

UNITED STATES NUCLEAR REGULATORY COMMISSION REGION II 101 MARIETTA STREET, N.W. ATLANTA, GEORGIA 30323

Report Nos.: 50-424/88-18 and 50-425/88-20

Licensee: Georgia Power Company

P. O. Box 4545 Atlanta, GA 30302

Docket Nos.: 50-424 and 50-425

License Nos.: NPF-61 and CPPR-109

Facility Name: Vogtle 1 and 2

Inspection Copyric 100/ 1601 18-22, 1988 and May 2-5, 1988

inspector:

Approved by:

Take. Section Chief

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SUMMARY

Scope: This routine, unannounced inspection was in the areas of licensee actions on previous enforcement matters (927018) (927028), heating, ventilating and air conditioning (HVAC) system (Unit 2), and readiness review Module 18A. "Heating Ventilation, and Air Condition."

Results: One violation was identified "Failure To Install HVAC Systems In Accordance with The FSAk.

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REPORT DETAILS

Persons Contacted

Licensee Employees

*A. B. Gallant, Project Compliance Coordinator

*E. D. Groover, Quality Assurance (QA) Site Manager Construction *I. D. Innes, Civil Engineer

*R. W. McManuw, Readiness Review

*R. H. Pinson, Vice President

*P. D. Rice, Vice President/Project Director

*P. R. Thomas, Readiness Review

Other licensee employees contacted included construction craftsmen, engineers, technicians, and office personnel.

Other Organization

*J. P. Hawlew, Bechtel Power Company (BPC) Project Engineer

*F. C. Ling, BPC - Engineering Group Leader

NRC Resident Inspector

*R. Schepens, Senior Resident Inspection (SRI)

*Attended exit interview

Exit Interview 2.

The inspection scope and findings were summarized on May 5, 1988, with those persons indicated in Paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The following new item(s) were identified during this inspection:

(Open) Violation -

50-424/88-18-01 and 50-525/88-20-01: "Failure To Install HVAC Systems In Accordance With The FSAR" -Paragraph 3b

(Open) Inspection Followup Item -

50-424/88-20-02: "Unavailable HVAC Documents" - Faragraph 5e

The licensee did identify some material as proprietary during this inspection, but this material is not included in this inspection report. 3. Licensee Action on Previous Enforcement Matters (92701B) (92702B)

a. (Closed) Unresolved Item 50-425/88-03-01: "Apparent Failure To Install and Inspect HVAC Duct Supports In Accordance With Drawings"

This item identified the following condition: completed, inspected and accepted HVAC Nuclear Safety-Related, Seismic Class 1, Duct Support No. 2-132-88 is depicted on Field Change Request (FCR) No. FCRB-5367F and BPC Drawing No. ACD67W041 Revision 1. Drawing AXD672041, Details for Type 301, specifies dimension"D" (the distance between the center line of the duct section and a 5x5x3/8-inch square tube) to be 1-foot 0 inches maximum (12-inches maximum). In point of fact the actual "D" dimension is 14 1/2-inches. Subsequent to the identification of this discrepant conditions by the NRC inspector the licensee documented the discrepancy in Deviation Report (DR) No. PK-4184.

This condition indicates that the installing craftsman failed to install the duct in accordance with the applicable drawing and that the Quality Control (QC) inspector accepting the discrepant nuclear safety-related, Seismic Category 1 HVAC duct support failed to inspect the duct support in accordance with the applicable drawing.

Failure to install and inspect the duct support in accordance with applicable drawing brings into sharp focus the following: the craftsman exceeded the 12-inch maximum specified by the drawing; the craftsman failed to get an engineering evaluation of the discrepant condition; the craftsman offered for inspection a duct support that deviated from the drawing; the QC inspector failed to identify fact that the "D" dimension exceeded the drawing maximum of 12-inches; the QC inspector accepted the discrepant condition; the QC inspector signed the inspector record indicating that the duct support conformed to the drawing when in point of fact it did not. By installing and accepting this discrepant nuclear safety-related Seismic Category 1 HVAC duct support, the installing craftsman and the accepting QC inspector usurped the prerogative, responsibility, and authority of the designer to evaluate and accept conditions outside of design envelope as defined by drawings.

