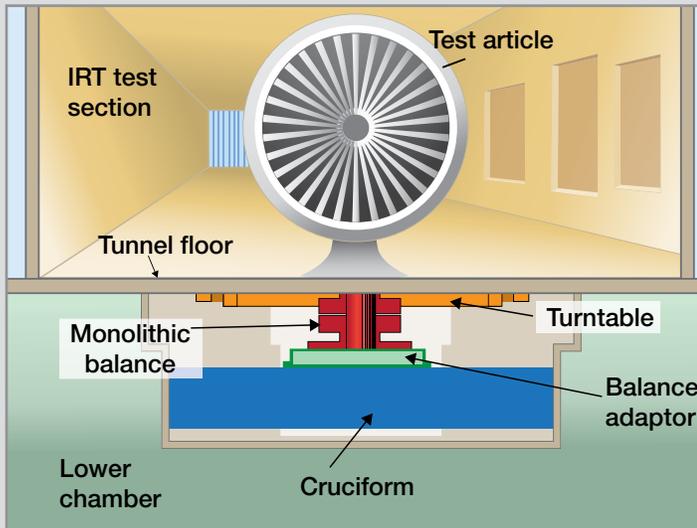




Icing Research Tunnel Force Measurement System Evaluation

Problem: GRC's Icing Research Tunnel (IRT) is one of NASA's unique aerodynamic test facilities. It is one of the largest icing wind tunnels in the world and is constantly in high demand due to this unique capability. One of the tunnel's main features is a large external balance and



NESC recommended concept for GRC IRT FMS includes a new monolithic balance and balance adaptor and modifications to the existing turntable and cruciform.

turntable system. The tunnel needs to update this force measurement system (FMS) to increase the force and moment measurement accuracy and to improve facility throughput. This FMS was designed and built in the early 1980s by civil servants who have since retired and GRC no longer has in-house knowledge of how best to upgrade the system. The NESC was requested to assess the current system, develop new concepts if required, and develop cost estimates and specifications for any suggested upgrades.

NESC Contribution: The NESC created a team of experts from NASA Centers and industry to address this issue. Initially, a study was performed to gather data on the existing IRT-FMS. The team then conducted multiple technical interchange meetings on-site with IRT facility personnel. From these meetings, a better understanding of how the facility is currently used, how the associated calibration hardware is used, and clearer understanding of requirements were developed.

Result: The NESC team developed multiple configurations that would result in satisfaction of the requirements. These concepts were drafted, and pros and cons of each system were discussed with the facility personnel. The concept pictured is the recommended system that best meets all of the facility requirements. In the near future, estimates of various stages of facility upgrades will be made to allow the facility to perform improvements as funding becomes available.