**Integrated VXI and Virtual Instrument Technology for Enhanced Centralized Testing and Management of Turbo-Shaft Engine Operations Using SIMATICS**

The significance of engine performance in the production and maintenance of a turbo-shaft engine cannot be overstated. Traditional computer-aided testing primarily functions as a data acquisition system, focusing on parameter measurement and device control. However, this paper introduces an advanced CAT system utilizing VXI and virtual instrument technology. This innovative system establishes communication with the Programmable Logic Controller (PLC), Electronic Control Unit (ECU), and dynamometer, creating a centralized information system for the operational aspects of a turbo-shaft engine.

This CAT system not only facilitates data collection but also interacts with key components involved in engine operation. By integrating with the PLC, ECU, and dynamometer, it ensures a comprehensive and streamlined approach to engine testing. The use of virtual instrument technology enhances the system's capabilities, providing users with a versatile set of functions that assist throughout the entire experimental process—pre-experiment preparation, real-time monitoring during experiments, and post-experiment analysis.

In summary, this paper presents a state-of-the-art CAT system that goes beyond traditional testing approaches. Through the incorporation of VXI and virtual instrument technology, coupled with seamless communication with crucial engine components, it establishes a robust and centralized information system for turbo-shaft engine operations. The multi-functional capabilities of this system aim to enhance user assistance, offering comprehensive support before, during, and after experimental procedures.  
  
