

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

December 13, 1979

Director of Nuclear Reactor Regulation
Attention: Mr. L. S. Rubenstein, Acting Chief
Light Water Reactors Branch No. 4
Division of Project Management
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Rubenstein:

In the Matter of the Application of) Docket Nos. 50-327
Tennessee Valley Authority) 50-328

As a result of our telephone conversation with members of the NRC staff on December 11, 1979, enclosed is the following information concerning the interim Auxiliary Building Secondary Containment Enclosure (ABSCE):

1. The scoping document for preoperational test No. TVA-9A (Interim) on the Auxiliary Building Gas Treatment System and the Interim Access Control System.
2. Pertinent excerpts from the test description of preoperational test No. TVA-9A (Interim).
3. A clarification of design requirements and preoperational test results for the interim ABSCE.
4. A copy of the March 29, 1976, TVA transmittal letter and enclosure from J. E. Gilleland to K. Kniel which originally submitted the TVA proposal for an interim ABSCE. The enclosure to the March 29, 1976, letter includes five drawings which show the interim ABSCE.

If you have any questions concerning this information, please get in touch with D. L. Lambert at FTS 854-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure

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ENCLOSURE 1

TVA SEQUOYAH

UNIT(S) 1 & 2

SCOPING DOCUMENT FOR PREOPERATIONAL TEST NO. TVA-9A (Interim)

TITLE: Auxiliary Building Gas Treatment System and Access Control System (Interim)

REVISION: 0

PREPARED BY: Joseph P. Pastry 4/23/76
DATE

SUBMITTED BY: G. E. Lerman 4-27-76
DATE

APPROVED BY: E. G. Bessley 4/27/76
DATE
for TVA (DED) BRANCH CHIEF

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2.0 REFERENCES

2.1 AUXILIARY BUILDING GAS TREATMENT SYSTEM

- (a) Flow diagrams: 47W866-2
47W866-10
47W866-11
- (b) Temporary architectural drawings: ABSCE Series
- (c) Control diagram: 47W610-30 - 3 & 4
- (d) Logic diagram: 47W611-30 - 5 & 6
- (e) Design criteria: SQN-DC-7.9, "Auxiliary Building Heating, Ventilation, and Air Conditioning Systems"
- (f) FSAR Section 6.2.3, "Containment Air Purification and Cleanup Systems," Section 9.4, "Heating, Ventilating, and Air Conditioning"
- (g) Regulatory Guide 1.52, "Design, Testing and Maintenance Criteria for Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants."

2.2 ACCESS CONTROL

- (a) Equipment drawings: 47W200 Series
- (b) Door and hardware schedule: 47W454-6, 7
- (c) Design Instruction: "Radiation Access Control."

3.0 DISCUSSION OF TEST

The test to be conducted will verify the capability of the Auxiliary Building Gas Treatment System (ABGTS) to function properly during accident conditions for which it was designed. In addition, proper functioning of the access control doors will be verified.

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4.2 ACCESS CONTROL

The test objective is to verify that controls and alarms necessary for proper regulations of access to potentially contaminated areas in the area defined by the interim ABSCE function as designed. Proper operation of locks, latches, and alarms for doors associated with Unit 1 equipment and/or contained within or are part of the interim ABSCE boundary shall be considered acceptable test results.

5.0 PREREQUISITES

That portion of Unit 1, and all equipment associated with the interim ABSCE, must be completed prior to this test. All components (ducting, filters, flow control dampers, etc.) associated with the Auxiliary Building Gas Treatment System must be completed. Installation and operability of building isolation dampers, general supply fans, and general exhaust fans must be assured. All penetrations of the interim ABSCE must be installed and properly sealed. Power and control circuitry must be operational for the ABGTS and associated dampers, instrumentation, and alarms. Control air must be available for pneumatically operated dampers.

Access control doors, locks, and other system components must be installed and operational. Power must be supplied to card-key readers, local alarms, Main Control Room alarms, and indicator lights.

6.0 ENVIRONMENTAL CONDITIONS

The test may be conducted at ambient conditions. Wind direction and velocity, ambient temperature, relative humidity, and outside barometric pressure shall be recorded during the test.

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In particular, the test portion which concerns the ABGTS will:

- (a) Verify the startup and control capabilities of the system, considering a single operating component failure.
- (b) Verify the capability to reach (within a specified time) and maintain the required negative pressure within the interim ABSCE defined for use during period between Unit 1 startup and Unit 2 startup. For the extent of this area see the temporary drawings marked ABSCE Series.
- (c) Verify the efficiency and proper operation of the components and instrumentation in the air cleanup unit.

The portion of the test related to the access control system will verify proper operation of locks, latches, and alarm annunciation for types 3, A, B, and C safety-related doors that are associated with Unit 1 equipment and/or contained within or are part of the interim Auxiliary Building Secondary Containment Enclosure boundary.

4.0 OBJECTIVES AND ACCEPTANCE CRITERIA

4.1 AUXILIARY BUILDING GAS TREATMENT SYSTEM

The test objective is to determine that the ABGTS has the capabilities necessary to reduce the concentration of radioactive nuclides in air releases from within the interim ABSCE to the environs during accidents to levels sufficiently low to keep the site boundary dose rate below the 10CFR100 guideline value. It must also minimize the spreading of airborne radioactivity within the Auxiliary Building following an accidental release in the fuel handling and waste packaging areas.

Individual system requirements needed to accomplish these objectives and the acceptance criteria for each requirement are listed in Table I.

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7.0 SPECIAL TEST EQUIPMENT

Permanently installed equipment will be utilized when appropriate. Special test equipment will be required for certain aspects of this test, however. Equipment required for testing the HEPA filters and charcoal adsorber banks shall be referenced in Regulatory Guide 1.52.

