NASA has implemented the Aeronautics Test Program (ATP) within its Aeronautics Mission Directorate. The purpose of the ATP is to ensure the long term availability and health of the large aeronautics ground test facilities that support NASA, DoD and U.S. industry research and development (R&D) and test and evaluation (T&E) needs. Furthermore, ATP provides rate stability to the aforementioned user community. The ATP facilities are located at the NASA Research Centers, including at Ames Research Center, Glenn Research Center and Langley Research Center. Classes of facilities within the ATP include low speed wind tunnels, transonic wind tunnels, supersonic wind tunnel, hypersonic wind tunnels, hypersonic propulsion integration test facilities, and air-breathing engine test facilities. A key component of ensuring a ground test facility's long term viability is to implement and continually improve on the efficiency and effectiveness of that facility's operations. To operate a facility in this manner requires the use of state-of-the-art test technologies and test techniques, creative facility performance capability enhancements, and novel means of acquiring test data. NASA is soliciting proposals in the areas of instrumentation, test measurement technology, test techniques and facility development to help in achieving the ATP goals of sustaining and improving our ground test capabilities. Proposals that describe products or processes that are transportable across multiple facility classes are of special interest. The proposals will also be assessed for their ability to develop products that can be implemented across government-owned, industry and academic institution ground test facilities.

**Subtopics**

**A4.01 Test Measurement Technology**

**Lead Center:** GRC

**Participating Center(s):** ARC, LaRC

NASA is concerned with operating its ground test facilities with new and innovative methods for test measurement technology. By using state-of-the-art test measurement technologies and novel means of acquiring test data, NASA will be able to operate its facilities more efficiently and effectively and also be able to meet the challenges presented by NASA's cutting edge research and development programs. NASA's aeronautics and space research and development pushes the limits of technology, including the ground test facilities that are used to confirm theory and provide validation and verification of new technologies. Therefore, NASA is seeking highly innovative and commercially viable test measurement technologies that would increase efficiency or overcome research and development technology barriers for ground test facilities.

The first emphasis for this subtopic is in the area of test measurement technology. Examples of the types of technology solutions sought, but not limited to, are data acquisition system improvements, skin friction experimental
measurement techniques, and improved flow transition detection methodologies.

The second emphasis for this subtopic is a specific area of test measurement technology: instrumentation. Instrumentation examples include new or novel, non-intrusive measurement technologies for pressure, temperature, and force measurements; and force measurement (balance) technology development. Solutions are also sought with regards to the instrumentation used to characterize ground test facility performance. This could be in the area of aerodynamics performance characterization (flow quality, turbulence intensity, etc.) or, for example, in the case of specialty facilities, the measurement of high ice water content conditions in an icing wind tunnel.

Proposals that lead to products or processes that are useful across multiple facility classes are especially important. The proposals will also be assessed for their ability to develop products that can be used in government-owned, industry and academic institution aerospace ground test facilities.

**A4.02 Test Techniques and Facility Development**

*Lead Center: GRC*

*Participating Center(s):* ARC, LaRC

NASA is concerned with continually improving on the efficiency and effectiveness of operation of its ground test facilities. NASA strives to operate its facilities in such a way as meet the requirements of the NASA research and development efforts into new and novel means of removing barriers to safe and efficient flight and to the exploration of space. To do so requires the use of state-of-art test techniques and creative facility performance capability enhancements. NASA is seeking highly innovative and commercially viable test techniques and facility performance technologies that would increase efficiency and effectiveness or overcome research and development technology barriers for ground test facilities.

Solutions are being sought in the areas of improvements in facility performance capabilities, e.g., expanded operating envelope, and enhanced or rapid characterization of facility performance. Solutions are also sought that are facility specific. Examples of facility specific projects include:

- Improved dynamic (forced oscillation) test capability at transonic and supersonic speeds;
- Improved flow transition detection methodologies;
- Modeling and simulation of high ice water content conditions.

The above are listed as examples only and should not be interpreted as the only areas of test technique and facility development innovative research proposals being sought.
Proposals that lead to products or processes that are useful across multiple facility classes are especially important. The proposals will also be assessed for their ability to develop products that can be used in government-owned, industry and academic institution aerospace ground test facilities.