



NATIONAL TRANSPORTATION SAFETY BOARD
Investigative Hearing

Washington Metropolitan Area Transit Authority Metrorail train 302 that encountered heavy smoke in the tunnel between the L'Enfant Plaza Station and the Potomac River Bridge on January 12, 2015

GROUP	H
EXHIBIT	
42	

Agency / Organization

Washington Metropolitan Area Transit Authority

Title

PLNT 1000 testing and Inspection
Ventilation
9/28/2015



Washington Metropolitan Area Transit Authority

PLNT-1000

Instructions for Testing and Inspection
of PLNT Systems



PLNT-1000

INSTRUCTIONS FOR TESTING AND INSPECTION OF PLNT FIRE AND LIFE SAFETY SYSTEMS



Randall Grooman
Director, PLNT



Louis Brown
Acting Chief Safety Officer



Lou Viner
Deputy Chief Engineer, CENI

Issued: ___ / ___ / ___



Comment Form

Your comments on PLNT-1000 are invited. Please send all suggestions to:

The Deputy Chief Engineer, PLNT
600 Fifth Street, NW
Washington, DC 20001

Please include with each suggestion:

Test # _____

Subpart (letter) _____

Subsection # (if any) _____

Page # _____

Recommended Changes, Corrections or Questions:

Submitter Name and contact information: _____



Foreword

These **Instructions for Testing and Inspection of Tunnel Fan and Damper Systems** are designed to be used to ensure that the Plant (PLNT) Systems, Subsystems and Equipment are in satisfactory condition to ensure **Safety** to the public and employees, and to ensure continued **Reliability** of the PLNT systems. This manual must be reviewed and approved by CENI, PLNT Maintenance, and System Safety on an annual basis regardless of revisions to the document.

During the performance of these Test Procedures, each person involved must **abide by current Safety Rules and Regulations**. This includes, but is not limited to, all General Rules, Rules of Conduct, Operating Rules, Safety Rules, and Standard Operating Procedures as outlined in the **Metrorail Safety Rules And Procedures Handbook**. Any employee that must perform work along the tracks must have the proper **Roadway Worker Protection** training to do so. Avoid creating conditions which can result in damage to WMATA property. When making critical decisions, sound judgment must be exercised to ensure the safety of all. Do not proceed with an on-going procedure if a clear sense of danger is perceived; protect personnel and train movements immediately and start taking steps to remove the cause of the danger.

Each procedure must be carried out by **personnel that are trained and competent** to work on the equipment in the procedure. The PLNT personnel (or individual when only one person is involved) must have successfully completed the training outlined in the associated section in order to take the **Responsibility** for the successful completion of the procedure.

All special tools and test equipment used in each procedure must be WMATA **approved** for the job, must be in satisfactory condition, and when required, must be **duly calibrated**. Personnel must be knowledgeable in the proper **use of the tools and test equipment** required in the applicable Test Procedures. **Always use the right tool for the job.**

Checklists must be completed during the performance of the applicable procedure. Falsification or tampering with records can result in disciplinary actions.

Personnel shall open appropriate follow-up work orders when a fault or deficiency is found during the inspection and testing process. An FLS work order shall be opened in the event that the fault or deficiency found may compromise the function of safety-critical systems. Standard work orders will be opened for those faults or deficiencies that will not compromise the systems operation. These work orders must be Follow-up work orders as defined by Maximo, in order to relate the repair to the inspection where the fault was discovered.

Maintenance and Adjustment Procedures to optimize the performance of PLNT Equipment will be based on prescribed procedures written in **the PLNT-3000 as applicable or the relevant Equipment O&M Manuals**. When performing **Corrective Maintenance**, refer to the related O&M Manual for the applicable



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Equipment to find tips for **Troubleshooting**. Additional troubleshooting tips are included in the Test Procedure whenever these tips are perceived to be helpful. When an O&M Manual Procedure is not available, not accurate or not clear, supplemental Maintenance Instructions may accompany the applicable Test Procedure.



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Acronyms and Abbreviations

AAR	Association of American Railroads
AC	Alternating Current
AWG	American Wire Gauge
BOP	Book of Plans
CCW	Counterclockwise
CW	Clockwise
HMI	Human Machine Interface
IDW	Intrusion, Detection and Warning
IB	Inbound
K	Kilo (x1000)
LCP	Local Control Panel
LOTO	Lock Out – Tag Out
M	Mega (x1000000)
MCC	Motor Control Center
MOC	Maintenance Operations Center
OB	Outbound
OOC	Out of Correspondence
PLC	Programmable Logic Controller
ROCC / OCC	Rail Operations Control Center
RTU	Remote Terminal Unit
Rx	Receiver
Tx	Transmitter
UPE	Under Platform Exhaust
WMATA	Washington Metropolitan Area Transit Authority



1001 - Inspection and Testing of Tunnel Fans and Damper Components

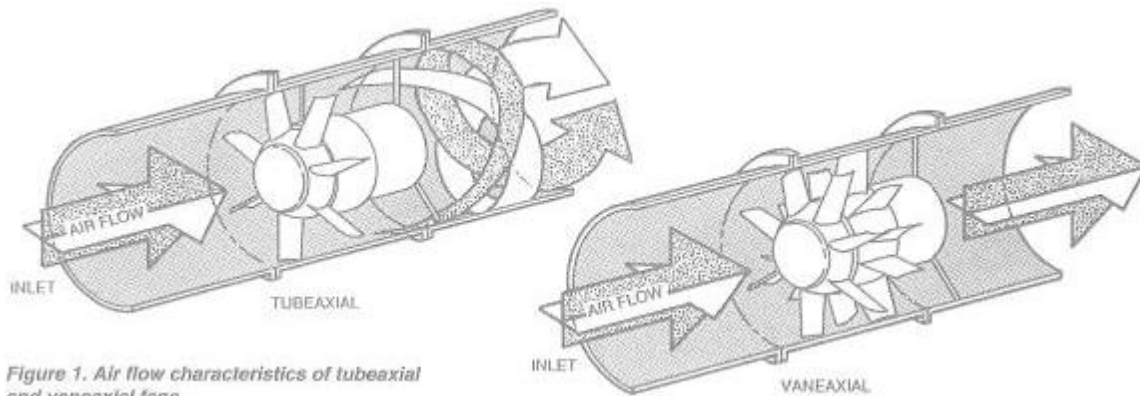


Figure 1. Air flow characteristics of tubeaxial and vaneaxial fans

Purpose

This procedure provides the steps required to carry out the inspection of tunnel fan components and controls in the fan and vent shafts. Tunnel fans located in fan shafts (FS), are used to ventilate and remove smoke from the tunnels. The fans are reversible (can be operated in exhaust mode or supply mode) and are controlled by the Rail Operations Control Center (ROCC). First responders can also operate fans locally at the fan shaft during an emergency. The fans and dampers work together to evacuate smoke. Vent shaft dampers close to seal the vent shafts and the fans either exhaust smoke/ noxious fumes from the tunnel system or supply fresh air to the tunnel system. First responders can also operate fans locally from the Fan Shaft during an emergency.

Reference Documents

- Western Vaneaxial/Tubeaxial O&M Manual
- Joy Series 1000 Axivane O&M Manual
- Howden Buffalo O&M Manual
- Standard Pneumatic Control and Flow Diagrams ST-M-139
- Remote Surveillance and Control Diagrams ST-M-142


Responsibility

Inspections are performed by trained PLNT personnel.

Prerequisites

Personnel performing inspections shall have completed the PLNT tunnel fan training course.

Frequency

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Each fan system, including fans, associated dampers, control systems, and pneumatic systems located in the fan and vent shafts shall be inspected and tested monthly.

Special Tools and Test Equipment

Standard hand tools and minimum PPE, including safety glasses, hearing protection, safety vest, flashlight, gloves, radio and safety shoes.

Records

PLNT Form 1001 Tunnel Fan and Damper Testing and Inspections Checklist

Results

The tunnel fans shall operate in the correct modes and the associated dampers shall fully open and close with no continuous abnormal indications. Intermittent indications that self-correct are expected and permissible. Corrective actions for equipment that is damaged or non-operational shall be noted on the inspection form and associated work orders shall be opened.

Procedure



Note: Prior to entering the fan and vent shafts, PLNT personnel must notify the ROCC operator of the commencing inspection and testing, as well as the location where the equipment will be temporarily out-of-service. PLNT personnel must also notify ROCC when the inspection is complete and the crew has left the shafts.

Tunnel Fan Inspection and Testing Instructions

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of work orders is to track failing components and systems.) Open Fire/Life Safety (FLS) work orders when deficiencies may render one or more fans inoperable; open regular work orders for non-FLS deficiencies.

Task	Testing and Inspection Task Description
10	Visually inspect the discharge grating at street level for trash/debris or overgrowth which might prevent or restrict airflow.
20	Verify the fan shaft telephone operates by calling ROCC. Give the location where tunnel fan testing/inspections is being performed. Inform the operator the fans will be temporarily out-of-service and alarms may be generated.
30	Perform visual inspection of the fans to verify there are no loose bolts or fasteners.
40	Perform visual inspection of the fan mounts and verify the fans are secure and the vibration isolators (springs/rubber) are intact.
50	Operate the fans locally in both manual "Exhaust" and "Supply" modes. Perform visual inspection for vibration in the fans and listen/check for any noise that might indicate abnormal operation.
60	Remove power to each fan by turning off the disconnect switch and following Lock Out/Tag Out (LOTO) procedures.




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1001 Testing and Inspection of Tunnel Fans and Damper Components

70	Perform visual inspection of all dampers and damper frames to verify there is no damage/deformation or loose, missing hardware or fasteners. Verify all damper blades are oriented correctly and are not missing.
80	Perform visual inspection of the fan housing, sound attenuators and flexible ductwork connections to verify there are no major tears or openings that would result in significant air leakages.
90	Perform visual inspection of the fan grilles; clean/remove any debris or trash from the grilles that would impact the airflow.
100	Perform visual inspection of the controls located within the control panel(s) to verify there are no air leaks or disconnected air lines. Verify the temperature gauge is operating and reads approximately the same as the tunnel temperature. For pneumatic controls, verify the regulated air pressure to the controls is between 20 and 25 PSI.
110	Visually inspect the water separator and drain if water is present.
120	Remove the LOTO and restore power to the fan; ensure fan selector switch is placed in "Remote Control" mode.
130	Request ROCC to command the fans to operate in "Emergency Exhaust" mode. <u>Record the name of the ROCC operator.</u>
140	Verify the fans operate in exhaust and no abnormal indications or alarms were generated, either at the fan control panel or at the ROCC. For abnormal indication(s) that do not self-correct, generate the required work order.
150	Request ROCC to command the fans to "Emergency Off." Verify the fans stop.
160	Request ROCC to command the fans to operate in "Emergency Supply" mode.
170	Verify the fans operate in the supply and no abnormal indications or alarms were generated, either at the fan control panel or at the ROCC. For abnormal indication(s) that do not self-correct, generate the required work order.
180	Perform visual inspection to verify the operation of the vent shaft dampers and bypass dampers (some fan shafts are not equipped with bypass dampers). Vent dampers and bypass dampers must be closed while the fans are operating in emergency modes (supply or exhaust).
190	Request ROCC to command the fans to "Emergency Off." Verify the fans stop.
200	Request ROCC to command the fans to "Auto Exhaust" mode. This is the normal operating mode for the tunnel fan system.
210	Notify ROCC the testing and inspection are complete.
220	Perform monthly fire extinguisher inspection.

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	Appendix - Inspection and Testing Checklists	

Appendix – Inspection and Testing Checklist

PLNT 1001 Tunnel Fan Testing and Inspection Checklist:

Inspection and Testing PLNT 1001

PLNT-1001 Testing and Inspections Checklist

Equipment: Tunnel Fans

Chain Marker: All Fan Shafts

Station: N/A

Location: N/A

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Tunnel Fan Systems. Tunnel Fans are used to provide airflow along the tunnel section. The location of a smoke or fire incident and the direction of customer evacuation determines how the fans are activated. The goal is to blow fresh air towards the customers as they exit the tunnel.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
10		Inspect street level discharge grating.
20		Verify telephone operation by contacting ROCC & inform ROCC of testing
30		Inspect for loose fasteners
40		Inspect fan mounts and vibration isolators.
50		Operate fans check for abnormal noise/vibration.
60		Remove power to each fan, LOTO.
70		Inspect dampers and frames.
80		Inspect housing, attenuator, ductwork.
90		Inspect fan grilles.
100		Inspect Control Cabinet and temperature gauge.
110		Inspect Water seperator.
120		Restore power to fans, place selector switch in "Remote Control"
130		Contact ROCC and request fan to operate in "Emergency Exhaust", record ROCC operator name.
140		Verify "Emergency Exhaust" operation.
150		Verify "Emergency Off" operation.
160		Contact ROCC and request fan to operate in "Emergency Supply".

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170		Verify "Emergency Supply" operation.
180		Verify damper operation for all modes.
190		Verify "Emergency Off" operation.
200		Request ROCC command fans to "Auto Exhaust".
210		Advice ROCC that testing and inspection is complete.
220		Inspect fire extinguisher.

Requirements for performing the Testing and Inspections:

Standard hand tools.

Minimum PPE to include hearing protection, safety glasses or goggles, safety vest, flashlight, gloves, radio, and safety shoes.

Date Completed: _____

Mechanic's #1 Name: _____

Supervisor's Sign: _____


Mechanic's #1 Sign: _____

Mechanic's #2 Name: _____

Mechanic's #2 Sign: _____

QC Performed: _____

WO#: _____

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	1002 Testing and Inspection of Section A Jet Fans and Components	

1002 –Testing and Inspection of Section A Jet Fans and Components

Purpose

This procedure provides the steps required to carry out the inspection and testing of jet fan components and controls, as well as related equipment. Jet fans are used to ventilate and remove smoke from tunnels. The fans are reversible (can be operated in an inbound mode or outbound mode) and are controlled by the Rail Operations Control Center (ROCC). First responders can also operate fans independently at the Jet Fan Control Room during emergencies. Multiple fans work together to evacuate smoke from the tunnel.

Reference Documents

- Jetfoil Axial-Flow Fan Assembly O&M Manual
- Standard Control and Flow Diagrams ST-M-148
- Drawings G4b-M-811L and G4b-M-812L
- Modes 401, 402, 403 and 404 Test Sheets for Section A PLNT 1002 Control Room #1

Responsibility

Inspections are performed by trained PLNT personnel.

Prerequisites

Personnel performing inspections shall have completed the PLNT tunnel fan training course.

Frequency

Each jet fan system, including fans, associated dampers, and control systems shall be inspected and tested monthly.

Special Tools and Test Equipment


Standard hand tools and minimum PPE, including safety glasses, hearing protection, safety vest, flashlight, gloves, radio and safety shoes.

Records

PLNT Form 1002 Section A Jet Fans Testing and Inspections Checklist

Results

The jet fans shall operate in the correct modes and the two tunnel dampers (East and West) shall operate with no continuous abnormal indications. Intermittent indications that self-correct are expected and permissible. Corrective actions for equipment that is damaged or non-operational shall be noted on the inspection form and associated work orders shall be opened.

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Procedure



Note: Prior to entering the fan and vent shafts, PLNT personnel must notify the ROCC operator of the commencing inspection and testing, as well as the location where the equipment will be temporarily out-of-service. PLNT personnel must also notify ROCC when the inspection is complete and the crew has left the shafts.

Jet Fan Section A Inspection and Testing

The automatic controls for the tunnel ventilation system assign operating modes for the jet fans based on the conditions within the tunnels. While the modes themselves are not visible, this series of tests is designed to test each of the emergency modes. The modes were developed based on an engineering analysis and computer modeling to optimize smoke removal and the safe evacuation of passengers. The ROCC needs to input three items: the direction of evacuation, the chain marker location of the fire or smoke incident, and the track number.

The details of each task for section 1002 follows. The test checklist and mode sheets are in the appendix. Follow the steps listed in the checklist, which will reference the mode sheets. Each mode sheet indicates the evacuation direction, incident chain marker location, and track number. The mode sheet also displays the operation configuration of the fans in the mode. The configuration must be verified as part of the test.

Jet Fan Inspection and Testing Instructions

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of work orders is to track all failing components and systems for trend analyses reports.) Open Fire/Life Safety (FLS) work orders when deficiencies may render one or more fans inoperable; open regular work orders for non-FLS deficiencies.



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1002 Testing and Inspection of Section A Jet Fans and Components

Task	Testing and Inspection Task Description
10	Request Roadway access from ROCC per the RWP to gain access to the Jet Fan Control Room.
20	Inform ROCC the fans will be temporarily out-of-service and alarms may be generated at the location where jet fan testing/inspections is being performed.
30	Visually inspect the pitot tubes/air flow switches are correctly showing airflow direction.
40	Verify the Motor Control Center/Jet Fan Control Room #1 telephone operates by calling ROCC. Record the name of the ROCC operator who will be performing the following remote operations tests.
50	Request ROCC operator to perform the following steps to prepare for the remote operation tests: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
60	Request ROCC operator to perform the following steps to shut off fans for the remote operation tests: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
70	Request ROCC operator to perform the following steps to open West Tunnel Damper for the remote operation tests: <ol style="list-style-type: none">1. Locate the West Tunnel Damper shown on ROCC console screen at "WTD."2. Left click on the "WTD."3. Select "Open."
80	Request ROCC operator to perform the following steps to open East Tunnel Damper for the remote operation tests: <ol style="list-style-type: none">1. Locate the East Tunnel Damper shown on ROCC console screen at "ETD."2. Left click on the "ETD."3. Select "Open." <p>Request ROCC operator stand-by while tunnel dampers are confirmed open before continuing the testing.</p>



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90	Visually verify the west tunnel damper is fully open.
100	Visually verify the east tunnel damper is fully open.
110	Request ROCC operator to report any alarms or abnormal indications on the ROCC console screen.
120	<p>Request ROCC operator to perform the following steps to perform Mode 401 Test for Section A PLNT 1002 Control Room #1:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 518505. Select "Track-1"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while tunnel dampers are confirmed closed and fans have started.</p>
130	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 401 Test Sheet</u> are running (JF23, JF11, JF12, JF13 and EES-2) <u>and</u> blowing in the correct direction.
140	Visually verify both tunnel dampers have closed.
150	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 401 Test Sheet</u> requirements. Record any discrepancies.
160	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
170	<p>Request ROCC operator to perform the following steps to prepare for the Mode 402 Test for Section A PLNT 1002 Control Room #1:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
180	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.



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190	<p>Request ROCC operator to perform the following steps to open West Tunnel Damper for the remote operation tests:</p> <ol style="list-style-type: none">4. Locate the West Tunnel Damper shown on ROCC console screen at “WTD.”5. Left click on the “WTD.”6. Select “Open.”
200	<p>Request ROCC operator to perform the following steps to open East Tunnel Damper for the remote operation tests:</p> <ol style="list-style-type: none">4. Locate the East Tunnel Damper shown on ROCC console screen at “ETD.”5. Left click on the “ETD.”6. Select “Open.” <p>Request ROCC operator stand-by while tunnel dampers are confirmed open before continuing the testing.</p>
210	<p>Visually verify the west tunnel damper is fully open.</p>
220	<p>Visually verify the east tunnel damper is fully open.</p>
230	<p>Request ROCC operator to report any alarms or abnormal indications on the ROCC console screen.</p>
240	<p>Request ROCC operator to perform the following steps to perform Mode 402 Test for PLNT 1002 Control Room #1:</p> <ol style="list-style-type: none">1. Click on the “Jet Fan Operation” gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select “Emergency Evac East”4. Enter Location Chain Marker: 518505. Select “Track-1”6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while tunnel dampers are confirmed closed and fans have started.</p>
250	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 402 Test Sheet</u> are running (JF21, JF11, JF12, JF13 and EES-2) <u>and</u> blowing in the correct direction.</p>
260	<p>Visually verify both tunnel dampers have closed.</p>
270	<p>After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 402 Test Sheet</u> requirements. Record any discrepancies.</p>



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1002 Testing and Inspection of Section A Jet Fans and Components

280	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
290	Request ROCC operator to perform the following steps to prepare for the Mode 403 Test for PLNT 1002 Control Room #1: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
300	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.
310	Request ROCC operator to perform the following steps to open West Tunnel Damper for the remote operation tests: <ol style="list-style-type: none">1. Locate the West Tunnel Damper shown on ROCC console screen at "WTD."2. Left click on the "WTD."3. Select "Open."
320	Request ROCC operator to perform the following steps to open East Tunnel Damper for the remote operation tests: <ol style="list-style-type: none">1. Locate the East Tunnel Damper shown on ROCC console screen at "ETD."2. Left click on the "ETD."3. Select "Open." <p>Request ROCC operator stand-by while tunnel dampers are confirmed open before continuing the testing.</p>
330	Visually verify the west tunnel damper is fully open.
340	Visually verify the east tunnel damper is fully open.
350	Request ROCC operator to report any alarms or abnormal indications on the ROCC console screen.
360	Request ROCC operator to perform the following steps to perform Mode 403 Test for PLNT 1002 Control Room #1: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 518505. Select "Track-2"6. Click "Execute"



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	Request ROCC operator stand-by for two minutes while tunnel dampers are confirmed closed and fans have started.
370	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 403 Test Sheet</u> are running (JF21, JF22, JF23, JF13 and EES-1) <u>and</u> blowing in the correct direction.
380	Visually verify both tunnel dampers have closed.
390	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 403 Test Sheet</u> requirements. Record any discrepancies.
400	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
410	Request ROCC operator to perform the following steps to prepare for the Mode 404 Test for PLNT 1002 Control Room #1 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
420	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.
430	Request ROCC operator to perform the following steps to open West Tunnel Damper for the remote operation tests: <ol style="list-style-type: none">1. Locate the West Tunnel Damper shown on ROCC console screen at "WTD."2. Left click on the "WTD."3. Select "Open."
440	Request ROCC operator to perform the following steps to open East Tunnel Damper for the remote operation tests: <ol style="list-style-type: none">1. Locate the East Tunnel Damper shown on ROCC console screen at "ETD."2. Left click on the "ETD."3. Select "Open." Request ROCC operator stand-by while tunnel dampers are confirmed open before continuing the testing.
450	Visually verify the west tunnel damper is fully open.