Negative pressure levels shall be verified with sensors accurate to ± 0.05 inches of water. Air flow rates shall be verified using an air velocity meter accurate to within ± 5 percent of the reading. Heater outputs shall be determined with a volt-ampere meter (or watt meter) accurate to within ± 1 kw. Heater temperature cutoff determination shall be made with sensors accurate to within ± 10 F.

8.0 SCOPE OF TESTING

The scope of testing to be performed includes performance tests of the Auxiliary Building Gas Treatment Systems, the interim Auxiliary Building Secondary Containment Enclosure, and all components of the ABGTS. It also includes functional tests of the doors and alarms required for proper operation of the radiation access control doors.

TABLE I: Individual Test Objectives and Acceptance Criteria (ABGTS)

Test Objective	Acceptance Criteria
Verification of proper ABGTS startup and interim ABSCE isolation	<p>A simulated Phase A Containment Isolation signal from either train A or B, or a simulated high radiation signal from the Auxiliary Building general exhaust vent, or a simulated high radiation signal from the Fuel Handling Area shall:</p> <p>(a) shut down the Auxiliary Building General Supply and Exhaust fans, and the Fuel Handling Area Exhaust Fans.</p> <p>(b) isolate the interim ABSCE by closing the following flow control dampers (ref. 2.1.a): FCO30-3, 6, 13, 18, 28, 29, 32, 33, 34, 35, 36, 41, 49, 55, 60, 69, 76, 79, 86, 87, 91, 96, 98, 106, 107, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 128, 129, 130, 131, 132, 137, 138, 140, 141, 160, 161, 166, 167, 271, 272, 275, 276, 294, 295.</p> <p>(c) shutoff charcoal heaters and start fans on both ABGTS air cleanup trains.</p> <p>(d) activate the appropriate modulating dampers associated with each air cleanup train.</p> <p>(e) start up RH heaters associated with each air cleanup train.</p>
Verification of manual shutdown and startup of each air cleanup train	Each train shall shutdown or start upon manually initiated signal from Main Control Room or from local control panel. Both capabilities shall be demonstrated.
Verification of startup of standby cleanup train upon failure of operation train	With one cleanup train operating and one on standby, automatic startup of standby train shall occur upon failure of operating train. Similar capability shall be shown for each train.
Verification of rated flow capacity of each train	Flow rate for each train shall be 9000 cfm $\pm 5\%$. If possible, flow measurement shall be taken in straight duct at least 8 duct diameters from nearest turn or branch.

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TABLE I: (Continued)

<u>Test Objective</u>	<u>Acceptance Criteria</u>
Verification of capability to reach and maintain the required negative pressure level in the interim ABSCE	With one train operating and interim ABSCE isolated, a negative pressure of 0.25 ± 0.05 inches water with respect to atmospheric shall be reached within 10.0 minutes after start-up of the train. A similar capability shall be shown for each train.
Verification of acceptable infiltration rate to interim ABSCE	At nominal negative pressure of 0.25 inch water gauge, inleakage to interim ABSCE shall be 6000 cfm. This may be measured by flow to cleanup train from interim ABSCE or by difference between total ABGTS flow through the vacuum relief duct.
Verification of charcoal heater performance	Heater output shall be at least 2.5 kw. Power cutoff shall occur when heater surface temperature exceeds 450 F. High heater surface temperature shall be by simulated signal (voltage) from temperature sensor.
Verification of leak tightness of HEPA filters and charcoal adsorbers	Tests and acceptance criteria shall be as specified in USAEC Regulatory Guide 1.52, Section C.5.
Verification of system instrumentation, controls, and alarms	System data outputs and performance shall be in accordance with references 2.1.c and d.
Verification of RH heater performance	Heater output shall be at least 32 kw continuous operation. Power cutoff shall occur when heater surface temperature exceeds 175 F. High heater surface temperature shall be by simulated signal (voltage) from temperature sensor.

→ JDJ

H. J. Green, Chief, Nuclear Generation Branch, 727 EB-C

D. R. Patterson, Chief, Mechanical Engineering Branch, W10C126 C-K

August 15, 1977

SEQUOYAH NUCLEAR PLANT - PREOPERATIONAL TEST PROGRAM - SQN-63

References: EN DES-Engineering Procedure 6.01, Revision 0, dated June 10, 1974.

Nuclear Operations Quality Assurance Manual, Part II, Section 4.1.

In accordance with the above references, a change sheet is attached for each preoperational test scoping document on which comments were made. Comments are addressed individually for:

Test No.

Title

TVA-9A (interim)

Auxiliary Building Gas Treatment
System and Access Control System,
Revision 0

Original sign.
E. G. Beash

D. R. Patterson

HLJ:JDJ:ST

Attachment

cc: F. W. Chandler (Electrical Branch Preop Test File), W8C126 K, w/1
Roy H. Dunham, W1A9 C-K
H. L. Jones, W9C171 C-K, w/1
R. H. Pierce, W4C126 C-K (2), w/2
MEDS, E4B37 C-K, w/1
L. D. Proctor, W9C136 C-K (EN DES Test Representative), w/1

8-15-77—RHD:PKM

cc: H. S. Fox, 716 EB-C (4), w/4 (3 for SQNP)
H. H. Mull, E7B24 C-K
G. G. Stack, Daisy (4), w/4
Power Manager's File, 730 PRB-C, w/1

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CHANGE SHEET
FOR SEQUOYAH NUCLEAR PLANT
PREOPERATIONAL TEST SCOPING DOCUMENT
TEST NO. TVA-9A (INTERIM)

TITLE: Auxiliary Building Gas Treatment System and Access Control System (Interim)

REVISION: 0 UNIT(S) 1 & 2 CHANGE SHEET NO. 1

PREPARED BY: Larry D. Proctor JH 4P Aug 10, 1977
DATE

SUBMITTED BY: G. E. German August 10, 1977
DATE

APPROVED BY: G. E. German 8/11/77
MEB BRANCH CHIEF DATE

CHANGES AND/OR COMMENTS:

... Table I:

Under "Test Objective" delete the following paragraph:

"Verification of charcoal heater performance"

Under "acceptance criteria" delete the following paragraph:

"Heater output shall be at least 2.5 kw. Power cut off...from temperature sensor."

