7/29/79

MEMO from:

N. D. BROWN

To: R.W. Zechman

Re: Natural Circulation Cooling Heat Sinks

1. Case One: Lose RCP's - No LOCA, No Loss of Emergency Feed
   Use OTSG's as Heat Sink with level at 21 ft (50% - Operating range) maintained by Emergency Feedwater.
   * Natural Circulation verified by ΔT ($T_H - T_C$) of RCS - Recommend 10-12° ΔT minimum and should be less than 48° ΔT. Maintain Hottest RCS Temp (T_H, T_a, Incore) < T_{sat}.
   Will not be able to verify RC flow on Console instrumentation.

2. Case Two: Lose RCP's - Have LOCA, No Loss of Emergency Feed
   Use OTSG's as Heat Sink with level at 95% - Operating range maintained by Emergency Feedwater
   Natural Circulation verified as above. (*)

3. Case Three: Lose RCP's - No LOCA, Lose Emergency Feed
   Use HPI as cooling for Core through the pressurizer Code Safety values (Requires Solid Operation) - This must then be maintained until 50°F Subcooled AND OTSG Heat Sink is AVAilable (as above) Use Hottest RCS Temp to verify Subcooling. (Could require use of LPI) ~~[illegible]~~

4. Case Three: Lose RCP's - LOCA, Lose Emergency Feed
   Use HPI as above, Use Hottest RCS Temp for Subcooling limit as above, Could require use of LPI, include long term flowpaths listed in Procedure. Can go out of this mode when OTSG's are available as a Heat Sink.

MLR

Shift Compositions - March 28, 1979 TMINS

TMI UNIT #1 AND UNIT #2 OPERATIONS DEPARTMENT SHIFT ASSIGNMENT
(Listed By Company Seniority)

	A	B	C	D	E	F
SHIFT SUPERVISOR	W. H. Zewe(SRO)	J. J. Chwastyk(SRO)	B. A. Mehler(SRO)	G. R. Hitz(SRO)	B. G. Smith(SRO)	K. P. Bryan(SRO)
SHIFT FOREMEN #1	D. L. Pilsitz(SRO)	T. L. Crouse(SRO)	L. G. Noll(SRO)	D. C. Janes(SRO)	T. H. Acker(SRO)	R. L. Parnell(SRO)
SHIFT FOREMEN #2	F. J. Schaimann(SRO)	W. T. Conaway(SRO)	C. D. Adams(SRO)	A. W. Miller(SRO)	K. R. Hoyt(SRO)	C. L. Guthrie(SRO)
C.R.O. #1	J. L. Masters(RO) S. W. Brantley(RO) **D. B. Mayhue	J. C. Banks(RO) **V. C. Ruppert, Jr. **R. W. Flanagan	R. E. Boyer(RO) J. E. Keisch(RO) **M. P. Kendig	P. F. Chalecki(RO) D. L. Wooddell(RO) **D. A. Smith	R. A. Heilman(RO) **J. C. Herman	T. H. Goodlavage(RO) D. E. Smith(RO) **W. A. Fraser
C.R.O. #2	E. R. Frederick(RO) C. C. Faust(RO)	T. F. Illjes(RO) J. M. Kidwell(RO) **C. F. Mell	J. R. Congdon(RO) M. V. Cooper(RO) **M. D. Phillippe	D. I. Olson(RO) L. O. Wright(RO) M. S. Coleman(RO)	R. R. Booher(RO) H. W. Hartman(RO) **J. J. Blessing	H. A. McGovern(RO) E. D. Hemmila(RO) ** L. P. Germer
AUX. OP. "A"	H. E. Farst (1) L. D. Bucher (1) D. R. Miller (2) D. W. Horton (1) J. W. Randisi (1) T. S. Daugherty (2) D. A. Buchter (2)	J. E. Kimmey (1) D. T. Calnan (1) D. A. Trump (1) M. B. Snyder (1) M. D. Demmy (2) E. A. Curry (2) F. D. Telenko (2)	C. F. Barge (1) C. W. Keyser (1) D. B. Wilson (2) J. Stupak (2) G. R. Schutt (1) A. M. Horney (1) G. J. Tilley (2)	J. Manoskey (2) N. J. Monson (1) R. N. Boehmer (1) H. M. Kohl (2) B. J. Keller (1) D. F. Spath (1)	F. M. Ditzler (1) J. D. Hartman (1) J. L. Fishell (1) H. L. Carr (1) R. K. Fountain, Sr. (2) P. H. Shannon (2)	C. S. Miller (1) M. R. Baynard (1) R. H. Lightner (2) K. A. Lebo (1) J. K. Lionarons (2) E. W. Tennis (1) W. H. Sawyer (2)
AUX. OP. "B"	M. S. Richards (1) G. L. Civijic (2) D. J. Laundermilch (2)	D. E. Althouse (1) J. L. Hetrick (2) D. C. Knerr (2)	E. H. Shue (2) F. D. Bomgardner, Jr. (2) D. M. Vastine (1)	W. J. Wentling (2) D. L. Wilt (1) G. A. Pierce (2) R. E. Johnson (2)	S. L. Martin (1) B. L. Corkle (2) J. M. Boyd (2) R. G. Kleinfelter (2)	T. M. Kauffman (2) D. J. Gorse (1)
AUX. OP. "C"	S. L. Mull (2) S. L. Turns (1) M. D. Willenbecher (1) J. A. Wehler (2)	C. S. Gordon (1) W. G. Ogle, Jr. (2) T. P. Stackpole (1) P. L. Hetrick (2)	B. E. Hoffman (2) R. S. Campbell (1) P. A. LaBar (2) F. J. Kacinko (1)	E. T. Matincheck (2) J. R. Barry (2) D. A. Tolene (1)	R. E. Neff (1) S. M. Furhman (1) C. A. Conrad (2)	J. P. Levengood (1) D. L. Heilman (2) D. M. Smith (2) G. J. Bixler (2)

