed to provide guidance for operation during heatup or cooldown (MODES 3, 4, and 5) or ISLH testing, their Applicability is at all times in keeping with the concern for nonductile failure. The limits do not apply to the pressurizer.

During MODES 1 and 2, other Technical Specifications provide limits for operation that can be more restrictive than or can supplement these P/T limits. LCO 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits"; LCO 3.4.2, "RCS Minimum Temperature for Criticality"; and Safety Limit 2.1, "Safety Limits," also provide operational restrictions for pressure and temperature and

BASES

APPLICABILITY (continued)

maximum pressure. Furthermore, MODES 1 and 2 are above the temperature range of concern for nonductile failure, and stress analyses have been performed for normal maneuvering profiles, such as power ascension or descent.

ACTIONS

A.1 and A.2

Operation outside the P/T limits during MODE 1, 2, 3, or 4 must be corrected so that the RCPB is returned to a condition that has been verified by stress analyses.

The 30 minute Completion Time reflects the urgency of restoring the parameters to within the analyzed range. Most violations will not be severe, and the activity can be accomplished in this time in a controlled manner.

Besides restoring operation within limits, an evaluation is required to determine if RCS operation can continue. The evaluation must verify the RCPB integrity remains acceptable and must be completed before continuing operation. Several methods may be used, including comparison with pre-analyzed transients in the stress analyses, new analyses, or inspection of the components.

ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

The 72 hour Completion Time is reasonable to accomplish the evaluation. The evaluation for a mild violation is possible within this time, but more severe violations may require special, event specific stress analyses or inspections. A favorable evaluation must be completed before continuing to operate.

Condition A is modified by a Note requiring Required Action A.2 to be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone per Required Action A.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

BASES

ACTIONS (continued)

B.1 and B.2

If a Required Action and associated Completion Time of Condition A are not met, the plant must be placed in a lower MODE because either the RCS remained in an unacceptable P/T region for an extended period of increased stress or a sufficiently severe event caused entry into an unacceptable region. Either possibility indicates a need for more careful examination of the event, best accomplished with the RCS at reduced pressure and temperature. In reduced pressure and temperature conditions, the possibility of propagation with undetected flaws is decreased.

If the required restoration activity cannot be accomplished within 30 minutes, Required Action B.1 and Required Action B.2 must be implemented to reduce pressure and temperature.

If the required evaluation for continued operation cannot be accomplished within 72 hours or the results are indeterminate or unfavorable, action must proceed to reduce pressure and temperature as specified in Required Action B.1 and Required Action B.2. A favorable evaluation must be completed and documented before returning to operating pressure and temperature conditions.

Pressure and temperature are reduced by bringing the plant to MODE 3 within 6 hours and to MODE 5 with RCS pressure < 500 psig within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1 and C.2

Actions must be initiated immediately to correct operation outside of the P/T limits at times other than when in MODE 1, 2, 3, or 4, so that the RCPB is returned to a condition that has been verified by stress analysis.

The immediate Completion Time reflects the urgency of initiating action to restore the parameters to within the analyzed range. Most violations will not be severe, and the activity can be accomplished in this time in a controlled manner.

BASES

ACTIONS (continued)

Besides restoring operation within limits, an evaluation is required to determine if RCS operation can continue. The evaluation must verify that the RCPB integrity remains acceptable and must be completed prior to entry into MODE 4. Several methods may be used, including comparison with pre-analyzed transients in the stress analyses, or inspection of the components.

ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

Condition C is modified by a Note requiring Required Action C.2 to be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone per Required Action C.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

SURVEILLANCE
REQUIREMENTS

SR 3.4.3.1

Verification that operation is within the specified limits is required every 30 minutes when RCS pressure and temperature conditions are undergoing planned changes. This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature rate of change limits are specified in hourly increments, 30 minutes permits assessment and correction for minor deviations within a reasonable time.

Surveillance for heatup, cooldown, or ISLH testing may be discontinued when the definition given in the relevant plant procedure for ending the activity is satisfied.

This SR is modified by a Note that only requires this SR to be performed during system heatup, cooldown, and ISLH testing. No SR is given for criticality operations because LCO 3.4.2 contains a more restrictive requirement.

