PURPOSE: To establish procedures for conducting aircraft engine run-ups for maintenance purposes at Tampa International Airport (TPA).

GENERAL: Ground run-ups are routine aircraft engine maintenance tests performed as a check to ensure safe and reliable operation of the aircraft engine, as required by Federal Aviation Regulations and aircraft engine manufacturers. In an effort to reduce noise impacts upon communities in the vicinity of TPA, formal procedures for ground run-ups have been established, including the use of the Ground Run-Up Enclosure (GRE). Run-ups may be either suppressed or unsuppressed. Suppressed run-ups are those maintenance engine run-ups conducted within the GRE. Unsuppressed run-ups are those maintenance run-ups conducted outside the GRE. The GRE facility is described in detail in Attachments B and E.

PROCEDURES:

A. Location:

All Commercial type jet aircraft are required to use the GRE. All other general aviation turbojets are required to utilize the GRE during the hours of 2200(L) to 0700(L). GRE use is recommended for all other types of aircraft. Due to size restrictions, aircraft with wingspans greater than 214 feet are prohibited from utilizing the GRE.

Engine run-ups that do not exceed idle power may be performed at the aircraft’s parking location when these run-ups do not present a hazard to persons or property. Maintenance on aircraft within the GRE will be limited to minor adjustments that will not affect use of the GRE by others nor create environmental concerns. All equipment and tools must be removed from the GRE at the completion of each run-up.

B. Suppressed Run-ups:

1. Operating Hours

The GRE is available for use 24 hours a day. Use will be on a first-come, first-served basis. Since use of the GRE is on a first-come, first-served basis, aircraft operators should exercise good planning to ensure that they have sufficient time to complete all required run-ups prior to returning an aircraft to service.
2. Confirming GRE Availability

Because the GRE is used on a first-come, first-served basis, users are responsible for confirming whether the GRE is vacant and available for use in order to prevent congestion at the GRE or taxiway. GRE availability may be determined by calling Operations through the Airport Operations Center (AOC).

3. Scheduling Use of the GRE

Users are required to call the AOC at 870-8770 to schedule use of the GRE.

When calling, users shall state:

a. Company/organization name
b. Aircraft type
c. Planned start time run-up
d. Estimated duration of run-up
e. Maximum power setting to be used during the test
f. Name of contact person and contact number.

Operations will inform the caller if the GRE is occupied or vacant at the time of their call. If the GRE is vacant, approval will be granted. If the GRE is occupied, Operations will inform the caller when the GRE is expected to be available and will notify the caller when the GRE is available for their run-up.

All users of the GRE must contact Operations at 870-8770 if they have not cleared the GRE by the time stated in the GRE use request. This notification assists all users in efficient scheduling of the GRE.

4. Priority for Use

Operations will assign use of the GRE on a first-come, first-served basis. In the event that two or more users request use of the GRE for the same time, use of the GRE will be assigned based on consideration of departure time and aircraft type, respectively. At all times, air carrier type turbojets will have priority over other aircraft.
Subject: Engine Run-Up Noise Management

5. Aircraft Ingress into the GRE

a. Wingspan 125 feet or less

At the aircraft operator’s discretion, aircraft with a wingspan of 125 feet or less may power into the GRE using no more than breakaway thrust. These power-in aircraft may enter from either the right or left side of the GRE. Taxi lead-in lines and turn-around markings are provided as visual references for proper positioning. Aircraft should initiate a minimum-radius turn with the nose wheel within the 10’ x 3’ Turn Position Indicator box. The minimum-radius turn should be maintained until the aircraft has completed a 180 degree turn and is parallel to the GRE centerline. Aircraft following this procedure will have a minimum wingtip clearance of 25’ to the sidewall and 35’ to the jet blast deflector. No assurance is given that reference markings will be visible under all lighting and weather conditions. Wingtip and tail clearance from GRE walls and the rear blast deflector is strictly under the control of the individual operating the aircraft. Proper positioning of the aircraft requires that turn-around must be fully completed so that the aircraft is parallel with the GRE centerline before conducting high-power run-ups.

b. Wingspan 125 to 214 feet

Any aircraft with a wingspan between 125 feet and 214 feet must be backed into the GRE with a tug. Operations must be contacted for an escort if an aircraft will be towed to the GRE via active taxiways.

c. Wingspan greater than 214 feet

Any aircraft with a wingspan greater than 214 feet is too large to use the GRE. Run-ups will be conducted in accordance with procedures for conducting unsuppressed run-ups established by Operations. Operations must be contacted for approval prior to conducting an unsuppressed run-up.
6. Wing Walkers

GRE users are encouraged to use wing walkers when positioning aircraft within the GRE to prevent damage and to assure the aircraft is correctly positioned within the GRE. The use of wing walkers is at the discretion of the individual user.

