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Georgia Power
the southern electric system

L. T. Gucwa
Manager Nuclear Engineering
and Chief Nuclear Engineer

December 27, 1983

NED-83-645

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC DOCKET 50-366
OPERATING LICENSE NPF-5
EDWIN I. HATCH NUCLEAR PLANT UNIT 2
REACTOR COOLANT PRESSURE BOUNDARY PIPING REPLACEMENT

Gentlemen:

On November 7, 1983, we provided a description of our plans for replacing the Unit 2 reactor coolant recirculation pipe. Following an initial review by your staff, several specific questions concerning radiological controls were raised during a telephone conference call December 6, 1983. The information requested concerning these questions is attached for your review.

Should you have any questions, please contact this office.

Sincerely yours,

L. T. Gucwa

SCE/blm

Attachments

A001
1/1

ATTACHMENT 1

RESPONSE TO NRC QUESTIONS CONCERNING RADIOLOGICAL ASPECTS OF THE UNIT 2 RECIRCULATION PIPE REPLACEMENT PROJECT

A. PLANS FOR MINIMIZING DOSE CONTRIBUTION FROM CONTROL BLADES

Four actions will be taken to minimize the dose contribution from the control blades:

1. The blades will be inserted to maintain the highly activated stellite bearings at the maximum possible distance from the nozzle areas and minimize the dose contribution from the bearings.

2. A shield plug will be placed on the vessel side of the suction nozzles. The shield plug will be 4" lead sandwiched between 1" stainless steel plates.

3. All discharge and suction nozzle bioshield openings will be shielded by a 3" equivalent lead shield. The shield will be composed of 2 layers of lead wool bricks which measure approximately 1 3/4" x 3 1/2" x 7".

4. A water bladder will be placed in the suction nozzles from the drywell side to provide shielding during weld preparation, fit up, and welding. The water bladder will provide approximately 24" of shielding.

B. SYSTEM DECONTAMINATION

High pressure water blasting of the interior of the recirculation system is planned. A DF of 2-3 for vertical pipe runs and 4-5 for horizontal pipe runs is expected. The entire recirculation systems, with the exception of the recirculation pumps and valves, will be included in this decon. The nozzle interiors and approximately 2' of the jet pump risers will be included.

C. AIRBORNE RADIOACTIVITY CONTROL

An extensive temporary ventilation system will be installed in the drywell to aid in airborne radioactivity control during the project. This system will cause a flow of air from the reactor building into the drywell. Air from the drywell will be exhausted to the reactor building through 4 HEPA filtration units. Two 4000 CFM units will be connected to the standby gas treatment system and take a suction near the top of the drywell. Two 24" ring headers, on the 156' el and 120' el, will be connected to 12,500 CFM units. Eight - 12" trunks will be connected to the ring header and each will draw 1500-2000 CFM. These trunks will be used to provide local ventilation for welding, grinding, cutting, etc.

Additional methods will be used to aid in controlling airborne radioactivity. These methods include a continuing decon effort in the drywell during the project, and use of containment enclosures and tents for evolutions with a significant probability of creating airborne contaminants.

D. AUTOMATED WELDING AND CUTTING MACHINES

Newport News Industrial (NNI) had designed and manufactured automatic cutting machines which will be used during the project. The cutting machine is designed to weld prep the cut in conjunction with performing the cut. In those cases where the weld prep does not pass inspection or where weld overlay has been performed, an EP-2 machine will be used to prep the surface.

The cutting machine requires two people to be in the area during operation. A person is stationed on either side of the pipe. Their responsibilities include lubricating the machine and ensuring that the machine remains properly aligned throughout the cut.

Welding will be performed using a Diametrics Gold Track II machine. The machine will be attended by two people during operation. A qualified welder will attend the machine and make any necessary adjustments. He will be assisted by a helper who will also function as the fire watch.