Under "acceptance criteria" change the paragraph which reads:

"(c) Shut off charcoal heaters and start fans on both ABGTS air cleanup trains." to:

"(c) Start fans on both ABGTS air cleanup trains."

Under "Test Objective" add the following paragraph:

"Verification of uniformity of air flow distribution through HEPA filters and charcoal absorbers."

Under "acceptance criteria" add the following paragraph opposite the above:

"The distribution of air flow through the HEPA filters and charcoal absorbers shall be within $\pm 20\%$ of the average flow per unit in accordance with Regulatory Guide 1.52."

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ENCLOSURE 2

EXCERPTS FROM PREOP. TEST DESCRIPTION

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PREOPERATIONAL TEST INSTRUCTION TVA-9A
AUXILIARY BUILDING GAS TREATMENT SYSTEM
AND ACCESS CONTROL SYSTEM

Test Description

The Auxiliary Building Gas Treatment System to be tested consists of the ABGTS filter assemblies, heaters, fans, dampers, and interim ABSCE as detailed by EN DES in the drawings attached in Appendix H. The ventilation system is bounded by the interface with the normal Auxiliary Building exhaust system on its supply side and continues to the Shield Building exhaust vent.

This test will verify the capability of the ABGTS to function properly during accident conditions for which it was designed. In particular, the startup and control of the system, considering a single operating component failure will be verified, the capability to reach and maintain the required negative pressure within the interim ABSCE will be verified, and the efficiency and proper operation of the components and instrumentation in the air cleanup unit will also be verified.

The Access Control System to be tested consists of all type 3, A, B, and C safety related doors that are associated with Unit 1 equipment and/or contained within or are part of the interim ABSCE. This part of the test related to the access control system will verify proper operation of locks, latches, and alarm annunciation.

The completed test data package will become part of the plant historical records.

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1.0 OBJECTIVES

- 1.1 Demonstrate proper operation of locks, latches, and alarms for doors associated with Unit 1 equipment and/or contained within or are part of the interim ABSCE.
- 1.2 Verify proper ABGTS startup and interim ABSCE isolation due to isolation signals.
- 1.3 Verify the manual shutdown and startup of each air cleanup train.
- 1.4 Verify the startup of the standby cleanup train upon failure of operation of the opposite train.
- 1.5 Show that each train can produce its rated flow capacity.
- 1.6 Show that each train has the capability to reach and maintain the required negative pressure level in the interim ABSCE.
- 1.7 Verify an acceptable infiltration rate to the interim ABSCE.
- 1.8 Verify the leak tightness of the HEPA filters and charcoal adsorbers.
- 1.9 Verify system instruments, controls, and alarms.

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- 2.1.7 Construction Test Instructions have been completed on the air operated dampers in accordance with the applicable sections of the SNP Construction Manual (CTM).

FCO-30-146A
FCO-30-146B
FCO-30-149
FCO-30-280

FCO-30-157A
FCO-30-157B
FCO-30-158
FCO-30-279

Verified by CONST

Date

- 2.1.8 Construction Test Instructions have been completed on the solenoid valves in accordance with the applicable sections of the SNP Construction Manual (CTM).

FSV-30-146A
FSV-30-146B
FSV-30-279

FSV-30-157A
FSV-30-157B
FSV-30-280

FOR INFORMATION ONLY

Verified by CONST

Date

- 2.1.9 The Interim ABSCE as defined by TVA drawings 46W501-1 thru 5 in Appendix H has been established and all penetrations sealed so that during an Auxiliary Building isolation signal, a negative pressure of .25 inches of water can be maintained in the area.

Verified by CONST

Date

- 2.1.10 All temporary features (temporary ducts, dampers, walls, doors, etc.) associated with this system have either been cleared in accordance with the requirements of the SNP Construction Procedure Manual or those still in effect are listed below, identified by Tag No. or Jumper No. and applicable drawing, and marked on an "as constructed" drawing as specified by test prerequisite 2.1.1.

Tag/Jumper No.

Drawing No.

1637 056

Verified by CONST

Date

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PREOPERATIONAL TEST INSTRUCTION TVA-9A AUXILIARY BUILDING GAS TREATMENT SYSTEM AND ACCESS CONTROL SYSTEM

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3.0 PRECAUTIONS

- 3.1 Be sure that all doors are kept closed in the interim ABSCE while trying to measure the pressure in that area.
- 3.2 when measuring output of heater, be sure thermostats are set at their maximum setpoints.

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→ 5.4 Operation of ABGTS and Interim Isolation Upon Auxiliary Building Isolation Signals Including Leak Tightness of HEPA Filters and Charcoal Adsorbers.

5.4.1 Verify or place Auxiliary Building Heating and Vent System in service according to Sequoyah SOI 30.5A. All "A" fans are to be placed in service, however, all "B" fans are to be verified that they will start. (Caution should be taken not to have more than one Unit 1 or 2 supply or exhaust fan operating at one time.)

5.4.2 Verify or place Fuel Handling Area Exhaust fan in service according to SOI 30.5B. Fan A should be placed in service, however, Fan B should be verified that it will start. (Caution must be taken not to have both fans operating at once.)

5.4.3 Verify or place Safety Feature Equipment Coolers in service according to Sequoyah SOI 30.5C. (Note: Be sure the thermostat for each cooler is set low enough to ensure continuous operation of these units.)