7. Taxiway Access

All aircraft will access the GRE via Taxiway “E”. The Federal Aviation Administration Air Traffic Control Tower (FAA ATCT) must be contacted for clearance before any aircraft or vehicles are operated on any movement area. All taxi-qualified mechanics that taxi aircraft must also have Movement Area Training (MAT) endorsement on their ID Badge, issued by Operations. Proper communications between the aircraft, tow tractor, and the FAA ATCT must be maintained at all times during the taxi/tow operation.

8. GRE User Responsibilities

The GRE users are responsible for the following items:

a. Inspecting the GRE for foreign object debris (FOD) and removal of such FOD prior to conducting a run-up, as well as insuring that the GRE is FOD-free upon completion of the run-up.

b. Performing engine run-ups in accordance with airframe and engine manufacturer's guidelines.

c. Closely monitoring engine operation and discontinuing any test if any condition exists preventing successful engine operation, in order to prevent damage to the aircraft or GRE.

d. Maintaining radio contact with the FAA ATCT during run-up activities in order to quickly communicate any emergency that may arise during run-up activity.
e. Insuring that all aircraft operators using the GRE are familiar with this Operating Directive.

f. Chocking the landing gear for high power engine runs, as required by the GRE users company/airline/operator policies and procedures and/or aircraft manufacturer recommendations.

9. Aircraft Orientation

All jet aircraft will be positioned with the aircraft nose facing straight out of the GRE, due south, and on or parallel to the GRE centerline prior to beginning a high-power run-up. Propeller aircraft may be oriented nose-in to the GRE as appropriate, in order to achieve better acoustical or aerodynamic performance. Under no circumstances should any run-up be performed with the blast pointed toward the sidewalls of the GRE, as it is not designed to withstand these forces.

As shown in Attachment B, two lines parallel to the face of the blast deflector have been painted on the pavement to identify appropriate clearance distance from the rear blast deflector. The aircraft shall be positioned so that no portion of the aircraft extends aft past the “No Tails Closer Line”, which is located 35 feet ahead of the jet blast deflector leading edge. The discharge nozzle of any engine which will be operated during the test must be forward of the “No Nozzle Closer Line”, which is located 60 feet ahead of the blast deflector leading edge. Aircraft should be positioned as far into the GRE as practical in order to achieve maximum acoustical attenuation.

Operators will position aircraft within the GRE based on two basic principles. In normal wind conditions, aircraft should be taxied into the GRE so that the side of the aircraft with the engine to be tested will be closer to the GRE side wall. For example, a B737 that is going to test its #1 engine will taxi in on the left lead-in line and make a right turn to position the aircraft with the #1 engine closer to the East wall. Placing the test engine nearer the wall will maximize acoustical attenuation.

When cross winds are present, placing the aircraft closer to the upwind wall may allow run-ups to be conducted in a wider range of wind conditions. As operators
gain experience conducting run-ups inside the GRE, they will develop their own preferences for this lateral placement.

10. Wind and Weather Conditions

Attachment A includes predicted aerodynamic usability wind roses for various aircraft types. These are general guidelines defining the wind direction and speed parameters during which the GRE can be used. These parameters will vary with the type of aircraft, engine position and the power settings used for the engine testing. An illuminated sign displaying the wind speed and direction is attached to the east wall of the GRE for easy visibility from the aircraft cockpit. The operator should closely monitor engine operating readings and abort the test if readings exceed engine manufacture’s limits, if variances in readings indicate unsteady engine operation, or if any indications suggest continued operation might endanger people or property. If the operator still needs to continue the run-up operation, it is recommended that the operator wait until conditions improve so that the run-up can be safely completed. If this is not possible, procedures must be followed as specified in Section C, Unsuppressed Run-Ups, below.

