ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 1
REPLACEMENT ITEMS PROGRAM
CORRECTIVE ACTION PLAN (RIP CAP)

I. BACKGROUND

Conservatism of the Approach: The RIP CAP established the Materials Improvement Program (MIP), the Replacement Items Program (RIP), and a Procurement Engineering Group (PEG) as the groups responsible for defining scopes, establishing applicable procedures, and implementing evaluations of replacement items. The RIP CAP did not attempt to quantify the actual number of evaluations necessary for either the RIP or MIP activities. In selecting and defining populations, and subsequent samples of items to evaluate/test, the RIP CAP approach could not take credit for any operational history of the plant. This is unlike any other materials evaluation of past procurement activities undertaken in the United States nuclear power industry. As such, a very high level of conservatism was factored into how populations of items were defined and how many items were selected from each population for evaluation.

In many cases, TVA opted to sample 100 percent of a given population (e.g., 50.49 items, items issued from the Release Tracking Log, etc.). To gain a high level of assurance of the adequacy of all materials at WBN, the RIP CAP focused on procurement controls in two time periods. Items procured prior to June 1991 comprised the largest population of items evaluated, and included items that had been installed as well as items in stock that may be installed at some later time to support plant operations. Items procured after June 1991 comprised the other population, and have been controlled by a Procurement Engineering Group since that time. The total numbers of evaluations/procurements performed to date are depicted on the following matrix and clearly exceed the original numbers anticipated when the RIP CAP was first implemented. Wherever feasible, exact numbers and references are provided in the matrix.

Indeterminate Nature of Previously Procured Items: Two major elements of the corrective action plan dealt with evaluating the adequacy of past procurements - MIP and RIP. The RIP CAP was necessary because the quality of some replacement material at Watts Bar, either in stock or installed at the time, was suspect (i.e., indeterminate). In other words, based on the procurement documentation available for review, one could not ensure the material had been specified properly or obtain sufficient objective evidence to reasonably assure the item was properly accepted/dedicated. Thus, the incomplete procurement documentation that was discovered in some cases lessened confidence that the actual hardware was conforming to its design and would perform its design functions.

"Indeterminate" did not necessarily mean that the actual hardware was nonconforming or that there was a history of part failures due to inherent part defects. This distinction is important because the RIP CAP was not required due to any "known deficiencies" with either the actual materials or

design output documents associated with the material such as drawings, system descriptions, etc.

In this regard, an analogy should not be made between indeterminate material resulting from incomplete procurement documentation and "known deficiencies" such as nonconforming material, conditions adverse to quality, or other processes, such as drawing deviations, which document identifiable deficiencies.

The results of the WBN RIP CAP overwhelmingly confirm that in only a few cases (<0.005 percent) was hardware found to be nonconforming after evaluating the adequacy of the procurement documents. Although some indeterminate items were surplused/removed, it was done for economic reasons and not because the material was found to be nonconforming. To surplus/remove the items, became economically feasible because these courses of action were less costly than the engineering required to recover or generate the procurement documentation needed. The enclosed summary matrix denotes the number of items disposed in this manner at this time.

Scope of the RIP CAP Assumptions:

Design of Items: All aspects of the RIP CAP were implemented to achieve a high level of confidence in the ability of replacement items to perform their design function. This assurance could be achieved by demonstrating that the material procured for WBN was specified correctly (i.e., the correct technical/design and quality requirements were communicated to the supplier) and was accepted properly for its end use, both in accordance with the requirements of 10 CFR 50, Appendix B, Criterion IV and VII respectively. As such, the scope of the RIP CAP assumed that the items being/having been procured were designed correctly and as designed, are/were suitable for their intended application(s). This premise is consistent with 10 CFR 50, Appendix B as well as current industry guidance provided through the Electric Power Research Institute (EPRI). Throughout all aspects of implementing procurement activities inherent to the RIP CAP, it was clearly out of the procurement engineer's or evaluator's scope to question the design adequacy of the item and its suitability for application, as this activity is/was controlled by the design engineer and the requirements of 10 CFR 50, Appendix B Criteria III.

Control of Materials: RIP CAP evaluations were based on the assumption that the item in question was/would be installed in the proper equipment as documented on the maintenance work orders. Conducting physical walk downs to verify the correct installation of replacement items was not in the scope of the RIP CAP.

Proper Installation of Replacement Items: RIP CAP evaluations assumed that items were installed correctly by qualified maintenance personnel. Conducting physical walk downs to verify the adequacy of maintenance installation practices was not in the scope of the RIP CAP.

Adequacy of Maintenance Instructions: A number of existing maintenance instructions were reviewed by RIP evaluators to determine whether the instruction included a test/inspection that may verify that an item's physical or performance design characteristics were. conforming to design requirements. Evaluating the adequacy of existing maintenance instructions for any other purpose was outside the scope of the RIP CAP.