The above is an example of failure to follow procedure for activities affecting quality. This matter will be closed as an unresolved item and became an example of Wiolation 50-424/88-18-01 and 50-425/88-20-01, discussed further in Paragraph 3.b.

b. (Closed) Unresolved Item 50-425/88-03-02: "Air Filter Housing Seismic Analysis"

This item identified the following. The 2-1561-N7-001 Engineered Safety Feature (ESF) air/filter housing assemblies is attached to the

datum foundation by 3-1/2x3-1/2x1/4x4-inch angle clips. These angle clips share a horizontal interface with the foundation, and a vertical interface with the air/filter housing. The interfaces are secured by bolting. The NRC inspector noted that several of these angle clips had only line contact at the top and bottom edge of the vertical interface the result of interference from a fillet weld on the air filter housing. The Vogtle plant (VEGP) Final Safety Analysis Report (FSAR) Section 6.5.1.3E states in part "the ESF filter systems are designed to Seismic Category 1 requirements. The NRC inspector discussed the above with the licensee, pointing out, that those connections with only double line contact could not be considered as friction connection. In view of the above, the NRC inspector questioned whether the lack of friction connections on the supports of a Seismic Category 1 component, abrogated the seismic analysis and qualification of the equipment, and thereby deviated from a commitment to the commission (FSAR 6.5.1.3.E). The licensee contacted the manufacturer of the air filter housing, American Air Filer (AAF) relaying the NRC inspectors concern. AAF indicated, to the licensee, that as long as the bolts connecting the clips to the filter housing were tight the seismic analysis and qualification was valid. AAF stated that they would send supporting documentation.

In addition to the above, but not documented in NRC Report Nos. 50-424/88-04, 425/88-03, The inspector noted that there were no washers installed between the bolt head and the angle clip's vertical surface, slotted hole (13/16 x $1\frac{1}{2}$ - inch).

As a result of this unresolved item, the licensee performed a reinspection of this air filter housing assembly's mounting bolts, as well as the mounting bolts for the remaining five Unit Two and eight Unit One other ESF air filter housing assemblies. This inspection revealed that all the Unit One air filter housing assemblies were mounted with 3/4-10 snug tight (not torqued) unmarked (assumed Type A-307 which has a tensile strength 50 to 70 Kips/Square Inch (KSI) bolts. The inspection revealed that all but one bolt used to mount the unit two air filter units were 3/4-10 snug tight (not torqued) Type A-325, or A-490 bolts (A-325 has tensile strength of 105 KSI and A-490 has a tensile strength of 150 KSI). The remaining bolt was a snug tight (not torqued) 5/8-11.

The applicable drawing available to the craftsman who installed the mounting bolts and the QC inspection who accepted the installation of the mounting bolts was 1X4AJ07-273-5 for unit one and 2X4AJ07-325-7 for unit two. Section "B-B" from both drawings (Reproducerd as Attachment 1 herein) specifies "3/4-10 hardware provided by AAF." The applicable procedure available to the craftsmen and inspectors for the installation of Type A 307 bolting, P/L-F JP-14.2, "Process Control Program" Exhibit 16 specifies snug tight with the warning "Do Not Over Torque".

The Applicable Procedures available to the Unit Two Craftsmen and QC inspectors were: P/K-F JP-513 "Installation and Inspection of High Strength Bolts" (Applicable To All Unit Two assemblies) and P/K-F MIP/Equipment Installation Special Instruction Sheet No 2-1561-N7-002 Housing (Applicable To the 2-1561-N7-002 assembly only). JP-513 Paragraph 5.4 requires that bolted contact surfaces shall have all burrs removed and shall be free of dirt, oil, loose scale, pits or other defects that would prevent solid seating or sound bearing of component parts. JP-513 Paragraph 6.2.2.d.1 requires that washers shall be installed under the bolt head and nut when the hole enlargement exceeds 1/8". P/K-F MPI/Equipment Installation special Instruction 2-1561-N7-002, Page 2 of 39, Item 7 specifies the use of Type A-325 equivalent or better 3/4-inch diameter bolting hardware to a snug tight condition.