11. Duration of Use

Users should be mindful that others may be waiting to use the GRE. Operations will generally allow no more than one hour for each run-up. If an aircraft departs the GRE for any reason except in a cooperative effort to allow another user to complete a more time-critical run-up, that run-up operation is considered to be complete. The user must contact Operations prior to each operation, even if it is for the same aircraft being run-up later that same day.

12. Aircraft Egress from the GRE

Following engine testing within the GRE, all aircraft may power out, using minimum power necessary. Operators shall contact FAA ATCT prior to entering the taxiway.
13. Facility Lighting

Security low-level lighting is provided within the GRE. The lights are on a photocell and remain on during hours of darkness. Operational lighting is provided within the GRE for use during all run-up operations.

14. GRE Damage

Damage to the GRE must be reported to the AOC at 870-8770 immediately. Representatives from Operations, Airport Police, and Maintenance may examine the damage and make a determination whether or not the damage is of a nature that would preclude continued use of the GRE. At the discretion of Operations, the GRE will be taken out of service until necessary repairs are made and the appropriate inspections are completed. Notification of the unavailability of the GRE will be electronically distributed via e-mail to all users.

In addition, if the damage was discovered by a user of the GRE, the Maintenance Ground Run-up Area Damage Report Form as found in Attachment C must be completed and emailed to Airfield Operations at ops-duty@tampaairport.com.

15. Equipment / Vehicle Parking

Any equipment or vehicles that accompany an aircraft should be parked close to the GRE control room on an area outside the GRE walls in such a manner as not to obstruct the taxiway/apron. Work stands, tow tractors, or other ground support equipment may not be stored at the GRE.

16. User Risk and Liability Disclaimer

The Authority disclaims any and all warranties, expressed or implied, with respect to the GRE or its use, including but not limited to, the implied warranty of merchantability and fitness for a particular purpose. Each user of the GRE uses it at the user’s own risk and is responsible for monitoring all wind and weather conditions, as described herein, to avoid risk of damage or injury to person or property. Improper use of the GRE or use during inappropriate weather conditions has been known to cause unreliable engine operation, up to and
including compressor stalls. By using the GRE, user assumes any and all risk of personal or property loss, damage, or injury of any kind and user shall make no claim or action against the Authority for any loss, damage, or injury, including any claim for loss of use, arising out of user’s use of the GRE. In no event will the Authority be liable for any special, consequential, indirect, punitive, or incidental damages, including but not limited to, loss of revenue or profits, arising out of or in connection with the use of the GRE or inability to use the GRE. User is responsible for any and all damage or destruction of the GRE caused by user. Nothing in this Operating Directive may be construed to supersede the recommendations of the aircraft manufacturer or of the aircraft operations manual regarding the safe operation of the aircraft.

C.  Unsuppressed Run-Ups:

1.  Conditions

There may be times when adverse wind or other conditions exist that may prevent a reliable test of engine performance using the GRE, or the GRE is not available due to use or being out of service. Under such conditions, an unsuppressed run-up may be conducted outside the GRE. Unsuppressed run-ups must be conducted in accordance with requirements set forth in this Section and at locations designated by the Authority.

2.  Hours

   a.  2200(L)-0700(L)

During the hours of 2200(L) to 0700(L), all air carrier turbojets and general aviation turbojets with wingspans up to 214 feet must conduct maintenance run-ups above idle power in the GRE, consistent with the engine manufacturer’s and aircraft operator’s specifications. Unsuppressed run-ups of commercial type carrier aircraft between the hours of 2200(L) to 0700(L) are prohibited, except under extreme circumstances. Any commercial type carrier aircraft operator wishing to perform an unsuppressed run-up during these times must contact Operations at 870-8752 to explain the situation and request approval.
Approval may be granted only during extreme circumstances, which do not include occupation of the GRE by another user.

