Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

November 8, 1994

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Braidwood Station Unit 2
Flaw Evaluation Report for
Residual Heat Removal
Heat Exchanger Nozzle to Shell Welds
NRC Docket No 50-457

References: 1) Teleconference between Commonwealth Edison Company and the Nuclear Regulatory Commission dated November 8, 1994, Regarding the Unit 2 RHR Heat Exchanger Nozzle Inspection Results

2) H. Pontious letter to NRC dated November 8, 1994, transmitting WCAP 13454, "Fracture Mechanics Evaluation Byron and Braidwood Units 1 and 2 Residual Heat Exchanger Tube Side Inlet and Outlet Nozzles"

3) R. Pulsifer letter to T. Kovach dated November 21, 1991, transmitting Safety Evaluation on Flaw Evaluation for Residual Heat Removal Heat Exchanger Nozzle to Shell Welds for Braidwood Unit 2

During Braidwood Station's 1994 Unit 2 Refueling Outage (A2R04) a volumetric examination of the Residual Heat Removal (RHR) Heat Exchanger nozzle to shell welds was conducted in accordance with the NRC approved Braidwood Inservice Inspection program. This examination disclosed indications on the RHR Heat Exchanger which exceed the acceptance criteria as approved by a Safety Evaluation transmitted in reference 3. As a result of the inspection results, several teleconferences were held in which the appropriateness of including the fillet weld in the available wall thickness. During the reference teleconference, ComEd committed to providing the Staff with the following documentation to clarify this issue:

1) 1994 Braidwood Unit 2 RHR Heat Fxchanger Inservice Inspection Results

2) WCAP 13454, "Fracture Mechanics Evaluation Byron and Braidwood Units 1 and 2 Residual Heat Exchanger Tube Side Inlet and Outlet Nozzles," dated August 1992, and

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3) Finite Element Analyses for the Byron and Braidwood Units 1 and 2 RHR Heat Exchanger Nozzle to Shell Welds

Attached is item 1. Item 2 was transmitted in reference 2. Item 3 will be provided to the Staff for their review by November 10, 1994.

ComEd believes that the information/analyses that will be docketed, provides adequate justification that the fillet weld thickness can be credited when performing limit load structural margin assessment of the nozzle to shell weld. ComEd understands that this topic may warrant further discussions, and would be happy to address any questions concerning this topic. Please address any questions concerning this correspondence to this office. ComEd appreciates the Staff's efforts towards expedited resolution of this issue.

Sincerely,

Denise M. Saccomando
Nuclear Licensing Administrator

Attachment

cc: R. Assa, Braidwood Project Manager-NRR
S. Dupont, Senior Resident Inspector-Braidwood
J. Martin, Regional Administrator-RIII
Office of Nuclear Safety-IDNS

Attachment

1994 Braidwood Unit 2
Residual Heat Removal (RHR)
Heat Exchanger
Inservice Inspection Results

The following summarizes, for each nozzle, the recordable indications detected during ultrasonic examinations in 1994. All indications are subsurface flaws, not open to the internal and external surfaces. Both the ultrasonic examinations and visual inspections of the repair cavities points to slag inclusions, porosity, and lack of fusion due to fabrication rather than service induced flaws. Following the methodology of ASME Section XI, IWA-3310 (b), several flaws have been considered as surface flaws and are so reported in these tables. The "a/t w/o fillet" column values have been developed using the actual nozzle wall thickness, as measured by ultrasonic examinations. The "a/t with Fillet" column values have been developed using a conservative effective throat distance based on the location of the indication from the heat exchanger shell wall. Please note that all dimensions are in inches. Due to differences in ultrasonic examination techniques the 1991 submitted data is not easily correlatable to the 1994 examination results. In addition, an independent Level III review and comparison of the 1993 and 1994 automated ultrasonic data did not reveal any evidence of flaw propagation.