Industry-wide Results of Past Procurement Evaluations: Since the mid-1980s, nuclear units in the United States have undergone evaluations of past procurement practices to alleviate concerns regarding the quality of installed or stock replacement items. These investigations/evaluations varied widely in scope, approach, cost, and purpose. One common result however was the extremely small number of items that were found to be nonconforming to design requirements. In many cases, utilities evaluated items only from suppliers with which they had past procurement difficulties or items with which they had experienced actual part failure in service. The results of the WBN RIP CAP discussed below are consistent with those found at other United States nuclear utilities.

II. RESULTS OF THE RIP CAP

Replacement Items Installed by Previous Maintenance and Construction Activities: Approximately 89,000 installed items were identified and evaluated. This population included items installed throughout the entire history of Watts Bar. Populations of items were identified based upon the defined scopes of work of the RIP CAP, the time period during which the items were installed in the plant, and the safety-related function(s) or criticality of the item or group of items. Sampling of each population was based upon the likelihood of finding nonconforming material. A high percentage of items were sampled for those populations with the highest probability of finding nonconforming hardware, and in some cases 100 percent of the items were evaluated.

The results of this effort enabled TVA to conduct special tests or inspections on over 300 commercial grade items as a means to adequately document the acceptance of these items. In only eleven cases, was an item's critical characteristic found to be nonconforming. These have been documented in accordance with the TVA Corrective Action Program.

Current Warehouse Inventory: Approximately 18,000 items in stock were evaluated with procedure Site Standard Practice (SSP)-10.B, "Materials Improvement Program." Of the inventory items evaluated by MIP, approximately 8,000 were approved for future use. About 45 percent did not warrant engineering evaluation, and for economic reasons, were put in surplus or designated for nonsafety-related use. In no cases did an evaluation/test/inspection of stock items identify material nonconforming to its design requirements.

Of the 18,000 items evaluated, about two thirds had a record of having a similar item installed. About 1,500 of these items with previous issuance lacked documentation to ensure the items were either specified correctly or accepted for safety-related use. In other words, these items were similarly of an indeterminate nature and could be evaluated in the same manner as all of the other items installed over the history of Watts Bar. Most of this population of installed items which resulted from the MIP has been evaluated by the RIP team. Results indicate the items issued after 1989 had already been evaluated by RIP resulting in a high confidence in their ability to perform design functions. The number of RIP evaluations of the items issued prior to 1989 exceeded the typical sample of items in this population in order to once again, ensure conservatism in the approach.

Current and Future Procurements: Since June of 1991, the WBN PEG has procured approximately 71,000 items. Approximately 27 percent were QA Level I, seven percent were QA Level II, and 27 percent were QA Level III. PEG procedures were enhanced prior to June 1991 to incorporate current industry guidance for the proper specification and acceptance of items intended for nuclear safety-related use, as well as to demonstrate effective support of the nuclear industry's comprehensive procurement initiatives. The PEG procedure provided both a means to continuously improve procurement processes as well as a control to preclude past procurement inadequacies from recurring. Since June 1991, a very small percentage of the quality level items (approximately one percent) were found to be nonconforming to design requirements during receipt inspection. In the vast majority of procurements, the items were specified with correct technical and quality requirements, and the items received met the specified requirements.

III. INDEPENDENT ASSESSMENT

In December of 1994, an independent assessment was conducted of the RIP CAP to include a status of progress made to date implementing the plan. The results of that assessment indicated that TVA has evaluated nearly 180,000 items specified, procured, and accepted by WBN from about 1975 until the present. This population constitutes nearly 70 percent of all items installed either to construct or maintain the plant, and represents an extremely large sample.

The approach for evaluating previously installed items, as well as the definition of the scope of items to evaluate was highly conservative because unlike other utilities conducting evaluations of indeterminate installed items, WBN did not have any plant operating experience. The scope was consistent with current regulatory guidance, but the 70 percent sample far exceeded typical populations of installed items evaluated at other nuclear facilities. At present, TVA WBN estimates that the collective initiatives have greatly exceeded the number of evaluations originally estimated in the RIP CAP.

The independent assessment confirmed that in no cases were evaluations necessary due to "known deficiencies" of hardware. On the contrary, evaluations were performed to determine the extent past procurement practices may have affected the quality of the installed plant hardware. The results of the assessment indicate that about nine percent of past safety-related procurements (about three percent overall) were not specified correctly. About eight percent of past procurements had incomplete documentation to properly accept Commercial Grade Items (CGIs) and additional testing/inspection was required to dedicate the items. However, less than 0.005 percent of the procured hardware was found to be nonconforming to design requirements. Thus, an extremely high confidence level that the installed material at WBN is adequate to perform its design functions has been achieved.

Conclusions: Past procurement practices at Watts Bar that may have resulted in incomplete procurement documentation had no significant adverse affect on the quality of the replacement items.

Further evaluations of previously procured items will add little, if any, additional confidence that the actual hardware is conforming and will perform its design functions.

Consequently, TVA concludes that the RIP CAP, upon completion of the remaining component testing, will accomplish its stated objectives and that curtailment of further sampling of remaining populations is appropriate.

