

ORGANIZATION: GILBERT/COMMONWEALTH, UTILITIES GROUP  
READING, PENNSYLVANIA

REPORT NO.: 99900525/81-02 INSPECTION DATE(S): 7/6-10/81 INSPECTION ON-SITE HOURS: 87

CORRESPONDENCE ADDRESS: Gilbert/Commonwealth  
ATTN: Mr. H. Lorenz, Group Vice President  
Utilities Group  
Post Office Box 1498  
Reading, PA 19603

ORGANIZATION CONTACT: Mr. N. R. Barker, Vice President, QA  
TELEPHONE: (215) 775-2600

PRINCIPAL PRODUCT: Architect Engineering and Consulting Services

NUCLEAR INDUSTRY ACTIVITY: The total effort committed to domestic nuclear activities at the Reading facilities is approximately 34% of the 2700 person staff of the Utilities Group. Major projects include Perry Units 1 and 2, V. C. Summer Unit 1 and Three Mile Island Unit 1 Restart.

ASSIGNED INSPECTOR: D F Fox  
D. F. Fox, Reactor Systems Section (RSS)

OTHER INSPECTOR(S): D. G. Breaux, RSS  
C. J. Hale, RSS

APPROVED BY: C J Hale  
C. J. Hale, Chief, RSS

INSPECTION BASES AND SCOPE:

- A. BASES: 10 CFR Part 50, Appendix B and the SAR for the Perry Nuclear Power Plant, Units 1 and 2.
- B. SCOPE: Design process management, design verification, design change control, design corrective action and status of previous inspection findings.

A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Follow up Item (80-01): The procurement documents for certain safety-related pumps did not appear to reflect all applicable ANSI standard requirements.

The procurement documents were reviewed by G/C Engineering and Quality Assurance against the committed ANSI standards. The essential elements of the committed standards appear to have been included in the purchasing documents at the time of their issue.

2. (Open) Nonconformance (81-01): Errors and deficiencies in the design process were not detected during the design verification process, nor during the performance of QA audits.

The status of the Task Force established by G/C to investigate the effectiveness of the overall G/C design control process was reviewed during this inspection. G/C's complete response to this item is scheduled for July 29, 1981.

3. (Closed) Unresolved Item (81-01): The generic impact potential safety hazard identified with a specific system, G/C did not appear to be fully evaluated in all other G/C designs.

Records of potential safety hazards that were processed in accordance with the recently revised G/C implementing procedure for 10 CFR Part 21 indicate that the generic impact of all hazards, determined by G/C to be reportable under the provisions of 10 CFR Part 21, was evaluated and documented.

4. (Closed) Follow Up Item (81-01): The corporate policy for verifying the education and experience of new employees did not appear to be clearly defined nor implemented.

Personnel records of newly hired employees indicate that their previous education and experience were verified in accordance with G/C corporate policy no. V-02 issued June 1, 1981. The retrofit program initiated by G/C already has verified the education or experience of over 90% of the employees hired between January 1, 1978, and May 3, 1981.

5. (Closed) Follow Up Item (81-01): The corporate policy for controlling the utilization and verification of programmable computers and calculators, and associated programs, did not appear to be clearly defined nor uniformly implemented.

All programmable computers and calculators and associated programs used to perform safety-related calculations and analyses are to be verified, certified, documented, controlled, revised, and periodically benchmark tested, in conformance with the G/C "Group I Computer Applications Manual" issued July 1, 1981.

E. OTHER FINDINGS OR COMMENTS:

1. Design Process Management

The NRC inspector examined the related sections of the Gilbert/Commonwealth Topical Report, the Perry Project PSAR and FSAR, and applicable Project Engineering and Quality Assurance procedures to determine if procedures were prepared, approved and issued to prescribe a controlled system for management of the design process that is consistent with commitments to NRC. In addition, the NRC inspector examined one system design description (SDD), seven specifications, nine drawings, four calculations, and selected revisions thereto, relating to the Emergency Closed Cooling Water (ECCW) system to determine if the committed program for management of the design process was being effectively implemented.