In view of the above the installing craftsmen and the accepting QC inspectors followed the appropriate drawing and procedure requirements for Unit One and Unit Two with the following exceptions:

- The bolted contact surfaces were not free of defects (the interfering fillet welds) which prevented solid seating and sound bearing of the component parts.
- Washers were not installed under the bolt heads over the slotted holes.
- A 5/8-inch diameter bolt was used when a 3/4-inch diameter bolt was required.

The support documentation submitted by AAF in response to the GPC question related to this unresolved item stated in part:

"To meet the seismic qualification, the angle clips should be bolted to the base channels with Type A-449 high strength bolts, or equivalent, pretensioned to meet the friction connection requirement." (Note: Type A-449 bolts are equal to Type A-325 with a 105-KSI specified tensile strength)

The AAF letter indicates that neither the Unit One or Two air filter housing assemblies were installed in accordance with the FSAR, in that the Unit One assemblies were installed with under-strength bolts that were not pretensioned (torqued) and the Unit Two assemblies were installed with appropriate strength bolts that were not pretensioned (torqued).

The above clearly indicates the procedures and drawings were not of a type appropriate to the circumstance to assure that proper bolting materials would be correctly installed to comply with the Commitments of the FSAR. In addition, the installing craftsmen failed, to assure

that bolted contact surfaces were free of defects that would prevent those surfaces to seat solidly and have sound bearing, and to install washers under bolt heads over slotted holes, and that bolts were of a proper diameter. The accepting QC inspectors accepted the same discrepant condition and the QC inspectors signed the inspection record attesting to the fact that the ESF Seismic Category 1 air filter housing assemblies were installed in accordance with procedures and drawings when in point of fact they were not.

The above condition has existed in some part since April 24, 1984. The licensee has had at least 14 opportunities to discover portions of this violation, once for each air filter housing assembly installation and inspection.

The above procedure inadequacies and, the examples of failure to follow procedures combined with the example of failure to follow procedure discussed in Paragraph 3a, show what activities affecting quality were not prescribed by documented drawings and procedures of a type appropriate to the circumstances and that those activities were not accomplished in accordance with those drawings and procedures. This is a violation of Title Ten, Code of Federal Regulations, Part 50 (10 CFR 50) Appendix B, Criterion V. This matter will be closed as an unresolved item and opened as violation 50-424/88-18-01 and 50-425/88-20-01: "Failure to Install HVAC Systems In Accordance With The FSAR."

5. Heating Ventilating and Air Conditioning (HVAC) Systems (50100) (Unit 2)

The inspector reviewed records to determine: whether the installation of safety-related HVAC system in compliance with Nuclear Regulatory Commission (NRC) requirements, licensee commitments, and applicable codes; whether the licensee was adequately preparing, reviewing, and maintaining a system of quality records; whether the records reflect work accomplished consistent with NRC requirements and Safety Analysis Report (SAR) commitments; and whether the records indicate any potentially generic problems, management control inadequacies, or other weaknesses that could have safety significance.

a. The inspector reviewed selected documentation for the below listed components to verify seismic qualification per IEEE-344-1975, "Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Station", or other appropriate requirements.

Content

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- Fan with motor for air handling assembly 2 15561-N7-001-000
- Cooling coils for air handling assembly 2 1555-A7-003
- b. The inspector reviewed selected documentation for the below listed mechanical components to verify conformance with the applicable portions of Regulatory Guide 1.52

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Components

HEPA Filters Ser. No. 41344297-316 Neopreme Duct Gasket - ASTM-D-SCE-43, Silicone Ruber Sealant - 732 RTV

c. The inspector reviewed the below list Nonconformance (NCR) Reports to determine whether: The records are being properly identified, stored, and can be retrieved in a reasonable time; the records are legible, complete, and indicate that reports are promptly reviewed by qualified personnel for evaluation and disposition of the immediate problem as well as for generic implications and trending; the records adequately document current status of nonconformances or deviation and corrective action; and resolution of nonconformances demonstrates good engineering practice.

NCR's Examined

SQ-354 PK-3912 PK-2805 PK-3463 PK-3184 PK 1009 PK-2752 PK-2632 PK-2632 PK-4133

d. The inspector reviewed the relevant portions of the below listed license audit reports concerning the installation of safety-related supports and HVAC systems to determine whether: The required audits have been performed in accordance with schedule and functional areas in established audit plans; audit findings have been reported in sufficient detail to permit a meaningful assessment by those responsible for corrective action, final disposition, and trending; and the licensee/contractor have taken proper and timely followup action on those matters in need of correction.