E. MAN-REM ESTIMATE

A preliminary man-rem estimate has been developed for the project. The estimate is based on man-hours provided by the various groups involved with the project. The man-hours will be refined as the work groups better define the extent of their tasks (i.e. interference removal, as-built measurements required, etc.).

A revision will also be made to account for ALARA techniques which are in the final approval stage. These techniques are the high pressure water blast of the piping system and the use of the water bladder in the suction nozzles.

The estimate is structured to reflect the major tasks to be performed during the project. Data received early in the project will be used to update the estimate on a continuing basis. The current estimates (as of 12/20/83) are attached, however are subject to continuing revision and refinement.

DRAFT

12/20/83
WATCH II

Tasks ID	Job Description	Est. Man-Hours	Ave. Dose-Rate	Est. Person-Rem
1.	Install temporary power 7 lights	60	0.015	0.90
2.	Install temporary ventilation	60	0.015	0.90
3.	Install pneumatic system	40	0.015	0.60
4.	Install audio-visual system	32	0.015	0.48
5.	Install pump supports, snubbers, turnbuckles	144	0.025	3.60
6.	Pull recirc pump motors, remove from drywell	120	0.040	4.8
7.	Install pad eyes, beam	16	0.015	0.24
8.	Install scaffolding, work platforms (initial)	300	0.015	4.50
9.	Open nozzle shield doors	32	0.075	2.40
10.	Remove insulation, bag, remove from drywell	2064	0.020	41.28
11.	Install temporary shielding	64	0.075	4.80
12.	Move shielding into drywell location	112	0.015	1.68
13.	Establish cut liners	180	0.070	12.60
14.	Rig cutting machines into drywell for initial cut	24	0.020	0.48
15.	Perform ABN measurements	2772	0.015	41.58
16.	Remove/replace interferences			
	A. Instrumentation	400	0.015	6.00
	B. Electrical	2700	0.015	40.50
	C. Structural	1500	0.015	22.50
	D. HVAC	2000	0.015	30.00
	E. Small piping	3600	0.015	54.00
17.	Set up hp equipment in drywell			
	A. RM-16's	10	0.015	0.15
	B. Air samplers	20	0.015	0.30
18.	Make cuts			
	A. 28" pipe, nozzle area			
	- Set up machine	24	0.200	4.80
	- Verify cut lines	2	0.200	0.40
	- Attach and verify rigging	18	0.075	1.35
	- Cut, proceed to 3/4" mark	6	0.075	0.45
	- Complete cuts	3	0.075	0.225
	- Remove cutting machines	6	0.075	0.45
	- Clean and inspect cutting machines	8	0.015	0.12
	- Install shield plugs	4	0.400	1.60
		x 2 cuts		x 2 cuts
		142		18.79
	B. 28" pipe, valve and pump area			
	-Set up machine	24	0.050	1.20
	-Verify cut lines	2	0.060	0.12
	-Attach and verify rigging	18	0.050	0.90
	-Cut, proceed to 3/4" mark	6	0.050	0.30
	-Complete cuts	3	0.050	0.15
	-Remove cutting machines	6	0.050	0.30
	-Clean and inspect cutting machines	8	0.015	0.12
		x 12 cuts		X 12 cuts
		804		37.08
	C. 28" pipe, garbage cuts			
	-Set up machine	12	0.060	0.72
	-Verify cut lines	2	0.060	0.12
	-Attach and verify rigging	18	0.050	0.90
	-Cut, proceed to 3/4" mark	6	0.060	0.36
	-Complete cuts	3	0.060	0.180
	-Remove cutting machines	6	0.060	0.36
	-Clean and inspect cutting machines	8	0.015	0.12
		x 13		x 13
		715		35.88

