

Jet Engine Noise Attenuation Device (NAD)

Background

Open Air Engine Test facilities are used to perform outdoor tests on installed and uninstalled aircraft engines. Because of the elevated noise levels generated during test operations at these facilities, Naval activities have a high probability of receiving complaints from surrounding community members and businesses. In response, Open Air Test facilities establish guidelines for their operations, including consideration of weather and wind conditions. These guidelines may restrict when engine tests can be performed to days where weather conditions are favorable and noise disturbances reduced. These restrictions can negatively affect operational readiness.

The continued operation of Open Air Test facilities is essential to the Navy. Naval aviation research, development, test and evaluation (RDT&E) efforts to mitigate noise impacts on the surrounding communities have become increasingly important as mission capabilities increase and areas surrounding bases continue to grow and encroach on military installations. The challenge for many military activities is balancing mission objectives with being a “good neighbor”.

Technology

The NAVFAC Engineering Service Center at Port Hueneme, CA has performed full scale testing of the Noise Attenuation Device (NAD) for the reduction of noise generated by Open Air jet engine tests. Test results for the J-52 jet engine (from an EA-6B Prowler) showed noise reductions of 14 decibels at 100 percent power. This translates to a factor of four reduction in noise. Tests with the F-404 engine (F/A-18 Hornet engine) and its application to other DoD jet engines, both low- and high-by-pass, is also being investigated. Results of these studies will provide a more complete indication of the full noise reduction potential of the NAD.

It is envisioned that the NAD will be used to reduce noise from DoD jet engines during stationary testing whether installed in an aircraft or on a test stand. With additional testing and a still-improving design, the goal for the NAD is to reduce engine noise by >20 decibels from a variety of DoD low- and high-by-pass engines and to make a useful contribution to reducing the noise produced at military activities.

Technology Benefits

Benefits of this technology include:

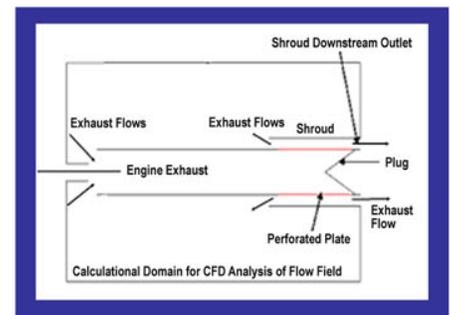
- Support fleet readiness by eliminating operational restrictions due to noise.
- Reduces noise during stationary testing of full-scale engines by > 20 decibels.
- Useful at remote sites where Jet Engine Test Cell (JETC) costs would be prohibitive.
- Useful for test stand and hi-power run-up of installed engines.
- Projected application is for low-by-pass engines such as the Navy's F-414/F-404 engines, JSF F-135 engine and other USAF high performance jet engines as well as high-by-pass engines used on transports.



Costs

Cost benefits of this technology are as follows:

- The NAD can be produced for \$250K vs \$15M for the cost of a new JETC, making it a low-cost alternative.
- Reduced life cycle costs:
 - Annualized cost of NAD (15-year life) is \$17k/yr.
 - Annualized cost of JETC (20-year life) is \$900k/yr.



Availability

The NAD will be available for purchase through NAVFAC Engineering Service Center.

Sponsored By:

Navy Environmental Sustainability Development
to Integration Program (NESDI)
and
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