Audit Reports Examined

CP-22-87/38 CP-22-87/03 CP-20/CP-22-86/50 CP-22-86/29

e. With regard to the inspection above the licensee was unable to provide the documentation described in ANSI/ASME N509-1980, "Nuclear Power Plant Air Cleaning Units and Components", Paragraph 5.4.2. for

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the 2-1561-N7-001-000, Moisture Separator Unit. The licensee indicated that they would located the documentation and make it available to the inspector. Pending NRC review of this documentation, this matter will be identified as Inspector Followup Item 50-425/88-20-02: "Unavailable HVAC Documents."

Within the areas examined no deviations or violations were identified.

6. Readiness Review, Module 18A "Heating Ventilation, and Air Conditioning"

Readiness Review Module 18A was submitted to the NRC on February 12, 1983, with an effective date of July 15, 1987. The module was reviewed for program description, implementation, technical commitment adequacy, and program assessment.

The specific commitments evaluated for adequacy are listed in Attachment 2. Unit 2 HVAC activities were examined by the NRC and discussed in NRC Reports indicated below.

Report No

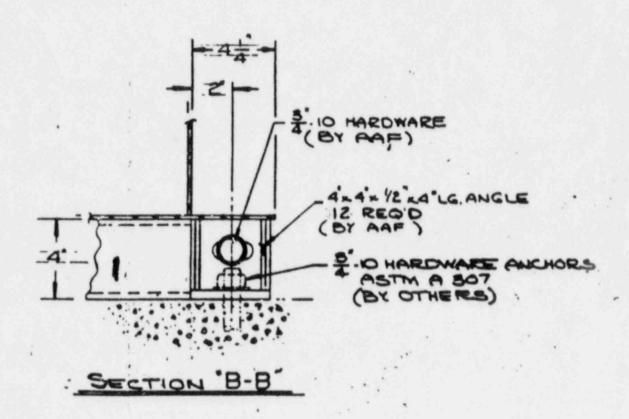
50-424/87-11 and 50-425/87-07 50-424/88-04 and 50-425/88-03 50-424/88-18 and 50-425/88-20

Within the area examined no violations or deviations were identified.

7. Acronyms and initialisums

AAF - American Air Filter
BPC - Bechtel Power Company
DR - Deviation Report
ESF - Engineered Safety Features
FCR - Field Change Request
FSAR - Final Safety Analysis Report
HVAC - Heating Ventilating and Air Conditioning
MWO - Maintenance Work Order
NRC - Nuclear Regulatory Commission
P&ID - Piping and Instrumentation Diagram
P/K-F - Pullman/Kenith - Fortson
QA - Quality Assurance
QC - Quality Control
RII - Region II
SRI - Senior Resident Inspector
10 CFR 50 - Title Ten, Code of Federal Regulation Part 50

Attachments:



	TUMBER		SEC	TIO	N			COMMITMENT SUBJECT	DOCUMENT/ FEATURE	MODULE	DESIGN	CONST	AMEN	REMARKS
(18	855.00	FSAR	1.	9.	31.	2		CONTROL OF FERRITE CONTENT IN STAINLESS STEEL WELD METAL	RG 1.31	18A	х		0	
15	49.00	FSAR	1.	9.	52.	2		DESIGN, TEST & MAINT. CRITERIA FOR POST-ACC. ESF ATMOSPHERE CLEAN-UP SYSTEM AIR FILTRATION & ADSORPTION UNITS		18A	х	X	25	
15	50.00	FSAR	1.	9.	52.	2		DESIGN, TEST & MAINT. CRITERIA FOR POST-ACC. ESF ATMOSPHERE CLEAN-UP SYSTEM AIR FILTRATION & ADSORPTION UNITS	CONFORMS TO ANSI N510-1975 OR 1980 DEPENDING ON DATE OF P.O., OR CONFORMS TO ANSI N510-1980 WHEN SPECIFICALLY CALLED OUT IN SPEC	18A	х	х	25	
7	15.00	FSAR	1.	9.	92			COMBINING MODAL RESPONSES & SPATIAL COMPONENTS IN SEISMIC RESPONSE ANALYSIS	RG 1.92, REV 1, 2/76	18A	х		0	SEE FSAR 3.7.B, 3.7.N, 3.7.N.2.7
49	73.00	FSAR	1.	9.	94.	2.	9	VISUAL WELDING ACCEPTANCE CRITERIA	WE'DING VISUAL INSPECTION ACCEPTANCE CRITERIA IN ACCORDANCE WITH AWS D1.1-75 FOR INSPECTIONS PERFORMED PRIOR TO 12/02/85, AND NCIG-01, REV. 2 FOR INSPECTIONS PERFORMED AFTER 12/02/85.	184		х	20	