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460	Visually verify the east tunnel damper is fully open.
470	Request ROCC operator to report any alarms or abnormal indications on the ROCC console screen.
480	<p>Request ROCC operator to perform the following steps to perform Mode 404 Test for PLNT 1002 Control Room #1:</p> <ol style="list-style-type: none">7. Click on the "Jet Fan Operation" gray button on the ROCC console screen.8. Select "Enable Manual" in the "Modes" section of the pop-up box.9. Select "Emergency Evac East"10. Enter Location Chain Marker: 5185011. Select "Track-2"12. Click "Execute" <p>Request ROCC operator stand-by for two minutes while tunnel dampers are confirmed closed and fans have started.</p>
490	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 404 Test Sheet</u> are running (JF21, JF22, JF23, JF11 and EES-1) <u>and</u> blowing in the correct direction.
500	Visually verify both tunnel dampers have closed.
510	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 404 Test Sheet</u> requirements. Record any discrepancies.
520	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
530	<p>Request ROCC operator to perform the following steps to prepare to end testing in Control Room #1:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
540	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off. Ensure all the selector switches on each motor starter compartment are in the "AUTO" position.




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of PLNT Systems**

1002 Testing and Inspection of Section A Jet Fans and Components

550	Request ROCC operator to perform the following steps to prepare for the remote operation tests: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Disable Manual" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
560	Inform all field inspection and testing crew the testing has concluded and to await permission to access Roadway before exiting.
570	Request Roadway access from ROCC per the RWP to leave the Jet Fan Control Room; inform the operator the fans have been returned to normal service.

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Appendix – Checklist and Test Sheets

PLNT 1002 Jet Fan Testing and Inspection Checklist:

MODE 401 Test Sheet

MODE 402 Test Sheet

MODE 403 Test Sheet

MODE 404 Test Sheet

PLNT 1002 Inspection and Testing

PLNT-1002 Testing and Inspections Checklist

Equipment: Tunnel Jet Fans section "A"

Chain Marker: 494+00 to 535+35

Station: Jet Fan Control Room #1

Location: 517+00 on Track #1 (Outbound)

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Jet Fan system. Jet fans are used in various groupings to provide airflow along the tunnel section. The location of a smoke or fire incident and the direction of customer evacuation determines how the fans are activated. The goal is to blow fresh air towards the customers as they exit the tunnel. Tunnel dampers between the tracks close to ensure no short cycling of air, and to provide the most airflow.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
10		Contact ROCC for Roadway access
20		Advise ROCC fans out of service for testing, alarms possible
30		Visually inspect pitot tubes
40		Verify MCC / Control Room #1 telephone, record ROCC operator name
50		Request ROCC to "Enable Manual" on Jet Fans
60		Request ROCC to select "All Fans Off" on Jet Fans
70		Request ROCC to open West Tunnel Damper (WTD)
80		Request ROCC to open East Tunnel Damper (ETD)
90		Visually verify WTD open
100		Visually verify ETC open

PLNT 1002 Inspection and Testing

110		Request ROCC to report alarms
120		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "51850"; "Track 1"
130		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 401 Test Sheet</u>
140		Visually verify both tunnel dampers closed.
150		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 401 Test Sheet</u>
160		Record alarms from the ROCC. Ignore "GCS" alarms.
170		Request ROCC to select "All Fans Off" on Jet Fans
180		Perform visual inspection of Control Room. Verify motor starters off.
190		Request ROCC open West Tunnel Damper (WTD)
200		Request ROCC open East Tunnel Damper (ETD)
210		Visually verify WTD open
220		Visually verify ETD open
230		Request ROCC to report alarms
240		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "51850"; "Track 1"
250		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 402 Test Sheet</u>
260		Visually verify both tunnel dampers closed.

PLNT 1002 Inspection and Testing

270		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 402 Test Sheet</u>
280		Record alarms from the ROCC. Ignore "GCS" alarms.
290		Request ROCC to select "All Fans Off" on Jet Fans
300		Perform visual inspection of Control Room. Verify motor starters off.
310		Request ROCC open West Tunnel Damper (WTD)
320		Request ROCC open East Tunnel Damper (ETD)
330		Visually verify WTD open
340		Visually verify ETD open
350		Request ROCC to report alarms
360		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "51850"; "Track 2"
370		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 403 Test Sheet</u>
380		Visually verify both tunnel dampers closed.
390		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 403 Test Sheet</u>
400		Record alarms from the ROCC. Ignore "GCS" alarms.
410		Request ROCC to select "All Fans Off" on Jet Fans
420		Perform visual inspection of Control Room. Verify motor starters off.

PLNT 1002 Inspection and Testing

430		Request ROCC open West Tunnel Damper (WTD)
440		Request ROCC open East Tunnel Damper (ETD)
450		Visually verify WTD open
460		Visually verify ETD open
470		Request ROCC to report alarms
480		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "51850"; "Track 2"
490		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 404 Test Sheet</u>
500		Visually verify both tunnel dampers closed.
510		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 404 Test Sheet</u>
520		Record alarms from the ROCC. Ignore "GCS" alarms.
530		Request ROCC to select "All Fans Off" on Jet Fans
540		Perform visual inspection of Control Room; verify all starters in "AUTO"
550		Request ROCC to select "Disable Manual" on Jet Fans
560		Inform all field & test crew testing is complete
570		Request Roadway access from ROCC, follow RWP to exit Control Room.

Requirments for performing the Testing and Inspections:	
Standard hand tools.	
Minimum PPE to include hearing protection, safety glasses or goggles, safety vest, flashlight, gloves, radio, and safety shoes.	

PLNT 1002 Inspection and Testing

Date Completed: _____

Mechanic's #1 Name: _____

Supervisor's Sign: _____

Mechanic's #1 Sign: _____

Mechanic's #2 Name: _____

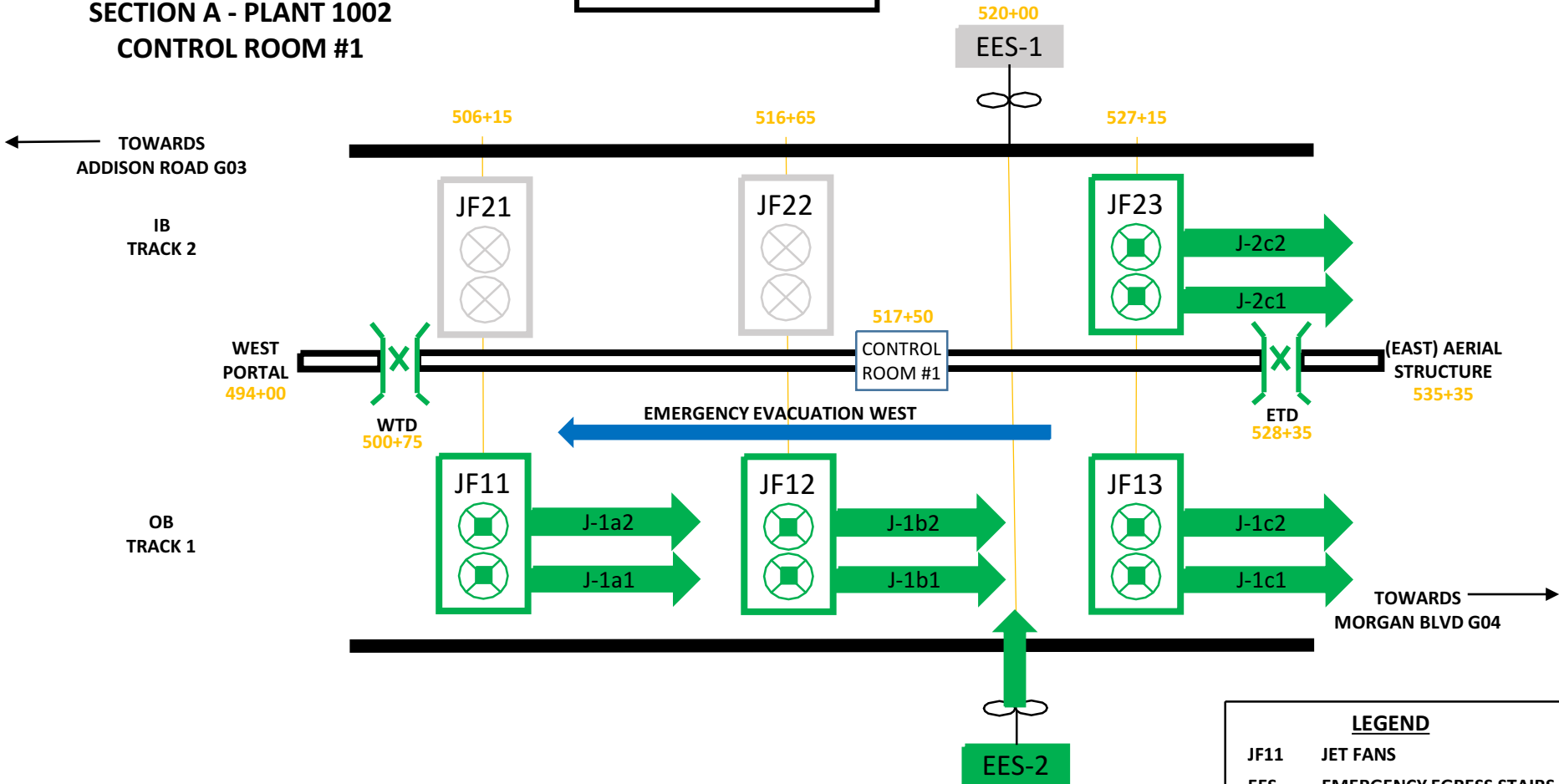
Mechanic's #2 Sign: _____

QC Performed: _____

WO#: _____

**JET FANS
SECTION A - PLANT 1002
CONTROL ROOM #1**

MODE 401 TEST SHEET



LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS
ETD	EAST TUNNEL DAMPER
WTD	WEST TUNNEL DAMPER
	OPEN TUNNEL DAMPER
	CLOSED TUNNEL DAMPER

REFERENCES
FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

FOR PLANT 1002 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST "ENABLE MANUAL" AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 518+50**
 - **TRACK 1**

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

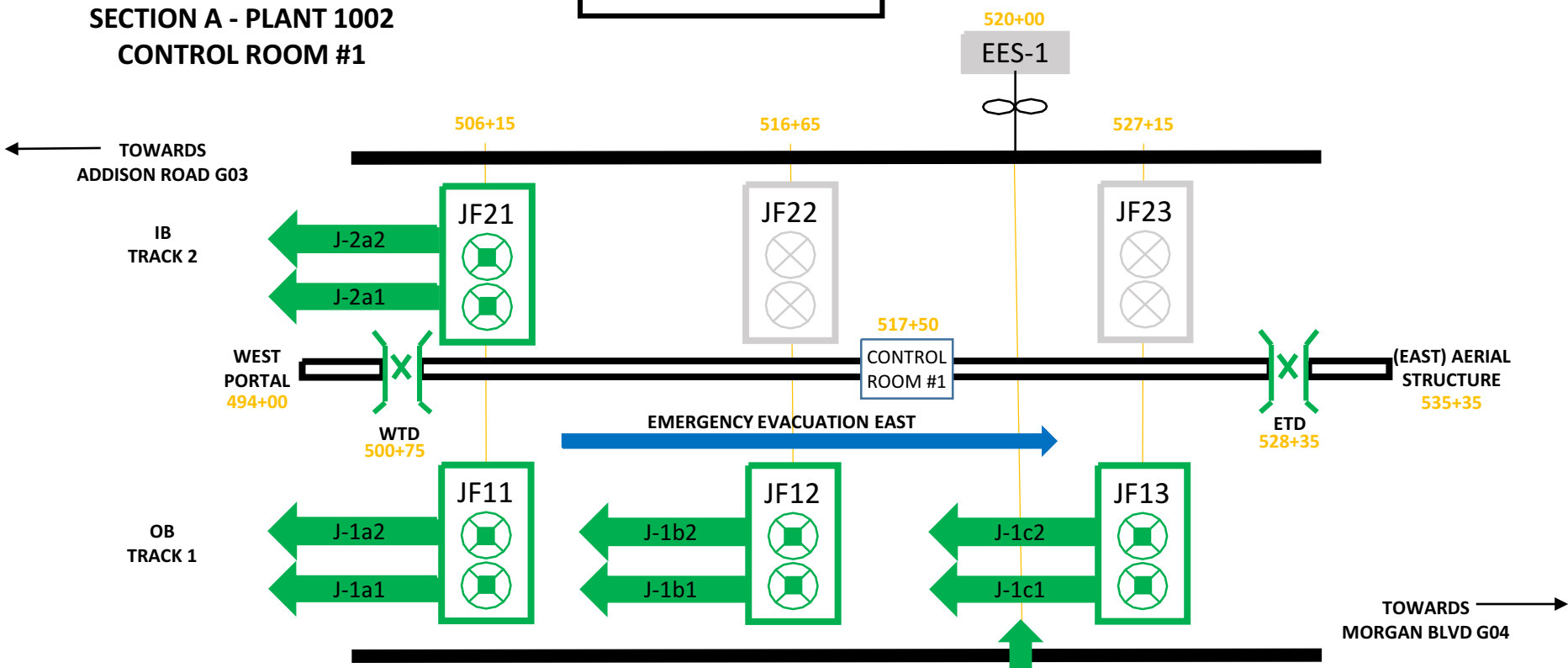
Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

**JET FANS
SECTION A - PLANT 1002
CONTROL ROOM #1**

MODE 402 TEST SHEET



LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS
ETD	EAST TUNNEL DAMPER
WTD	WEST TUNNEL DAMPER
	OPEN TUNNEL DAMPER
	CLOSED TUNNEL DAMPER

REFERENCES
FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

FOR PLANT 1002 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST "ENABLE MANUAL" AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 518+50**
 - **TRACK 1**

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

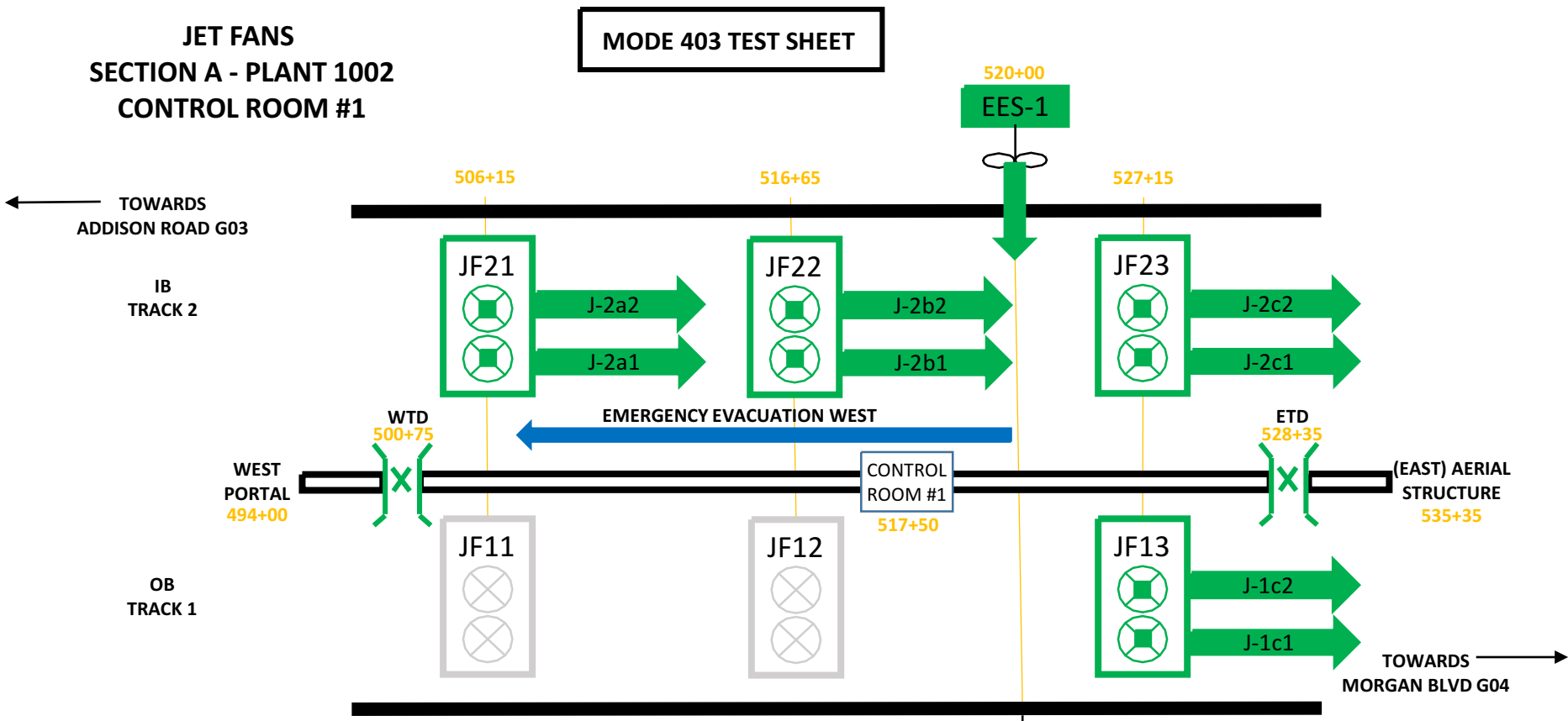
Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

**JET FANS
SECTION A - PLANT 1002
CONTROL ROOM #1**

MODE 403 TEST SHEET



LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS
ETD	EAST TUNNEL DAMPER
WTD	WEST TUNNEL DAMPER
	OPEN TUNNEL DAMPER
	CLOSED TUNNEL DAMPER

FOR PLANT 1002 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST "ENABLE MANUAL" AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 518+50**
 - **TRACK 2**

REFERENCES
FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

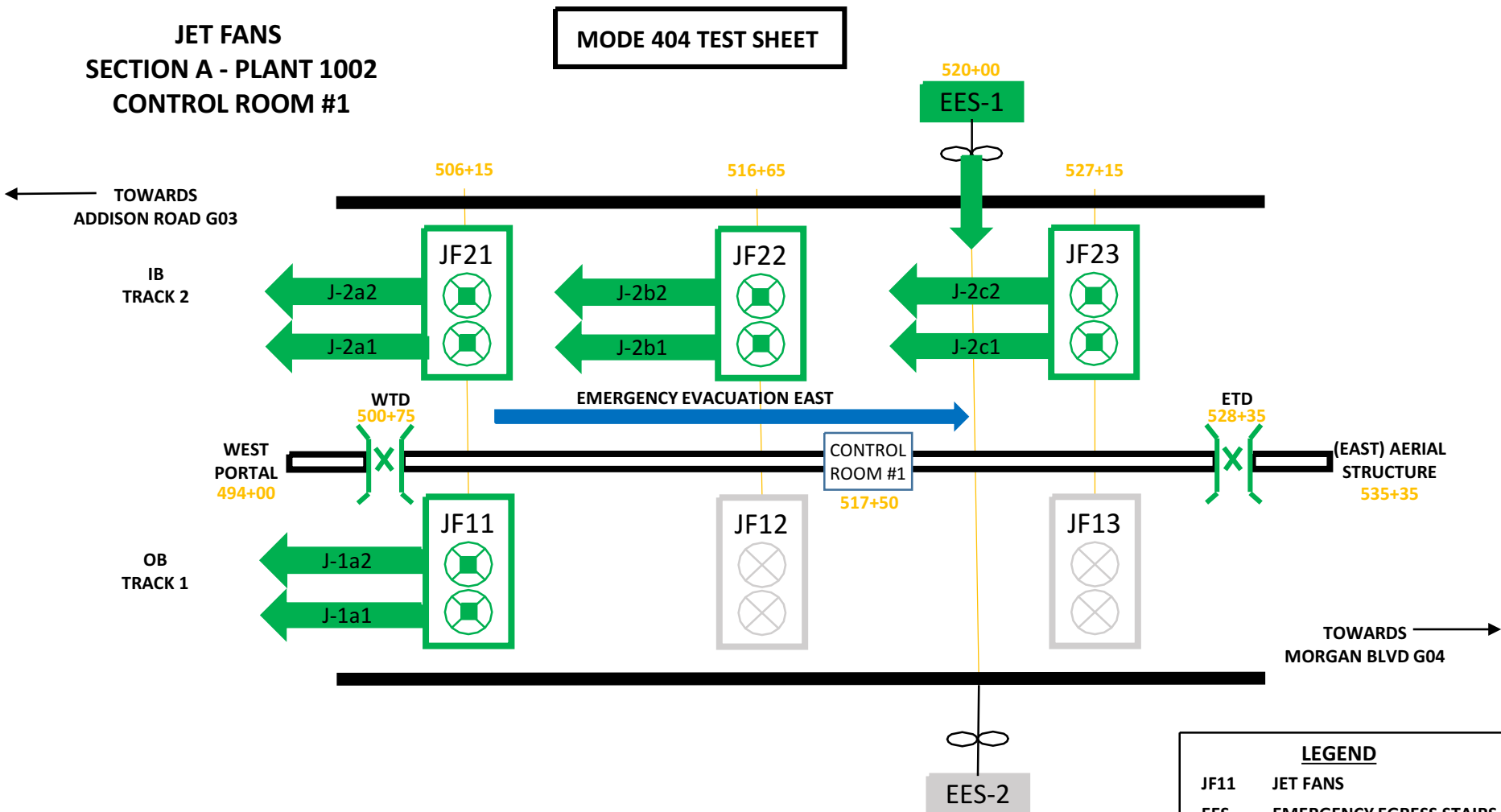
Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

**JET FANS
SECTION A - PLANT 1002
CONTROL ROOM #1**

MODE 404 TEST SHEET



LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS
ETD	EAST TUNNEL DAMPER
WTD	WEST TUNNEL DAMPER
	OPEN TUNNEL DAMPER
	CLOSED TUNNEL DAMPER

FOR PLANT 1002 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST "ENABLE MANUAL" AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 518+50**
 - **TRACK 2**

REFERENCES
FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

Jet Fan Operation


Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

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1003 – Inspection and Testing of Section B Jet Fans and Components

Purpose

This procedure provides the steps required to carry out the inspection and testing of jet fan components and controls, as well as related equipment. Jet fans are used to ventilate and remove smoke from tunnels. The fans are reversible (can be operated in an inbound mode or outbound mode) and are controlled by the Rail Operations Control Center (ROCC). First responders can also operate fans independently at the Jet Fan Control Room during emergencies. Multiple fans work together to evacuate smoke from the tunnel.