In the event that use of the GRE is not possible, an alternate location for an unsuppressed engine run-up may be assigned at the discretion of Operations and the FAA ATCT. Alternate locations will be used only when the GRE is out of service due to maintenance or repair, when weather conditions preclude its use, or when other extreme circumstances exist.

b. 0700(L)-2200(L)

Aircraft operators are encouraged to use the GRE at all times for all run-ups above idle power. Run-ups by commercial type carrier aircraft are mandatory during the hours of 0700(L)-2200(L). Other aircraft types are not required to use the GRE during the hours of 0700(L) to 2200(L). Operators of general aviation turbojets must contact Operations for approval of unsuppressed run-ups during the hours of 0700(L) to 2200(L). Operators of other aircraft types are not required to contact Operations for approval of unsuppressed run-ups during these hours.

3. Locations

The following locations may be utilized for unsuppressed run-ups, pending coordination with FAA ATCT.

b. Extreme south end of taxilane “F”.
c. Other locations that do not present a hazard to persons or property.
USABILITY WIND ROSES

- A 300
- A 310
- A 319/320/321
- B 717
- B 727-200
- B 737-200
- B 737-300/400/500++
- B 747
- B 757-200
- B 767
- B 777
- CORPORATE JET/CRJ
- DC8
- DC8-R
- DC9
- DC10/MD11
- MD88
- TURBOPROP
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

Aircraft: B717

- High-Power Runs Possible
- High-Power Runs May be Possible (Dependent on Wind Stability & Engine Power Setting)
- High-Power Runs Unlikely
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

Aircraft: B737-300/400/500++

- High-Power Runs Possible
- High-Power Runs May be Possible (Dependent on Wind Stability & Engine Power Setting)
- High-Power Runs Unlikely
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

**Aircraft: B747**

- **High-Power Runs Possible**
- **High-Power Runs May be Possible** (Dependent on Wind Stability & Engine Power Setting)
- **High-Power Runs Unlikely**
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

Aircraft: B757-200

- High-Power Runs Possible
- High-Power Runs May be Possible (Dependent on Wind Stability & Engine Power Setting)
- High-Power Runs Unlikely
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

Aircraft: B767

- High-Power Runs Possible
- High-Power Runs May be Possible (Dependent on Wind Stability & Engine Power Setting)
- High-Power Runs Unlikely
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

**Aircraft: B777**

- Green: High-Power Runs Possible
- Blue: High-Power Runs May be Possible (Dependent on Wind Stability & Engine Power Setting)
- Red: High-Power Runs Unlikely

Wind Speeds:
- 0-16 Kts
- 16-32 Kts
- 32-64 Kts
- 64-100 Kts
- 100-150 Kts
- 150-200 Kts
- 200-250 Kts
- 250-300 Kts
- 300-350 Kts
- 350-400 Kts
- 400-500 Kts
- 500-600 Kts
- 600-700 Kts
- 700-800 Kts
- 800-900 Kts
- 900-1000 Kts
- 1000-1100 Kts
- 1100-1200 Kts
- 1200-1300 Kts
- 1300-1400 Kts
- 1400-1500 Kts
- 1500-1600 Kts
- 1600-1700 Kts
- 1700-1800 Kts
- 1800-1900 Kts
- 1900-2000 Kts
- 2000-2100 Kts
- 2100-2200 Kts
- 2200-2300 Kts
- 2300-2400 Kts
- 2400-2500 Kts
- 2500-2600 Kts
- 2600-2700 Kts
- 2700-2800 Kts
- 2800-2900 Kts
- 2900-3000 Kts
- 3000-3100 Kts
- 3100-3200 Kts
- 3200-3300 Kts
- 3300-3400 Kts
- 3400-3500 Kts
- 3500-3600 Kts
- 3600-3700 Kts
- 3700-3800 Kts
- 3800-3900 Kts
- 3900-4000 Kts
- 4000-4100 Kts
- 4100-4200 Kts
- 4200-4300 Kts
- 4300-4400 Kts
- 4400-4500 Kts
- 4500-4600 Kts
- 4600-4700 Kts
- 4700-4800 Kts
- 4800-4900 Kts
- 4900-5000 Kts
- 5000-5100 Kts
- 5100-5200 Kts
- 5200-5300 Kts
- 5300-5400 Kts
- 5400-5500 Kts
- 5500-5600 Kts
- 5600-5700 Kts
- 5700-5800 Kts
- 5800-5900 Kts
- 5900-6000 Kts
- 6000-6100 Kts
- 6100-6200 Kts
- 6200-6300 Kts
- 6300-6400 Kts
- 6400-6500 Kts
- 6500-6600 Kts
- 6600-6700 Kts
- 6700-6800 Kts
- 6800-6900 Kts
- 6900-7000 Kts
- 7000-7100 Kts
- 7100-7200 Kts
- 7200-7300 Kts
- 7300-7400 Kts
- 7400-7500 Kts
- 7500-7600 Kts
- 7600-7700 Kts
- 7700-7800 Kts
- 7800-7900 Kts
- 7900-8000 Kts
- 8000-8100 Kts
- 8100-8200 Kts
- 8200-8300 Kts
- 8300-8400 Kts
- 8400-8500 Kts
- 8500-8600 Kts
- 8600-8700 Kts
- 8700-8800 Kts
- 8800-8900 Kts
- 8900-9000 Kts
- 9000-9100 Kts
- 9100-9200 Kts
- 9200-9300 Kts
- 9300-9400 Kts
- 9400-9500 Kts
- 9500-9600 Kts
- 9600-9700 Kts
- 9700-9800 Kts
- 9800-9900 Kts
- 9900-10000 Kts