The NRC inspector found that the committed program was adequately implemented. The NRC inspector noted that interdisciplinary review of certain electrical and instrumentation and control drawings was not formalized in procedures. This area will be examined during a future inspection to determine if the design information transmitted between engineering disciplines is controlled, documented and verified.

2. Design Verification

The NRC inspector examined the related sections of the Gilbert/Commonwealth (G/C) Topical Report, the Perry Project PSAR and FSAR, and applicable implementing procedures to determine if procedures were prepared, approved, and issued that prescribe a controlled system for verifying designs that is consistent with commitments to the NRC. The NRC inspector examined the documentation of the design verification of four specifications, two calculations, five drawings, and all revisions thereto, relating to the ECCW system to determine if the committed program was being effectively implemented.

The NRC inspector found that the committed program was adequately implemented, although it was noted that several of the documents examined did not appear to have been verified in a timely manner. This area will be examined further during a future inspection to determine the effect, if any, on the final G/C designs.

3. Design Change Control

The NRC inspector examined the Gilbert/Commonwealth Nuclear Quality Assurance Manual, along with generated Engineering and Quality Assurance procedures for proper addressing of design change control. Twelve Engineering Change Notices, four specifications, three SDDs, along with their subsequent revisions, were reviewed to assure that design change control commitments were implemented.

It was observed that several Perry Nuclear Power Plant Units 1 and 2 SDDs had been transmitted to Cleveland Electric (client) for their review and comments; however, the client had not responded to these requests. There exists an action tracking system for follow up of correspondence to clients; however, only correspondence with specific action required and a date for this response is tracked by this system. SDDs are classified as "response required" and contain no action date, consequently, they are not tracked thru this correspondence control system. This same condition existed for certain SAR changes sent to the client. G/C has committed to modify this system as necessary to provide more positive control of client responses to G/C correspondence.

Upon review of a design calculation for the Perry Project Emergency Service Water Screen Wash Pump Sizing, there was an approximate time span of three years between preparation and review of this calculation. Procurement of the screen wash pump had occurred prior to the design calculation review. All procurement documents were reviewed, assuring that procurement of the pumps had been in accordance with the design conditions transmitted by the reviewed/verified calculation.

A subsequent review by the inspector of approximately thirty additional design calculations (including revisions) revealed that the previous example of untimely design review appeared to have been an isolated case.

4. Design Corrective Action

The NRC inspector examined the Gilbert/Commonwealth Nuclear Quality Assurance Manual and specific Engineering and Quality Assurance Procedures to assure proper addressing of design corrective action.

Time did not permit a total assesment of the G/C design corrective action program. Based on the review performed, the G/C program for design corrective action described in their corporate procedures may not totally satisfy Section 9.0 of ANSI N45.2.11. Section 9.0 includes

the requirement that procedures address corrective action for recurring deficiencies, determination of the cause, and instituting appropriate changes in the design process and the quality assurance program that would prevent similar types of deficiencies from recurring. It also requires provisions for reporting the deficiency and corrective action to appropriate levels of supervision and management. Our evaluation of the incorporation of these ANSI requirements in Design Corrective Action Procedures will be made during a subsequent inspection.



PERSONS CONTACTED

Company GILBERT / COMMONWEALTH

Dates 7/6 - 10/81

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PERSONS CONTACTED

Company GILBERT / COMMONWEALTH

Dates 7-6 / 7-10-81

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Scope/Module	PREVIOUS INSPECTION FINDINGS
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DOCUMENTS EXAMINED

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## Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

## Columns:

1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)



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\* = ALSO DESIGN VERIFICATION MODULE