BASES

REFERENCES

1. 10 CFR 50, Appendix G.
2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
3. ASTM E 185-82, July 1982.
4. 10 CFR 50, Appendix H.
5. Regulatory Guide 1.99, Revision 2, May 1988.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
7. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.12 Low Temperature Overpressure Protection (LTOP) System

BASES

BACKGROUND

The LTOP System controls RCS pressure at low temperatures so the integrity of the reactor coolant pressure boundary (RCPB) is not compromised by violating the pressure and temperature (P/T) limits of 10 CFR 50, Appendix G (Ref. 1). The reactor vessel is the limiting RCPB component for demonstrating such protection. This specification provides the maximum allowable actuation logic setpoints for the power operated relief valves (PORVs) and LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," provides the maximum RCS pressure for the existing RCS cold leg temperature during cooldown, shutdown, and heatup to meet the Reference 1 requirements during the LTOP MODES.

The reactor vessel material is less tough at low temperatures than at normal operating temperature. As the vessel neutron exposure accumulates, the material toughness decreases and becomes less resistant to pressure stress at low temperatures (Ref. 2). RCS pressure, therefore, is maintained low at low temperatures and is increased only as temperature is increased.

The potential for vessel overpressurization is most acute when the RCS is water solid, occurring only while shutdown; a pressure fluctuation can occur more quickly than an operator can react to relieve the condition. Exceeding the RCS P/T limits by a significant amount could cause brittle cracking of the reactor vessel. LCO 3.4.3 requires administrative control of RCS pressure and temperature during heatup and cooldown to prevent exceeding the specified limits.

This LCO provides RCS overpressure protection by having a minimum coolant input capability and having adequate pressure relief capacity. Limiting coolant input capability requires all but one centrifugal charging pump or one safety injection pump incapable of injection into the RCS and isolating the accumulators. The pressure relief capacity requires either two redundant PORVs or a depressurized RCS and an RCS vent of sufficient size. One PORV or the open RCS vent is the overpressure protection device that acts to terminate an increasing pressure event.

With minimum coolant input capability, the ability to provide core coolant addition is restricted. The LCO does not require the makeup control

BASES

BACKGROUND (continued)

system deactivated or the safety injection (SI) actuation circuits blocked. Due to the lower pressures in the LTOP MODES and the expected core decay heat levels, the makeup system can provide adequate flow via the makeup control valve. If conditions require the use of more than one centrifugal charging pump for makeup in the event of loss of inventory, then pumps can be made available through manual actions.

PORV Requirements

As designed for the LTOP System, each PORV is signaled to open if the RCS pressure reaches 385 psig when the PORVS are in the "lo-press" mode of operation. If the PORVs are being used to meet the requirements of this specification, then RCS cold leg temperature is limited in accordance with the LTOP analysis. For cases where no reactor coolant pumps are in operation, this temperature limit is met by monitoring of BOTH the Wide Range Cold Leg temperatures and Residual Heat Removal Heat Exchanger discharge temperature. These temperatures are the most representative of the fluid in the reactor vessel downcomer region. The LTOP actuation logic monitors both RCS temperature and RCS pressure. The signals used to generate the pressure setpoints originate from the safety related narrow range pressure transmitters. The signals used to generate the temperature permissives originate from the wide range RTDs on cold leg C and hot leg D. Each signal is input to the appropriate NSSS protection system cabinet where it is converted to an internal signal and then input to a comparator to generate an actuation signal. If the indicated pressure meets or exceeds the bistable setpoint, a PORV is signaled to open.

This Specification presents the PORV setpoints for LTOP. Having the setpoints of both valves within the limits ensures that the Reference 1 limits will not be exceeded in any analyzed event.

When a PORV is opened in an increasing pressure transient, the release of coolant will cause the pressure increase to slow and reverse. As the PORV releases coolant, the RCS pressure decreases until a reset pressure is reached and the valve is signaled to close. The pressure continues to decrease below the reset pressure as the valve closes.