TVA WBN RIP CAP

	PLANT								Warehouse			Future
2/7/95 13:30	Maintenance Installed 50.49 Items(7)	Pro-TIICs	Release Tracking Log Items(5)	Sorting Construction Installed Items(1),(2)	Sorting Direct Charge Construction Installed Items	Level III classification verification	On hold for RIP #1 (From MIP)(12)(13)	On hold for RIP #2 (From MIP)(4)	Original ~18K contracts (MIP) (10)	PEG (11)(14)(15)	Totals to date	Additional ~9K contracts (MIP)(3)
Total population (items)	2456	276	5516	55000	19240	5215	1464	35	17796	71353	178075	9000
Total population (TIICs)	1152	276	2340	55000	19240	5215	1464	35	17796	36685	139203	9000
When installed	'84-'89	'84-'89	'89-'90	'75-'84	'75-'84	'75-'89	'75-'89	'75-'89	N/A	N/A	'75-pres	N/A
# items to evaluate (RIP)	1152	276	2340	55000	500	5215	1464	35	See PLANT	N/A	65982	70 (est)
# items to sanitize (MIP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17796	N/A	17796	9000
Sampling Plan	(9)	100%	100%	100%	MIL-STD 105.E	100%	(6)	(6)	100%	N/A		TBD
Procedure	AI-5.19	SSP-10.C	SSP-10.C	SSP-10.C	SSP-10.C	SSP-10.C	SSP-10.C	SSP-10.C	SSP-10.B	SSP-10.5		SSP-10.5
# RIP packages req'd	413	0	2340	N/A	N/A	N/A	645	35	N/A	N/A	3433	70 (est)
# RIP pack remain	0	0	127	0	0	0	645	35	N/A	N/A	772	70 (est)
# SAN packages done	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8226	N/A	8226	TBD
# SAN pack remain	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	0	TBD
# PEG packages	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	48000	48000	N/A
Work duration	1991	1991	'92-'94	'92-'94	'92-'94	'91-'93	10/93-pres	11/94-pres	'91-'93	6/91-pres	'91-pres	'94-pres
# items surplused/removed/salvaged for economic reasons (8)	23	0	400	0	0	0	0		7971	0	8394	TBD
# items passed PIT	0	0	300	0	0	0	0		N/A	928	1228	TBD
# items awaiting PIT	11	0	127	0	0	0	80		N/A	0	218	160 (est)
# items found with non-conformances	3	0	7	0	0	0	0		N/A	183	193	0 (est)
NRC sample	Process	Process	31 Packages	Process	Process	315 items	12 packages	N/A	38 packages	27 packages		N/A
# deficiencies	0	0	7	0	0	0	0		2	2	11	
References	A,F	A	E,F	B	B	G	E,F		C,D	H,I,J		C,D

References:

A: FINAL REPORT Maintenance Installed 10CFR 50.49 Items Evaluation Program, dated 11/20/91
B: FINAL REPORT Replacement Items Program, Task 3, Construction Installed Replacement Items, dated 1/25/93
C: WBN Materials Improvement Program (MIP) Project White Paper, dated 10/23/92
D: WBN MIP database
E: RIP CAP Interim Closure Report, dated 4/28/94
F: RIP database
G: FINAL REPORT RIP TASK 4A Investigate QA Level III Population, dated 6/30/94
H: WBN Database Report No: 1111MIX dated 1/5/95
I: Receiving Inspection Results Database Report, dated 1/5/95
J: TVA Materials Receipt Rejection Reports

Notes: (Some quantities approximated based on source information referenced above)

(1) Ledger cards were reviewed and sorted
(2) RIP evaluation consisted of sorting items by commodity and determining adequacy of each item's procurement requirements and acceptance documentation.
(3) Completion of walk down is required to completely scope the remaining population of warehouse items.
(4) Remaining population of "on hold for RIP" items is estimated based on experience with MIP process
(5) Remaining RIP packages are awaiting results of post-installation tests
(6) Number o RIP packages required was reduced by eliminating duplicated TIICs already evaluated by RIP
(7) 90 CGI packages had to be redone and were added to the RIP scope in 1992
(8) # of items removed is based on work request log
(9) Number of RIP packages required was reduced by eliminating items being resolved by other engineering evaluations
(10) SAN packages could have included more than one TIIC
(11) PEG processed ~36K TIICs, (14,307 QA0, 9,830 QA1, 2,651 QA2, and 9,897 QA3) and ~35K non-TIICs, (21,147QA and 12,521 non-QA).
(12) To date ~94% of "on hold for RIP" items have been previously evaluated by RIP 50.49 review, RIP RTL, CEG, or PEG. (18 new PPSP's required)
(13) ~80% of remaining RIP packages remain open for PIT and/or comparative review of TIIC against previously evaluated item
(14) ~1% material rejection rate overall, .5% material rejection due to inherent item defects, rejections do NOT represent CGI non-conformances found during dedication
(15) ~35% of CGI's dedicated using special tests/inspections, including post-installation tests