NOTE: (1)(2) INDICATES UNIT PRINCIPALLY ASSIGNED TO
(**) CRO IN TRAINING

Approved M. J. Ross 1/1/79
Supervisor of Ops. Unit #1 or #2 Date

OFF SHIFT ASSIGNMENTS:

Operations Engineers Nuclear - H. B. Shipman, C. C. Seitz
W. J. Marshall, D. Berry

Ops. Clerk, Jr. - Linda L. Ritter(1) Jane Eckroth(2)
Tech. Analyst - W. R. Desh
Shift Supervisor Training - R. S. Hutchison (SRO)
Shift Foreman Training - J. W. Garrison
Shift Foreman - D. Deiter(SRO)

Shift Rotation Schedule

TMI UNIT #1 AND UNIT #2 SHIFT SCHEDULE

Day	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
11-7	A	A	A	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	C	D	D	D	D	D	D	D	E	E	E	E	E	E	E	F	F	F	F	F	F	A	A
7-3	C		D	D	D	D	D	D		E	E	E	E	E	E		F	F	F	F	F	F		A	A	A	A	A	A		B	B	B	B	B	B		C	C	C	C	C
Relief	F	F	F	F	F			A	A	A	A	A			B	B	B	B	B			C	C	C	C	C			D	D	D	D	D			E	E	E	E	E		
3-11	B	B	B	C	C	C	C	C	C	C	D	D	D	D	D	D	D	E	E	E	E	E	E	E	F	F	F	F	F	F	F	A	A	A	A	A	A	A	B	B	B	B
Training	L	E	E	E	E			F	F	F	F	F			A	A	A	A	A			B	B	B	B	B			C	C	C	C	C			D	D	D	D	D		
JAN-FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11
FEB-MAR	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
MAR-APR-MAY	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6
MAY-JUNE	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
JUNE-JULY	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
JULY-AUG-SEP	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
SEPT-OCT	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
OCT-NOV-DEC	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2
DEC-JAN(1980	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13
JAN-FEB	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FEB-MAR-APR	25	26	27	28	29	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6
APR-MAY	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
MAY-JUNE	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
JUNE-JULY-AUG	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10
AUG-SEPT	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
SEPT-OCT-NOV	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2
NOV-DEC	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14
DEC-JAN(1981)	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
JAN-FEB-MAR	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8
MAR-APR	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
APR-MAY	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUNE-JULY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12
JULY-AUG	13	14	15	16	17	18	19	20	21	22	23	24	25	[illegible]	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
AUG-SEPT-OCT	24	25	26	27	28	29	30	31	1	2	3	4	5	[illegible]	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4
OCT-NOV	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NOV-DEC	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
DEC-JAN(1982)	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7
FEB-MAR	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MAR-APR-MAY	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2
MAY-JUNE	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13
JUNE-JULY	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
JULY-AUG-SEP	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
SEPT-OCT	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11						
OCT-NOV	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
NOV-DEC-JAN 1983)	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	[illegible]	31	1	2	3						