DRAFT

Task ID	Job Description	Est. Man-Hours	Ave. Dose-Hours	Est. Person-Rem
	D. 24" pipe			
	-Set up machine	16	0.060	0.96
	-Verify cut lines	2	0.060	0.12
	-Attach and verify rigging	18	0.050	0.90
	-Cut, proceed to 3/4" mark	6	0.060	0.36
	-Complete cuts	3	0.060	0.18
	-Remove cutting machines	6	0.060	0.36
	-Clean and inspect cutting machines	8	0.015	0.12
		x 4 cuts		x 4 cuts
		236		12.00
	E. 22" cuts			
	-Set up machine	20	0.075	1.50
	-Verify cut lines	2	0.075	0.15
	-Attach and verify rigging	18	0.060	1.08
	-Cut, proceed to 3/4" mark	5	0.075	0.375
	-Complete cuts	2	0.075	0.15
	-Remove cutting machines	6	0.075	0.45
	-Clean and inspect cutting machines	8	0.015	0.12
		x 8 cuts		x 8 cuts
		488		30.6
	F. 20" cuts			
	-Set up machine	12	0.070	0.84
	-Verify cut lines	2	0.070	0.14
	-Attach and verify rigging	18	0.060	1.08
	-Cut, proceed to 3/4" mark	5	0.070	0.35
	-Complete cuts	2	0.070	0.14
	-Remove cutting machines	6	0.070	0.42
	-Clean and inspect cutting machines	8	0.015	0.12
		x 2 cuts		x 2 cuts
		106		6.18
	G. 12" cuts, nozzle area			
	-Set up machine	24	0.150	3.60
	-Verify cut lines	1	0.150	0.15
	-Attach and verify rigging	16	0.150	2.40
	-Cut, proceed to 3/4" mark	2	0.150	0.30
	-Complete cuts	1	0.150	0.15
	-Remove cutting machines	4	0.150	0.60
	-Clean and inspect cutting machines	8	0.015	0.12
		x 10 cuts		x 10 cuts
		560		23.20
	H. 12" cuts, header area			
	-Set up machine	12	0.075	0.90
	-Verify cut lines	1	0.075	0.075
	-Attach and verify rigging	16	0.060	0.96
	-Cut, proceed to 3/4" mark	2	0.075	0.15
	-Complete cuts	1	0.075	0.075
	-Remove cutting machines	4	0.060	0.24
	-Clean and inspect cutting machines	8	0.015	0.12
		x 10		x 10
		540		25.20

Task ID	Job Description	Estimated Man-Hours	Average Dose Rate	Estimated Person-rem
	I. 6" Cuts			
	-Set up machine	10	0.100	0.90
	-Verify cut lines	1	0.100	0.10
	-Attach and verify rigging	8	0.100	0.80
	-Cut, proceed to 3/4" mark	4	0.100	0.40
	-Complete cuts	1	0.100	0.10
	-Remove cutting machines	4	0.100	0.40
	-Clean and inspect cutting machines	8	0.150	1.20
		x 2 cuts		x 2
		72		8.0
19.	Rig out pipe sections			
	A. Move 28" nozzle sections to ride	8	0.150	1.20
		x 2 sec		x 2
		16		2.40
	B. Move other large pipes to side (28", 24", 22", 20")	8	0.060	0.48
		x 20 sec		x 20
		160		9.60
	C. Move 12" nozzles to side	3	0.100	0.30
		x 10 sec		x 10
		30		3.00
	D. Rig out all pipe sections	36	.020	0.72
		x 32 sec		x 32
		1152		23.04
	E. Rig out 6" pipe	18	0.030	0.54
20.	Weld preps			
	A. 28" nozzles			
	-Inspect and clean end preps	6	0.50	3.00
	-Rig in EP-2 machine	6	0.20	1.20
	-Set EP-2 machine in place	8	0.20	1.60
	-Counter bore end	24	0.20	4.80
	-Remove EP-2 machine	6	0.15	0.90
	-Clean and flap prep	8	0.50	4.00
	-PT prep	8	0.20	1.60
		x 2		x 2
		132		34.2
	B. Valve and pumps			
	-Inspect and clean end preps	6	0.040	0.24
	-Rig in EP-2 machine	6	0.015	0.90
	-Set EP-2 machine in place	8	0.040	0.32
	-Counter bore end	24	0.040	0.96
	-Remove EP-2 machine	6	0.020	0.12
	-Clean and flap prep	8	0.050	0.40
	-PT prep	8	0.020	0.16
		x 12		x 12
		792		37.2