Reference Documents

- Jetfoil Axial-Flow Fan Assembly O&M Manual
- Standard Control and Flow Diagrams ST-M-148
- Drawings G4b-M-811L and G4b-M-812L
- Modes 405, 406, 407, 408, 409, 410, 411, 412, 413 and 414 Test Sheets for Section B PLNT 1003 Control Room #2

Responsibility

Inspections are performed by trained PLNT personnel.

Prerequisites

Personnel performing inspections shall have completed the PLNT tunnel fan training course.

Frequency

Each jet fan system, including fans, associated dampers, and control systems shall be inspected and tested monthly.

Special Tools and Test Equipment


Standard hand tools and minimum PPE, including safety glasses, hearing protection, safety vest, flashlight, gloves, radio and safety shoes.

Records

PLNT Form 1003 Section B Jet Fans Testing and Inspections Checklist

Results

The jet fans shall operate in the correct modes with no continuous abnormal indications. Intermittent indications that self-correct are expected and permissible. Corrective actions for equipment that is damaged or non-operational shall be noted on the inspection form and associated work orders shall be opened.

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Procedure



Note: Prior to entering the fan and vent shafts, PLNT personnel must notify the ROCC operator of the commencing inspection and testing, as well as the location where the equipment will be temporarily out-of-service. PLNT personnel must also notify ROCC when the inspection is complete and the crew has left the shafts.


Jet Fan Section B Inspection and Testing

The automatic controls for the tunnel ventilation system assign operating modes for the jet fans based on the conditions within the tunnels. While the modes themselves are not visible, this series of tests is designed to test each of the emergency modes. The modes were developed based on an engineering analysis and computer modeling to optimize smoke removal and the safe evacuation of passengers. The ROCC needs to input three items: the direction of evacuation, the chain marker location of the fire or smoke incident, and the track number.

The details of each task for section 1003 follows. Follow the steps listed in the checklist, which will reference the mode sheets. Each mode sheet indicates the evacuation direction, incident chain marker location, and track number. The mode sheet also displays the operation configuration of the fans in the mode. The configuration must be verified as part of the test.

Jet Fan Inspection and Testing Instructions

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of work orders is to track all failing components and systems for trend analyses reports.) Open Fire/Life Safety (FLS) work orders when deficiencies may render one or more fans inoperable; open regular work orders for non-FLS deficiencies.

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Task	Testing and Inspection Task Description
10	Request Roadway access from ROCC per the RWP to gain access to the Jet Fan Control Room.
20	Inform ROCC the fans will be temporarily out-of-service and alarms may be generated at the location where jet fan testing/inspections is being performed.
30	Visually inspect the pitot tubes/air flow switches are correctly showing airflow direction.
40	Verify the Motor Control Center/Jet Fan Control Room #2 telephone operates by calling ROCC. Record the name of the ROCC operator who will be performing the following remote operations tests.
50	Request ROCC operator to perform the following steps to prepare for the remote operation tests: <ol style="list-style-type: none"> 1. Click on the "Jet Fan Operation" gray button on the ROCC console screen. 2. Select "Enable Manual" in the "Modes" section of the pop-up box. 3. Ensure ROCC selects nothing else on their pop-up screen. 4. Click "Execute."
60	Request ROCC operator to perform the following steps to shut off fans for the remote operation tests: <ol style="list-style-type: none"> 1. Click on the "Jet Fan Operation" gray button on the ROCC console screen. 2. Select "All Fans Off" in the "Modes" section of the pop-up box. 3. Ensure ROCC selects nothing else on their pop-up screen. 4. Click "Execute."
70	Request ROCC operator to perform the following steps to perform Mode 405 Test for Section B PLNT 1003 Control Room #2: <ol style="list-style-type: none"> 1. Click on the "Jet Fan Operation" gray button on the ROCC console screen. 2. Select "Enable Manual" in the "Modes" section of the pop-up box. 3. Select "Emergency Evac West" 4. Enter Location Chain Marker: 54566 5. Select "Track-1" 6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed started.</p>
80	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 405 Test Sheet are running (JF41, JF42, JF31, JF32 and EES-3) and blowing in the correct direction required by the Mode 405 Test Sheet.



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90	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 405 Test Sheet</u> requirements. Record any discrepancies.
100	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
110	Request ROCC operator to perform the following steps to prepare for the Mode 406 Test for Section B PLNT 1003 Control Room #2: <ol style="list-style-type: none">1. Click on the “Jet Fan Operation” gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
120	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.
130	Request ROCC operator to perform the following steps to perform Mode 406 Test for Section B PLNT 1003 Control Room #2: <ol style="list-style-type: none">1. Click on the “Jet Fan Operation” gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select “Emergency Evac East”4. Enter Location Chain Marker: 545665. Select “Track-1”6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>
140	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 406 Test Sheet</u> are running (JF41, JF42, JF43, JF31, JF32, JF33 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 406 Test Sheet.
150	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 406 Test Sheet</u> requirements. Record any discrepancies.
160	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.



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170	<p>Request ROCC operator to perform the following steps to prepare for the Mode 407 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
180	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.</p>
190	<p>Request ROCC operator to perform the following steps to perform Mode 407 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 545665. Select "Track-2"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>
200	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 407 Test Sheet</u> are running (JF41, JF42, JF31, JF32 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 407 Test Sheet.</p>
210	<p>After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 407 Test Sheet</u> requirements. Record any discrepancies.</p>
220	<p>Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.</p>
230	<p>Request ROCC operator to perform the following steps to prepare for the Mode 408 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
240	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.</p>



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250	<p>Request ROCC operator to perform the following steps to perform Mode 408 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac East"4. Enter Location Chain Marker: 545665. Select "Track-2"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>
260	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 408 Test Sheet</u> are running (JF41, JF42, JF43, JF31, JF32 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 408 Test Sheet.</p>
270	<p>After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 408 Test Sheet</u> requirements. Record any discrepancies.</p>
280	<p>Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.</p>
290	<p>Request ROCC operator to perform the following steps to prepare for the Mode 409 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
300	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.</p>
310	<p>Request ROCC operator to perform the following steps to perform Mode 409 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 547355. Select "All Tracks"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>



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320	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 409 Test Sheet</u> are running (JF41, JF42, JF43, JF31, JF32, JF33 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 409 Test Sheet.
330	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 409 Test Sheet</u> requirements. Record any discrepancies.
340	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
350	Request ROCC operator to perform the following steps to prepare for the Mode 410 Test for Section B PLNT 1003 Control Room #2: <ol style="list-style-type: none">1. Click on the “Jet Fan Operation” gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
360	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.
370	Request ROCC operator to perform the following steps to perform Mode 410 Test for Section B PLNT 1003 Control Room #2: <ol style="list-style-type: none">1. Click on the “Jet Fan Operation” gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select “Emergency Evac East”4. Enter Location Chain Marker: 547355. Select “All Tracks”6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>
380	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 410 Test Sheet</u> are running (JF41, JF42, JF43, JF31, JF32, JF33 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 410 Test Sheet.
390	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 410 Test Sheet</u> requirements. Record any discrepancies.
400	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.



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410	<p>Request ROCC operator to perform the following steps to prepare for the Mode 411 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
420	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.</p>
430	<p>Request ROCC operator to perform the following steps to perform Mode 411 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 549505. Select "Track 1"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>
440	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 411 Test Sheet</u> are running (JF41, JF42, JF43, JF31, JF32, JF33 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 411 Test Sheet.</p>
450	<p>After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 411 Test Sheet</u> requirements. Record any discrepancies.</p>
460	<p>Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.</p>
470	<p>Request ROCC operator to perform the following steps to prepare for the Mode 412 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
480	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.</p>



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**Instructions for Testing and Inspection
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1003 - Appendix A Inspection and Testing Checklists

490	<p>Request ROCC operator to perform the following steps to perform Mode 412 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac East"4. Enter Location Chain Marker: 549505. Select "Track 1"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>
500	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 412 Test Sheet</u> are running (JF41, JF42, JF43, JF31, JF32, JF33 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 412 Test Sheet.</p>
510	<p>After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 412 Test Sheet</u> requirements. Record any discrepancies.</p>
520	<p>Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.</p>
530	<p>Request ROCC operator to perform the following steps to prepare for the Mode 413 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
540	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.</p>
550	<p>Request ROCC operator to perform the following steps to perform Mode 413 Test for Section B PLNT 1003 Control Room #2:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 549505. Select "Track 2"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>




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560	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 413 Test Sheet</u> are running (JF41, JF42, JF43, JF31, JF32, JF33 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 413 Test Sheet.
570	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 413 Test Sheet</u> requirements. Record any discrepancies.
580	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
590	Request ROCC operator to perform the following steps to prepare for the Mode 414 Test for Section B PLNT 1003 Control Room #2: <ul style="list-style-type: none">5. Click on the “Jet Fan Operation” gray button on the ROCC console screen.6. Select "All Fans Off" in the "Modes" section of the pop-up box.7. Ensure ROCC selects nothing else on their pop-up screen.8. Click "Execute."
600	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.
610	Request ROCC operator to perform the following steps to perform Mode 414 Test for Section B PLNT 1003 Control Room #2: <ul style="list-style-type: none">7. Click on the “Jet Fan Operation” gray button on the ROCC console screen.8. Select "Enable Manual" in the "Modes" section of the pop-up box.9. Select “Emergency Evac East”10. Enter Location Chain Marker: 5495011. Select “Track 2”12. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed to have started.</p>
620	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the <u>Mode 414 Test Sheet</u> are running (JF41, JF42, JF43, JF31, JF32, JF33 and EES-3) <u>and</u> blowing in the correct direction required by the Mode 414 Test Sheet.
630	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 414 Test Sheet</u> requirements. Record any discrepancies.
640	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.

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650	<p>Request ROCC operator to perform the following steps to prepare to end testing in Control Room #2:</p> <ol style="list-style-type: none"> 1. Click on the "Jet Fan Operation" gray button on the ROCC console screen. 2. Select "All Fans Off" in the "Modes" section of the pop-up box. 3. Ensure ROCC selects nothing else on their pop-up screen. 4. Click "Execute."
660	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.
670	Perform visual inspection of all the fan motor starters in the Control Room to ensure all the selector switches on each motor starter compartment are in the "AUTO" position.
680	<p>Request ROCC operator to perform the following steps to prepare for the remote operation tests:</p> <ol style="list-style-type: none"> 1. Click on the "Jet Fan Operation" gray button on the ROCC console screen. 2. Select "Disable Manual" in the "Modes" section of the pop-up box. 3. Ensure ROCC selects nothing else on their pop-up screen. 4. Click "Execute."
690	Inform all field inspection and testing crew the testing has concluded and to await permission to access Roadway before exiting.
700	Request Roadway access from ROCC per the RWP to leave the Jet Fan Control Room; inform the operator the fans have been returned to normal service.

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Appendix – Checklist and Test Sheets

PLNT 1003 Jet Fan Testing and Inspection Checklist:

MODE 405 Test Sheet

MODE 406 Test Sheet

MODE 407 Test Sheet

MODE 408 Test Sheet

MODE 409 Test Sheet

MODE 410 Test Sheet

MODE 411 Test Sheet

MODE 412 Test Sheet

MODE 413 Test Sheet

MODE 414 Test Sheet

PLNT 1003 Inspection and Testing

PLNT-1003 Testing and Inspections Checklist

Equipment: Tunnel Jet Fans section "B"

Chain Marker: 540+15 to 550+38.5

Station: Jet Fan Control Room #2

Location: 543+85

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Jet Fan system. Jet fans are used in various groupings to provide airflow along the tunnel section. The location of a smoke or fire incident and the direction of customer evacuation determines how the fans are activated. The goal is to blow fresh air towards the customers as they exit the tunnel.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
10		Contact ROCC for Roadway access
20		Contact ROCC to advise Jet Fan System testing
30		Visually inspect pitot tubes
40		Verify MCC / Control Room #2 telephone, record ROCC operator name
50		Request ROCC to "Enable Manual" on Jet Fans
60		Request ROCC to select "All Fans Off" on Jet Fans
70		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "54566"; "Track 1"
80		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 405 Test Sheet</u>
90		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 405 Test Sheet</u>
100		Record alarms from the ROCC. Ignore "GCS" alarms.
110		Request ROCC to select "All Fans Off" on Jet Fans
120		Perform visual inspection of Control Room. Verify motor starters off.
130		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "54566"; "Track 1"
140		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 406 Test Sheet</u>
150		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 406 Test Sheet</u>

PLNT 1003 Inspection and Testing

160		Record alarms from the ROCC. Ignore "GCS" alarms.
170		Request ROCC to select "All Fans Off" on Jet Fans
180		Perform visual inspection of Control Room. Verify motor starters off.
190		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "54566"; "Track 2"
200		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 407 Test Sheet</u>
210		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 407 Test Sheet</u>
220		Record alarms from the ROCC. Ignore "GCS" alarms.
230		Request ROCC to select "All Fans Off" on Jet Fans
240		Perform visual inspection of Control Room. Verify motor starters off.
250		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "54566"; "Track 2"
260		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 408 Test Sheet</u>
270		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 408 Test Sheet</u>
280		Record alarms from the ROCC. Ignore "GCS" alarms.
290		Request ROCC to select "All Fans Off" on Jet Fans
300		Perform visual inspection of Control Room. Verify motor starters off.
310		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "54735"; "All Tracks"
320		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 409 Test Sheet</u>
330		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 409 Test Sheet</u>
340		Record alarms from the ROCC. Ignore "GCS" alarms.
350		Request ROCC to select "All Fans Off" on Jet Fans
360		Perform visual inspection of Control Room. Verify motor starters off.

PLNT 1003 Inspection and Testing

370		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "54735"; "All Tracks"
380		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 410 Test Sheet</u>
390		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 410 Test Sheet</u>
400		Record alarms from the ROCC. Ignore "GCS" alarms.
410		Request ROCC to select "All Fans Off" on Jet Fans
420		Perform visual inspection of Control Room. Verify motor starters off.
430		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "54950"; "Track 1"
440		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 411 Test Sheet</u>
450		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 411 Test Sheet</u>
460		Record alarms from the ROCC. Ignore "GCS" alarms.
470		Request ROCC to select "All Fans Off" on Jet Fans
480		Perform visual inspection of Control Room. Verify motor starters off.
490		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "54950"; "Track 1"
500		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 412 Test Sheet</u>
510		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 412 Test Sheet</u>
520		Record alarms from the ROCC. Ignore "GCS" alarms.
530		Request ROCC to select "All Fans Off" on Jet Fans
540		Perform visual inspection of Control Room. Verify motor starters off.
550		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "54950"; "Track 2"
560		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 413 Test Sheet</u>
570		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 413 Test Sheet</u>

PLNT 1003 Inspection and Testing

580		Record alarms from the ROCC. Ignore "GCS" alarms.
590		Request ROCC to select "All Fans Off" on Jet Fans
600		Perform visual inspection of Control Room. Verify motor starters off.
610		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "54950"; "Track 2"
620		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 414 Test Sheet</u>
630		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 414 Test Sheet</u>
640		Record alarms from the ROCC. Ignore "GCS" alarms.
650		Request ROCC to select "All Fans Off" on Jet Fans
660		Perform visual inspection of Control Room. Verify motor starters off.
670		Perform visual inspection of Control Room; verify all starters in "AUTO"
680		Request ROCC to select "Disable Manual" on Jet Fans
690		Inform all field & test crew testing is complete
700		Request Roadway access from ROCC, follow RWP to exit Control Room.
Standard hand tools.		
Minimum PPE to include hearing protection, safety glasses or goggles, safety vest, flashlight, gloves, radio, and safety shoes.		

Date Completed: _____

Mechanic's #1 Name: _____

Supervisor's Sign: _____

Mechanic's #1 Sign: _____

Mechanic's #2 Name: _____

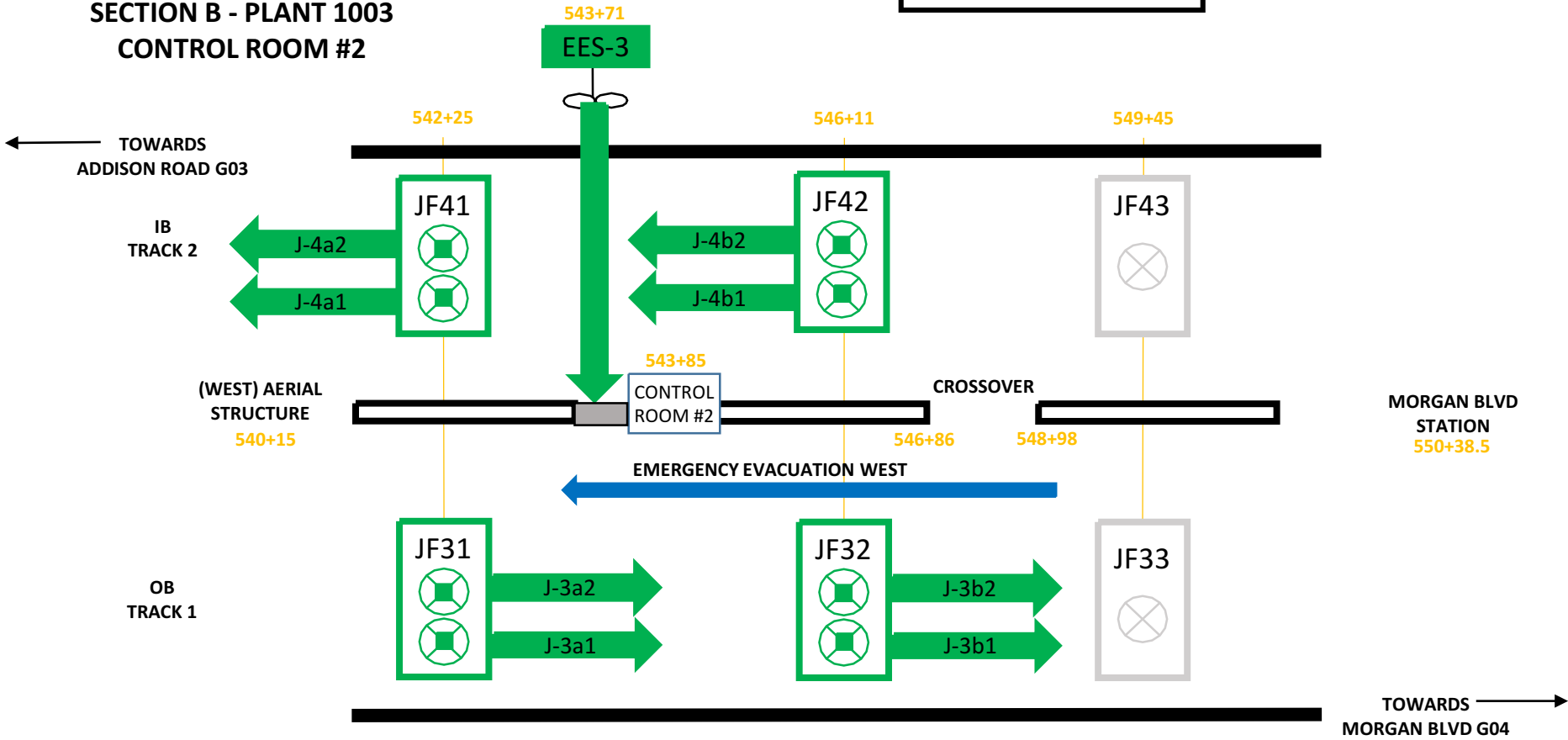
Mechanic's #2 Sign: _____

QC Performed: _____

WO#: _____

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

MODE 405 TEST SHEET



FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

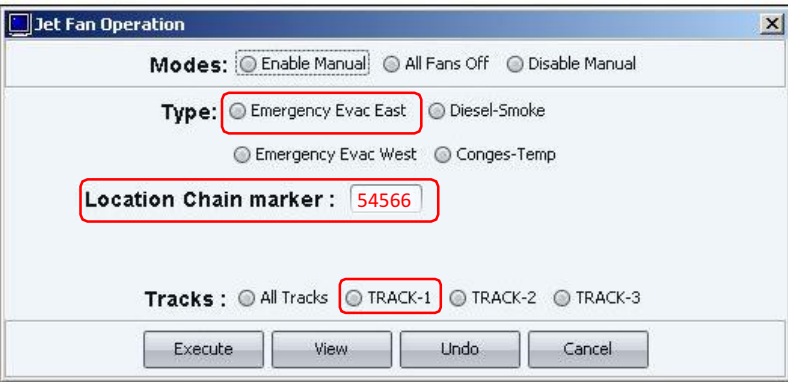
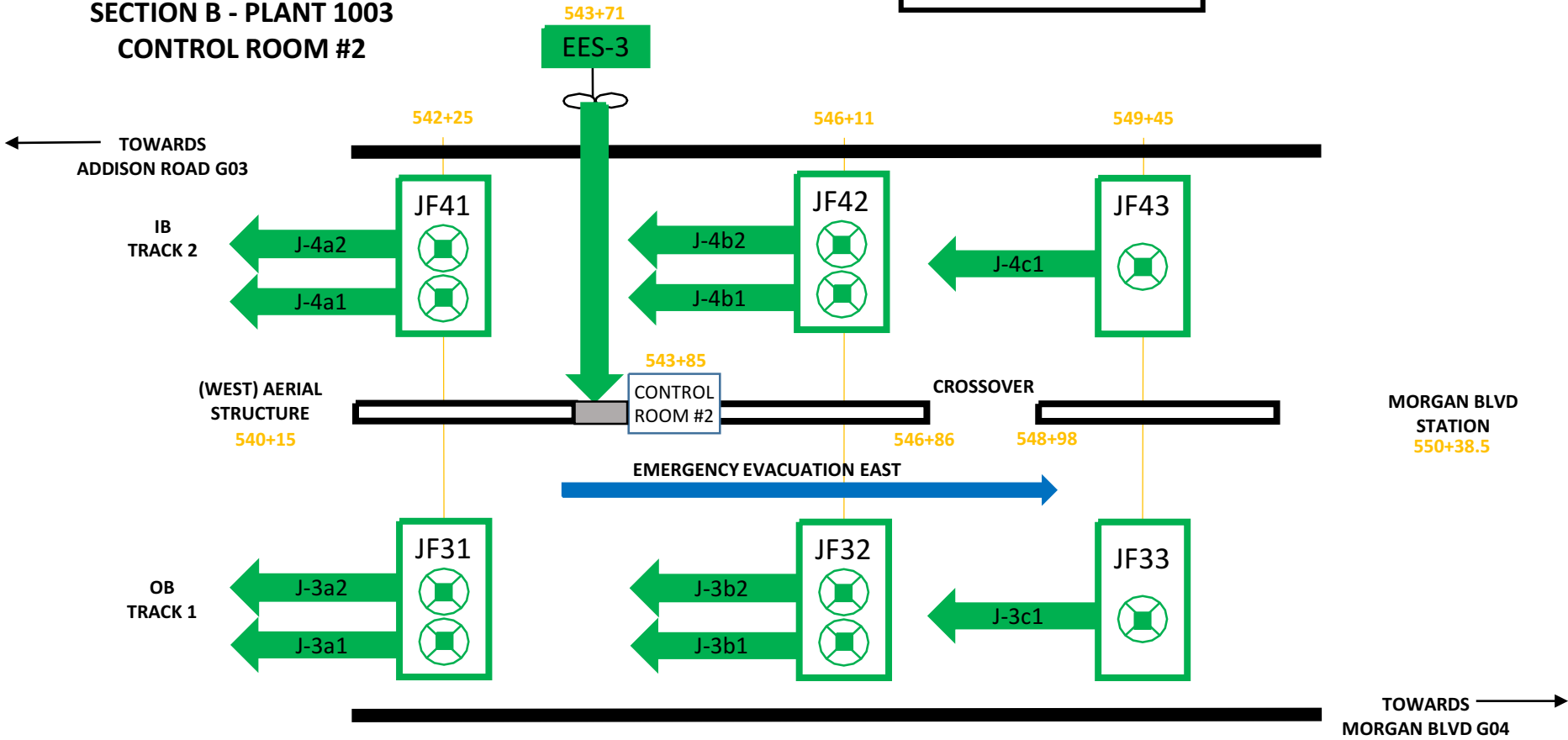
- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 545+66**
 - **TRACK 1**