2.2

TRAINING ASSIGNMENT ADMINISTRATIVE FORM

1. Lesson/Course: FIRE BRIGADE BULLETIN #3

2. Name: D. R. MILLER

Employee No. (4–8): 05155

Completion Date (9–14): MO. 07 DAY 23 YR. 79

3. Classification: AOA

CATALOG NUMBER

15	CATA	TYPE	SUBJECT	LESSON ID 26
14	6	06	061	1 1 1

COURSE DURATION HOURS (27–31): 00005

MODE PREFIX (32–34): MUP

MODE PREFIXES
Makeup - MUP
Correspondence - CCS

COMMENTS (35–59): FIRE BRIG BULLETIN #3

4. Reason for assignment

___ FSR Requirement
X Lecture Missed Type FIRE BRIG. TRNG.
___ Test Not Taken
___ < 80% on Test

Cycle: 6
Cycle Completion Date: 3-1-80
Time Period: 5/21/79 - 6/29/79
Type of License (RO/SRO): N/A

5. Instructor Assigned: F. A. McCORMICK Instructions:

1. READ THE ATTACHED FIRE BRIGADE BULLETIN (#3 - 5/30/79 - HOSE HOUSE EQUIPMENT)

2. SIGN, INDICATING COMPREHENSION

SIGNATURE: D. R. Miller 5155

6. RETURN TO TRAINING DEPARTMENT BY: 8/10/79

7. Method of Evaluation: (Check at least one)
a) Written Test ________ Score: ________
b) Oral Spot Check ________
c) Other ✓ (Explain): Bulletin Review

8. [signature] 7/23/79 [signature] 7/25/79
Instructor's Signature Date Supervisor of Training Date

9. Comments: (On reverse side)

42 classes ≈ 170 hrs

≈ 4 hrs/class — Average.

42
32 / class need make up - average

1200 Pakges. ≈ 2400 Man Hours.

figure 2 Man hours/package
includes package prep
receipt & review of
material (quiz possible)
by training dept.

---

also - FSL Packages

3 Man hours/pakage

≈ 100 packages ≈ 300 Man hours
to 400 Man hours
depending on grading
time.

Dick,

AO-C Statistics

Total participation	85
Perantage of failures	5.8%
Percentage remaining in OPS	83.5%

5 Failures
9 Transfers

TABLE 6.2-1

MINIMUM SHIFT CREW COMPOSITION#

LICENSE CATEGORY	APPLICABLE MODES	
	1, 2, 3 & 4	5 & 6
SOL	1	1*
OL	2	1
Non-Licensed	2	1

*Does not include the licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling, supervising CORE ALTERATIONS.

#Shift crew composition may be less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements of Table 6.2-1.

OPERATIONAL MODES

MODE	REACTIVITY CONDITION, K_{eff}	%RATED THERMAL POWER*	AVERAGE COOLANT TEMPERATURE
1. POWER OPERATION	$\geq$ 0.99	> 5%	$\geq$ 280°F
2. STARTUP	$\geq$ 0.99	$\leq$ 5%	$\geq$ 280°F
3. HOT STANDBY	< 0.99	0	$\geq$ 280°F
4. HOT SHUTDOWN	< 0.99	0	280°F > T_{avg} > 200°F
5. COLD SHUTDOWN	< 0.99	0	$\leq$ 200°F
6. REFUELING**	$\leq$ 0.95	0	$\leq$ 140°F

*Excluding decay heat.

**Reactor vessel head unbolted or removed and fuel in the vessel.