Task ID	Job Description	Estimated Man-Hours	Average Dose Rate	Estimated Person-rem
	C. 20" pipe			
	-Inspect and clean end preps	6	0.030	0.18
	-Rig in EP-2 machine	6	0.015	0.90
	-Set EP-2 machine in place	8	0.030	0.24
	-Counter bore end	16	0.030	0.48
	-Remove EP-2 machine	6	0.020	0.12
	-Clean and flap prep	8	0.030	0.24
	-PT prep	8	0.020	0.16
		58		2.32
	D. 24" pipe			
	-Inspect and clean end preps	6	.025	0.15
	-Rig in EP-2 machine	6	.015	0.09
	-Set EP-2 machine in place	8	.025	0.20
	-Counter bore end	18	.025	0.45
	-Remove EP-2 machine	6	.015	0.09
	-Clean and flap prep	8	.025	0.20
	-PT prep	8	.015	0.12
		x 2		x 2
		120		2.60
	E. 12" Nozzles			
	-Inspect and clean end preps	6	0.200	1.20
	-Rig in EP-2 machine	6	0.060	0.36
	-Set EP-2 machine in place	8	0.200	1.60
	-Counter bore end	12	0.200	2.40
	-Remove EP-2 machine	6	0.100	0.60
	-Clean and flap prep	8	0.200	1.60
	-PT prep	6	0.100	0.60
		x 10		x 10
		540		83.6
21.	Fit up and weld			
	A. 28" nozzle			
	-Remove prep covers	1	0.200	0.20
	-Clean preps	8	0.200	1.60
	-Fit and tack insert	12	0.150	1.80
	-Install purge dam	1	0.200	0.200
	-Fit up joint	20	0.150	3.00
	-Establish purge	8	0.100	0.80
	-Tack joint	10	0.150	1.50
	-Install track and welding head	6	0.150	0.90
	-Consume insert, two hot passes	8	0.100	0.80
	-RT root	4	0.075	0.30
	-Install seal plug, flood	18	0.075	1.35
	-Weld out joint	110	0.075	8.25
	-Remove track	2	0.150	0.30
	-Drain, remove seal plug	6	0.150	0.90
	-Weld crown reduction	60	0.200	12.00
	-PT	6	0.150	0.90
	-RT	8	0.075	0.60
		x 2		x 2
		576		70.8

Task ID	Job Description	Estimated Man-Hours	Average Dose Rate	Estimated Person-rem
	B. 28" valves and pumps			
	-Remove prep covers	1	0.040	0.04
	-Clean preps	8	0.040	0.32
	-Fit and tack insert	12	0.040	0.48
	-Install purge dam	1	0.040	0.04
	-Fit up joint	20	0.025	0.50
	-Establish purge	8	0.015	0.12
	-Tack joint	10	0.025	0.25
	-Install track and welding head	6	0.025	0.15
	-Consume insert, two hot passes	8	0.025	0.20
	-RT root	4	0.015	0.60
	-Install seal plug, flood	18	0.015	0.27
	-Weld out joint	110	0.015	1.65
	-Remove track	2	0.025	0.05
	-Drain, remove seal plug	6	0.015	0.09
	-Weld crown reduction	60	0.025	1.50
	-PT	6	0.025	0.15
	-RT	8	0.015	0.12
		x 12		x 12
		3456		78.36
	C. Other 28" welds			
	-Remove prep covers	1	0.015	0.015
	-Clean preps	8	0.015	0.12
	-Fit and tack insert	12	0.015	0.18
	-Install purge dam	1	0.015	0.015
	-Fit up joint	20	0.015	0.30
	-Establish purge	8	0.015	0.12
	-Tack joint	10	0.015	0.15
	-Install track and welding head	6	0.015	0.90
	-Consume insert, two hot passes	8	0.015	0.12
	-RT root	4	0.015	0.06
	-Install seal plug, flood	18	0.015	0.27
	-Weld out joint	110	0.015	1.65
	-Remove track	2	0.015	0.03
	-Drain, remove seal plug	6	0.015	0.09
	-Weld crown reduction	60	0.015	0.60
	-PT	6	0.015	0.09
	-RT	8	0.015	0.12
		x 13		x 13
		3744		62.79
	D. 24" Welds			
	-Remove prep covers	1	0.025	0.025
	-Clean preps	8	0.025	0.40
	-Fit and tack insert	10	0.025	0.25
	-Install purge dam	1	0.025	0.025
	-Fit up joint	20	0.025	0.50
	-Establish purge	8	0.015	0.12
	-Tack joint	10	0.025	0.25
	-Install track and welding head	6	0.025	0.15