LEGEND	
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES
FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

MODE 406 TEST SHEET



FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 545+66**
 - **TRACK 1**

LEGEND	
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

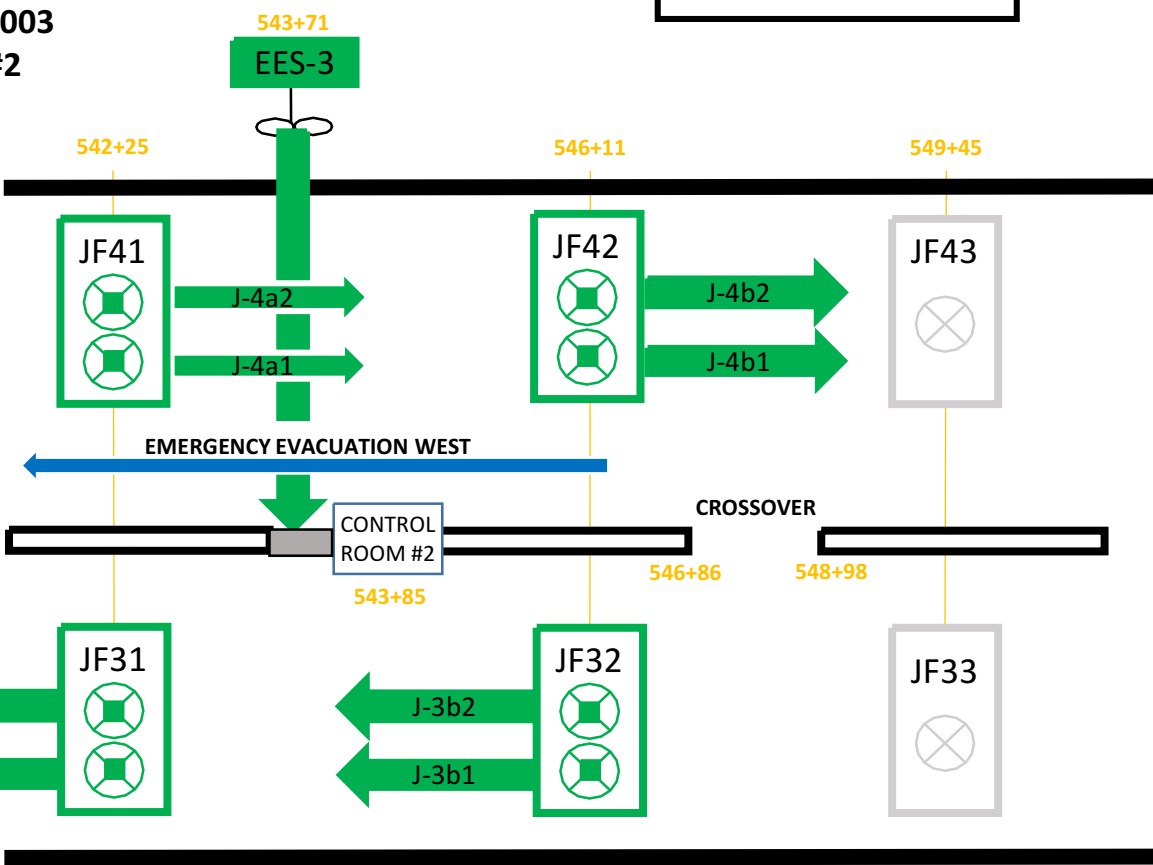
REFERENCES
FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

MODE 407 TEST SHEET

← TOWARDS
ADDISON ROAD G03

IB
TRACK 2



(WEST) AERIAL
STRUCTURE
540+15

CONTROL
ROOM #2
543+85

CROSSOVER
546+86

548+98

MORGAN BLVD
STATION
550+38.5

OB
TRACK 1

→ TOWARDS
MORGAN BLVD G04

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

**FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A
JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT
FIRE INCIDENT AS FOLLOWS:**

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 545+66**
 - **TRACK 2**

LEGEND

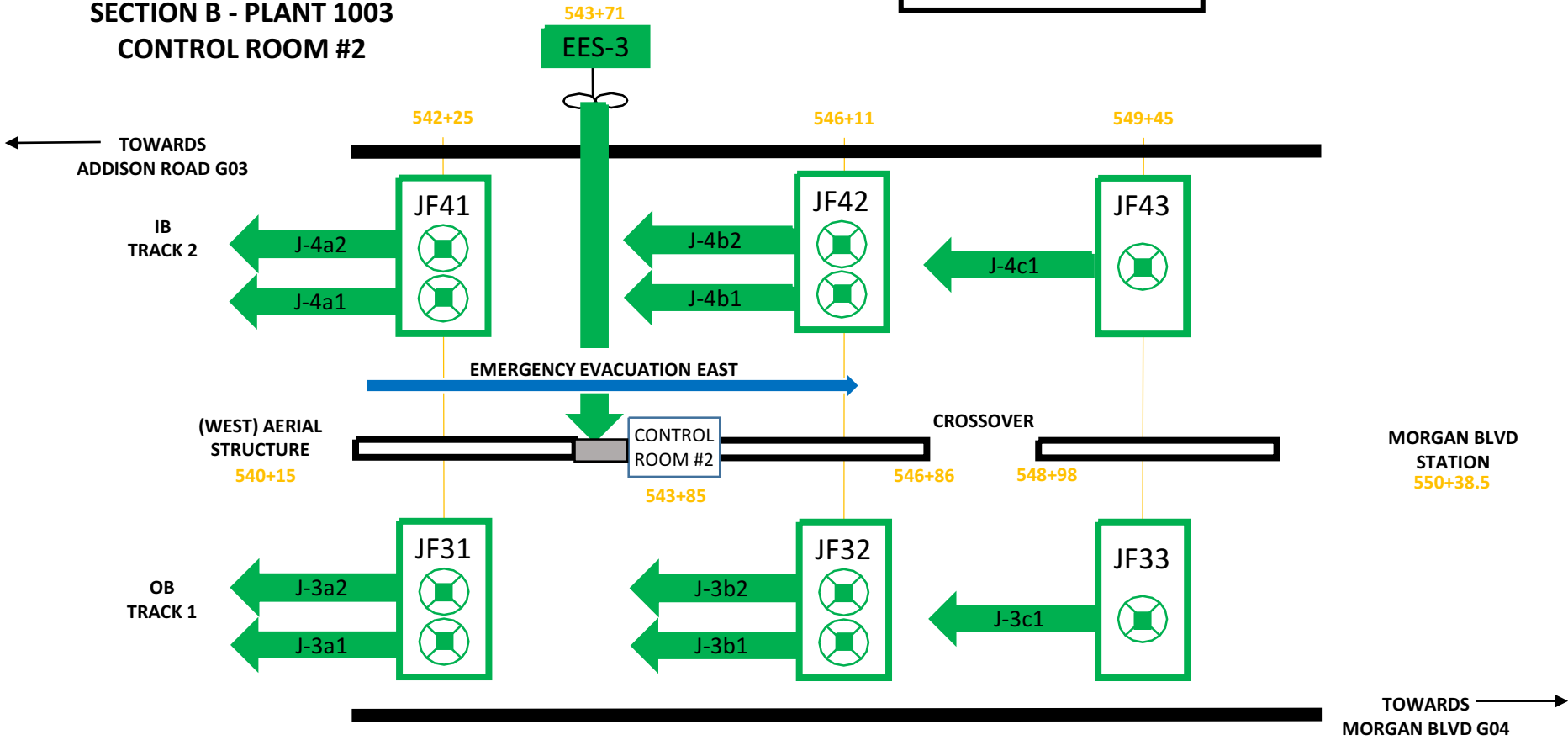
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042,
DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

MODE 408 TEST SHEET



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 545+66**
 - **TRACK 2**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

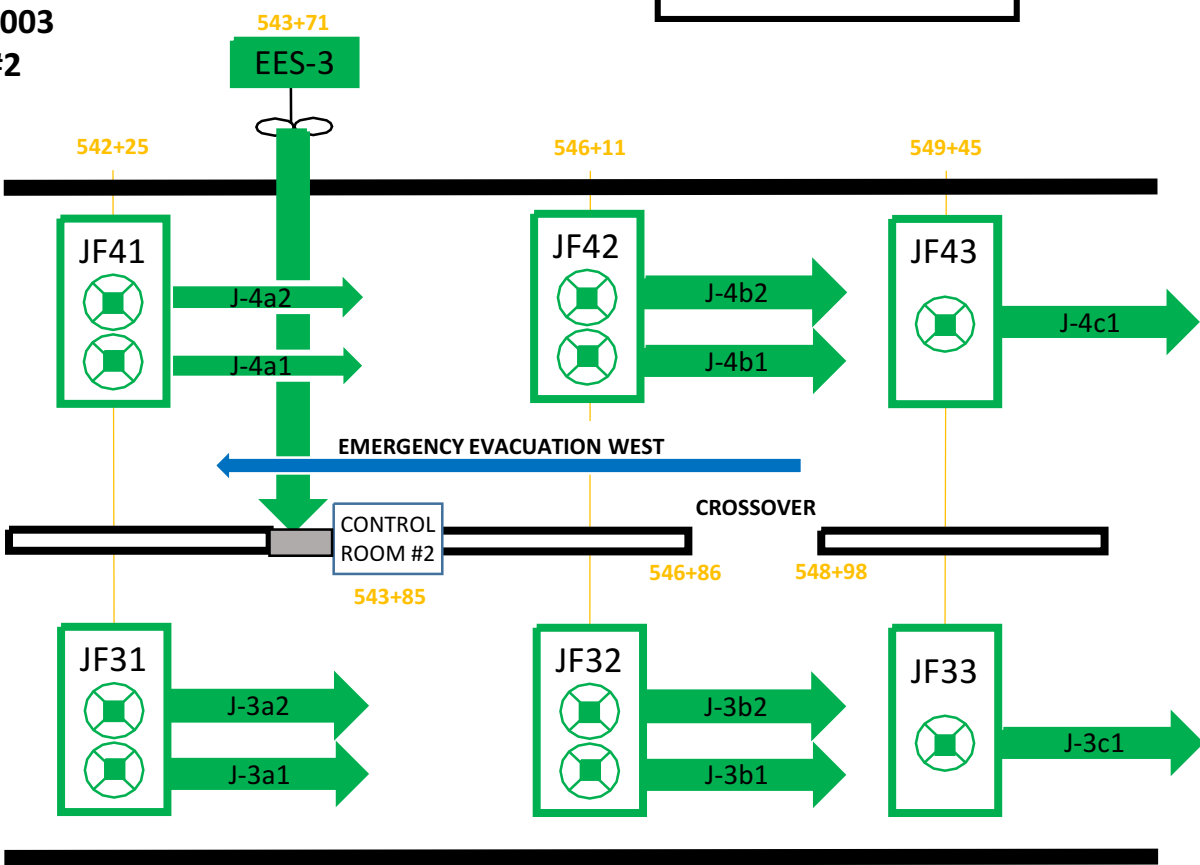
MODE 409 TEST SHEET

← TOWARDS
ADDISON ROAD G03

IB
TRACK 2

(WEST) AERIAL
STRUCTURE
540+15

OB
TRACK 1



→ TOWARDS
MORGAN BLVD G04

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 547+35**
 - **ALL TRACKS**

LEGEND

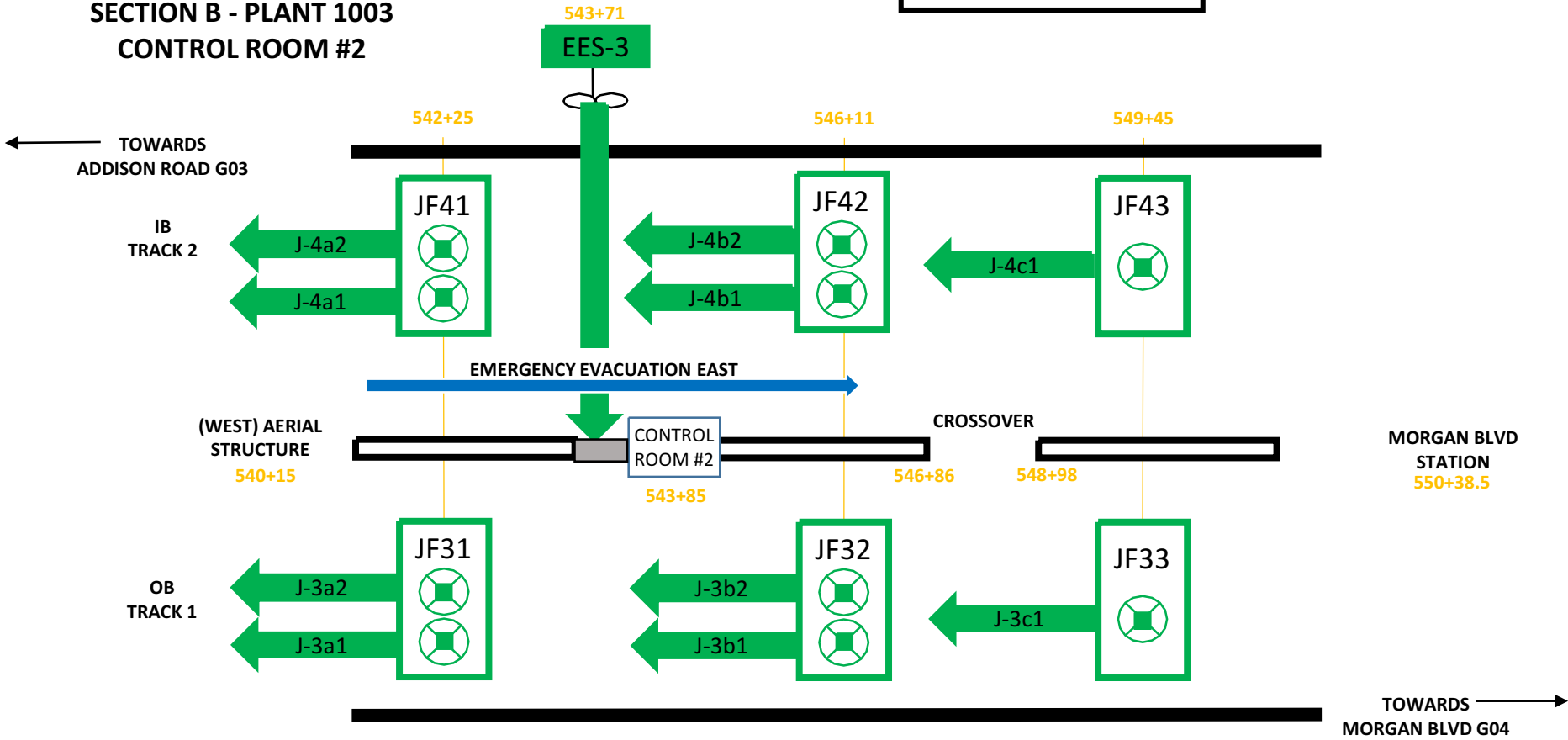
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

MODE 410 TEST SHEET



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 547+35**
 - **ALL TRACKS**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

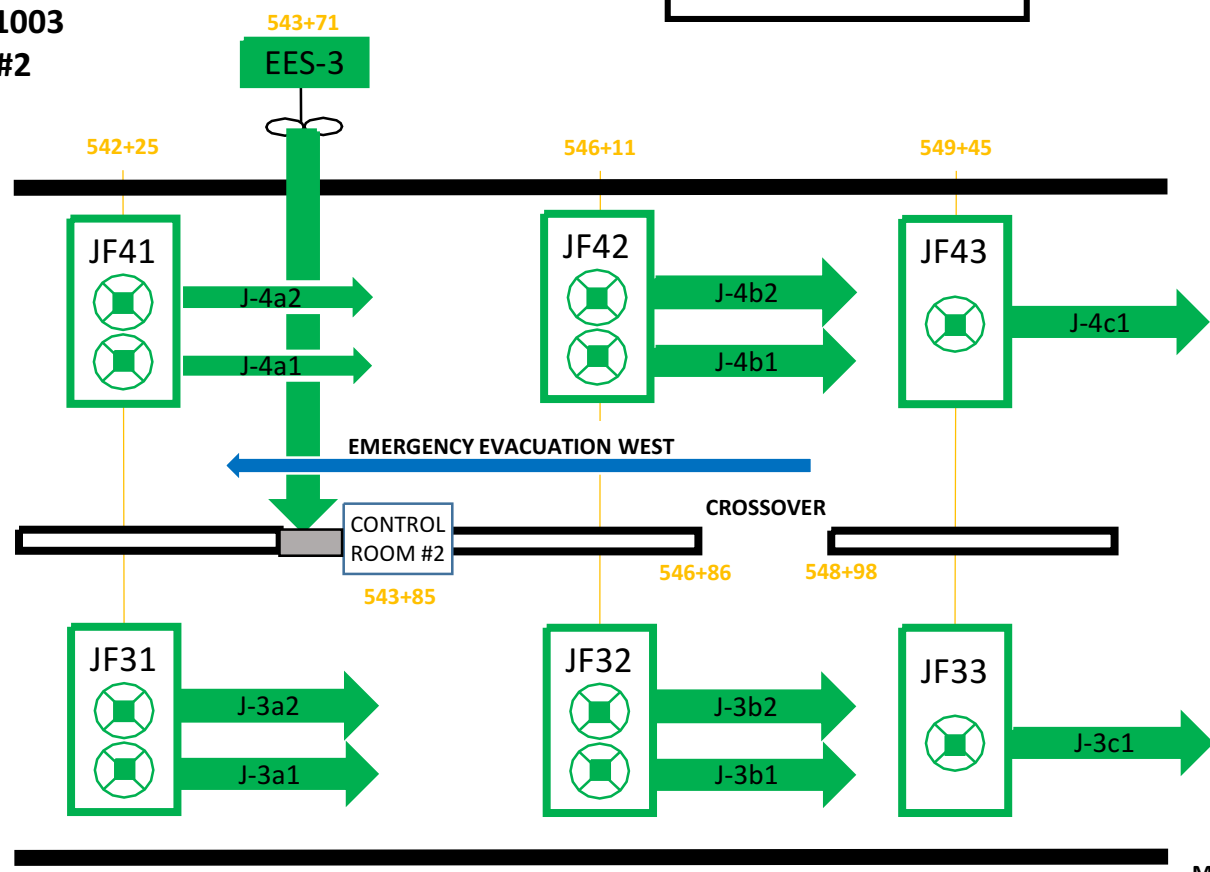
MODE 411 TEST SHEET

← TOWARDS
ADDISON ROAD G03

IB
TRACK 2

(WEST) AERIAL
STRUCTURE
540+15

OB
TRACK 1



MORGAN BLVD
STATION
550+38.5

→ TOWARDS
MORGAN BLVD G04

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST "ENABLE MANUAL" AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 549+50**
 - **TRACK 1**

