



Ground Run-up Enclosure (GRE)

How the Airlines use our Ground Run-up enclosure at PDX

Airlines routinely inspect and maintain their aircraft to ensure the safety of the traveling public, and each aircraft is on a stringent maintenance schedule based on its number of hours in operation.

As part of this regularly scheduled maintenance, the Federal Aviation Administration (FAA) requires that aircraft engines be tested at high power levels to ensure their proper operation. These tests typically occur at night when the aircraft are through flying for the day.

While necessary for safety, engine run-up operations can be a disturbance at a time when area residents are trying to sleep.

In 1996, the Port worked with community representatives to develop an interim plan that severely restricted nighttime jet engine tests. The Port/community team further worked out an engine run-up maintenance plan that went into effect upon completion of the Ground Run-up Enclosure (GRE).

This plan requires all engine testing (except for very small propeller aircraft) be done inside the GRE at all times. Following strict procedures, aircraft occasionally may be permitted to test engines outside the GRE when the facility is closed for repairs or when adverse wind conditions occur that prevent the reliable operation of engines inside the GRE. Due to the advanced aerodynamic design of the GRE at Portland International Airport (PDX), this could happen less than five percent of the time.

In 2000 there were 2,232 engine run-ups at PDX. The PDX Noise Management Office will continue monitoring the performance of the GRE to ensure that it meets community expectations and Oregon's noise regulations.

Since the GRE went into operation in late spring of 2001, airlines and PDX neighbors have benefited from this world-class facility.

GRE Performance Test

On March 30, 2001 the performance acceptance test was conducted. The Port's GRE design specifications were aggressive -- a noise reduction of 18 decibels (dBA) at specified measurement points. Final results showed that the goal for noise level reduction was met or exceeded for the three different aircraft used in the test. Noise levels were reduced by as much as 20 dBA, which amounts to a 75 percent reduction of the sound level during engine run-ups.

The logistics of the test were impressive.

The test was conducted as a collaborative effort with the help of meteorologists, airline staff, noise consultant staff, community volunteers, PDX Operations personnel, Port engineers, Public Affairs, the PDX Noise Abatement Office, and the GRE designer/builder.



United Airlines and Horizon Air donated the use of a Boeing 737, a Fokker F28, and a deHavilland Dash-8 turboprop. Each plane was put through the paces of an engine run-up inside the GRE and then outside the GRE to compare noise levels.

Test procedures required the operation of 20 noise monitors at precise locations around the GRE and in residential neighborhoods. A complex system of communication using cell phones, 800 MHz radios and aircraft radios ensured constant communication between the aircraft, engineers and noise monitoring teams.

The formal part of the test began at 2 p.m. with training of community volunteers and staff for monitoring community noise sites. The last run-up test was completed around 5:30 a.m. the following morning.

As a result of the successful tests, the Port formally accepted the GRE in April and the airlines have been using the facility with positive results, for both aircraft operators and noise-sensitive communities around the airport. The specification applied to the PDX facility is considered by acoustical experts to be the most rigorous standard to date for a GRE in the United States, and possibly worldwide. As a result, the PDX facility is at the forefront of a relatively new and rapidly developing technology.

GRE Design and Construction

The Ground Run-up Enclosure is the result of more than three years of effort by the Port of Portland and residents from neighboring communities to reduce noise generated when aircraft conduct engine run-ups for maintenance and safety purposes. In November 1999 the Port Commission approved the plan to build the \$7.8 million facility as part of its ongoing commitment to reduce aircraft noise levels around the airport.

Engineering Design Challenges:

Limited locations on the airfield to build the facility;
Seasonally varying winds; and
Oregon's stringent noise regulations.

Port engineers and Operations staff conducted extensive research, including visits to engine run-up facilities in Chicago and various airports in Germany and England before settling on what they considered the most advanced, low-risk design. The PDX project team considered several designs - three sides with a door, two sides with a roof, and three sides with an open roof. The three-sided design with an open roof was chosen as the most workable.

Completed under budget and ahead of schedule, the PDX Ground Run-up Enclosure is the third such facility in the United States. This successful project came to fruition thanks to a lot of hard work on the part of all interested parties, including Port staff, the airlines serving PDX, community and neighborhood leaders and the environmental community.

GRE Dimensions Height: 55 feet

Length: 278 feet

Width: 207 feet