Task ID	Job Description	Estimated Man-Hours	Average Dose Rate	Estimated Person-rem
	-Consume insert, two hot passes	8	0.025	0.20
	-RT root	4	0.015	0.06
	-Install seal plug, flood	18	0.015	0.27
	-Weld out joint	110	0.025	2.75
	-Remove track	2	0.025	0.05
	-Drain, remove seal plug	6	0.015	0.09
	-Weld crown reduction	60	0.025	1.50
	-PT	6	.025	0.15
	-RT	8	.015	0.12
		x 4		x 2
	E. 20" Welds			
	-Remove prep covers	1	0.030	0.03
	-Clean preps	8	0.030	0.24
	-Fit and tack insert	10	0.030	0.30
	-Install purge dam	1	0.030	0.03
	-Fit up joint	20	0.030	0.60
	-Establish purge	8	0.020	0.16
	-Tack joint	9	0.030	0.27
	-Install track and welding head	6	0.030	0.18
	-Consume insert, two hot passes	8	0.030	0.24
	-RT root	4	0.015	0.06
	-Install seal plug, flood	18	0.015	0.27
	-Weld out joint	110	0.030	3.30
	-Remove track	2	0.030	0.06
	-Drain, remove seal plug	6	0.015	0.09
	-Weld crown reduction	60	0.030	1.80
	-PT	6	0.030	0.18
	-RT	8	0.015	0.12
		x 2		x 2
		570		15.86
	F. 22" Welds			
	-Remove prep covers	1	0.020	0.02
	-Clean preps	8	0.020	0.16
	-Fit and tack insert	10	0.020	0.20
	-Install purge dam	1	0.020	0.02
	-Fit up joint	20	0.020	0.40
	-Establish purge	8	0.015	0.12
	-Tack joint	9	0.020	0.18
	-Install track and welding head	6	0.020	0.12
	-Consume insert, two hot passes	8	0.020	0.16
	-RT root	4	0.015	0.06
	-Install seal plug, flood	18	0.015	0.27
	-Weld out joint	110	0.020	2.20
	-Remove track	2	0.020	0.04
	-Drain, remove seal plug	6	0.015	0.09
	-Weld crown reduction	60	0.020	1.20
	-PT	6	0.020	0.12
	-RT	8	0.015	0.12
		x 8		x 8
		2280		43.84

