Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

John H. Garrity
Vice President, Watts Bar Nuclear Plant

APR 21 1992

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of) Docket No. 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) - (WBN) UNIT 1 - NRC BULLETIN 88-05, NONCONFORMING MATERIALS SUPPLIED BY PIPING SUPPLIES, INC., AT FOLSOM, NEW JERSEY, AND WEST JERSEY MANUFACTURING (WJM) COMPANY AT WILLIAMSTOWN, NEW JERSEY (TAC NO. M68848)

This letter provides additional information for the subject bulletin as requested in a teleconference with NRC's reviewers, G. Hammer and D. Naujock, and NRC Project Manager P. Tam on January 30, 1992.

In the referenced teleconference, NRC requested TVA to provide complete chemistry test results, including carbon from each of the three WJM heat numbers listed in Attachment 2 of TVA's letter dated January 14, 1992, and to provide the correlation between Equotip and Brinell hardness testing.

Enclosure 1 provides the chemistry analysis results for WJM heat numbers 7559, CAO, and 4064. Enclosure 2 provides the excerpts from TVA's process specification that converts Equotip hardness factors L_D to Brinell hardness factors. These enclosures should provide the necessary information to complete the review of the subject bulletin for WBN Unit 1.

No commitments are identified in this letter. If you have any questions concerning this matter, please telephone John Vorees at (615) 365-8819.

Sincerely,

JH Garrity

John H. Garrity

Enclosures
cc: See Page 2

9204280114 920421
PDR ADOCK 05000390
A PDR

JE11

APR 21 1992

cc (Enclosures):

NRC Resident Inspector
Watts Bar Nuclear Plant
P.O. Box 700
Spring City, Tennessee 37381

Mr. P. S. Tam, Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Mr. B. A. Wilson, Project Chief
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

ENCLOSURE 1

E13 920330 302

TECHNICAL REPORT

REPORT NO.: 92-7323

SHEET NO.: 1 of 2 sheets

DATE OF REPORT: MAR 30 1992

LOCATION: Central Laboratories - PSC - Chattanooga

SUBJECT: Chips from Installed Flanges, Watts Bar Nuclear Plant (WBN)

STANDARDS USED: 891324, 531900, 904701, 904694

COPIES SENT TO: RIMS, R. D. Briggs (4), Lab Files

PREPARED BY: G. T. Eidson/D. L. Frazier APPROVED BY: Rebecca S. Goins

I. Sample(s) Description

Approximately five grams of material was removed from three different installed flanges at WBN. The flanges were manufactured by West Jersey Mfg., Williamstown, New Jersey. The removed material was identified by the numbers of the valves to which the flanges of interest were attached. They are 1-ISV-1-816 (Heat # 4064), 1-FCV-1-7-B (Heat # 7559), and 1-DRV-01B-906 (Heat # CA0).

II. Photography

As Received	____
Macro	____
Micro	____
SEM	____
Other, specify	____
See attached sheet(s) for photographs.	

III. Chemical Analysis

X-ray fluorescence	____
Induction Furnace Combustion Techniques	X
Atomic Absorption	____
Energy Dispersive X-ray Analyses	____
Inductively Coupled Argon Plasma Spectroscopy	X
Other, specify	____
See attached sheet(s) for data.	

IV. Mechanical Properties

Rockwell Hardness	____
Superficial Hardness	____
Microhardness (Conv. from Knoop)	____
Dimensions	____
Impact Strength	____
Lateral Expansion	____
Shear, %	____
Other, specify	____

Table I

Ultimate Tensile Strength	____
Yield Strength	____
Elongation	____
Reduction in Area	____
ASTM Grain Size	____
See attached sheet(s) for data.	