ATTACHMENT

BRAIDWOOD UNIT 2 RHR HEATER EXCHANGER NOZZLE WELD UT EXAM DATA

November 8, 1994

IND #	LOCATION	SURFACE/ SUBSURFACE	LENGTH	a(2a)	a/l	NOZZLE THICKNESS t	EFFECTIVE FILLET THROAT tc	a/t W/O FILLET	a/t WITH FILLET
2A RHR HEAT EXCHANGER INLET NOZZLE									
1	23.7 to 24.4	Subsurface	0.700	(.160)	0.114	0.390	n/a	21%	n/a
2	9.3 to 10.5	Subsurface	1.200	(.240)	0.100	0.390	n/a	31%	n/a
3	41.1 to 41.7	Subsurface	0.600	(.220)	0.183	0.390	n/a	28%	n/a
2A RHR HEAT EXCHANGER OUTLET NOZZLE									
1	18.4 to 18.9	Surface	0.500	0.100	0.200	0.365	n/a	27%	n/a
2	19.8 to 23.1	Surface	3.300	0.280	0.085	0.365	0.132	77%	56%
3	30.4 to 30.5	Subsurface	0.100	(0.030)	0.150	0.365	n/a	4%	n/a
2B RHR HEAT EXCHANGER INLET NOZZLE									
1	0 to 0.32	Subsurface	0.320	(.180)	0.281	0.394	n/a	23%	n/a
2	0.76 to 1.20	Subsurface	0.440	(.440)	0.500	0.394	n/a	56%	n/a
3	4.9 to 5.7	Surface	0.800	0.300	0.375	0.394	0.132	76%	57%
4	8.4 to 9.9	Surface	1.500	0.240	0.160	0.394	0.132	61%	46%
5	8.4 to 9.8	Subsurface	1.400	(.080)	0.029	0.394	n/a	10%	n/a
6	13.2 to 14.6	Subsurface	1.400	(.060)	0.021	0.394	n/a	8%	n/a
7	15.0 to 15.1	Subsurface	0.100	(.040)	0.200	0.394	n/a	5%	n/a
8	16.2 to 16.3	Subsurface	0.100	(.030)	0.150	0.394	n/a	4%	n/a
9	23.0 to 23.2	Subsurface	0.200	(.160)	0.400	0.394	n/a	20%	n/a
10	25.4 to 25.5	Subsurface	0.100	(.040)	0.200	0.394	n/a	5%	n/a
11	29.1 to 29.5	Subsurface	0.400	(.100)	0.125	0.394	n/a	13%	n/a
12	36.0 to 36.3	Subsurface	0.300	(.080)	0.133	0.394	n/a	10%	n/a
13	41.7 to 41.75	Subsurface	0.050	(.020)	0.200	0.394	n/a	3%	n/a
14	42.3 to 42.4	Subsurface	0.100	(.060)	0.300	0.394	n/a	8%	n/a
15	44.6 to 44.7	Subsurface	0.100	(.140)	0.700	0.394	n/a	18%	n/a
2B RHR HEAT EXCHANGER OUTLET NOZZLE									
1	0 to 1.9	Surface	1.900	0.500	0.263	0.385	n/a	130%	Removed
2	2.5 to 2.8	Subsurface	0.300	(0.140)	0.233	0.385	n/a	18%	n/a
3	3.2 to 3.25	Subsurface	0.050	(.040)	0.400	0.385	n/a	5%	n/a
4	4.0 to 4.2	Subsurface	0.200	(.120)	0.300	0.385	n/a	16%	n/a
5	5.0 to 9.9	Surface	4.900	0.440	0.090	0.385	n/a	114%	Removed
6	13.1 to 13.5	Subsurface	0.400	(.180)	0.225	0.385	n/a	23%	n/a
7	21.6 to 23.6	Subsurface	2.000	(.240)	0.060	0.385	n/a	31%	Removed
8	24.6 to 25.0	Subsurface	1.400	(.060)	0.075	0.385	n/a	8%	n/a
9	26.3 to 26.4	Subsurface	0.100	(.030)	0.150	0.385	n/a	4%	n/a
10	27.0 to 27.1	Subsurface	0.100	(.030)	0.150	0.385	n/a	4%	n/a
11	28.3 to 28.4	Subsurface	0.100	(.030)	0.150	0.385	n/a	4%	n/a
12	30.1 to 30.2	Subsurface	0.100	(.040)	0.200	0.385	n/a	5%	n/a
13	32.3 to 32.9	Subsurface	0.600	(.180)	0.150	0.385	n/a	23%	n/a
14	35.3 to 38.7	Subsurface	3.400	(.480)	0.071	0.385	n/a	62%	Removed
15	41.5 to 41.6	Subsurface	0.100	(.120)	0.600	0.385	n/a	16%	n/a
16	42.2 to 44.6	Subsurface	2.400	(.440)	0.092	0.385	n/a	57%	Removed