LEGEND

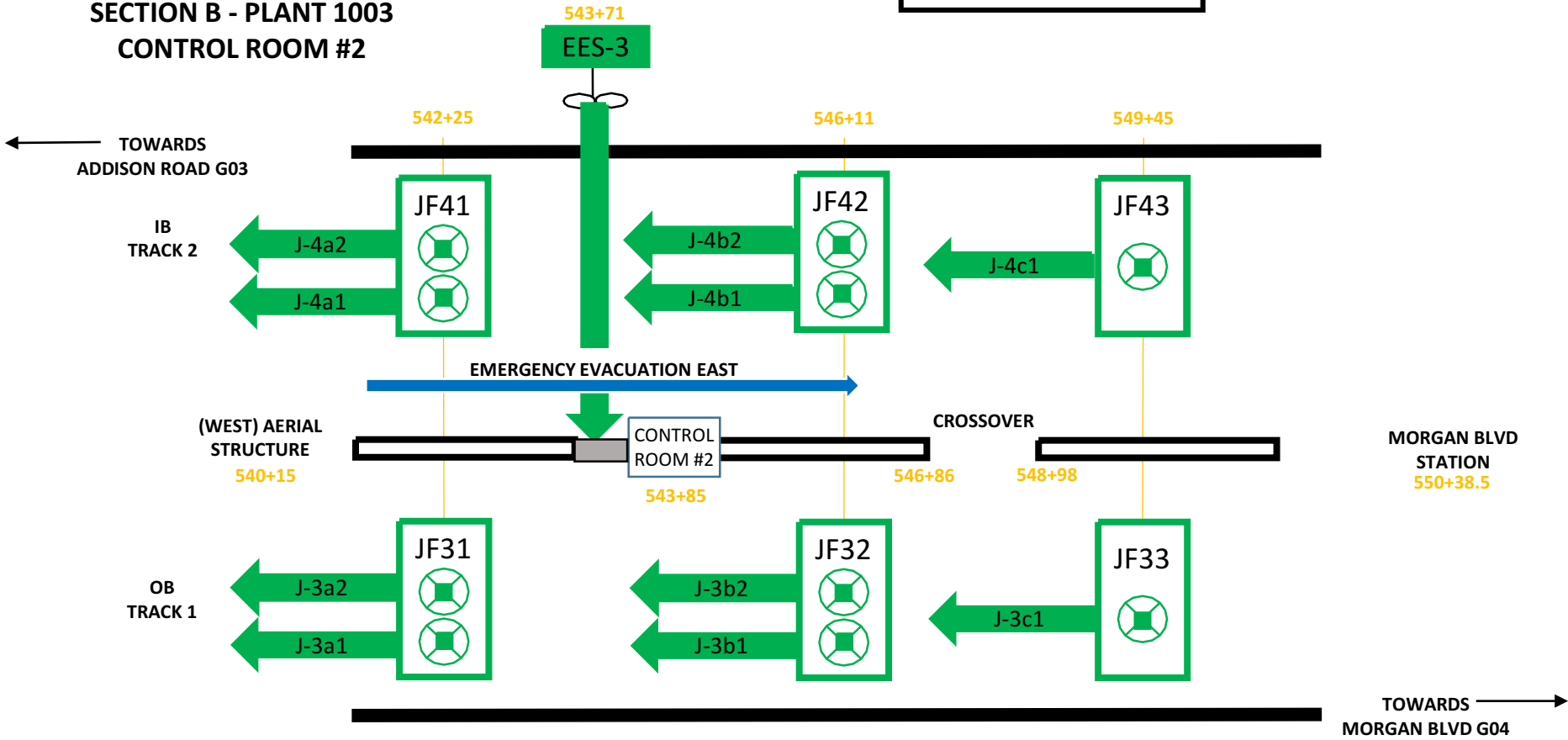
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

MODE 412 TEST SHEET



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 549+50**
 - **TRACK 1**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

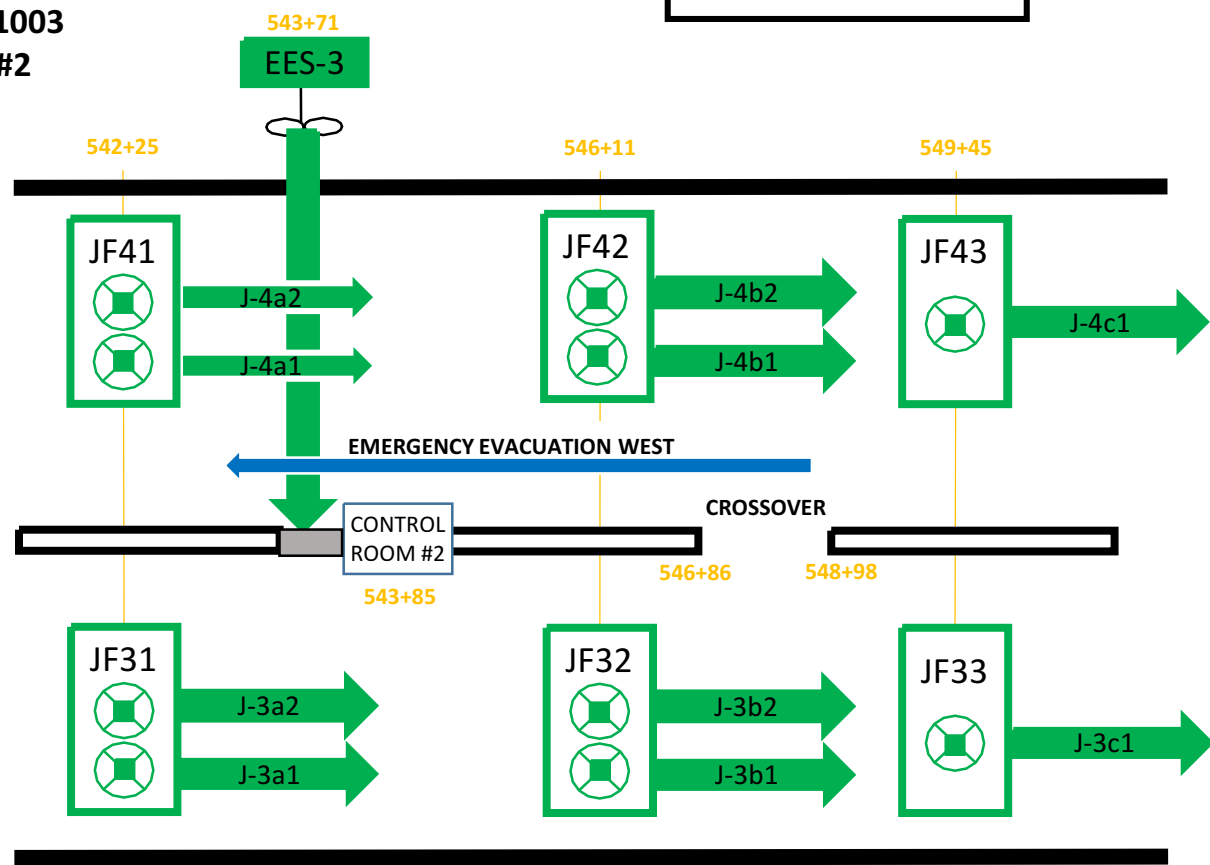
MODE 413 TEST SHEET

← TOWARDS
ADDISON ROAD G03

IB
TRACK 2

(WEST) AERIAL
STRUCTURE
540+15

OB
TRACK 1



→ TOWARDS
MORGAN BLVD G04

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST "ENABLE MANUAL" AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 549+50**
 - **TRACK 2**

LEGEND

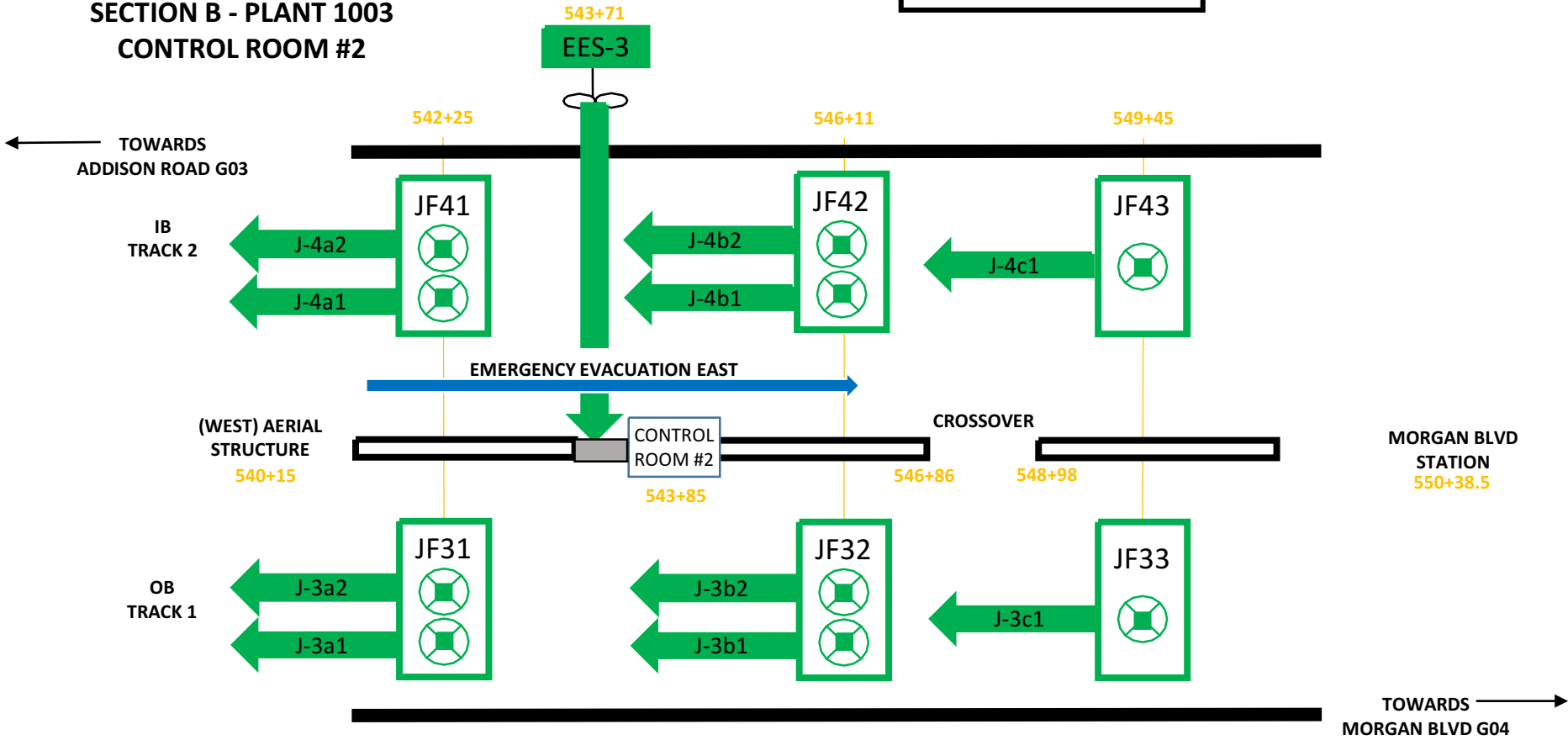
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION B - PLANT 1003
CONTROL ROOM #2**

MODE 414 TEST SHEET



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1003 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:


- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 549+50**
 - **TRACK 2**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

	Washington Metropolitan Area Transit Authority	
	PLNT-1000	Instructions for Testing and Inspection of Tunnel Fan and Damper components
	1004 Testing and Inspection of Section C Jet Fans and Components	

1004 – Inspection and Testing of Section C Jet Fans and Components

Purpose

This procedure provides the steps required to carry out the inspection and testing of jet fan components and controls, as well as related equipment. Jet fans are used to ventilate and remove smoke from tunnels. The fans are reversible (can be operated in an inbound mode or outbound mode) and are controlled by the Rail Operations Control Center (ROCC). First responders can also operate fans independently at the Jet Fan Control Room during emergencies. Multiple fans work together to evacuate smoke from the tunnel.

Reference Documents

- Jetfoil Axial-Flow Fan Assembly O&M Manual
- Standard Control and Flow Diagrams ST-M-148
- Drawings G4b-M-811L and G4b-M-812L
- Modes 415, 416, 417, 418 Test Sheets for Section C PLNT 1004 Control Room #3

Responsibility

Inspections are performed by trained PLNT personnel.

Prerequisites

Personnel performing inspections shall have completed the PLNT tunnel fan training course.

Frequency

Each jet fan system, including fans, associated dampers, and control systems shall be inspected and tested monthly.

Special Tools and Test Equipment

Standard hand tools and minimum PPE, including safety glasses, hearing protection, safety vest, flashlight, gloves, radio and safety shoes.

Records

PLNT Form 1004 Section C Jet Fan Testing and Inspections Checklist

Results

The jet fans shall operate in the correct modes with no continuous abnormal indications. Intermittent indications that self-correct are expected and permissible. Corrective actions for equipment that is damaged or non-operational shall be noted on the inspection form and associated work orders shall be opened.

	Washington Metropolitan Area Transit Authority	
	PLNT-1000	Instructions for Testing and Inspection of Tunnel Fan and Damper components
	1004 Testing and Inspection of Section C Jet Fans and Components	

Procedure



Note: Prior to entering the fan and vent shafts, PLNT personnel must notify the ROCC operator of the commencing inspection and testing, as well as the location where the equipment will be temporarily out-of-service. PLNT personnel must also notify ROCC when the inspection is complete and the crew has left the shafts.

Jet Fan Section C Inspection and Testing

The automatic controls for the tunnel ventilation system assign operating modes for the jet fans based on the conditions within the tunnels. While the modes themselves are not visible to ROCC, this series of tests is designed to test each of the emergency modes. The modes were developed based on an engineering analysis and computer modeling to optimize smoke removal and the safe evacuation of passengers. The ROCC needs to input three items: the direction of evacuation, the chain marker location of the fire or smoke incident, and the track number.

The details of each task for section 1004 follows. Follow the steps listed in the checklist, which will reference the mode sheets. Each mode sheet indicates the evacuation direction, incident chain marker location, and track number. The mode sheet also displays the operation configuration of the fans in each mode. The configuration must be verified as part of the test.

Jet Fan Inspection and Testing Instructions

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of work orders is to track all failing components and systems for trend analyses reports.) Open Fire/Life Safety (FLS) work orders when deficiencies may render one or more fans inoperable; open regular work orders for non-FLS deficiencies.



Washington Metropolitan Area Transit Authority

PLNT-1000

Instructions for Testing and Inspection
of PLNT Systems

1004 Testing and Inspection of Section C Jet Fans and Components

Task	Testing and Inspection Task Description
10	Request Roadway access from ROCC per the RWP to gain access to the Jet Fan Control Room.
20	Inform ROCC the fans will be temporarily out-of-service and alarms may be generated at the location where jet fan testing/inspections is being performed.
30	Visually inspect the pitot tubes/air flow switches are correctly showing airflow direction.
40	Verify the Motor Control Center/Jet Fan Control Room #3 telephone operates by calling ROCC. Record the name of the ROCC operator who will be performing the following remote operations tests.
50	Request ROCC operator to perform the following steps to prepare for the remote operation tests: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
60	Request ROCC operator to perform the following steps to shut off fans for the remote operation tests: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
70	Request ROCC operator to perform the following steps to perform Mode 415 Test for Section C PLNT 1004 Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 586245. Select "Track-1"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed started.</p>
80	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 415 Test Sheet are running (JF63, JF51, JF52, JF53 and EES-4) and blowing in the correct direction required by the Mode 415 Test Sheet.
90	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound.



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Instructions for Testing and Inspection of PLNT Systems

1004 Testing and Inspection of Section C Jet Fans and Components

	Ensure the fans on the ROCC console are running according to the Mode 415 Test Sheet requirements. Record any discrepancies.
100	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
110	Request ROCC operator to perform the following steps to prepare for the Mode 416 Test for Section C PLNT 1004 Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
120	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.
130	Request ROCC operator to perform the following steps to perform Mode 416 Test for Section C PLNT 1004 Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac East"4. Enter Location Chain Marker: 586245. Select "Track-1"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed started.</p>
140	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 416 Test Sheet are running (JF51, JF52, JF53 and EES-4) and blowing in the correct direction required by the Mode 416 Test Sheet .
150	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the Mode 416 Test Sheet requirements. Record any discrepancies.
160	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
170	Request ROCC operator to perform the following steps to prepare for the Mode 417 Test for Section C PLNT 1004 Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."



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Instructions for Testing and Inspection
of PLNT Systems

1004 Testing and Inspection of Section C Jet Fans and Components

180	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.
190	Request ROCC operator to perform the following steps to perform Mode 417 Test for Section C PLNT 1004 Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 586245. Select "Track-2"6. Click "Execute" Request ROCC operator stand-by for two minutes while fans are confirmed started.
200	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 417 Test Sheet are running (JF61, JF62, JF63 and EES-5) and blowing in the correct direction required by the <u>Mode 417 Test Sheet</u> .
210	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 417 Test Sheet</u> requirements. Record any discrepancies.
220	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
230	Request ROCC operator to perform the following steps to prepare for the Mode 418 Test for Section C PLNT 1004 Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
240	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for the fans turn off.
250	Request ROCC operator to perform the following steps to perform Mode 418 Test for Section C PLNT 1004 Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac East"4. Enter Location Chain Marker: 586245. Select "Track-2"6. Click "Execute" Request ROCC operator stand-by for two minutes while fans are confirmed started.




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PLNT-1000

Instructions for Testing and Inspection
of PLNT Systems

1004 Testing and Inspection of Section C Jet Fans and Components

260	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 418 Test Sheet are running (JF61, JF62, JF63 and EES-5) and blowing in the correct direction required by the <u>Mode 418 Test Sheet</u> .
270	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 418 Test Sheet</u> requirements. Record any discrepancies.
280	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
290	Request ROCC operator to perform the following steps to prepare to end testing in Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
300	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.
310	Perform visual inspection of all the fan motor starters in the Control Room to ensure all the selector switches on each motor starter compartment are in the "AUTO" position.
320	Request ROCC operator to perform the following steps to prepare for the remote operation tests: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Disable Manual" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
330	Inform all field inspection and testing crew the testing has concluded and to await permission to access Roadway before exiting.

	Washington Metropolitan Area Transit Authority	
	PLNT-1000	Instructions for Testing and Inspection of PLNT Systems
	Appendix - Inspection and Testing Checklists	

Appendix - Inspection and Testing Checklists

PLNT 1004 Jet Fan Testing and Inspection Checklist:

MODE 415 Test Sheet

MODE 416 Test Sheet

MODE 417 Test Sheet

MODE 418 Test Sheet

PLNT 1004 Inspection and Testing

PLNT-1004 Testing and Inspections Checklist

Equipment: Tunnel Jet Fans section "C"

Chain Marker: 557+11 to 606+15

Station: Jet Fan Control Room #3

Location: 584+30

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Jet Fan system. Jet fans are used in various groupings to provide airflow along the tunnel section. The location of a smoke or fire incident and the direction of customer evacuation determines how the fans are activated. The goal is to blow fresh air towards the customers as they exit the tunnel.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
10		Contact ROCC for Roadway access
20		Contact ROCC to advise Jet Fan System testing
30		Visually inspect pitot tubes
40		Verify MCC / Control Room #3 telephone, record ROCC operator name
50		Request ROCC to "Enable Manual" on Jet Fans
60		Request ROCC to select "All Fans Off" on Jet Fans
70		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "58624"; "Track 1"
80		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 415 Test Sheet</u>
90		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 415 Test Sheet</u>
100		Record alarms from the ROCC. Ignore "GCS" alarms.
110		Request ROCC to select "All Fans Off" on Jet Fans
120		Perform visual inspection of Control Room. Verify motor starters off.
130		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "58624"; "Track 1"
140		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 416 Test Sheet</u>

PLNT 1004 Inspection and Testing

150		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 416 Test Sheet</u>
160		Record alarms from the ROCC. Ignore "GCS" alarms.
170		Request ROCC to select "All Fans Off" on Jet Fans
180		Perform visual inspection of Control Room. Verify motor starters off.
190		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "58624"; "Track 2"
200		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 417 Test Sheet</u>
210		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 417 Test Sheet</u>
220		Record alarms from the ROCC. Ignore "GCS" alarms.
230		Request ROCC to select "All Fans Off" on Jet Fans
240		Perform visual inspection of Control Room. Verify motor starters off.
250		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "58624"; "Track 2"
260		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 418 Test Sheet</u>
270		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 418 Test Sheet</u>
280		Record alarms from the ROCC. Ignore "GCS" alarms.
290		Request ROCC to select "All Fans Off" on Jet Fans
300		Perform visual inspection of Control Room. Verify motor starters off.
310		Perform visual inspection of Control Room; verify all starters in "AUTO"
320		Request ROCC to select "Disable Manual" on Jet Fans
330		Inform all field & test crew testing is complete
340		Request Roadway access from ROCC, follow RWP to exit Control Room.

Requirments for performing the Testing and Inspections:

Standard hand tools.

PLNT 1004 Inspection and Testing

Minimum PPE to include hearing protection, safety glasses or goggles, safety vest, flashlight, gloves, radio, and safety shoes.