V. Conclusions/Recommendations

The Laboratory Services Metallurgical Section received a request from R. D. Briggs to witness the removal of material from installed flanges at Watts Bar Nuclear Plant (WBN), and to verify that the amount of material removed was enough for chemical analysis. The removal of the material was performed by WBN craft personnel on March 17, 1992, and was witnessed by George T. Eidson of the

(continued on next page)

Central Laboratories Services Department Metallurgical Laboratory. The chemical analysis was accomplished subsequently, and the results are listed in Table I. Each sample met the chemical requirements for ASME SA105 material.

All test equipment and instrumentation used in the performance of this evaluation are calibrated in accordance with applicable TVA standards and Quality Assurance (QA) Procedures and conform to applicable portions of ANSI N45.2, 10 CFR 50/Appendix B, and 10 CFR 21. Standards used are traceable to the National Institute of Standards Technology (NIST), natural physical constants, or commercially accepted practices. All personnel, procedures, and instructions used comply with the requirements of the Central Laboratories Services (CLS) QA Program.

In the event that additional information or subsequent testing regarding this sample should be required, please refer to Report No. 92-7323.

GTE/DLF:SWH
Attachments: Table I

TABLE I

REPORT OF CHEMICAL COMPOSITION ANALYSIS (WEIGHT PERCENT)

REPORT NO: 92-7323

STANDARDS: 891324, 531900, 904701, 904694

SAMPLE NO.	1-ISV-1-816 Heat # 4064	1-FCV-1-7-B Heat # 7559	1-DRV-01B-906 Heat # CAO	ASME SA 105
CARBON	0.21	0.22	0.32	0.035 max.
CHROMIUM	0.10	0.10	0.02	Not specified
COPPER	0.25	0.25	Nil	Not specified
IRON	Bal.	Bal.	Bal.	Balance
LEAD	Nil	Nil	Nil	Not recommended
MANGANESE	0.97	0.97	0.86	0.60-1.05
MOLYBDENUM	0.02	0.02	Nil	Not specified
NICKEL	0.09	0.09	0.02	Not specified
PHOSPHORUS	0.028	0.016	0.017	0.040 max.
SILICON	0.31	0.24	0.25	0.35 max.
SULFUR	0.03	0.04	0.02	0.050 max.
TIN				
TITANIUM				
VANADIUM				
ZINC				

COMMENTS:

ANALYZED BY: G. T. Eidson/R. L. Brannan

DATE OF ANALYSIS: 3/18/92 and 3/19/92

(1) X-Ray Fluorescence, TVA No. 890699
(2) Induction Furnace Combustion, TVA No. 572700
(3) Energy Dispersive X-Ray Analysis - Semi-quantitative Techniques using no standards, TVA No. 453855
(4) Atomic Absorption, TVA No. 890203
(5) Inductively Coupled Argon Plasma Spectrometer, TVA No. 531900

For proper coupling, the following prerequisites must be observed:

a. The contact surface of the sample and the surface of the base support plate must be ground (see figures 7 and 8).

b. The direction of the test impact must be perpendicular to the coupled surfaces (see figure 9).

c. The sample should have a shape as compact as possible and must weigh at least four (4) ounces and have a thickness of at least 1/4-inch.

Proper coupling requires some practical experience. Poorly coupled samples result in large variations in individual readings on the sample, which are too low (L-values) and operation characterized by a rattling, hollow noise upon impact of the test tip.

7.0 HARDNESS MEASUREMENT

7.1 The EQUOTIP is to be operated in accordance with section 4.0.

7.2 Impact Direction

The impact device is calibrated for vertical impact direction (from top to bottom). For other impact directions, the measured hardness values in six units must be corrected in accordance with the following table:

a) Impact Direction
The impact device is calibrated for vertical impact direction (impact from top to bottom). For other impact directions, the measured hardness values L must be corrected in accordance with the following table. The correction values must be subtracted from the L-value.