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	NUMBER		SECTION	COMMITMENT SUBJECT	DOCUMENT/ FEATURE	MODULE	DESIGN CONST	FSAR REMARKS AMEN
2 3 3 3 3		FSAR	3. 1. 5	CONFORMANCE WITH NRC GDC, PRIMARY CONTAINMENT ISOLATION	10CFR50, APP. A, GDC 56	18A	х	0
X X X X		FSAR	3. 7.B. 3. 1. 3	SEISMIC SUBSYSTEM ANALYSIS OF CAT. I SUBSYSTEMS AND COMPONENTS	MODAL RESPONSE SPECTRUM OR EQUIVALENT STATIC LOAD METHOD	18A	х	0
X X X		FSAR	3. 7.B. 3. 5	SEISMIC SUBSYSTEM ANALYSIS, USE OF EQUIVALENT STATIC LOAD METHOD OF ANALYSIS	SEISMIC ACCELERATION VALUES A'E PEAK ACCELERATION VALUES MULTIPLIED BY A FACTOR OF 1.5 UNLESS A LOWER FACTOR IS JUSTIFIED	18A	X	30
X X X X		FSAR	3. 7.B. 3. 6	SEISMIC SUBSYSTEM ANALYSES - THREE COMPONENTS OF EARTHQUAKE MOTION.	COMPONENT EARTHQUAKE EFFECTS COMBINED BY SRSS METHOD (FOR QUAL. BY ANALYSIS).	18A	х	0
X X X X		FSAR	3. 8. 4. 5	WELDING OF STRUCTURAL STEEL	WELDING OF STRUCTURAL STEEL, MISC. STEEL, RACEWAY SUPPORTS, & HVAC DUCT SUPPORTS IS PERFORMED IN ACCORD. WITH AWS D1.1-1975 OR LATER	18A	х х	25 ADDED BY FSAR AMEND. 25
X	5117.00	FSAR	6, 2, 4, 3.C	CONTAINMENT ISOLATION SYSTEM, DESIGN EVALUATION	PREACCESS MINI PURGE LINE ISOLATION VALVES SHUT IN LESS THAN 5 SEC.	18A	X	0

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	NUMBER	COMMITMENT SOURCE	SEC	CTI	ON				COMMITMENT SUBJECT	DOCUMENT/ FEATURE		DESIGN	 AMEN	REMARKS
X X X X		FSAR	6.	. 2		5.	2.	2	CONTAINMENT H/2 PURGE SYSTEM	EXHAUST FILTERS AND EXHAUST DUCT TO PLANT VENT ARE DESIGNED AS SIESMIC CAT. I	18A	X	22	ADDED BY FSAR AMENDMENT 22
X X X X		FSAR	6	. 4		2.	2.	2.J	HABITABILITY SYSTEMS	TWO SETS OF DOORS WITH VESTIBULE ACT AS AN AIR LOCK AT CONTROL ROOM EXTRANCES	18A	х	30	
X X X X	5112.00	FSAR	6.	. 4	١.	2.	2.	2.J	HABITABILITY SYSTEMS	DOORS TO RECORD STORAGE AREAS ARE EQUIPPED WITH SELF-CLOSING DEVICES	18A	х	30	
X X X X		FSAR	6	. 4	١.	2.	2.	2.J	HABITABILITY SYSTEMS	ACCESS TO RECORD STORAGE AREA THROUGH AN AIRLOCK OR TWO DOORS IN SERIES	18A	х	30	
X X X X		FSAR	6	. 4	1.	2.	3		HABITABILITY SYSTEMS - VENTILATION LEAK-TIGHTNESS	CONVENTIONAL BLDGS, FOR REACTOR CONTAINMENT PUBLISHED BY ATOMICS INT'L, CAT. NAA-SR-19100, 6-15-65	18A	X	25	
X	5114.00	FSAR	6	. 4	1.	2.	4.1		HABITABILITY SYSTEMS, INTERACTION WITH OTHER ZONES	CONTROL ROOM DOORWAYS WITH TWO SETS OF DOORS ACTING AS AN AIRLOCK	18A	х	30	