RCS Vent Requirements

Once the RCS is depressurized, a vent exposed to the containment atmosphere will maintain the RCS at containment ambient pressure in an RCS overpressure transient, if the relieving requirements of the transient do not exceed the capabilities of the vent. Thus, the vent path must be

BASES

BACKGROUND (continued)

capable of relieving the flow resulting from the limiting LTOP mass or heat input transient, and maintaining pressure below the P/T limits. The required vent capacity may be provided by one or more vent paths.

The vent path(s) must be above the level of reactor coolant, so as not to drain the RCS when open.

APPLICABLE SAFETY ANALYSES

Safety analyses (Ref. 4) demonstrate that the reactor vessel is adequately protected against exceeding the Reference 1 P/T limits. In MODES 1, 2, and 3, and in MODE 4 with RCS cold leg temperature exceeding 300°F, the pressurizer safety valves will prevent RCS pressure from exceeding the Reference 1 limits. At about 300°F and below, overpressure prevention falls to two OPERABLE PORVs or to a depressurized RCS and a sufficient sized RCS vent. Each of these means has a limited overpressure relief capability.

The actual temperature at which the pressure in the P/T limit curve falls below the pressurizer safety valve setpoint increases as the reactor vessel material toughness decreases due to neutron embrittlement. Each time the P/T curves are revised, the LTOP System must be re-evaluated to ensure its functional requirements can still be met using the PORV method or the depressurized and vented RCS condition.

Any change to the RCS must be evaluated against the Reference 4 analyses to determine the impact of the change on the LTOP acceptance limits.

Transients that are capable of overpressurizing the RCS are categorized as either mass or heat input transients, examples of which follow:

Mass Input Type Transients

- a. Inadvertent safety injection; or
- b. Charging/letdown flow mismatch.

Heat Input Type Transients

- a. Inadvertent actuation of pressurizer heaters;
- b. Loss of RHR cooling; or

BASES

APPLICABLE SAFETY ANALYSES (continued)

- c. Reactor coolant pump (RCP) startup with temperature asymmetry within the RCS or between the RCS and steam generators.

The following are required during the LTOP MODES to ensure that mass and heat input transients do not occur, which either of the LTOP overpressure protection means cannot handle:

- a. Rendering all but one centrifugal charging pump or one safety injection pump incapable of injection;
- b. Deactivating the accumulator discharge isolation valves in their closed positions; and
- c. Disallowing start of an RCP if secondary temperature is more than 50°F above primary temperature in any one loop. LCO 3.4.6, "RCS Loops—MODE 4," and LCO 3.4.7, "RCS Loops—MODE 5, Loops Filled," provide this protection.

The Reference 4 analyses demonstrate that either one PORV or the depressurized RCS and RCS vent can maintain RCS pressure below limits when only one centrifugal charging pump or one safety injection pump are actuated. Thus, the LCO allows only one centrifugal charging pump or one safety injection pump OPERABLE during the LTOP MODES. Since neither one PORV nor the RCS vent can handle the pressure transient from accumulator injection when RCS temperature is low the LCO also requires the accumulators isolation when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in LCO 3.4.3.

The isolated accumulators must have their discharge valves closed and power removed.

Fracture mechanics analyses established the temperature of LTOP Applicability at 300°F.

The consequences of a small break loss of coolant accident (LOCA) in LTOP MODE 4 conform to 10 CFR 50.46 and 10 CFR 50, Appendix K (Refs. 5 and 6), requirements by having a maximum of one centrifugal charging pump OPERABLE and SI actuation enabled.

BASES

APPLICABLE SAFETY ANALYSES (continued)

PORV Performance

The fracture mechanics analyses show that the vessel is protected when the PORVs are set to open at or below the specified limit. The setpoints are derived by analyses that model the performance of the LTOP System, assuming the limiting LTOP transient of one centrifugal charging pump or one safety injection pump injecting into the RCS. These analyses consider pressure overshoot and undershoot beyond the PORV opening and closing, resulting from signal processing and valve stroke times. The PORV setpoints at or below the derived limit ensures the Reference 1 P/T limits will be met.