Task ID	Job Description	Estimated Man-Hours	Average Dose Rate	Estimated Person-rem
	G. 12" nozzles			
	-Remove prep covers	1	0.025	0.25
	-Clean preps	4	0.250	1.00
	-Fit and tack insert	7	0.175	1.225
	-Install purge dam	1	0.150	0.15
	-Fit up joint	36	0.150	5.40
	-Establish purge	8	0.075	0.60
	-Tack joint	4	0.150	0.60
	-Install track and welding head	4	0.150	0.60
	-Consume insert, two hot passes	6	0.100	0.60
	-RT root	4	0.050	0.20
	-Install seal plug, flood	12	0.100	1.20
	-Weld out joint	60	0.075	4.50
	-Remove track	2	0.150	0.30
	-Drain, remove seal plug	3	0.100	0.30
	-Weld crown reduction	40	0.150	6.00
	-PT	4	0.100	0.40
	-RT	8	0.050	0.40
		x 10		x 10
		2040		237.25
	H. Other 12" welds			
	-Remove prep covers	1	0.020	0.02
	-Clean preps	4	0.020	0.08
	-Fit and tack insert	7	0.020	0.14
	-Install purge dam	1	0.020	0.02
	-Fit up joint	36	0.020	0.72
	-Establish purge	8	0.020	0.16
	-Tack joint	4	0.020	0.08
	-Install track and welding head	4	0.020	0.08
	-Consume insert, two hot passes	6	0.020	0.12
	-RT root	4	0.020	0.08
	-Install seal plug, flood	12	0.020	0.24
	-Weld out joint	60	0.020	1.20
	-Remove track	2	0.020	0.04
	-Drain, remove seal plug	3	0.020	0.06
	-Weld crown reduction	40	0.020	0.80
	-PT	4	0.020	0.08
	-RT	8	0.020	0.16
		x 10		x 10
		2040		40.80
	I. 6" welds			
	-Remove prep covers	1	0.025	0.025
	-Clean preps	4	0.025	0.10
	-Fit and tack insert	8	0.025	0.20
	-Install purge dam	1	0.025	0.025
	-Fit up joint	36	0.025	0.90
	-Establish purge	7	0.025	0.175
	-Tack joint	4	0.025	0.10
	-Install track and welding head	4	0.025	0.10

Task ID	Job Description	Estimated Man-Hours	Average Dose Rate	Estimated Person-rem
	-Consume insert, two hot passes	6	0.025	0.15
	-RT root	4	0.025	0.10
	-Install seal plug, flood	12	0.025	0.30
	-Weld out joint	60	0.025	1.50
	-Remove track	2	0.025	0.05
	-Drain, remove seal plug	3	0.025	0.075
	-Weld crown reduction	40	0.025	1.00
	-PT	4	0.025	0.10
	-RT	8	0.015	0.12
		x 2		x 2
		408		10.04
22.	Miscellaneous			
	A. Project drywell coordinators	1260	0.015	18.90
	B. Construction supervision	700	0.015	10.50
	C. Move scaffolds around	600	0.030	18.00
	D. Move electric power and lights	100	0.020	2.00
	E. Erect tents - glove bags	300	0.050	15.00
	F. Decon - labor support	2000	0.020	40.00
	G. Engineering Inspections	3000	0.015	45.00
23.	Systems testing			
	A. Calibrations	128	0.015	1.92
	B. Functional testing	7750	0.010	77.50
24.	Hp coverage			
	A. Control point	8640	0.002	17.28
	B. Routine surveys/air samples	720	0.015	10.80
	C. Routine surveillance	3600	0.015	54.00
	D. Breach surveys/air samples	250	0.060	15.00
	E. Welding coverage	600	0.015	12.00
25.	Remove health physics equipment			
	A. RM-16	10	0.015	.15
	B. Air samples	10	0.015	.15

Task ID	Job Description	Estimated Man-Hours	Average Dose Rate	Estimated Person-rem
	26. Remove construction machines, pneumatics	150	0.015	2.25
	27. Remove temporary shielding	200	0.015	3.00
	28. Reinstall insulation	1500	0.020	30.00
	29. Close nozzle doors	25	0.075	1.875
	30. Remove scaffolding	100	0.015	1.50
	31. Remove rigging	100	0.015	1.50
	32. Replace pump motors	120	0.020	2.40
	33. Remove pump supports	40	0.020	0.80
	34. Remove audio-visual equipment	25	0.015	0.375
	35. Remove ventilation	70	0.015	1.05
	36. Remove temporary power and lights	40	0.015	0.60
	Total in drywell	71,227		~~1,261.06~~ 1688.40