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		COMMITMENT		CONTRACTOR OF THE CONTRACTOR O	DOCUMENT/ FEATURE	MODULE	DESIGN CONST	FSAR REMARKS AMEN
	2527000	********	025002502502502502					2000 20000000000000000
X X		FSAR	6. 4. 2. 4.E	SYSTEMS, INTERACTION	DOORS TO THE COTA	18A	х	30
X	5116.00	FSAR	6. 4. 2. 4.E	HADITABILIT? SYSTEMS, INTERACTION WITH OTHER ZONES	WOODOD IO HOUSE	18A	x	30
2	2123.00) FSAR	6. 5. 1. 1.B	ESF FILTER SYSTEMS DESIGN BASIS PIPING PENETRATION FILTER EXHAUST SYSTEM	DESIGNED TO MAINTAIN -1/4-IN. WG WITH RESPECT TO ATMOS., NECATIVE WITH RESPECT TO SURROUNDING AREAS	18A	X	30
	X 2125.00 X X X) FSAR	6. 5. 1. 1.C	ESF FILTER SYSTEM DESIGN BASIS FHB POST-ACCIDENT EXHAUST SYSTEM	DESIGNED TO MAINTAIN A SLIGHTLY NEGATIVE PRESSURE IN THE FHB FOLLOWING A FUEL HANDLING ACCIDENT.	18A	Х	30
	x 4015.0 x x x x	0 FSAR	9. 4. 3. 2. 4	AUX. BLDG. EMERG. VENT. SYSTEM - DUCT LEAK TESTING	SMACNA, 1975 & ANSI N510, SECT. 6, 1980	18A	х х	25
	X 4066.0 X X X	O FSAR	9. 4. 5. 2. 1	CONTROL BLDG. SAFETY FEATURE ELEC. EQUIFMENT ROOM HVAC	MAINTAINED AT	18A	x	30
	x 4070.0 x x x x	00 FSAR	9. 4. 5. 3. 2	ELEC. PENETRATION ROOM FILTRATION AND EXHAUST SYSTEM	Of Old HEODEN'S OF "		X	3

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PLANT VOGTLE UNIT 2 READINESS REVIW PROGRAM COMMITMENT MATRIX - MODULE 18A

	NUMBER	COMMITMENT SOURCE	SEC	TION			COMMITMENT SUBJECT	DOCUMENT/ FEATURE		DESIGN		AMEN	REMARKS
3	X 4096.00 X X X	FSAR	9.	4.	5.	6	CONTROL BLDG. ESF HVAC DUCTWORK LEAK TESTING	SMACNA 1975 & ANSI N510, SECT. 6, 1980	18A	х	х	25	
	x 5094.00 x x x x	FSAR	9.	4.	7.	4	DIESEL GEN. BLDG. VENT. SYSTEM DUCTWORK LEAK TESTING	SMACNA, 1975 & ANSI N510, SECT. 6, 1980	184	х	X	25	
	x 5095.00 x x x x	FSAR	9.	4.	8.	5	AUX. FEEDWATER PUMPHOUSE HVAC DUCTWORK LEAK TESTING	SMACNA, 1975 & ANSI N510, SECT. 6, 1980	184	Х	X	25	
	X 5096.00 X X X	FSAR	9.	4.	9.	2. 4	MISC HVAC SYSTEMS, ELECT. TUNNEL VENT. SYSTEM, DUCTWORK LEAK TESTING	SMACNA, 1975 & ANSI N510, SECT. 6, 1980	18A	X	X	25	