The PORV setpoints will be updated when the revised P/T limits conflict with the LTOP analysis limits. The P/T limits are periodically modified as the reactor vessel material toughness decreases due to neutron embrittlement caused by neutron irradiation. Revised limits are determined using neutron fluence projections and the results of examinations of the reactor vessel material irradiation surveillance specimens. The Bases for LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," discuss these examinations.

The PORVs are considered active components. Thus, the failure of one PORV is assumed to represent the worst case, single active failure.

RCS Vent Performance

With the RCS depressurized, analyses show a vent size of 2.75 square inches is capable of mitigating the allowed LTOP overpressure transient. The capacity of a vent this size is greater than the flow of the limiting transient for the LTOP configuration, one centrifugal charging pump or one safety injection pump OPERABLE, maintaining RCS pressure less than the maximum pressure on the P/T limit curve.

The RCS vent size will be re-evaluated for compliance each time the P/T limit curves are revised based on the results of the vessel material surveillance.

The RCS vent is passive and is not subject to active failure.

The LTOP System satisfies Criterion 2 of 10 CFR 50.36 (Ref. 7).

BASES

LCO

This LCO requires that the LTOP System is OPERABLE. The LTOP System is OPERABLE when the minimum coolant input and pressure relief capabilities are OPERABLE. Violation of this LCO could lead to the loss of low temperature overpressure mitigation and violation of the Reference 1 limits as a result of an operational transient.

To limit the coolant input capability, the LCO permits a maximum of one centrifugal charging pump or one safety injection pump capable of injecting into the RCS and requires all accumulator discharge isolation valves closed and immobilized when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in LCO 3.4.3.

The elements of the LCO that provide low temperature overpressure mitigation through pressure relief are:

- a. Two OPERABLE PORVs (NC-32B and NC-34A); or

A PORV is OPERABLE for LTOP when its block valve is open, its lift setpoint is set to the specified limit and testing proves its automatic ability to open at this setpoint, and motive power is available to the valve and its control circuit.

- b. A depressurized RCS and an RCS vent.

An RCS vent is OPERABLE when open with an area of ≥ 2.75 square inches.

Each of these methods of overpressure prevention is capable of mitigating the limiting LTOP transient.

The LCO is modified with a note that specifies that a PORV secured in the open position may be used to meet the RCS vent requirement provided that its associated block valve is open and power removed. With the PORV physically secured or locked in the open position with its associated block valve open and power removed, this vent path is passive and is not subject to active failure.

APPLICABILITY

This LCO is applicable in MODE 4 when any RCS cold leg temperature is $\leq 300^{\circ}\text{F}$, in MODE 5, and in MODE 6 when the reactor vessel head is on. The pressurizer safety valves provide overpressure protection that meets the Reference 1 P/T limits above 300°F . When the reactor vessel head is off, overpressurization cannot occur.

LCO 3.4.3 provides the operational P/T limits for all MODES. LCO 3.4.10, "Pressurizer Safety Valves," requires the OPERABILITY of

BASES

APPLICABILITY (continued)

the pressurizer safety valves that provide overpressure protection during MODES 1, 2, and 3, and MODE 4 above 300°F.

Low temperature overpressure prevention is most critical during shutdown when the RCS is water solid, and a mass or heat input transient can cause a very rapid increase in RCS pressure when little or no time allows operator action to mitigate the event.

The Applicability is modified by a Note stating that accumulator isolation is only required when the accumulator pressure is more than or at the maximum RCS pressure for the existing temperature, as allowed by the P/T limit curves. This Note permits the accumulator discharge isolation valve Surveillance to be performed only under these pressure and temperature conditions.

ACTIONS

LCO 3.0.4 is not applicable for entry into LTOP operation.

A.1, A.2.1, A.2.2.1, A.2.2.2, A.3, A.4, A.5.1, and A.5.2

With two centrifugal charging pumps, safety injection pumps, or a combination of each, capable of injecting into the RCS, RCS overpressurization is possible.