Date Completed: _____

Mechanic's #1 Name: _____

Supervisor's Sign: _____

Mechanic's #1 Sign: _____

Mechanic's #2 Name: _____

Mechanic's #2 Sign: _____

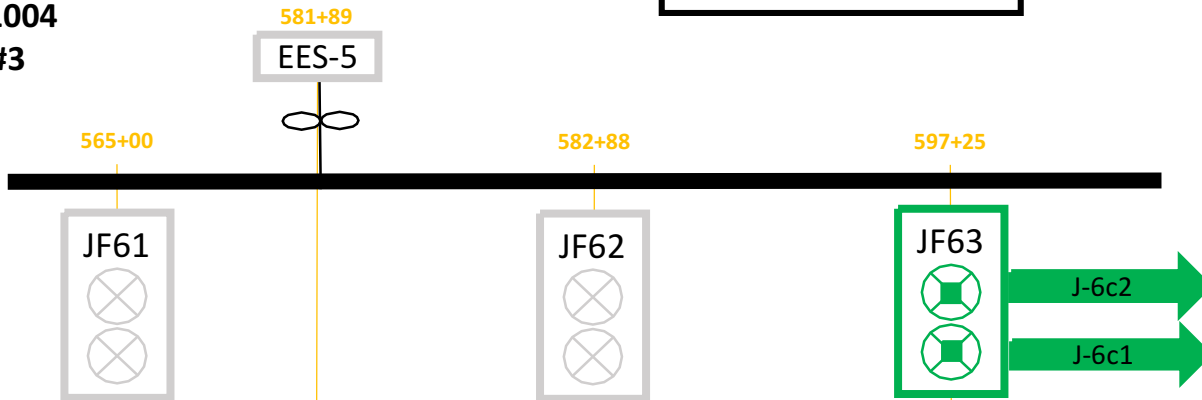
QC Performed: _____

WO#: _____

**JET FANS
SECTION C - PLANT 1004
CONTROL ROOM #3**

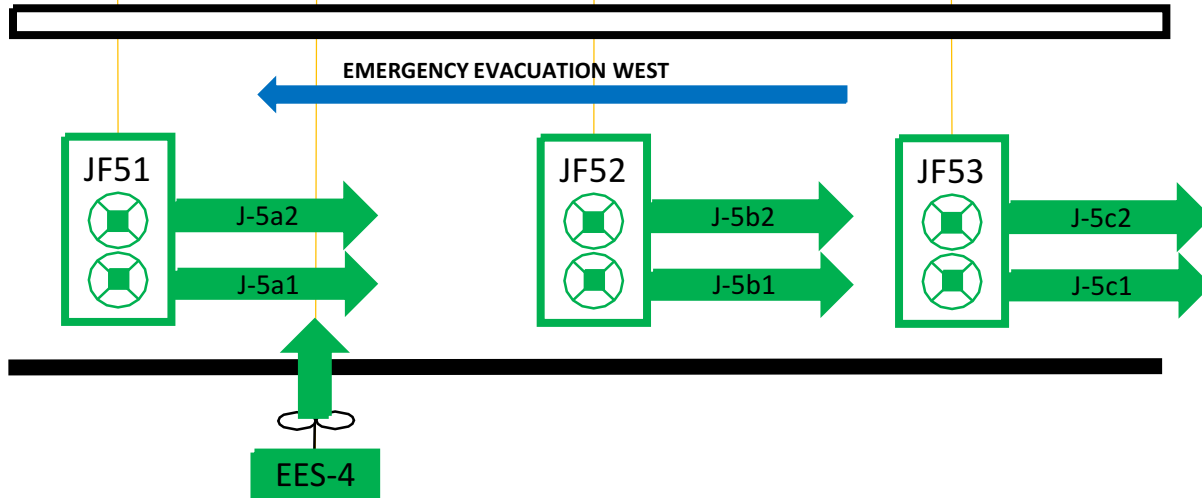
MODE 415 TEST SHEET

IB
TRACK 2



MORGAN BLVD
STATION
557+11

OB
TRACK 1



PORTAL
606+15

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1004 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 586+24**
 - **TRACK 1**

LEGEND

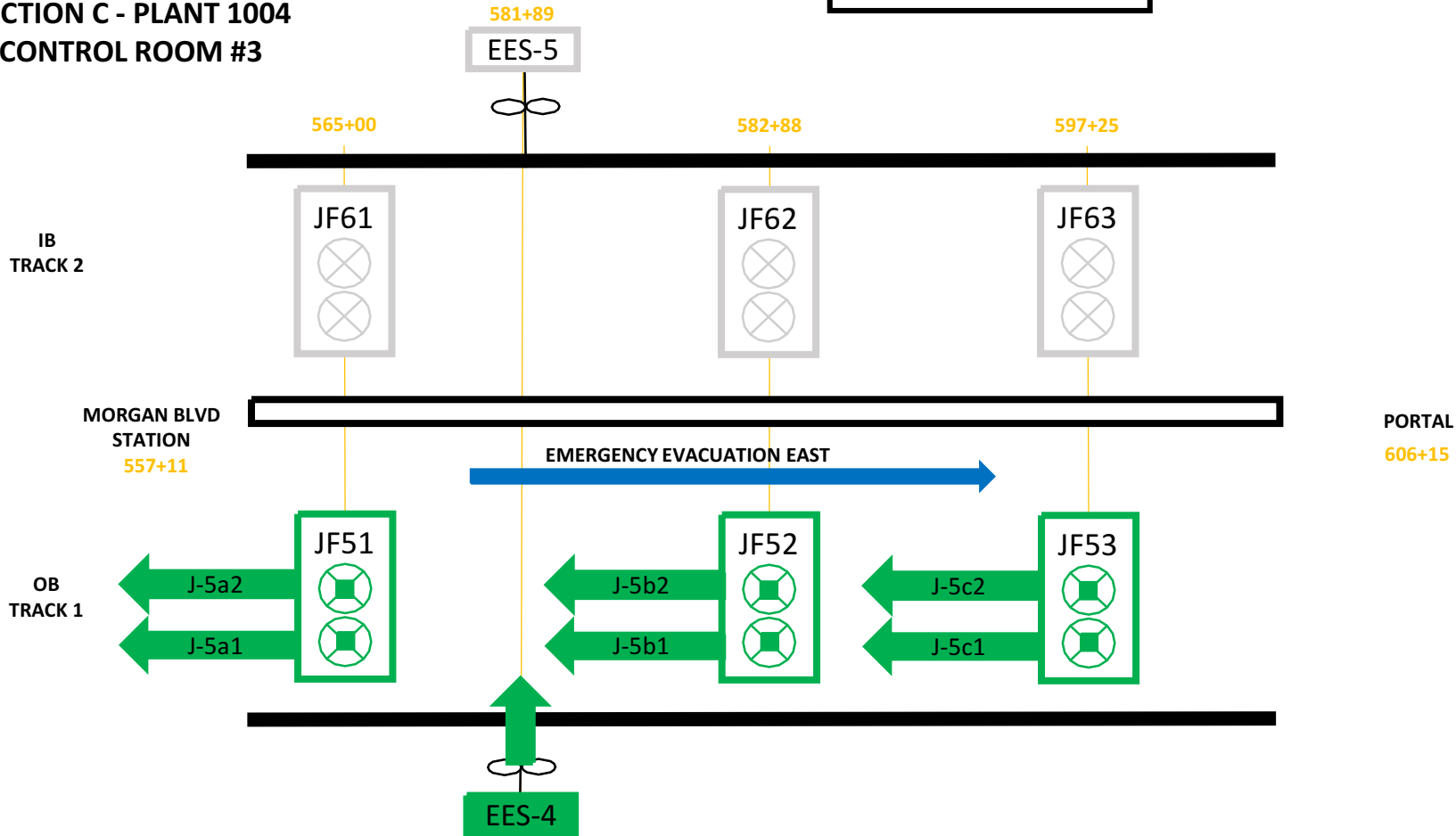
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION C - PLANT 1004
CONTROL ROOM #3**

MODE 416 TEST SHEET



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1004 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 586+24**
 - **TRACK 1**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION C - PLANT 1004
CONTROL ROOM #3**

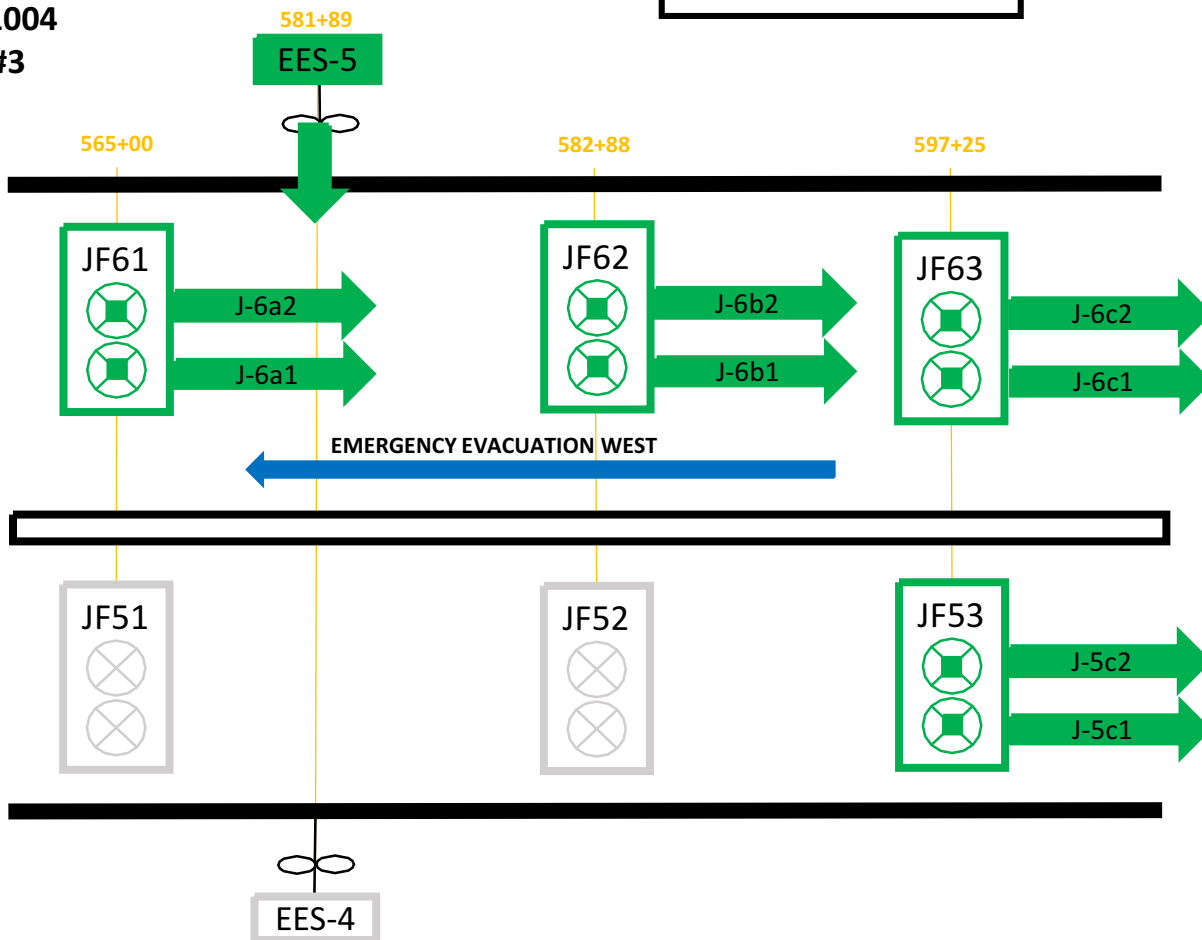
MODE 417 TEST SHEET

IB
TRACK 2

MORGAN BLVD
STATION
557+11

OB
TRACK 1

PORTAL
606+15



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1004 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 586+24**
 - **TRACK 2**

LEGEND

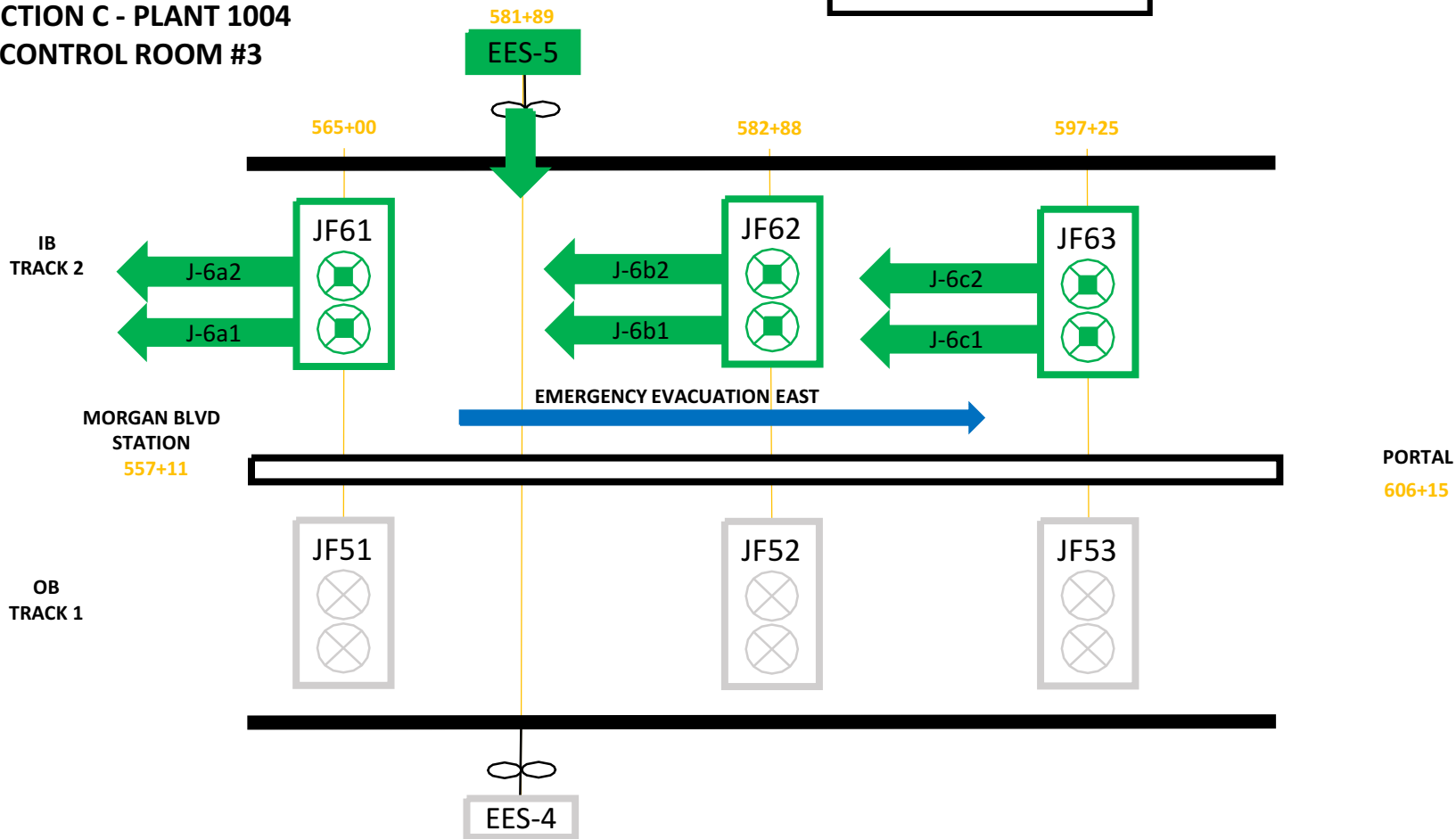
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION C - PLANT 1004
CONTROL ROOM #3**

MODE 418 TEST SHEET



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1004 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:


- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 586+24**
 - **TRACK 2**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

	Washington Metropolitan Area Transit Authority	
	PLNT-1000	Instructions for Testing and Inspection of Tunnel Fan and Damper components
	1005 Testing and Inspection of Section D Tunnel Fans and Components	

1005 – Inspection and Testing of Section D Tunnel Ventilation Fans and Components

Purpose

This procedure provides the steps required to carry out the inspection and testing of tunnel ventilation fan components and controls. The tunnel fans located in the fan shaft are used to ventilate and remove smoke from the tunnels. The fans are reversible (can be operated in exhaust mode or supply mode) and are controlled by the Rail Operations Control Center (ROCC). First responders can also operate the fans independently at the fan shaft during emergencies.

The fans and dampers work together to evacuate smoke. The fans in Section D are located in a room in the Operations Building at the end of the tail tracks past Largo Town Center. Although they are not jet fans, these are axial fans in a fan shaft, known as tunnel fans in the rest of the system. They are controlled in the same manner as the jet fans in this section of the rail system.

Reference Documents

- Tunnel Fans ABB O & M
- Drawings G4b-M-811L and G4b-M-812L and G4b-M-701L
- Standard Control and Flow Diagrams ST-M-148
- Modes 419, 420, 421, 422, 423 and 424 Test Sheets for Section D PLNT 1005 Operations Building Control Room

Responsibility

Inspections are performed by trained PLNT personnel.

Prerequisites

Personnel performing inspections shall have completed the PLNT tunnel fan training course.

Frequency

Each fan system, including fans, associated dampers, and control systems shall be inspected and tested monthly.

Special Tools and Test Equipment


Standard hand tools and minimum PPE, including safety glasses, hearing protection, safety vest, flashlight, gloves, radio and safety shoes.

Records

PLNT Form 1005 Section D Tunnel Fan Testing and Inspections Checklist

Results

The axial tunnel fans shall operate in the correct modes with no continuous abnormal indications. Intermittent indications that self-correct are expected and permissible. Corrective actions for equipment that is damaged or non-operational shall be noted on the inspection form and associated work orders shall be opened.

	Washington Metropolitan Area Transit Authority	
	PLNT-1000	Instructions for Testing and Inspection of Tunnel Fan and Damper components
	1005 Testing and Inspection of Section D Tunnel Fans and Components	

Procedure



Note: Prior to entering the fan and vent shafts, PLNT personnel must notify the ROCC operator of the commencing inspection and testing, as well as the location where the equipment will be temporarily out-of-service. PLNT personnel must also notify ROCC when the inspection is complete and the crew has left the shafts.

Note: While the tunnel ventilation fans in Section D are not jet fans, they are mode actuated in coordination with the rest of the jet fan system.

Fan Section D Inspection and Testing

The automatic controls for the tunnel ventilation system assign operating modes for the jet fans based on the conditions within the tunnels. While the modes themselves are not visible to ROCC, this series of tests is designed to test each of the emergency modes. The modes were developed based on an engineering analysis and computer modeling to optimize smoke removal and the safe evacuation of passengers. The ROCC needs to input three items: the direction of evacuation, the chain marker location of the fire or smoke incident, and the track number.

The details of each task for section 1005 follows. Follow the steps listed in the checklist, which will reference the mode sheets. Each mode sheet indicates the evacuation direction, incident chain marker location, and track number. The mode sheet also displays the operation configuration of the fans in each mode. The configuration must be verified as part of the test.

Jet Fan Inspection and Testing Instructions

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of work orders is to track all failing components and systems for trend analyses reports.) Open Fire/Life Safety (FLS) work orders when deficiencies may render one or more fans inoperable; open regular work orders for non-FLS deficiencies.



Washington Metropolitan Area Transit Authority

PLNT-1000

**Instructions for Testing and Inspection
of PLNT Systems**

1005 Testing and Inspection of Section D Tunnel Fans and Components

Task	Testing and Inspection Task Description
10	Verify the Operations Building Control Room telephone operates by calling ROCC. Give the location where tunnel fan testing/inspections is being performed. Inform the operator the fans will be temporarily out-of-service and alarms may be generated.
20	Record the name of the ROCC operator who will be performing the following remote operations tests.
30	Request ROCC operator to perform the following steps to prepare for the remote operation tests: <ol style="list-style-type: none"> 1. Click on the "Jet Fan Operation" gray button on the ROCC console screen. 2. Select "Enable Manual" in the "Modes" section of the pop-up box. 3. Ensure ROCC selects nothing else on their pop-up screen. 4. Click "Execute."
40	Request ROCC operator to perform the following steps to shut off fans for the remote operation tests: <ol style="list-style-type: none"> 1. Click on the "Jet Fan Operation" gray button on the ROCC console screen. 2. Select "All Fans Off" in the "Modes" section of the pop-up box. 3. Ensure ROCC selects nothing else on their pop-up screen. 4. Click "Execute."
50	Request ROCC operator to perform the following steps to perform Mode 419 Test for Section D PLNT 1005 Operations Building Control Room: <ol style="list-style-type: none"> 1. Click on the "Jet Fan Operation" gray button on the ROCC console screen. 2. Select "Enable Manual" in the "Modes" section of the pop-up box. 3. Select "Emergency Evac West" 4. Enter Location Chain Marker: 63816 5. Select "Track-1" 6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed started.</p>
60	Perform visual inspection of the motor starter cabinet doors within the Operations Building Control Room. Verify the motor starters for all the fans shown in green only on the Mode 419 Test Sheet are running (TVF-1,2) and blowing in the correct direction required by the Mode 419 Test Sheet.
70	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 419 Test Sheet</u> requirements. Record any discrepancies.



Washington Metropolitan Area Transit Authority

PLNT-1000

**Instructions for Testing and Inspection
of PLNT Systems**

1005 Testing and Inspection of Section D Tunnel Fans and Components

80	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
90	Request ROCC operator to perform the following steps to prepare for the remote operation tests: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
100	Request ROCC operator to perform the following steps to prepare for the Mode 420 Test for Section D PLNT 1005 Operations Building Control Room : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
110	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.
120	Request ROCC operator to perform the following steps to perform Mode 420 Test for Section D PLNT 1005 Operations Building Control Room : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac East"4. Enter Location Chain Marker: 638165. Select "Track-1"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed started.</p>
130	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 420 Test Sheet are running (TVF-1,2) and blowing in the correct direction required by the <u>Mode 420 Test Sheet</u> .
140	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 420 Test Sheet</u> requirements. Record any discrepancies.
150	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.