Wind Directions:
- 0-90°
- 90-180°
- 180-270°
- 270-360°
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

Aircraft: Corporate Jet/CRJ

- High-Power Runs Possible
- High-Power Runs May be Possible (Dependent on Wind Stability & Engine Power Setting)
- High-Power Runs Unlikely
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

Aircraft: DC9

High-Power Runs Possible
High-Power Runs May be Possible (Dependent on Wind Stability & Engine Power Setting)
High-Power Runs Unlikely
TPA Ground Run-Up Facility

Aerodynamic Usability Windrose

Aircraft: DC10/MD11
ATTACHMENT “B”
MAINTENANCE GROUND RUN-UP ENCLOSURE LAYOUT
Attachment C – Maintenance Ground Run-up Area Damage Report Form

In addition to making a voice report to the Airport Operations Center at 870-8770, complete this form describing any and all damages incurred to the aircraft or facility and submit it to Airfield Operations immediately via e-mail at opsduty@tampaairport.com.

1. AIRLINE/COMPANY: ________________________________

2. DATE: __________________________________________

3. TIME: ___________________________________________

4. AIRCRAFT:
   Make/Model: _____________________________________  N-number: __________

5. PURPOSE FOR TESTING: __________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________

6. DESCRIPTION OF DAMAGE:
   ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________

7. PROBABLE CAUSE FOR DAMAGE:
   ________________________________________________________________________________
   ________________________________________________________________________________
   ________________________________________________________________________________

8. Name of individual reporting damage: ________________________________

9. Name of operator (mechanic): ________________________________

10. PHONE: ____________________________  12. FAX: ________________________________
Attachment D – Maintenance Ground Run-up Difficulty Report Form

Complete this form describing any difficulties encountered which prevented a successful engine run-up operation within the Maintenance Run-up Area. Email to Airfield Operations at opsduty@tampaairport.com.

1. AIRLINE/COMPANY: _______________________________________________

2. DATE: ____________________________

3. RUN-UP START TIME: ___________ 4. RUN-UP END TIME: ___________

5. WIND ATIS: ________ (deg) ________ (knots)

6. WIND DISPLAY: ________ (deg) ________ (knots)

7. AIRCRAFT: Type _______ N-number __________

8. AIRCRAFT SCHEDULED FOR FLIGHT NUMBER _________________________

9. POWER SETTING (When difficulty occurred)

   ENGINE #1 _______ #2 _______ #3 _______ #4 _______

10. DESCRIBE DIFFICULTY ENCOUNTERED

    _______________________________________________________________________

    _______________________________________________________________________

    _______________________________________________________________________

11. WAS TEST SUCCESSFULLY COMPLETED: Yes _______ No _______

12. PROBABLE CAUSE OF DIFFICULTY

    _______________________________________________________________________

    _______________________________________________________________________

    _______________________________________________________________________

13. OPERATOR’S NAME: _________________________________________________

14. OPERATOR’S PHONE NUMBER: ___________ FAX: ________________
Attachment E – Description of the Ground Run-Up Enclosure Facility

Location
The Facility is located on Taxiway E and adjacent to Taxiway U. It is oriented 190° magnetic.