5.4.4 Verify or place Auxiliary Building Gas Treatment System in the standby condition according to Sequoyah SOI 30.6B.

5.4.5 From Control Room instruments record wind direction and velocity, ambient temperature, relative humidity, barometric pressure, and time of day on Data Sheet 5.4.

5.4.6 Verify the list of equipment on Data Sheet 5.4 is in the condition as stated.

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5.4.24 Repeat test steps 5.4.1 thru 5.4.4 and record performance on Data Sheet 5.4.

5.4.25 Verify the equipment listed on Data Sheet 5.4 is in the condition stated.

→ NOTE: Auxiliary Building Isolation will now be initiated due to a simulated Unit 1 phase A Containment Isolation signal from either Train A or Train B. Interim area pressures will be recorded upon tripping the ABGTS, therefore several of the following steps can be performed simultaneously.

5.4.26 Place jumper across terminals 3 to 4, TR 612, output Train A, relay K606, panel 1-R-48, to simulate a Train A, Phase A Containment Isolation Signal. Record in Appendix E.

5.4.27 After Train A trips begin recording the pressure from PDIS-30-149 on Data Sheet 5.4 over a 20 minute span, with readings every 5 minutes. (This is the pressure in the inter-train ISOL) ←

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5.4.28 Verify the equipment listed on Data Sheet 5.4 is in the condition stated.

5.4.29 From Unit 1 computer located in control room, obtain ABGTS Train A flow from log point F2701 and record on Data Sheet 5.4.

5.4.29.1 Using tachometer listed in test section 4.0 measure the speed of the Train A motor pulley and fan pulley. Record on Data Sheet 5.4.

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- 5.4.30 In vacuum relief duct for ABGTS Train A, use velometer to measure the flow in the duct and record on Data Sheet 5.4. Calculate infiltration rate on data sheet.
-

NOTE: Test steps 5.4.31 and 5.4.43 can be performed during this test or can be performed at a later time as long as the previous conditions are set up.

- 5.4.31 With ABGTS Train A operating, use Sequoyah Plant Instruction TI-9 to measure the leak tightness of HEPA filters and charcoal adsorbers. Record results on Data Sheet 5.4. Attach copy of all data to test. This should include traverse velocities for each filter, and visual observation of equipment prior to testing. (This data will be used to meet acceptance criteria in test Section 6.0.)
-

- 5.4.32 After completing test step 5.4.27 and with Train A operating, begin opening doors in the interim ABSCE to reduce the pressure until annunciation, window 5, annunciator group XA-55-5C, panel 1-M-5 initiates. (If pressure does not reduce enough, FCO-30-148 may be manually operated.)
-

- 5.4.33 Close all doors opened in test step 5.4.32 and then clear annunciation that was initiated.
-

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- 5.4.34 Remove the jumper across terminals 3 to 4, TB612, output Train A, relay K606, panel 1-R-48, placed in test step 5.4.26. Record in Appendix E.
-

- 5.4.35 Shut down ABGTS Train A according to Sequoyah SOI 30.6C.
-

- 5.4.36 Repeat test steps 5.4.1 thru 5.4.4 and record performance on Data Sheet 5.4.
-

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5.4.37 Verify the equipment listed on Data Sheet 5.4 is in the condition stated.

5.4.38 Place jumper across terminals 3 to 4, TB612, output Train B, relay K606, panel 1-R-51, to simulate a Train B, Phase A Containment Isolation Signal. Record in Appendix E.

⇒ 5.4.39 After Train B trips begin recording the pressure from Pd 1S-30-146 on Data Sheet 5.4 over a 20 minute span, with readings every 5 minutes. (~~This is the pressure in the interim ABSCE.~~) ←

5.4.40 Verify the equipment listed on Data Sheet 5.4 is in the condition stated.

5.4.41 From Unit 2 computer located in control room, obtain ABGTS Train B flow from log point F2701 and record on Data Sheet 5.4.

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5.4.41.1 Using tachometer listed in test section 4.0, measure the speed of the Train B motor pulley and fan pulley. Record on Data Sheet 5.4.

5.4.42 In vacuum relief duct for ABGTS Train B, use Velometer to measure the flow in the duct and record on Data Sheet 5.4. Calculate infiltration rate on Data Sheet.

5.4.43 With ABGTS Train B operating, use Sequoyah Plant Instruction, TI-9 to measure the leak tightness of the HEPA filters and charcoal adsorbers. Record results on Data Sheet 5.4. Attach all data sheets to test. This should include traverse velocities thru each filter, and visual observation of equipment prior to testing. (This data will be used to meet acceptance criteria in test Section 6.0.)

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- 5.4.44 After completing test step 5.4.39 and with Train B operating, begin opening doors in the interim ABSCE to reduce the pressure until annunciation, window 5, annunciator group XA-55-5C, panel 1-M-5 initiates. (If pressure does not reduce enough, FCO-30-149, may be manually operated.)

- 5.4.45 Close all doors opened in test step 5.4.44 and then clear annunciation that was initiated.

- 5.4.46 Remove the jumper across terminals 3 to 4, TB612, output Train B, relay K606, panel 1-R-51 placed in test step 5.4.38. Record in Appendix E.

- 5.4.47 Shutdown ABGTS Train B according to Sequoyah SOI 30.6C.

- 5.4.48 Repeat test steps 5.4.1 thru 5.4.4 and record performance on Data Sheet 5.4.

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- 5.4.49 Verify the equipment listed on Data Sheet 5.4 is in the condition stated.

NOTE: Auxiliary Building Isolation will now be initiated due to a simulated high radiation signal from the Auxiliary Building general exhaust vent.

- 5.4.50 Place jumper across terminals 3 to 9, KO-R101B, panel O-M-12 to simulate high radiation in Auxiliary Building. Record in Appendix E.