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Instructions for Testing and Inspection of PLNT Systems

1005 Testing and Inspection of Section D Tunnel Fans and Components

160	<p>Request ROCC operator to perform the following steps to prepare for the Mode 421 Test for Section D PLNT 1005 Operations Building Control Room:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
170	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.</p>
180	<p>Request ROCC operator to perform the following steps to perform Mode 421 Test for Section D PLNT 1005 Operations Building Control Room:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Enable Manual" in the "Modes" section of the pop-up box.3. Select "Emergency Evac West"4. Enter Location Chain Marker: 638165. Select "Track-2"6. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed started.</p>
190	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 421 Test Sheet are running (TVF-1,2) and blowing in the correct direction required by the <u>Mode 421 Test Sheet</u>.</p>
200	<p>After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 421 Test Sheet</u> requirements. Record any discrepancies.</p>
210	<p>Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.</p>
220	<p>Request ROCC operator to perform the following steps to prepare for the Mode 422 Test for Section D PLNT 1005 Operations Building Control Room:</p> <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
230	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.</p>



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**Instructions for Testing and Inspection
of PLNT Systems**

1005 Testing and Inspection of Section D Tunnel Fans and Components

240	<p>Request ROCC operator to perform the following steps to perform Mode 422 Test for Section D PLNT 1005 Operations Building Control Room:</p> <ol style="list-style-type: none">7. Click on the “Jet Fan Operation” gray button on the ROCC console screen.8. Select "Enable Manual" in the "Modes" section of the pop-up box.9. Select “Emergency Evac East”10. Enter Location Chain Marker: 6381611. Select “Track-2”12. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed started.</p>
250	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 422 Test Sheet are running (TVF-1,2) and blowing in the correct direction required by the <u>Mode 422 Test Sheet</u>.</p>
260	<p>After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 422 Test Sheet</u> requirements. Record any discrepancies.</p>
270	<p>Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.</p>
280	<p>Request ROCC operator to perform the following steps to prepare for the Mode 423 Test for Section D PLNT 1005 Operations Building Control Room:</p> <ol style="list-style-type: none">5. Click on the “Jet Fan Operation” gray button on the ROCC console screen.6. Select "All Fans Off" in the "Modes" section of the pop-up box.7. Ensure ROCC selects nothing else on their pop-up screen.8. Click "Execute."
290	<p>Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.</p>
300	<p>Request ROCC operator to perform the following steps to perform Mode 423 Test for Section D PLNT 1005 Operations Building Control Room:</p> <ol style="list-style-type: none">13. Click on the “Jet Fan Operation” gray button on the ROCC console screen.14. Select "Enable Manual" in the "Modes" section of the pop-up box.15. Select “Emergency Evac West”16. Enter Location Chain Marker: 6496617. Select “All Tracks”18. Click "Execute" <p>Request ROCC operator stand-by for two minutes while fans are confirmed started.</p>



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**Instructions for Testing and Inspection
of PLNT Systems**

1005 Testing and Inspection of Section D Tunnel Fans and Components

310	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 423 Test Sheet are running (TVF-1,2) and blowing in the correct direction required by the <u>Mode 423 Test Sheet</u> .
320	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 423 Test Sheet</u> requirements. Record any discrepancies.
330	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.
340	Request ROCC operator to perform the following steps to prepare for the Mode 424 Test for Section D PLNT 1005 Operations Building Control Room : 9. Click on the “Jet Fan Operation” gray button on the ROCC console screen. 10. Select "All Fans Off" in the "Modes" section of the pop-up box. 11. Ensure ROCC selects nothing else on their pop-up screen. 12. Click "Execute."
350	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.
360	Request ROCC operator to perform the following steps to perform Mode 424 Test for Section D PLNT 1005 Operations Building Control Room : 19. Click on the “Jet Fan Operation” gray button on the ROCC console screen. 20. Select "Enable Manual" in the "Modes" section of the pop-up box. 21. Select “Emergency Evac East” 22. Enter Location Chain Marker: 64966 23. Select “All Tracks” 24. Click "Execute" Request ROCC operator stand-by for two minutes while fans are confirmed started.
370	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify the motor starters for all the fans shown in green only on the Mode 424 Test Sheet are running (TVF-1,2) and blowing in the correct direction required by the <u>Mode 424 Test Sheet</u> .
380	After two (2) minutes, request ROCC operator to report which fans are indicated as running on the ROCC console screens and the direction—inbound or outbound. Ensure the fans on the ROCC console are running according to the <u>Mode 424 Test Sheet</u> requirements. Record any discrepancies.
390	Request ROCC operator report any alarms or indications on the ROCC console screens. Ignore GCS alarms. Record any other alarms or discrepancies reported by the ROCC operator.




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**Instructions for Testing and Inspection
of PLNT Systems**

1005 Testing and Inspection of Section D Tunnel Fans and Components

400	Request ROCC operator to perform the following steps to prepare to end testing in Control Room #3 : <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "All Fans Off" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
410	Perform visual inspection of the motor starter cabinet doors within the Control Room. Verify that the motor starters for the fans turn off.
420	Perform visual inspection of all the fan motor starters in the Control Room to ensure all the selector switches on each motor starter compartment are in the "AUTO" position.
430	Request ROCC operator to perform the following steps to prepare for the remote operation tests: <ol style="list-style-type: none">1. Click on the "Jet Fan Operation" gray button on the ROCC console screen.2. Select "Disable Manual" in the "Modes" section of the pop-up box.3. Ensure ROCC selects nothing else on their pop-up screen.4. Click "Execute."
	Inform all field inspection and testing crew the testing has concluded and to await permission to access Roadway before exiting.

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	PLNT-1000	Instructions for Testing and Inspection of PLNT Systems
	Appendix A Inspection and Testing Checklists	

Appendix A - Inspection and Testing Checklists

PLNT 1005 Tunnel Fan Testing and Inspection Checklist:

MODE 419 Test Sheet

MODE 420 Test Sheet

MODE 421 Test Sheet

MODE 422 Test Sheet

MODE 423 Test Sheet

MODE 424 Test Sheet

PLNT 1005 Inspection and Testing

PLNT-1005 Testing and Inspections Checklist

Equipment: Tunnel Jet Fans section "D"

Chain Marker: 634+59 to 656+34

Station: Operations Building

Location: 656+34

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Jet Fan system. Jet fans are used in various groupings to provide airflow along the tunnel section. The location of a smoke or fire incident and the direction of customer evacuation determines how the fans are activated. The goal is to blow fresh air towards the customers as they exit the tunnel.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
10		Verify Operations Building Control Room telephone; call ROCC to advise tunnel fan testing.
20		Record ROCC operator name
30		Request ROCC to "Enable Manual" on Jet Fans
40		Request ROCC to select "All Fans Off" on Jet Fans
50		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "63816"; "Track 1"
60		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 419 Test Sheet</u>
70		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 419 Test Sheet</u>
80		Record alarms from the ROCC. Ignore "GCS" alarms.
90		Request ROCC to select "Enable Manual" on Jet Fans
100		Request ROCC to select "All Fans Off" on Jet Fans
110		Perform visual inspection of Control Room. Verify motor starters off.

PLNT 1005 Inspection and Testing

120		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "63816"; "Track 1"
130		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 420 Test Sheet</u>
140		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 420 Test Sheet</u>
150		Record alarms from the ROCC. Ignore "GCS" alarms.
160		Request ROCC to select "All Fans Off" on Jet Fans
170		Perform visual inspection of Control Room. Verify motor starters off.
180		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "63816"; "Track 2"
190		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 421 Test Sheet</u>
200		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 421 Test Sheet</u>
210		Record alarms from the ROCC. Ignore "GCS" alarms.
220		Request ROCC to select "All Fans Off" on Jet Fans
230		Perform visual inspection of Control Room. Verify motor starters off.
240		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "63816"; "Track 2"
250		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 422 Test Sheet</u>
260		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 422 Test Sheet</u>
270		Record alarms from the ROCC. Ignore "GCS" alarms.

PLNT 1005 Inspection and Testing

280		Request ROCC to select "All Fans Off" on Jet Fans
290		Perform visual inspection of Control Room. Verify motor starters off.
300		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac West"; Location Chain Marker "64966"; "All Tracks"
310		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 423 Test Sheet</u>
320		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 423 Test Sheet</u>
330		Record alarms from the ROCC. Ignore "GCS" alarms.
340		Request ROCC to select "All Fans Off" on Jet Fans
350		Perform visual inspection of Control Room. Verify motor starters off.
360		Request ROCC to "Enable Manual" on Jet Fans; select "Emergency Evac East"; Location Chain Marker "64966"; "All Tracks"
370		Perform visual inspection of Control Room. Verify motor starters and fans' directions match <u>Mode 424 Test Sheet</u>
380		After two minutes, request ROCC operator which fans are running and which direction; verify with <u>Mode 424 Test Sheet</u>
390		Record alarms from the ROCC. Ignore "GCS" alarms.
400		Request ROCC to select "All Fans Off" on Jet Fans
410		Perform visual inspection of Control Room. Verify motor starters off.
420		Perform visual inspection of Control Room; verify all starters in "AUTO"
430		Request ROCC to select "Disable Manual" on Jet Fans

PLNT 1005 Inspection and Testing

440		Inform all field & test crew testing is complete
-----	--	--

Standard hand tools.

Minimum PPE to include hearing protection, safety glasses or goggles, safety vest, flashlight, gloves, radio, and safety shoes.

Date Completed: _____

Mechanic's #1 Name: _____

Supervisor's Sign: _____

Mechanic's #1 Sign: _____

Mechanic's #2 Name: _____

Mechanic's #2 Sign: _____

QC Performed: _____

WO#: _____

**JET FANS
SECTION D - PLANT 1005
OPERATIONS BUILDING CONTROL ROOM**

MODE 419 TEST SHEET

656+34

TVF-1, 2

641+44

IB
TRACK 2

AERIAL
STRUCTURE
634+59



OPERATIONS BUILDING

OB
TRACK 1

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1005 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 638+16**
 - **TRACK 1**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION D - PLANT 1005
OPERATIONS BUILDING CONTROL ROOM**

MODE 420 TEST SHEET

656+34

TVF-1, 2

641+44

OPERATIONS BUILDING

**IB
TRACK 2**

**AERIAL
STRUCTURE
634+59**

EMERGENCY EVACUATION EAST

**OB
TRACK 1**

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1005 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 638+16**
 - **TRACK 1**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION D - PLANT 1005
OPERATIONS BUILDING CONTROL ROOM**

MODE 421 TEST SHEET

656+34

TVF-1, 2

641+44

OPERATIONS BUILDING

IB
TRACK 2



AERIAL
STRUCTURE
634+59

OB
TRACK 1

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker: **63816**

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1005 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 638+16**
 - **TRACK 2**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION D - PLANT 1005
OPERATIONS BUILDING CONTROL ROOM**

MODE 422 TEST SHEET

656+34

TVF-1, 2

641+44

OPERATIONS BUILDING

**IB
TRACK 2**



**AERIAL
STRUCTURE
634+59**



**OB
TRACK 1**



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1005 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 638+16**
 - **TRACK 2**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION D - PLANT 1005
OPERATIONS BUILDING CONTROL ROOM**

MODE 423 TEST SHEET

656+34

TVF-1, 2

641+44

OPERATIONS BUILDING

IB
TRACK 2

AERIAL
STRUCTURE
634+59

OB
TRACK 1



Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1005 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION WEST**
 - **CHAIN MARKER 649+96**
 - **ALL TRACKS**

LEGEND

JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L

**JET FANS
SECTION D - PLANT 1005
OPERATIONS BUILDING CONTROL ROOM**

MODE 424 TEST SHEET

656+34

TVF-1, 2

641+44

OPERATIONS BUILDING

IB
TRACK 2

AERIAL
STRUCTURE
634+59

OB
TRACK 1

EMERGENCY EVACUATION EAST

Jet Fan Operation

Modes: Enable Manual All Fans Off Disable Manual

Type: Emergency Evac East Diesel-Smoke
 Emergency Evac West Conges-Temp

Location Chain marker:

Tracks: All Tracks TRACK-1 TRACK-2 TRACK-3

Execute View Undo Cancel

FOR PLANT 1005 – INSPECTION AND TESTING OF SECTION A JET FANS AND COMPONENTS, CONTACT ROCC AND REPORT FIRE INCIDENT AS FOLLOWS:

- **ROCC MUST FIRST “ENABLE MANUAL” AND EXECUTE**
- **REPORT FIRE INCIDENT:**
 - **EMERGENCY EVACUATION EAST**
 - **CHAIN MARKER 649+96**
 - **ALL TRACKS**

LEGEND

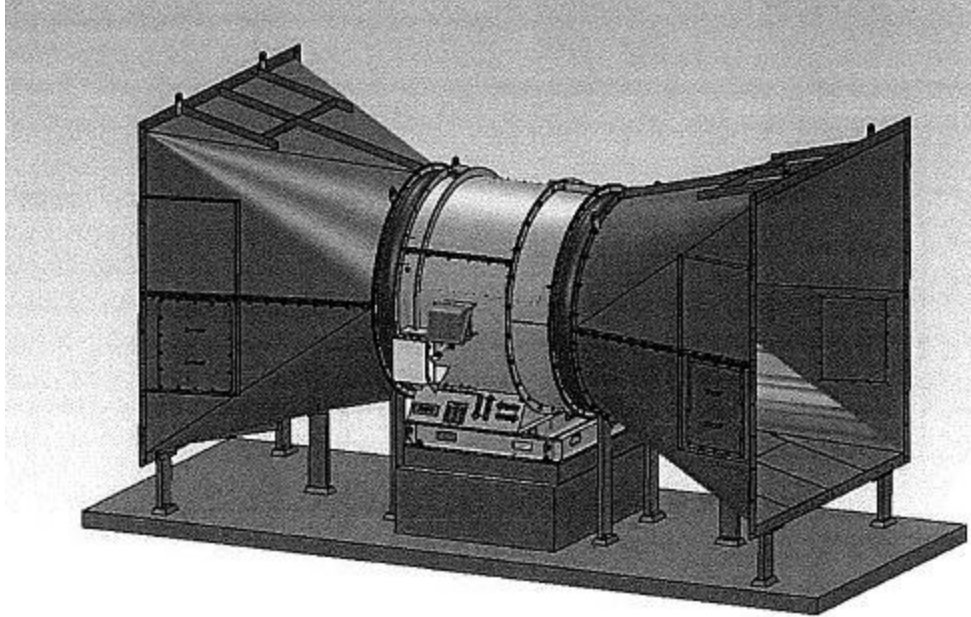
JF11	JET FANS
EES	EMERGENCY EGRESS STAIRS

REFERENCES

FOR MODE TABLES, REFER TO CONTRACT 1G0042, DRAWINGS #G4b-M-811L AND #G4b-M-812L



1006 - Testing and Inspection of Silver Line Tunnel Vent Systems



Purpose

This procedure provides the steps required to carry out the inspection of the Silver Line Tunnel Fan components and controls, as well as associated dampers. The Tunnel Ventilation System (TVS) consists of four reversible fans with four associated fan dampers and eight track dampers, evenly divided between two ventilation structures — the East structure at N-02 and the West structure at N-03. The fans and dampers are controlled by a PLC and HMI touch screen at each vent structure equipment room which is capable of activating the fans and dampers. The fans can be operated in preset modes from the ROCC, and they can also be operated locally from the fan control room by first responders during emergencies. The fans and dampers work together to evacuate smoke or supply fresh air.

Reference Documents

- Tunnel Ventilation Mode Table Drawing N00-M-063.

Responsibility


Inspections are performed by two trained PLNT personnel.

Prerequisites

Personnel performing Inspections shall have completed the PLNT Tunnel Fan Training Course.

Frequency

- a. Each Tunnel Vent Fan system, including fans, dampers and control systems, shall be inspected and tested monthly.

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	PLNT-1000	Instructions for Testing and Inspection of PLNT Systems
	1006 Testing and Inspection of Silver Line Tunnel Vent Systems	

Special Tools and Test Equipment


- Standard hand tools and minimum PPE, to include hearing protection and safety glasses, safety vest, flashlight, gloves radio and safety shoes.

Records

PLNT Form (Number to come) PLNT-1000 Testing and Inspections Checklist

Results

The tunnel fans shall operate in the correct modes and the associated dampers shall fully open and close with no abnormal indications. Corrective action for equipment which is damaged or non-operational shall be noted on the Checklist and associated work orders shall be opened.

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	PLNT-1000	Instructions for Testing and Inspection of PLNT Systems
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Procedure



Note: Notify ROCC that PLNT personnel are performing inspections and tests of the TVS fans prior to entering. Notify the ROCC that the fans in that location will be temporarily out of service until the inspection and testing are complete. Notify ROCC when the Inspection Procedure is complete.



Note: It is critical to **WAIT TEN MINUTES** between tests of the various emergency modes. When in any Emergency Mode, all safeties are overridden and the fan will “Run to Fail”. Start and Reverse direction operations stress the motors. These motors are limited to **SIX** Start or Reverse operations per hour. In order to prevent catastrophic failure of the fans, **PAUSE TEN MINUTES** after each Emergency Mode Test.

Fan Inspection

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of the work orders is to track any failing components and systems.) Open Fire/Life Safety (FLS) work orders or for non-FLS deficiencies, open regular work orders.

Task	Testing and Inspection Task Description
10	Prior to testing, remove loose objects and alert personnel in both fan equipment rooms that fan testing is to begin.
20	Perform visual inspection of fan dampers and track dampers for damage, deformation or any loose, missing hardware or fasteners.
30	Verify the fan control room telephone is operational by calling ROCC to notify them that tunnel fan testing/inspections will occur, alarms may be generated.
40	Perform visual inspection of HMI panels in fan control rooms for alarms or fault indications. Reset and correct faults as required.
50	Set fan controls to “Maintenance Mode” (Mode 500-Manual/Fail Safe). Operate track dampers and fan dampers manually and confirm the open and closed positions at HMI panel. Visually verify at the HMI panel that they open and close.
60	Request ROCC to command the fans to “Mode 100” Normal Operation. Verify at the HMI panel that fans shut off, fan dampers close and track dampers open.
70	Request ROCC to command the fans to “Emergency Mode 401.”
80	Verify no abnormal indications or alarms were generated, either at the HMI panel or at the ROCC. Record the name of the ROCC Operator. Make adjustments as needed and re-test when abnormal indications or alarms occur. If unable to resolve the abnormal indications, generate the required work order.
90	Request ROCC to command the fans to “Mode 100” Normal Operation.
100	Verify the fans stop. Wait Ten (10) minutes for the fan motors to cool. Failure to



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Instructions for Testing and Inspection of PLNT Systems

1006 Testing and Inspection of Silver Line Tunnel Vent Systems

	do so could cause severe damage to the motors.
110	Request ROCC to command the fans to "Emergency Mode 403."
120	Verify no abnormal indications or alarms were generated, either at the HMI panel or at the ROCC. Record the name of the ROCC Operator. Make adjustments as needed and re-test when abnormal indications or alarms occur. If unable to resolve the abnormal indications, generate the required work order.
130	Request ROCC to command the fans to "Mode 100" Normal Operation.
140	Verify the fans stop. Wait Ten (10) minutes for the fan motors to cool. Failure to do so could cause severe damage to the motors.
150	Request ROCC to command the fans to "Emergency Mode 404."
160	Verify no abnormal indications or alarms were generated, either at the HMI panel or at the ROCC. Record the name of the ROCC Operator. Make adjustments as needed and re-test when abnormal indications or alarms occur. If unable to resolve the abnormal indications, generate the required work order.
170	Request ROCC to command the fans to "Mode 100" Normal Operation.
180	Verify the fans stop. Wait Ten (10) minutes for the fan motors to cool. Failure to do so could cause severe damage to the motors.
190	Request ROCC to command the fans to "Emergency Mode 405."
200	Verify no abnormal indications or alarms were generated, either at the HMI panel or at the ROCC. Record the name of the ROCC Operator. Make adjustments as needed and re-test when abnormal indications or alarms occur. If unable to resolve the abnormal indications, generate the required work order.
210	Request ROCC to command the fans to "Mode 100" Normal Operation.
220	Verify the fans stop. Wait Ten (10) minutes for the fan motors to cool. Failure to do so could cause severe damage to the motors.
230	Request ROCC to command the fans to "Emergency Mode 421."
240	Verify no abnormal indications or alarms were generated, either at the HMI panel or at the ROCC. Record the name of the ROCC Operator. Make adjustments as needed and re-test when abnormal indications or alarms occur. If unable to resolve the abnormal indications, generate the required work order.
250	Request ROCC to command the fans to "Mode 100" Normal Operation.
260	Verify the fans stop. Wait Ten (10) minutes for the fan motors to cool. Failure to do so could cause severe damage to the motors.
270	Request ROCC to command the fans to "Emergency Mode 423."
280	Verify no abnormal indications or alarms were generated, either at the HMI panel




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1006 Testing and Inspection of Silver Line Tunnel Vent Systems

	or at the ROCC. Record the name of the ROCC Operator. Make adjustments as needed and re-test when abnormal indications or alarms occur. If unable to resolve the abnormal indications, generate the required work order.
290	Request ROCC to command the fans to "Mode 100" Normal Operation.
300	Verify the fans stop. Wait Ten (10) minutes for the fan motors to cool. Failure to do so could cause severe damage to the motors.
310	Request ROCC to command the fans to "Emergency Mode 424."
320	Verify no abnormal indications or alarms were generated, either at the HMI panel or at the ROCC. Record the name of the ROCC Operator. Make adjustments as needed and re-test when abnormal indications or alarms occur. If unable to resolve the abnormal indications, generate the required work order.
330	Request ROCC to command the fans to "Mode 100" Normal Operation.
340	Verify the fans stop. Wait Ten (10) minutes for the fan motors to cool. Failure to do so could cause severe damage to the motors.
350	Request ROCC to command the fans to "Emergency Mode 425."
360	Verify no abnormal indications or alarms were generated, either at the HMI panel or at the ROCC. Record the name of the ROCC Operator. Make adjustments as needed and re-test when abnormal indications or alarms occur. If unable to resolve the abnormal indications, generate the required work order.
370	Request ROCC to command the fans to "Mode 100" Normal Operation.
380	Verify the fans stop.
390	Notify ROCC the testing and inspection is complete.
400	Perform monthly fire extinguisher inspection.

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	Appendix Inspection and Testing Checklists	

Appendix - Inspection and Testing Checklists

PLNT 1006 Silver Line Fan Checklist:

PLNT 1006 Inspection and Testing

PLNT-1006 Testing and Inspections Checklist

Equipment: Silver Line Tunnel Fans

Chain Marker: N701+50 to N728+09

Station: Between Tysons Corner and Greensboro

Location: Silver Line

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Silver Line Tunnel Fan System. The Silver Line Tunnel Fans are used to provide airflow along the tunnel section. The location of a smoke or fire incident and the direction of customer evacuation determines how the fans are activated. The goal is to blow fresh air towards the customers as they exit the tunnel.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
10		Alert personnel in Fan Equipment Room that testing to occur.
20		Inspect dampers and frames.
30		Contact ROCC verify telephone operation and advise that tunnel fan testing/inspections will occur alarms maybe generated.
40		Inspect HMI panels for alarms or faults.
50		Set fan control to "Maintenance Mode", verify damper operation.
60		Contact ROCC and request fans to "Mode 100" Normal operation, verify fan and damper operation at HMI.
70		Request ROCC command "Emergency Mode 401".
80		Verify alarm generation at HMI & ROCC, record ROCC operator name.
90		Request ROCC command "Mode 100" Normal Operation.
100		Verify fans stop, WAIT TEN (10) MINUTES FOR MOTORS TO COOL.
110		Request ROCC command "Emergency Mode 403".
120		Verify alarm generation at HMI & ROCC, record ROCC operator name.
130		Request ROCC command "Mode 100" Normal Operation.
140		Verify fans stop, WAIT TEN (10) MINUTES FOR MOTRS TO COOL.
150		Request ROCC command "Emergency Mode 404".
160		Verify alarm generation at HMI & ROCC, record ROCC operator name.