To immediately initiate action to restore restricted coolant input capability to the RCS reflects the urgency of removing the RCS from this condition. Two pumps may be capable of injecting into the RCS provided the RHR suction relief valve is OPERABLE with:

1. RCS cold leg temperature > 174°F (Unit 1), or
2. RCS cold leg temperature > 89°F (Unit 2), or
3. RCS cold leg temperature > 74°F and cooldown rate < 20°F/hr (Unit 1),
or
4. RCS cold leg temperature > 74°F and cooldown rate < 60°F/hr (Unit 2),
or
5. two PORVs secured open with associated block valves open and power removed, or
6. a RCS vent of ≥ 4.5 square inches, or
7. a RCS vent of ≥ 2.75 square inches and two OPERABLE PORVs (the RCS vent shall not be one of the two OPERABLE PORVs).

For cases where no reactor coolant pumps are in operation, RCS cold leg temperature limits are to be met by monitoring of BOTH the WR Cold Leg temperatures and Residual Heat Removal Heat Exchanger discharge temperature. With both PORVS and block valves secured open, or with

BASES

ACTIONS (continued)

an RCS vent of 4.5 square inches, there are no credible single failures to limit the flow relief capacity. For the RHR relief valve to be OPERABLE, the RHR suction isolation valves must be open and the relief valve setpoint at 450 psig consistent with the safety analysis. The RHR suction relief valves are spring loaded, bellows type water relief valves with pressure tolerances and accumulation limits established by Section III of the American Society of Mechanical Engineers (ASME) Code (Ref. 3) for Class 2 relief valves.

Required Action A.1 is modified by a Note that permits two centrifugal charging pumps capable of RCS injection for ≤ 15 minutes to allow for pump swaps.

B.1, C.1, and C.2

An unisolated accumulator requires isolation within 1 hour. This is only required when the accumulator pressure is at or more than the maximum RCS pressure for the existing temperature allowed by the P/T limit curves.

If isolation is needed and cannot be accomplished in 1 hour, Required Action C.1 and Required Action C.2 provide two options, either of which must be performed in the next 12 hours. By increasing the RCS temperature to $> 300^{\circ}\text{F}$, an accumulator pressure of 639 psig cannot exceed the LTOP limits if the accumulators are fully injected. Depressurizing the accumulators below the LTOP limit also gives this protection.

The Completion Times are based on operating experience that these activities can be accomplished in these time periods and on engineering evaluations indicating that an event requiring LTOP is not likely in the allowed times.

D.1

In MODE 4 when any RCS cold leg temperature is $\leq 300^{\circ}\text{F}$, with one PORV inoperable, the PORV must be restored to OPERABLE status within a Completion Time of 7 days. Two PORVS are required to provide low temperature overpressure mitigation while withstanding a single failure of an active component.

The Completion Time considers the facts that only one of the PORVs is required to mitigate an overpressure transient and that the likelihood of an

BASES

ACTIONS (continued)

active failure of the remaining valve path during this time period is very low.

E.1 and E.2

The consequences of operational events that will overpressurize the RCS are more severe at lower temperature (Ref. 8). Thus, with one of the two PORVs inoperable in MODE 5 or in MODE 6 with the head on, all operations which could lead to a water solid pressurizer must be suspended immediately and the Completion Time to restore two valves to OPERABLE status is 24 hours.

The Completion Time represents a reasonable time to investigate and repair several types of relief valve failures without exposure to a lengthy period with only one OPERABLE PORV to protect against overpressure events.

F.1 and F.2

If the Required Actions and associated Completion Times of Condition E are not met, then alternative actions are necessary to establish the required redundancy in relief capacity. This is accomplished by verifying that the RHR relief valve is OPERABLE and the RHR suction isolation valves open and the RCS cold leg temperature > 174°F (Unit 1) or > 89°F (Unit 2). For cases where no reactor coolant pumps are in operation, RCS cold leg temperature limits are to be met by monitoring of BOTH the WR Cold Leg temperatures and Residual Heat Removal Heat Exchanger discharge temperature. The Completion Time of 1 hour reflects the importance of restoring the required redundancy at lower RCS temperatures.

G.1

The RCS must be depressurized and a vent must be established within 8 hours when:

- a. Both required PORVs are inoperable; or
- b. A Required Action and associated Completion Time of Condition C, D, E, or F is not met; or

BASES

ACTIONS (continued)

- c. The LTOP System is inoperable for any reason other than Condition A, B, C, D, E, or F.