- 5.4.51 Verify the equipment listed on Data Sheet 5.4 is in the condition stated.

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- 6.8 Proper ABGTS startup and interim ABSCE isolation due to a Phase A Containment Isolation Signal from either Train A or Train B was verified.

Test Director

Date

- 6.9 Proper ABGTS startup and interim ABSCE isolation due to a high radiation signal from the Auxiliary Building general exhaust vent was verified.

Test Director

Date

- 6.10 Proper ABGTS startup and interim ABSCE isolation by manual initiation from the main control room was verified.

Test Director

Date

- 6.11 The capability to reach and maintain within 10 minutes the required negative pressure of 0.25 ± 0.05 inches of water in the interim ABSCE was verified.

Test Director

Date

- 6.12 The flow rate for ABGTS Train A was verified to be 9000 cfm \pm 5% during interim ABSCE isolation.

Test Director

Date

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- 6.13 The flow rate for ABGTS Train B was verified to be 9000 cfm \pm 5% during interim ABSCE isolation.

Test Director

Date

- 6.14 The infiltration rate to interim ABSCE during ABGTS Train A operation was verified to be less than or equal to 6000 cfm.

Test Director

Date

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- 6.15 The infiltration rate to interim ABSCE during ABGTS Train B operation was verified to be less than or equal to 6000 cfm.

Test Director

Date

- 6.16 The leak tightness of ABGTS Train A HEPA filters was verified to meet the acceptance criteria.

Test Director

Date

- 6.17 The leak tightness of ABGTS Train A charcoal adsorbers was verified to meet the acceptance criteria.

Test Director

Date

- 6.18 The leak tightness of ABGTS Train B HEPA filters was verified to meet the acceptance criteria.

Test Director

Date

- 6.19 The leak tightness of ABGTS Train B charcoal adsorbers was verified to meet the acceptance criteria.

Test Director

Date

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- 6.20 The proper operation of the ABGTS alarms and annunciations was verified.

Test Director

Date

- 6.21 Proper operation of the alarms and controls for access control doors associated with Unit 1 equipment and/or contained within or are part of the interim ABSCE has been demonstrated.

Test Director

Date

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PREOPERATIONAL TEST INSTRUCTION TVA-9A
 AUXILIARY BUILDING GAS TREATMENT SYSTEM AND ACCESS CONTROL SYSTEM

TVA-9A
 Data Sheet 5.4
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TEST STEP	CONDITION	Exh Fan 1A	Exh Fan 2A	Sup. Fan 1A	Sup. Fan 2A	ABGT Fan A-A	Fuel Hdg Fan A	FCO-30-3	FCO-30-13	FCO-30-28	FCO-30-32	FCO-30-34	FCO-30-36	FCO-30-49	FCO-30-60	FCO-30-76	FCO-30-86	FCO-30-91	FCO-30-98	FCO-30-113
5.4.6	FCO's open, Fans running except ABGT fans																			
5.4.8	FCO's closed, Fans stopped except ABGT fan & AHU's																			
5.4.16	FCO's open. Fans running except ABGT fan																			
5.4.18	FCO's closed. Fans stopped except ABGT fan & AHU's																			
5.4.25	FCO's open. Fans running except ABGT fan																			
5.4.28	FCO's closed. Fans stopped except ABGT fan & AHU's																			
5.4.37	FCO's open. Fans running except ABGT fan																			
5.4.51	FCO's closed. Fans stopped except ABGT fan & AHU's																			
5.4.55	FCO's open. Fans running except ABGT fan																			
5.4.57	FCO's closed. Fans stopped except ABGT fan & AHU's																			

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NOTE: Place a check in each block, when equipment is in the stated condition.

-yy-

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PREOPERATIONAL TEST INSTRUCTION IWA-9A
 AUXILIARY BUILDING GAS TREATMENT SYSTEM AND ACCESS CONTROL SYSTEM

IWA-9A
 Data Sheet 5
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DATE: 10/1/77

POOR ORIGINAL

FOR INFORMATION ONLY

APPROVED FOR USE

TEST STEP	CONDITION	FCO-30-115	FCO-30-117	FCO-30-119	FCO-30-121	FCO-30-122	FCO-30-125	FCO-30-129	FCO-30-131	FCO-30-137	FCO-30-140	FCO-30-160	FCO-30-166	FCO-30-271	FCO-30-275	PENT. 1A-A, 714	PENT. 1A-A 669, AHU	PENT. 1A-A, 690, AHU	Pipe Chase 1A-A, 714	A-A, 714	SFP A-A, 714
5.4.6	FCO's open, fans running except ABGT fans																				
5.4.8	FCO's closed, fans stop- ped except ABGT fan & AHU's																				
5.4.16	FCO's open. Fans running except ABGT fan																				
5.4.18	FCO's closed. Fans stop- ped except ABGT fan & AHU's																				
5.4.25	FCO's open. Fans running except ABGT fan																				
5.4.28	FCO's closed. Fans stop- ped except ABGT fan & AHU's																				
5.4.37	FCO's open. Fans running except ABGT fan																				
5.4.51	FCO's closed. Fans stop- ped except ABGT fan & AHU's																				
5.4.55	FCO's open. Fans running except ABGT fan																				
5.4.57	FCO's closed. Fans stop- ped except ABGT fan & AHU's																				

NOTE: Place a check in each block, when equipment is in the stated condition.