Correction values for other impact directions												
Measured L-value	Impact devices D and DC				Impact device D+15				Impact device G			
	↘	⊣	↗	T	↘	⊣	↗	T	↘	⊣	↗	T
200	7	14	23	33	8	15	28	41			12	19
250	6	13	22	31	7	14	26	39			11	18
300	6	12	20	29	7	14	25	37			11	17
350	6	12	19	27	7	13	24	35			10	16
400	5	11	18	25	6	13	23	33	2	5	10	15
450	5	10	17	24	6	12	21	31			9	14
500	5	10	16	22	6	12	20	29			9	13
550	4	9	15	20	5	11	19	28			8	12
600	4	8	14	19	5	10	18	26			8	11
650	4	8	13	18	5	10	17	25				
700	3	7	12	17	4	9	16	23				
750	3	6	11	16	4	9	15	22				
800	3	6	10	15	4	8	14	21				
850	2	5	9	14	3	7	13	20				
900												

TABLE 2

LD - Brinell

LD	HB (F=3000 kg)	±HB*
300	80	
302	81	
304	81	
306	82	
308	83	
310	84	
312	85	
314	86	
316	87	
318	88	
320	90	
322	91	
324	92	
326	93	
328	94	
330	95	
332	96	
334	97	
336	98	
338	99	
340	100	
342	101	
344	103	
346	104	
348	105	
350	106	10
352	107	
354	108	
356	110	
358	111	
360	112	
362	113	
364	115	
366	116	
368	117	
370	118	
372	120	
374	121	
376	122	
378	123	
380	125	
382	126	
384	127	
386	129	
388	130	
390	131	
392	133	
394	134	
396	136	
398	137	
400	138	

LD	HB (F=3000 kg)	±HB*
400	138	
402	140	
404	141	
406	143	
408	144	
410	145	
412	147	
414	148	
416	150	
418	151	
420	153	
422	154	
424	156	
426	157	
428	159	
430	160	
432	162	
434	164	
436	165	
438	167	
440	168	
442	170	
444	172	
446	173	
448	175	
450	176	13
452	178	
454	180	
456	181	
458	183	
460	185	
462	186	
464	188	
466	190	
468	192	
470	193	
472	195	
474	197	
476	199	
478	200	
480	202	
482	204	
484	206	
486	208	
488	209	
490	211	
492	213	
494	215	
496	217	
498	219	
500	221	

LD	HB (F=3000 kg)	±HB*
500	221	
502	222	
504	224	
506	226	
508	228	
510	230	
512	232	
514	234	
516	236	
518	238	
520	240	
522	242	
524	244	
526	246	
528	248	
530	250	
532	252	
534	254	
536	256	
538	258	
540	260	
542	262	
544	264	
546	267	
548	269	
550	271	16
552	273	
554	275	
556	277	
558	279	
560	281	
562	284	
564	286	
566	288	
568	290	
570	292	
572	295	
574	297	
576	299	
578	301	
580	304	
582	306	
584	308	
586	311	
588	313	
590	315	
592	317	
594	320	
596	322	
598	324	
600	327	

LD	HB (F=3000 kg)	±HB*
600	327	
602	329	
604	332	
606	334	
608	336	
610	339	
612	341	
614	344	
616	346	
618	348	
620	351	
622	353	
624	356	
626	358	
628	361	
630	363	
632	366	
634	368	
636	371	
638	373	
640	376	
642	378	
644	381	
646	383	
648	386	
650	389	20
652	391	
654	394	
656	396	
658	399	
660	402	
662	404	
664	407	
666	409	
668	412	
670	415	
672	417	
674	420	
676	423	
678	425	
680	428	
682	431	
684	434	
686	436	
688	439	
690	442	
692	444	
694	447	
696	450	
698	453	
700	455	

* Conversion-Deviation of the Table value in comparison to direct Brinell Hardness testing

The values are valid for unalloyed and low alloy steel and cast steel in hot rolled or forged and thermally treated condition.

* Corrections to subtract from measured L-value

LD	*	*	*	*
300	6	12	20	29
350	6	12	19	27
400	5	11	18	25
450	5	10	17	24
500	5	10	16	22
550	4	9	15	20
600	4	8	14	19
650	4	8	13	18
700				