PLNT 1006 Inspection and Testing

170		Request ROCC command "Mode 100" Normal Operation.
180		Verify fans stop, WAIT TEN (10) MINUTES FOR MOTORS TO COOL.
190		Request ROCC command "Emergency Mode 405".
200		Verify alarm generation at HMI & ROCC, record ROCC operator name.
210		Request ROCC command "Mode 100" Normal Operation.
220		Verify fans stop, WAIT TEN (10) MINUTES FOR MOTORS TO COOL.
230		Request ROCC command "Emergency Mode 421".
240		Verify alarm generation at HMI & ROCC, record ROCC operator name.
250		Request ROCC command "Mode 100" Normal Operation.
260		Verify fans stop, WAIT TEN (10) MINUTES FOR MOTORS TO COOL.
270		Request ROCC command "Emergency Mode 423".
280		Verify alarm generation at HMI & ROCC, record ROCC operator name.
290		Request ROCC command "Mode 100" Normal Operation.
300		Verify fans stop, WAIT TEN (10) MINUTES FOR MOTORS TO COOL.
310		Request ROCC command "Emergency Mode 423".
320		Verify alarm generation at HMI & ROCC, record ROCC operator name.
330		Request ROCC command "Mode 100" Normal Operation.
340		Verify fans stop, WAIT TEN (10) MINUTES FOR MOTORS TO COOL.
350		Request ROCC command "Emergency Mode 425".
360		Verify alarm generation at HMI & ROCC, record ROCC operator name.
370		Request ROCC command "Mode 100" Normal Operation.
380		Verify fans stop.

PLNT 1006 Inspection and Testing

390		Advise ROCC that testing and inspection is complete.
400		Inspect Fire Extinguisher.

Requirements for performing the Testing and Inspections:		
Standard hand tools.		
Minimum PPE to include hearing protection, safety glasses or goggles, safety vest, flashlight, gloves, radio, and safety shoes.		

Date Completed: _____

Mechanic's #1 Name: _____

Supervisor's Sign: _____


Mechanic's #1 Sign: _____

Mechanic's #2 Name: _____

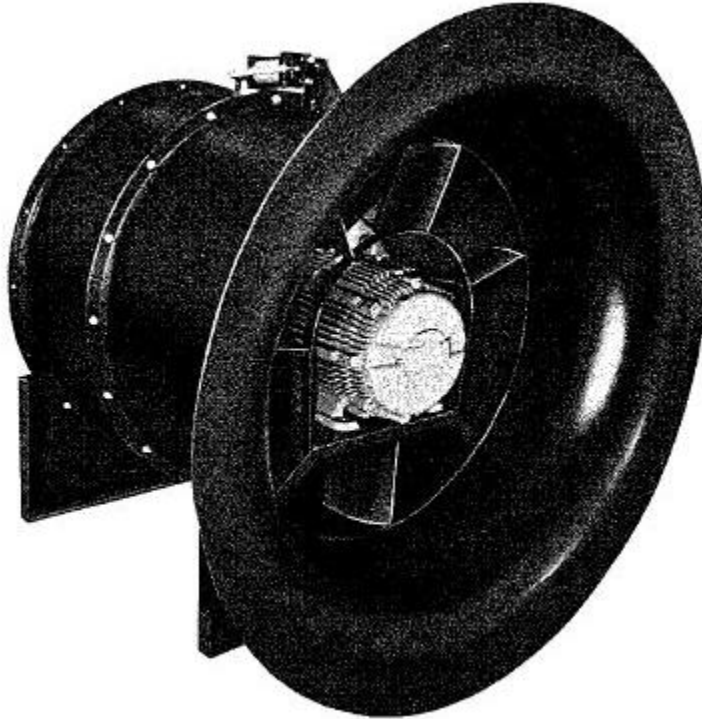
Mechanic's #2 Sign: _____

QC Performed: _____

WO#: _____

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	PLNT-1000	Instructions for Testing and Inspection of Under Platform Exhaust (UPE) Fans and Damper Components
	1007 Testing and Inspection of UPE Fan and Damper Components	

1007 - Inspection and Testing of UPE Fan System.



Purpose

This procedure provides the steps required to carry out the inspection and testing of the under platform exhaust (UPE) fan system. UPE fans are vane-axial type fans located in underground stations. The fans are reversible (can be operated in exhaust mode or supply mode) and are controlled by the Rail Operations Control Center (ROCC). First responders can also operate fans locally from the Mechanical Rm during an emergency.

Reference Documents

- Western Vaneaxial/Tubeaxial O&M Manual
- Standard Pneumatic Control and Flow Diagrams ST-M-139
- Remote Surveillance and Control Diagrams ST-M-143

Responsibility


Inspections are performed by trained PLNT personnel.

Prerequisites

Personnel performing inspections shall have completed the PLNT tunnel fan training course.

Revised
9/28/2015

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	1007 Testing and Inspection of UPE Fan and Damper Components	

Frequency

Each UPE fan system, including fan, associated dampers and control system shall be inspected and tested monthly.

Special Tools and Test Equipment

Standard hand tools and minimum PPE, including safety glasses, hearing protection, safety vest, flashlight, gloves, radio and safety shoes.

Records

PLNT Form 1007 UPE Fan System Testing and Inspections Checklist

Results

The UPE fan shall operate in the correct modes and the associated dampers shall fully open with no continuous abnormal indications. Intermittent indications that self-correct are expected and permissible. There are two fans in each underground station. Each fan and associated dampers must be tested. Corrective actions for equipment that is damaged or non-operational shall be noted on the inspection form and associated work orders shall be opened.

Procedure




Note: Prior to performing inspections and testing of the UPE fan(s), PLNT personnel must notify the ROCC operator of the commencing inspection and testing, as well as the location where the equipment will be temporarily out-of-service. PLNT personnel must also notify ROCC when the inspection is complete and the crew has left the shafts.


UPE Fan System Inspection and Testing Instructions

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of work orders is to track failing components and systems.) Open Fire/Life Safety (FLS) work orders when deficiencies may render one or more fans inoperable; open regular work orders for non-FLS deficiencies.


Task	Testing and Inspection Task Description
10	Visually inspect the discharge grating at street level for trash/debris or overgrowth which might prevent or restrict airflow.
20	Verify Mechanical Rm telephone is operational by calling ROCC to notify them that UPE fan testing/inspections will occur and the fans will be temporarily out-of-service and alarms may be generated.
30	Operate the UPE fan locally in manual "Exhaust" mode. Inspect for vibration in the fan; listen for noises that might indicate abnormal operation.
40	Operate the UPE fan locally in manual "Supply" mode. Inspect for vibration in the

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	fan; listen for noises that might indicate abnormal operation.
50	Visually inspect the UPE fan for loose bolts or fasteners.
60	Visually inspect the UPE fan mounts and verify that the fan is secure and the vibration isolators (springs/rubber) are intact.
70	Remove power to the fan by turning off the disconnect switch and following Lock Out/Tag Out (LOTO) procedures.
80	Perform visual inspection of all dampers and damper frames to verify there is no damage/deformation or loose, missing hardware or fasteners. Verify all damper blades are oriented correctly and are not missing.
90	Perform visual inspection of the fan housing, ductwork and flexible connections to verify there are no major tears or openings that would result in significant air leakages.
100	Perform visual inspection of the controls located within the control panel to verify there are no air leaks or disconnected air lines. For pneumatic controls, verify the regulated air pressure to the controls is between 20 and 25 PSI.
110	Visually inspect the water separator and drain if water is present.
120	Remove the LOTO and restore power to the fan.
130	Place fan selector switch in "Remote Control" mode.
140	Request the ROCC operator to command the UPE fan to operate in "Emergency Exhaust" mode. <u>Record the name of the ROCC operator.</u>
150	Verify the fan operates in the "Exhaust" mode. Open inspection access door and verify the direction of air flow.
160	Verify that the fan dampers fully open.
170	Verify no abnormal indications or alarms were generated at the ROCC. For abnormal indication(s) that do not self-correct, generate the required work order.
180	Request the ROCC operator to command the UPE fan to "Emergency Off." Visually verify the fan has stopped. Ensure ROCC confirms its controls indicate the fan stopped.
190	Request the ROCC operator to command the fan to operate in "Emergency Supply" mode.
200	Verify the fan operates in the "Supply" mode. Open inspection access door and verify the direction of air flow.
210	Verify that the fan dampers fully open.

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	1007 Testing and Inspection of UPE Fan and Damper Components	

220	Verify no abnormal indications or alarms were generated at the ROCC. For abnormal indication(s) that do not self-correct, generate the required work order.
230	Request the ROCC operator command the dome fan to “Emergency Off.” Visually verify the fan has stopped. Ensure ROCC confirms its controls indicate the fan stopped.
240	Request the ROCC operator command the UPE fan to “Auto Exhaust/Remote” mode. This is the normal operating mode for the UPE fan system.
250	Notify ROCC the testing and inspection are complete.
260	Perform monthly fire extinguisher inspection.

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	PLNT-1000	Instructions for Testing and Inspection of Under Platform Exhaust (UPE) Fans and Damper Components
	1007 Testing and Inspection of UPE Fan and Damper Components	

Appendix – Inspection and Testing Checklists

PLNT 1007 UPE Fan Testing and Inspection Checklist

PLNT 1007 Inspection and Testing

PLNT-1007 Testing and Inspections Checklist

Equipment: UPE Fans

Chain Marker: All Below Ground Stations

Station: N/A

Location: Below Ground

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Under Platform Exhaust (UPE) Fan Systems. UPE Fans are used to remove heat as well as smoke from underground stations.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
10		Inspect street level discharge grating.
20		Contact ROCC verify telephone operation and advice that UPE fan testing/inspections will occur alarms maybe generated
30		Operate fans locally in "Exhaust" mode check for abnormal noise/vibration.
40		Operate fans locally in "Supply" mode check for abnormal noise/vibration.
50		Inspect for loose fasteners
60		Inspect mounts and vibration isolators
70		Remove power to fan, LOTO.
80		Inspect dampers and frames
90		Inspect housing, ductwork, flex connections
100		Inspect Control Cabinet
110		Inspect water separator and drain if required.
120		Remove LOTO, restore power to fan.
130		Place selector switch in "Remote Control" mode.
140		Request ROCC command "Emergency Exhaust" mode, record ROCC operator name.
150		Verify "Emergency Exhaust" operation.

PLNT 1007 Inspection and Testing

160		Verify the dampers fully open.
170		Verify alarms.
180		Request ROCC command "Emergency Off", verify fan stops.
190		Request ROCC command "Emergency Supply"
200		Verify "Emergency Supply" operation.
210		Verify the dampers fully open..
220		Verify alarm generation.
230		Request ROCC command "Emergency Off", verify fan stops.
240		Request ROCC command "Auto Exhaust/Remote"
250		Advice ROCC that testing and inspection is complete.
260		Inspect fire extinguisher.

Requirements for performing the Testing and Inspections:
Standard hand tools.
Minimum PPE to include hearing protection, safety glasses or goggles, safety vest, flashlight, gloves, radio, and safety shoes.

Date Completed: _____

Mechanic's #1 Name: _____

Supervisor's Sign: _____


Mechanic's #1 Sign: _____

Mechanic's #2 Name: _____

Mechanic's #2 Sign: _____

QC Performed: _____

WO#: _____

	Washington Metropolitan Area Transit Authority	
	PLNT-1000	Instructions for Testing and Inspection of PLNT Systems
	1008 Inspection and Testing of Dome Fan System	

1008 - Inspection and Testing of Dome Fan System.

Purpose

This procedure provides the steps required to carry out the inspection and testing of the dome fan system. Dome fans are vane-axial type fans located above the dome in underground stations. They are capable of operating in exhaust or supply modes. The dome fan can be controlled locally by emergency response, or by ROCC in cases of fire/life safety or other specific needs.

Reference Documents

- Western Vaneaxial/Tubeaxial O&M Manual
- Standard Pneumatic Control and Flow Diagrams ST-M-149

Responsibility

Inspections are performed by trained PLNT personnel.

Prerequisites

Personnel performing inspections shall have completed the PLNT tunnel fan training course.

Frequency

Each dome fan system, including fan, associated dampers, and control system shall be inspected and tested monthly.

Special Tools and Test Equipment


Each fan system, including fans, associated dampers, control systems, and pneumatic systems located in the fan and vent shafts shall be inspected and tested monthly.

Records

PLNT Form 1008 Dome Fan System Testing and Inspections Checklist

Results

The dome fan(s) shall operate in the correct modes and the associated dampers shall fully open with no continuous abnormal indications. Corrective actions for equipment that is damaged or non-operational shall be noted on the inspection form and associated work orders shall be opened.

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	PLNT-1000	Instructions for Testing and Inspection of PLNT Systems
	1008 Inspection and Testing of Dome Fan System	

Procedure



Note: Prior to performing inspection and testing of the dome fan system, PLNT personnel must notify the ROCC operator of the commencing inspection and testing, as well as the location where the equipment will be temporarily out-of-service. PLNT personnel must also notify ROCC when the inspection is complete.

Dome Fan Inspection and Testing

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of work orders is to track failing components and systems.) Open Fire/Life Safety (FLS) work orders when deficiencies may render one or more fans inoperable; open regular work orders for non-FLS deficiencies.

Task	Testing and Inspection Task Description
10	Visually inspect the discharge grating at street level for trash/debris or overgrowth which might prevent or restrict airflow.
20	Contact ROCC and give the location where dome fan testing/inspections will occur. Inform the operator the fans will be temporarily out-of-service and alarms may be generated.
30	Operate the dome fan locally in manual “Exhaust” mode. Wait at least 20 seconds, then inspect for vibration in the fan; listen for noises that might indicate abnormal operation.
40	Operate the dome fan locally in manual “Supply” mode. Wait at least 20 seconds, then inspect for vibration in the fan; listen for noises that might indicate abnormal operation.
50	Visually inspect the dome fan for loose bolts or fasteners.
60	Visually inspect the dome fan mounts and verify the fan is secure and the vibration isolators (springs/rubber) are intact.
70	Remove power to the fan by turning off the disconnect switch and following Lock Out/Tag Out (LOTO) procedures.
80	Perform visual inspection of all dampers and damper frames to verify there is no damage/deformation or loose, missing hardware or fasteners. Verify all damper blades are oriented correctly and are not missing.



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**Instructions for Testing and Inspection
of PLNT Systems**

1008 Inspection and Testing of Dome Fan System

90	Perform visual inspection of the fan housing, sound attenuators and flexible ductwork connections to verify there are no major tears or openings that would result in significant air leakages.
100	Perform visual inspection of the controls located within the control panel(s) to verify there are no air leaks or disconnected air lines. For pneumatic controls, verify the regulated air pressure to the controls is between 20 and 25 PSI.
110	Visually inspect the water separator and drain if water is present.
120	Remove the LOTO and restore power to the fan.
130	Place fan control system in "Auto Exhaust/Remote" mode.
140	Contact ROCC and request ROCC operator to command the dome fan to operate in "Emergency Exhaust" mode. <u>Record the name of the ROCC operator.</u>
150	Verify the fan operates in the "Exhaust" mode. Open inspection access door and verify the direction of air flow.
160	Verify that the dome relief dampers fully open.
170	Verify the dome fan operates in the "Exhaust" mode and no abnormal indications or alarms were generated, either at the fan control panel or at the ROCC. For abnormal indication(s) that do not self-correct, generate the required work order.
180	Request ROCC operator to command the dome relief fan to "Emergency Off." Visually verify the fan has stopped. Ensure ROCC confirms its controls indicate the fan stopped.
190	Request the ROCC operator to command the dome fan to operate in "Emergency Supply" mode.
200	Verify the fan operates in the "Supply" mode. Open inspection access door and verify the direction of air flow.
210	Verify that the dome relief dampers fully open.
220	Verify the dome fan operates in the "Exhaust" mode and no abnormal indications or alarms were generated, either at the fan control panel or at the ROCC. For abnormal indication(s) that do not self-correct, generate the required work order.




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**Instructions for Testing and Inspection
of PLNT Systems**

1008 Inspection and Testing of Dome Fan System

230	Request the ROCC operator command the dome fan to "Emergency Off." Visually verify the fan has stopped. Ensure ROCC confirms its controls indicate the fan stopped.
240	Request the ROCC operator command the dome fan to "Auto Exhaust/Remote" mode. This is the normal operating mode for the dome fan system.
250	Notify ROCC the testing and inspection are complete.

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	Appendix Inspection and Testing Checklists	

Appendix - Inspection and Testing Checklists

PLNT 1008 Dome Fan Checklist:

PLNT 1008 Inspection and Testing

PLNT-1008 Testing and Inspections Checklist

Equipment: Dome Fans

Chain Marker: Below Ground Stations

Station: N/A

Location: Below Ground

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Dome Fan Systems. Dome Fans are used to remove heat as well as smoke from underground stations.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
10		Inspect street level discharge grating.
20		Contact ROCC advise that Dome fan testing/inspections will occur alarms maybe generated
30		Operate fans in Exhaust, check for abnormal noise/vibration.
40		Operate fans in Supply, check for abnormal noise/vibration.
50		Inspect for loose fasteners
60		Inspect mounts and vibration isolators.
70		Remove power to fan, LOTO.
80		Inspect dampers and frames.
90		Inspect housing, ductwork, flex connections.
100		Inspect Control Cabinet.
110		Inspect water separator and drain.
120		Remove the LOTO and restore power.
130		Place in "Auto Exhaust/Remote"
140		Contact ROCC. Request "Emergency Exhaust". Record ROCC operator name.
150		Verify "Emergency Exhaust" operation.

PLNT 1008 Inspection and Testing

160		Verify dome relief dampers are open.
170		Verify alarm generation.
180		Contact ROCC. Request "Emergency Off".
190		Contact ROCC. Request "Emergency Supply".
200		Verify "Emergency Supply " operation.
210		Verify dome relief dampers are open.
220		Verify alarm generation.
230		Contact ROCC. Request "Emergency Off".
240		Contact ROCC. Request "Auto Exhaust/Remote" Mode
250		Notify ROCC testing is complete.

Requirements for performing the Testing and Inspections:
Standard hand tools.
Minimum PPE to include hearing protection, safety glasses or goggles, safety vest, flashlight, gloves, radio, and safety shoes.

Date Completed: _____

Mechanic's #1 Name: _____

Supervisor's Sign: _____


Mechanic's #1 Sign: _____

Mechanic's #2 Name: _____

Mechanic's #2 Sign: _____

QC Performed: _____

WO#: _____

	Washington Metropolitan Area Transit Authority	
	PLNT-1000	Instructions for Testing and Inspection of PLNT Systems
	1009 Inspection and Testing of Dome Relief Vent System	

1009 - Inspection and Testing of Dome Relief Vent System (Dome with no Dome Fan, damper only).

Purpose

This procedure provides the steps required to carry out the inspection and testing of the Dome Relief Vent system. These systems contain only relief dampers (no dome fan) and are controlled by the corresponding UPE fan.

Reference Documents

- Western Vaneaxial/Tubeaxial O&M Manual

Responsibility

Inspections are performed by trained PLNT personnel.

Prerequisites

Personnel performing inspections shall have completed the PLNT tunnel fan training course.

Frequency

Each dome relief system, including associated dampers, and controls shall be inspected and tested monthly.

Special Tools and Test Equipment


Each fan system, including fans, associated dampers, control systems, and pneumatic systems located in the fan and vent shafts shall be inspected and tested monthly.

Records

PLNT Form 1009 Dome Relief System Testing and Inspections Checklist

Results

The dome relief dampers shall fully open when the corresponding UPE fan is activated. Corrective actions for equipment that is damaged or non-operational shall be noted on the inspection form and associated work orders shall be opened.

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	PLNT-1000	Instructions for Testing and Inspection of PLNT Systems
	1009 Inspection and Testing of Dome Relief Vent System	

Procedure




Note: Prior to performing inspection and testing of the dome relief system, PLNT personnel must notify the ROCC operator of the commencing inspection and testing, as well as the location where the equipment will be temporarily out-of-service. PLNT personnel must also notify ROCC when the inspection is complete.

Dome Relief Vent System Inspection and Testing

Generate work orders for all deficiencies identified during the inspection, even when the deficiencies are corrected during the inspection. (One purpose of work orders is to track failing components and systems.) Open Fire/Life Safety (FLS) work orders when deficiencies may render one or more fans inoperable; open regular work orders for non-FLS deficiencies.

The following tasks must be sequenced into the PLNT 1007 Testing and Inspection of UPE Fan and Damper Components. Perform these tasks in addition to the PLNT 1007 tasks to complete the testing and inspection of Dome Relief Dampers.

Task	Testing and Inspection Task Description
81	Perform visual inspection of all dome relief dampers and damper frames for damage or deformation. Verify all damper blades are oriented correctly and are not missing. Perform visual inspection of the dampers and damper frames for any loose or missing mounting hardware/fasteners.
82	Perform visual inspection of the ductwork for major tear or openings that would result in significant air leakages.
141	Request ROCC to command the corresponding UPE fan to operate in "Emergency Exhaust" mode. Visually verify the dome relief dampers fully open.
191	Request ROCC to command the corresponding UPE fan to operate in "Emergency Supply" mode. Visually verify the dome relief dampers fully open.

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Appendix - Inspection and Testing Checklists

PLNT 1007 UPE Fan Checklist:

PLNT 1009 DOME RELIEF VENT SYSTEM Checklist:

PLNT 1009 Inspection and Testing

PLNT-1009 Testing and Inspections Checklist

Equipment: Dome Relief Vent System

Chain Marker: _____

Station: _____

Location: _____

DESCRIPTION: This Checklist provides the steps required to carry out the testing and inspections of the Dome Relief Vent Dampers. The follow steps are to be sequenced into the PLNT 1007 Testing and Inspection of UPE Fan and Damper Components. Use these tasks in addition to the PLNT 1007 tasks to complete the testing and inspection of Dome Relief Dampers.

MONTHLY TASKS:

Task	<input type="checkbox"/>	Testing and Inspection Task Description
81		Verify dome damper condition.
82		Verify dome ductwork.
141		Verify dome dampers fully open.
191		Verify dome dampers fully open.

There is no signature block here. Include the steps above in PLNT 1007