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PREOPERATIONAL TEST INSTRUCTION TVA-9A
 AUXILIARY BUILDING GAS TREATMENT SYSTEM AND ACCESS CONTROL SYSTEM

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POOR ORIGINAL

DATA SHEET 5.4

TEST STEP	CONDITION	PENT. 2A-A 714, AHU	PENT. 2A-A 669, AHU	EGTS A-A, AHU	APW. BA A-A, AHU	PENT. 2A-A, 690, AHU	Pipe Chase 2A-A, AHU	FCO-30-296	FCO-30-299
5.4.6	FCO's open, fans running except ABGT fans								
5.4.8	FCO's closed, fans stop- ped except ABGT fan & AHU's								
5.4.16	FCO's open. Fans running except ABGT fan								
5.4.18	FCO's closed. Fans stop- ped except ABGT fan & AHU's								
5.4.25	FCO's open. Fans running except ABGT fan								
5.4.28	FCO's closed. Fans stop- ped except ABGT fan & AHU's								
5.4.37	FCO's open. Fans running except ABGT fan								
5.4.51	FCO's closed. Fans stop- ped except ABGT fan & AHU's								
5.4.55	FCO's open. Fans running except ABGT fan								
5.4.57	FCO's closed. Fans stop- ped except ABGT fan & AHU's								

FOR INFORMATION ONLY

APPROVED FOR USE

NOTE: Place a check in each block, when equipment is in the stated condition.

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PREOPERATIONAL TEST INSTRUCTION TVA-9a
 AUXILIARY BUILDING GAS TREATMENT SYSTEM AND ACCESS CONTROL SYSTEM

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DATA SHEET 3.4

POOR ORIGINAL

TEST STEP	CONDITION	ABGT Fan B-B	FCO-30-6	FCO-30-18	FCO-30-29	FCO-30-33	FCO-30-35	FCO-30-41	FCO-30-55	FCO-30-69	FCO-30-79	FCO-30-87	FCO-30-96	FCO-30-107	FCO-30-112	FCO-30-114
5.4.6	FCO's open, Fans running except ABGT fans															
5.4.10	FCO's closed. Fans stop- ped except ABGT fan & AHU's															
5.4.16	FCO's open. Fans running except ABGT fan															
5.4.20	FCO's closed. Fans stop- ped except ABGT fan & AHU's															
5.4.25	FCO's open. Fans running except ABGT fan															
5.4.40	FCO's closed. Fans stop- ped except ABGT fan & AHU's															
5.4.49	FCO's open. Fans running except ABGT fan															
5.4.51	FCO's closed. Fans stop- ped except ABGT fan & AHU's															
5.4.55	FCO's open. Fans running except ABGT fan															
5.4.59	FCO's closed. Fans stop- ped except ABGT fan & AHU's															

FOR INFORMATION ONLY

APPROVED FOR USE

NOTE: Place a check in each block, when equipment is in the stated condition.

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AUXILIARY BUILDING GAS TREATMENT SYSTEM AND ACCESS CONTROL SYSTEM

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DATA SHEET 5.4

POOR ORIGINAL

TEST STEP	CONDITION	FCO-30-116	FCO-30-118	FCO-30-170	FCO-30-123	FCO-30-124	FCO-30-128	FCO-30-130	FCO-30-132	FCO-30-138	FCO-30-141	FCO-30-161	FCO-30-167	FCO-30-272	FCO-30-276	PENT. 1B-B, 714, AHU	PENT. 1B-B, 669, AHU	PENT. 1B-B, 690, AHU	Pipe Chase 1B-B, A	CCS AHU	SFP B-B, AHU
5.4.6	FCO's open. Fans running except ABGT fans																				
5.4.10	FCO's closed. Fans stopped except ABGT fan & AHU's																				
5.4.16	FCO's open. Fans running except ABGT fan																				
5.4.20	FCO's closed. Fans stopped except ABGT fan & AHU's																				
5.4.25	FCO's open. Fans running except ABGT fan																				
5.4.40	FCO's closed. Fans stopped except ABGT fan & AHU's																				
5.4.49	FCO's open. Fans running except ABGT fan																				
5.4.51	FCO's closed. Fans stopped except ABGT fan & AHU's																				
5.4.55	FCO's open. Fans running except ABGT fan.																				
5.4.59	FCO's closed. Fans stopped except ABGT fan & AHU's																				

FOR INFORMATION ONLY

APPROVED FOR USE

NOTE: Place a check in each block, when equipment is in the stated condition.

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DATA SHEET 5.1

POOR ORIGINAL

TEST STEP	CONDITION	PENT. 2B-B, 714, AHU	Pent. 2B-B, 669, AHU	Pipe Chase 2B-B, AHU	PENT. 2B-B 690, AHU	EGTS B-B, AHU	APW, BA B-B, AHU	FCO-30-297	FCO-30-298
5.4.6	FCO's open. Fans running except ABGT fans								
5.4.10	FCO's closed. Fans stop- ped except ABGT fan & AHU's								
5.4.16	FCO's open. Fans running except ABGT fan								
5.4.20	FCO's closed. Fans stop- ped except ABGT fan & AHU's								
5.4.25	FCO's open. Fans running except ABGT fan								
5.4.40	FCO's closed. Fans stop- ped except ABGT fan & AHU's								
5.4.49	FCO's open. Fans running except ABGT fan								
5.4.51	FCO's closed. Fans stop- ped except ABGT fan & AHU's								
5.4.55	FCO's open. Fans running except ABGT fan								
5.4.59	FCO's closed. Fans stop- ped except ABGT fan & AHU's								

FOR INFORMATION ONLY

APPROVED FOR USE

NOTE: Place a check in each block, when equipment is in the stated condition.