The vent must be sized ≥ 2.75 square inches to ensure that the flow capacity is greater than that required for the worst case mass input transient reasonable during the applicable MODES. This action is needed to protect the RCPB from a low temperature overpressure event and a possible brittle failure of the reactor vessel.

The Completion Time considers the time required to place the plant in this Condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

**SURVEILLANCE
REQUIREMENTS**

SR 3.4.12.1 and SR 3.4.12.2

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, all but one centrifugal charging pump or

one safety injection pump are verified incapable of injecting into the RCS and the accumulator discharge isolation valves are verified closed and power removed (See Ref. 10).

The centrifugal charging pump and safety injection pump are rendered incapable of injecting into the RCS through removing the power from the pumps by racking the breakers out under administrative control. An alternate method of LTOP control may be employed using at least two independent means to prevent a pump start such that a single failure or single action will not result in an injection into the RCS. This may be accomplished through two valves in the discharge flow path being closed.

The Frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

SR 3.4.12.3

The RHR suction relief valve shall be demonstrated OPERABLE by verifying the RHR suction isolation valves are open and by testing it in accordance with the Inservice Testing Program. This Surveillance is only required to be performed if the RHR suction relief valve is being used to meet the Required Actions of this LCO.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The RHR suction valves are verified to be opened every 12 hours. The Frequency is considered adequate in view of other administrative controls such as valve status indications available to the operator in the control room that verify the RHR suction valves remain open.

The ASME Code, Section XI (Ref. 9), test per Inservice Testing Program verifies OPERABILITY by proving proper relief valve mechanical motion and by measuring and, if required, adjusting the lift setpoint.

SR 3.4.12.4

The RCS vent of ≥ 2.75 square inches is proven OPERABLE by verifying its open condition either:

- a. Once every 12 hours for a valve that cannot be locked.
- b. Once every 31 days for a valve that is locked, sealed, or secured in position. A removed pressurizer safety valve fits this category.

The passive vent arrangement must only be open to be OPERABLE. This Surveillance is required to be performed if the vent is being used to satisfy the pressure relief requirements of the LCO 3.4.12b.

SR 3.4.12.5

The PORV block valve must be verified open every 72 hours to provide the flow path for each required PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This Surveillance is performed if the PORV satisfies the LCO.

The block valve is a remotely controlled, motor operated valve. The power to the valve operator is not required removed, and the manual operator is not required locked in the inactive position. Thus, the block valve can be closed in the event the PORV develops excessive leakage or does not close (sticks open) after relieving an overpressure situation.

The 72 hour Frequency is considered adequate in view of other administrative controls available to the operator in the control room, such as valve position indication, that verify that the PORV block valve remains open.

SR 3.4.12.6

Performance of a COT is required within 12 hours after decreasing RCS temperature to $\leq 300^{\circ}\text{F}$ and every 31 days on each required PORV to

BASES

SURVEILLANCE REQUIREMENTS (continued)

verify and, as necessary, adjust its lift setpoint. The COT will verify the setpoint is within the allowed maximum limits. PORV actuation could depressurize the RCS and is not required.

The 12 hour Frequency considers the unlikelihood of a low temperature overpressure event during this time.

A Note has been added indicating that this SR is required to be met 12 hours after decreasing RCS cold leg temperature to $\leq 300^{\circ}\text{F}$. The test must be performed within 12 hours after entering the LTOP MODES.

SR 3.4.12.7

Performance of a CHANNEL CALIBRATION on each required PORV actuation channel is required every 18 months to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.

REFERENCES

1. 10 CFR 50, Appendix G.
2. Generic Letter 88-11.
3. ASME, Boiler and Pressure Vessel Code, Section III.
4. UFSAR, Section 5.2.
5. 10 CFR 50, Section 50.46.
6. 10 CFR 50, Appendix K.
7. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
8. Generic Letter 90-06.
9. ASME, Boiler and Pressure Vessel Code, Section XI.
10. Duke letter to NRC, "Cold Leg Accumulator Isolation Valves", dated September 8, 1987.