1	2	TITLE/SUBJECT	3	4
* 1	8	G/C TOPICAL REPORT GAI-TR-106	2/1/80	2A
* 2	4	G/C NUCLEAR QUALITY ASSURANCE MANUAL	4/6/81	NA
* 3	8	PROJECT PROCEDURES MANUAL, PERRY PROJECT	8/15/73-7/1/81	0 → 14
4	8	CEI PROJECT ADMINISTRATION MANUAL, PERRY PROJECT	7/25/80	0
* 5	8	G/C DESIGN CONTROL PROCEDURE MANUAL	6/11/81	16
* 6	8	PSAR- PERRY NUCLEAR POWER PLANT, UNITS 1 + 2	3/28/73-7/15/75	0 → 24
* 7	8	FSAR- PERRY NUCLEAR POWER PLANT, UNITS 1 + 2	9/12/80-5/23/81	0 → 2
8	8	SAR DEVIATIONS No. 78, 79, 89 AND 114	4/1/77-8/15/78	NA
* 9	2	SP-562-4549-00 "CLASS 2E DIESEL GENERATOR UNITS"	7/17/78	IV
* 10	9	EØ72 DGLD "DIESEL GENERATOR LOADING STUDY"	3/15/76	0
* 11	1	04-4549-D-206-010-E "MAIN ONELINE DIAGRAM-13.8 KV & 4.16 KV"	6/21/81	E
* 12	1	04-4549-D-206-017-F "ONELINE DIAGRAM- CLASS 2E BUS EH 11 & EH 12"	10/2/80	F
* 13	1	04-4549-D-206-018-F "ONELINE DIAGRAM- CLASS 2E BUS EH 13"	10/3/78	F
* 14	2	SP-550-4549-00 "CLASS 2E 4,000 VOLT & 460 VOLT INDUCTION MOTORS"	12/15/90	VI
15	1	04-4549-D-208-216 "STANDBY DIESEL GENERATOR DIESEL CONTROL PANEL	45 SHEETS	VARIOUS
16	10	P42 "EMERGENCY CLOSED COOLING SYSTEM" (ECCW)	6/4/81	I
* 17	1	04-4549-D-302-621-D "ECCW BASIC SYSTEM"	6/8/81	D
* 18	1	04-4549-D-302-621-D "ECCW RHR PUMP SEALS"	4/27/81	D

## Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)
9. CALCULATION
10. SYSTEM DESCRIPTION

## Columns:

1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)

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Scope/Module DESIGN PROCESS MANAGEMENT  
(CONTINUED)

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1	2	TITLE/SUBJECT	3	4
* 19	1	04-4549-D-302-621-D "ECCW OPERATING DATA"	4/27/81	D
20	1	04-4549-SS-804-842-A "ECCW SEPARATION LIST"	12/15/80	A
21	1	04-4549-S-802-621-D "ECCW LOGIC DIAGRAM"	3/4/77	D
22	3	DP:0423/2.0.0 "SYSTEM FUNCTIONAL (LOGIC) DIAGRAMS"	9/18/78	O
23	1	04-4549-B-208-173 "ECCW ELECTRICAL ELEMENTARY DIAGRAMS"	23 SHEETS	VARIOUS
24	9	M23-C01 "M23 SYSTEM RO80 CONTROLLER SET POINT CALCULATION"	PRELIMINARY	NA
25	2	SP-604-4549-00 "DESIGN, FAB., & DEL. OF S.B. PRESSURE & D.P. TRANSMITTERS"	11/25/80	V
* 26	2	SP-644-4549-00 "DESIGN, FAB., & DEL. OF CONTROL CONDENSED CHILLED WATER & ECCW PUMPS"	2/16/77	III
* 27	2	SP-625-4549-00 "DESIGN, FAB., & DEL. OF ECCW & FUEL POOL HEAT EXCHANGERS"	9/13/77	V
28	9	P42-3 "ECCW HEAT EXCHANGER SIZING - PRELIMINARY"	3/17/78	O
* 29	9	P42-4 "ECCW HEAT EXCHANGER SIZING - FINAL"	1/6/81	O
* 30	2	SP-596-4549-00 "DESIGN, FAB., & DEL. OF S.B. THERMOCOUPLES, RTDs, & TEMP. TRANSMITTERS"	3/20/81	IV

## Document Types:

1. Drawing
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3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

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Scope/Module DESIGN VERIFICATION