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APPROVED FOR USE

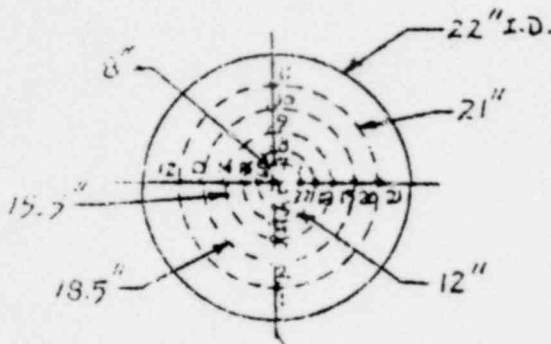
TVA-9A
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Data Sheet 5.4 (Continued)

→ 5.4.27 Interim ABSCE Pressure
PdIS-30-149 _____ time 0
_____ time 5 min
_____ time 10 min
_____ time 15 min
_____ time 20 min

Acceptance Criteria
-0.25 ± 0.05" H₂O
within 10 minutes

5.4.30 Vacuum Relief Flow



Velocity Pt 1 _____ fpm	Velocity Pt 12 _____ fpm
Velocity Pt 2 _____ fpm	Velocity Pt 13 _____ fpm
Velocity Pt 3 _____ fpm	Velocity Pt 14 _____ fpm
Velocity Pt 4 _____ fpm	Velocity Pt 15 _____ fpm
Velocity Pt 5 _____ fpm	Velocity Pt 16 _____ fpm
Velocity Pt 6 _____ fpm	Velocity Pt 17 _____ fpm
Velocity Pt 7 _____ fpm	Velocity Pt 18 _____ fpm
Velocity Pt 8 _____ fpm	Velocity Pt 19 _____ fpm
Velocity Pt 9 _____ fpm	Velocity Pt 20 _____ fpm
Velocity Pt 10 _____ fpm	Velocity Pt 21 _____ fpm
Velocity Pt 11 _____ fpm	Avg Velocity _____ fpm

Flow = Avg Vel x Area = _____ x (2.64 ft²) = _____ cfm
Infiltration Rate = ABGTS Fan Flow - Vacuum Relief Flow
= _____ cfm

Acceptance Criteria
≤ 6000 cfm

FOR INFORMATION ONLY

5.4.31 ABGTS Train A
HEPA Filter Eff _____
Charcoal Adsorber Eff _____

Acceptance Criteria
≥ 99.95%

5.4.41 ABGTS Fan B-B
Flow _____ cfm

Acceptance Criteria
9000 cfm ± 5%

5.4.41.1 ABGTS Fan B-B
Motor rpm _____
Fan rpm _____

POOR ORIGINAL

APPROVED FOR USE

Data Sheet 5.4 (Continued)

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→ 5.4.39

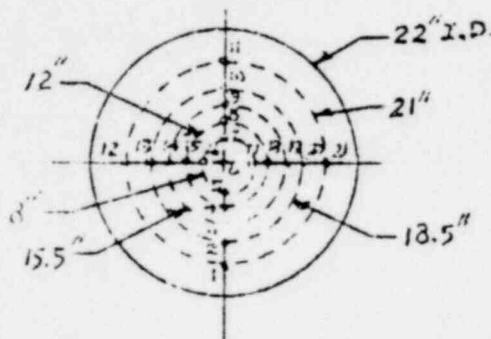
Interim ABSCE Pressure

PdIS-30-148

_____ time 0
_____ time 5 min
_____ time 10 min
_____ time 15 min
_____ time 20 min

Acceptance Criteria
 $-0.25 \pm 0.05" \text{ H}_2\text{O}$
within 10 minutes

5.4.42 Vacuum Relief Flow



Velocity Pt 1 _____ fpm	Velocity Pt 12 _____ fpm
Velocity Pt 2 _____ fpm	Velocity Pt 13 _____ fpm
Velocity Pt 3 _____ fpm	Velocity Pt 14 _____ fpm
Velocity Pt 4 _____ fpm	Velocity Pt 15 _____ fpm
Velocity Pt 5 _____ fpm	Velocity Pt 16 _____ fpm
Velocity Pt 6 _____ fpm	Velocity Pt 17 _____ fpm
Velocity Pt 7 _____ fpm	Velocity Pt 18 _____ fpm
Velocity Pt 8 _____ fpm	Velocity Pt 19 _____ fpm
Velocity Pt 9 _____ fpm	Velocity Pt 20 _____ fpm
Velocity Pt 10 _____ fpm	Velocity Pt 21 _____ fpm
Velocity Pt 11 _____ fpm	Avg Velocity _____ fpm

Flow = Avg Vel x Area = _____ x (2.64 ft^2) = _____ cfm
Infiltration Rate = ABGTS Fan Flow - Vacuum Relief Flow
= _____ cfm

Acceptance Criteria
 $\leq 6000 \text{ cfm}$

FOR INFORMATION ONLY

5.4.43

ABGTS Train B

HEPA Filter Eff _____

Charcoal Adsorber Eff _____

Acceptance Criteria
 $\geq 99.95\%$

POOR ORIGINAL

APPROVED FOR USE
PREOPERATIONAL TEST INSTRUCTION TVA-9A
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Appendix A

References

- 1.0 TVA Scoping Document for Preoperational Test TVA-9A (Interim),
Auxiliary Building Gas Treatment System and Access Control
System, SQN Dated 4-27-76.
- 2.0 Sequoyah Nuclear Plant FSAR section 6.2.3 and 9.4 .
- 3.0 TVA, Sequoyah Nuclear Plant System Operating Instruction 30.5,
"Auxiliary Building Heating and Ventilating System and Room
Coolers," and 30.6 "Auxiliary Building Emergency Gas Treatment
System."
- 4.0 TVA Flow Diagram Drawings
47W866-2 R13
47W866-10 R5
47W866-11 R6
- 5.0 TVA Control Diagram Drawings
47W610-30-3 R5
47W610-30-4 R8
- 6.0 TVA Logic Diagram Drawings **FOR INFORMATION ONLY**
47W611-30-5 R7
47W611-30-6 R8
- 7.0 TVA Mechanical Drawings
46W454-6 R11 47W920-6 R16 47W501-1 R1 47W501-4 R1
46W454-7 R13 47W920-23 R14 47W501-2 R0 47W501-5 R1
46W454-8 R4 47W920-23 R12 47W501-3 R0
- 8.0 TVA Electrical Drawings
45N779-20 R11 45N657-18 R3
45N769-9 R4 45N630-9 R4
45N690-2 R4 45N756-1 R9
45N630-4 R5 45N756-5 R10
45N744-2 R5 45N657-1 R3
45N744-3 R6 45N630-13 R4
 45N1676-4 R6
 45N1677-4 R7
- 9.0 TVA Instrument Tabulation Drawings
47B601-30-38 R9
47B601-30-39 R9 47B601-55-43 R5
45B601-30-40 R9 47B601-55-54 R3
47B601-30-41 R9 47B601-55-55 R3
47B601-30-43 R9 47B601-55-11 R3