Access
Aircraft Access: Aircraft will access the Facility from Taxiway “E”.

Vehicle Access: Vehicles may access the Facility via the Service Road.

Description and Dimensions
Orientation: The Facility is a three-sided, open-roofed structure. Jet aircraft will be positioned within the Facility with nose pointing outward toward the open end at a heading of 180° magnetic. Propeller aircraft may be oriented nose-in as appropriate.

Size: Interior dimensions are 264’ wide by 292’ deep.

Pavement Markings
Centerline: A yellow line 6” wide will be located in the center of the facility.

Lead-in Lines and Turn Position Indicator: Aircraft with wingspans less than 125 feet can power-in and power-out of the Facility. Two yellow lines 6” wide and offset 42’ from either side of the main centerline are provided to mark the nose wheel position for turn-around aircraft (power-in/power-out). Aircraft should initiate a minimum-radius turn with the nose wheel within the 10’ x 3’ Turn Position Indicator box. The minimum-radius turn should be maintained until the aircraft has completed a 180° turn and is parallel to the Facility centerline. Aircraft following this procedure will have a minimum wingtip clearance of 25’ to the sidewall and 35’ to the jet blast deflector.

Tail Position: A stripe across the facility floor located 35’ ahead of the jet blast deflector is provided. This stripe extends 10’ up the sidewalls of the facility and is labeled “No Tails Closer.”

Engine Position: A stripe across the facility floor, located 60’ ahead of the jet blast deflector is provided. This stripe extends 10’ up the sidewalls of the facility and is labeled “No Nozzles Closer.”

Utility Buildings
Control Room:
- Location: On the West outside wall of the Facility, near the open end of the Facility.
- Size: 14’-6” wide x 9’ deep.
- Access: 3’ x 7’ personnel door on the West wall, unlocked at all times.

Storage sheds (3):
- Location: Outside the Facility near the exit doors.
- Size: 5’ x 5’ x 12’ high.
- Access: 3’ x 7’ personnel door on the outside wall with hasp lock.
Windows
One window 3’-0” x 4’-0”, is provided in the Control Room to view aircraft operating within the Facility.

Electrical
Lighting: Three overhead, fluorescent fixtures within the control room.
Wind Speed, and Direction, and LED readout board.
On-Off Switch for Operational Lighting.
Fire Alarm: Pull station and horn/strobe light (Both in the control room and on the West Facility wall).
Convenience Outlets: GFI outlets inside and outside the control room.

Electronics
Wind Speed/Direction Monitoring Sensors are located on a mast atop the East wall of the Facility. A display system is mounted on the East wall of the Facility.
Wind Speed/Direction Monitoring and Data Storage are mounted on a computer rack in the control room.

HVAC
A ductless, wall-mounted heat pump is provided for heating and cooling the control room.

Emergency Equipment
A First Aid Kit and Stand-Alone Eye Wash unit are located in the Control Room.
Two large, wheeled fire extinguishers are located adjacent to the emergency exit doors in the Facility.
Notify Airport Police at 870-8760 in the event of injuries and/or to obtain medical assistance.

Electrical System
Service: 300 amp 240v power is provided to the Facility.

Facility Lighting
- Security low-level lighting is provided within the Facility. The lights are on a photocell and remain on during hours of darkness. A manual maintenance test override switch is located in the control room.
- Operational Lighting: Lighting is provided within the Facility. These lights may be operated from within the control room. The operational lights are on a photocell to prevent their use during the daytime. Maintenance test override switches are provided within the equipment room for testing both the photocell and the dial up modem system.
- Obstruction Lights: Red obstruction lights are provided along the top of the Facility structure. They are controlled by a photocell and will remain on after dark. A maintenance test override switch is provided in the control room.
- Exit Lights: Exit lights are provided over each egress door in the Facility. They are connected to the photocell and will remain on after dark. A maintenance test override switch is provided in the control room.
- Grounding: A continuous ground is provided for steel Facility structures including the jet blast deflector.
- Lighting Protection: A complete lighting protection system is attached to the Facility structure.