DOCUMENTS EXAMINED

NOTE: REFER TO THE DESIGN  
PROCESS MANAGEMENT LIST  
FOR ADDITIONAL DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
1	2	SP-562-4549-00; ATTESTATION LISTS & DESIGN REVIEW SUMMARY REPORTS	12/15/75-7/17/78	I → IV
2	9	EØ 72 DGLD; ANALYTICAL REVIEW & COMPUTER PROGRAM CERTIFICATION	3/15/76	O
3	1	04-4549-D-206-010-E; DESIGN REVIEW SUMMARY SHEETS (DRSS)	6/21/81	O → E
4	1	04-4549-D-206-017-F; DRSS	10/2/80	O → F
5	1	04-4549-D-206-018-F; DRSS	10/3/78	A, D, E, F
6	1	SP-550-4549-00; ATTESTATION LISTS (AL) & DRSS	12/15/80	I → VI
7	1	04-4549-D-302-621-D; DESIGN VERIFICATION RECORDS	4/15/77-4/28/81	A, D
8	2	SP-644-4549-00; DRSS	9/24/76-3/19/77	I → III
9	2	SP-625-4549-00; DRSS	4/5/76-9/13/77	I → V
10	9	P42-4; DESIGN VERIFICATION RECORD (DVR)	1/6/81	O
11	2	SP-596-4549-00; DRSS	4/13/78	II

Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)
9. CALCULATION

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
1	TOPICAL REPORT	Gilbert / Commonwealth Quality Assurance Program for Nuclear Power Plants	2/80	REV 2A
2	PROCEDURES MANUAL	Design Control Procedures Manual / Gilbert Commonwealth		
	3	DCP 1.10 "Design Input"	12-01-80	1
	3	DCP 1.20 "Design Analysis and Calculations"	6-17-80	2
	3	DCP 1.30 "GAT Drawings"	3-6-81	1
	3	DCP 2.05 "Design Verification"	6-17-80	3
	3	DCP 2.20 "Change Notices"	9-1-77	0
	3	DCP 3.15 "Design Records"	10-16-80	3
3		Design Change Control Manual (Perry Project)		
		Appendix F "System Design Descriptions and System Diagram"		
		Appendix H "Procurement Specifications"		
		Appendix N "Engineering Change Notice"		
		Appendix P "Non-Conformance Conditions"		
		Appendix R "Design Review Status Reports"		
		Appendix T "Sur Deviations"		
		Appendix V "Design Interfaces"		

## Document Types:

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| 1. Drawing       | 5. Purchas Order                |
| 2. Specification | 6. Internal Memo                |
| 3. Procedure     | 7. Letter                       |
| 4. QA Manual     | 8. Other (Specify-if necessary) |

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
4	8	Appendix W "Field Variance Authorization" Appendix Z "Test Specifications and Test Procedures" Engineering Change Notice (ECN) # 245 B-033-01 ECN # 5325, 5247, 5085, 5959, 5300 # 3473, 4004, 3787 # 6331, 3130 # 1865, 2566	10/31/80	
	2	Specifications 033 "Electrical Construction in Safety Related area" System Design Description R10 "Plant Electrical Power System" Spec 090 "Safety Related Instrumentation Installation" SDD D-11 "Plant Monitoring System"	12/8/80 2/16/78 12/17/80 2/27/75	III  III
	CALCS.	G 43-A "Suppression Pool make-up"	1-8-79	1
	CALC	G 43-B "Suppression Pool make-up"	1-9-79	1
	CALC	P 49-3 "Pump Sizing" Emergency Service Water Screen Wash	12/15/78	1
	CALC	P 49-1	12/15/78	0
	CALC	PEN Penetration Analysis Design Information Safety Class 1, 2, 3		

## Document Types:

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| 1. Drawing       | 5. Purchas Order                |
| 2. Specification | 6. Internal Memo                |
| 3. Procedure     | 7. Letter                       |
| 4. QA Manual     | 8. Other (Specify-if necessary) |

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| 3. Date of Document         |
| 4. Revision (If applicable) |



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Scope/Module 37996 B

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
		PEN-1 "Pressure Temp Transient - Misc Penetrations"	9/26/78	1
		PEN-2 "Pressure Temp Transient Misc Penetrations"	9/26/78	1
		SDD P 49 "Emergency Service Water Screen Wash System"	7/3/79	
	2	SP 501 "Design Fabrication, and delivery of Emergency Service Water Pumps and Emergency Service Water Screen wash pump"		
	8	Bill of Material W2/044549 Sheet #59		
	Letter	Revision to the design conditions for SP-501	7/27/80	
	3	Engineering Instruction #12 "Design Feedback"	12/80	0

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