APPROVED FOR USE

PREOPERATIONAL TEST INSTRUCTION TVA-9A
AUXILIARY BUILDING GAS TREATMENT SYSTEM
AND ACCESS CONTROL SYSTEM

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MISCELLANEOUS DRAWINGS

Appendix H

→ This test instruction is written to reflect the interim Auxiliary Building Secondary Containment Enclosure (ABSCE) as defined by EN DES on the following TVA drawings:

46W501-1	R1
46W501-2	RO
46W501-3	RO
46W501-4	R1
46W501-5	R1

These drawings will be attached to and become a part of this test instruction.

FOR INFORMATION ONLY

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6.0 ACCEPTANCE CRITERIA

- 6.1 Manual startup and shutdown of ABGTS Train A, from the local and main control stations was demonstrated.

Test Director

Date

- 6.2 Manual startup and shutdown of ABGTS Train B, from the main control room and local control station was demonstrated.

Test Director

Date

- 6.3 Upon failure of either cleanup train while in operation, the automatic startup of the opposite train was verified when it was in a standby position and with an ABI signal applied.

Test Director

Date

- 6.4 The output of the ABGTS Train A relative humidity heater was verified to be 32 KW \pm 3.2 KW.

Test Director

Date

- 6.5 Power cutoff to the ABGTS Train A relative humidity heater occurred when the heater surface temperature exceeded 175°F.

FOR INFORMATION ONLY

Test Director

Date

- 6.6 The output of the ABGTS Train B relative humidity heater was verified to be 32 KW \pm 3.2 KW.

Test Director

Date

- 6.7 Power cutoff to the ABGTS Train B relative humidity heater occurred when the heater surface temperature exceeded 175°F.

Test Director

Date

POOR ORIGINAL

APPROVED FOR USE

- 6.22 From the data received on the flow traverses for each HEPA filter assembly, the flow through each filter did not vary from the average by more than ± 20 percent.

Test Director

Date

- 6.23 From the data received on the flow traverses for each charcoal adsorber section, the flow through each adsorber did not vary from the average by more than ± 20 percent.

Test Director

Date

FOR INFORMATION ONLY

ENCLOSURE 3

CLARIFICATION OF DESIGN REQUIREMENTS AND PREOP TEST RESULTS

1. Background

The interim ABSCE boundaries were defined and operations during the interim period were discussed in the enclosures to the March 29, 1976, memo to NRC. As stated in that writeup, operation of the ABGTS is not changed by utilization of the interim ABSCE. ABGTS operation is described in FSAR Section 6.2.3.

2. Testing

Proper operation of the ABGTS and isolation of the interim ABSCE are verified during the preop testing program. In particular, the capability of the ABGTS to establish and maintain the required negative pressure within the interim ABSCE is verified. Infiltration to the interim ABSCE at the negative pressure is shown to be no greater than that value stated in Section 6.2 of the FSAR. In addition, it is also shown that redundant low-leakage dampers installed at the boundaries of the interim ABSCE close automatically to isolate the interim ABSCE upon receipt of an accident signal.

Test results to this date have shown that the required negative pressure can be established and maintained in the isolated interim ABSCE. However, infiltration rates have exceeded the acceptance criterion. TVA personnel are presently in the process of identifying and sealing leakage paths. The test results package will not be approved until the acceptance criterion is met.

3. Seismic Criteria

Isolation dampers and associated controls installed in the interim boundary are safety grade and seismically qualified. These dampers and controls interface with the previously installed two-unit ABSCE isolation damper controls which are also seismically qualified. Doors and hatch covers added to complete the interim boundary have not been seismically qualified. The short duration of the interim period between unit 1 completion and unit 2 completion coupled with the relatively small chance of a significant seismic occurrence during that period did not warrant the qualification of these doors.

4. Passage of Construction Material and Personnel

Two temporary roll-up doors have been installed in series at the entrance to the unit 2 containment to provide an interim boundary and also allow passage of construction materials. All heavy construction has been completed in unit 2 containment; thus it is expected that construction materials shipped through the doors will generally be small and easily moved. In addition, two personnel doors have been installed in parallel with the roll-up doors. These allow passage of personnel and hand-held materials without opening the roll-up doors. The series nature of the door installation ensures that at least one door will be closed except during passage of material, such as insulation, when its size requires that both doors be open simultaneously.

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Construction material which must be moved into the lower floors of the auxiliary building must pass through the main hatch at the 734 elevation. A temporary hatch cover has been installed at this hatch to provide an interim boundary. This hatch cover will remain closed except during passage of construction materials.

Upon initiation of an evacuation alarm, closure of the doors or hatch cover used for passage of materials will be the responsibility of employees stationed at the doors while open, who will be specifically charged with the duty of door closure upon alarm or after use for materials passage.

5. Single Failure

Redundant, series dampers are installed in all ducts penetrating the interim ABSCE. Doors in the boundary are either installed two-in-series or if a single door has been used, the doors are locked closed and under administrative control. In the closed position, these doors are considered to be passive components.