

# Propulsion Instrumentation Working Group (PIWG)

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## PIWG Overview

PIWG was formed in 1995 to address critical turbine engine test cell instrumentation, sensors and measurement technology to keep pace with the needs of the turbine engine and gas turbine power communities. PIWG encourages commercial sources to develop advanced test cell instrumentation and works cooperatively with other similar groups in the US and abroad.

## PIWG Focuses On

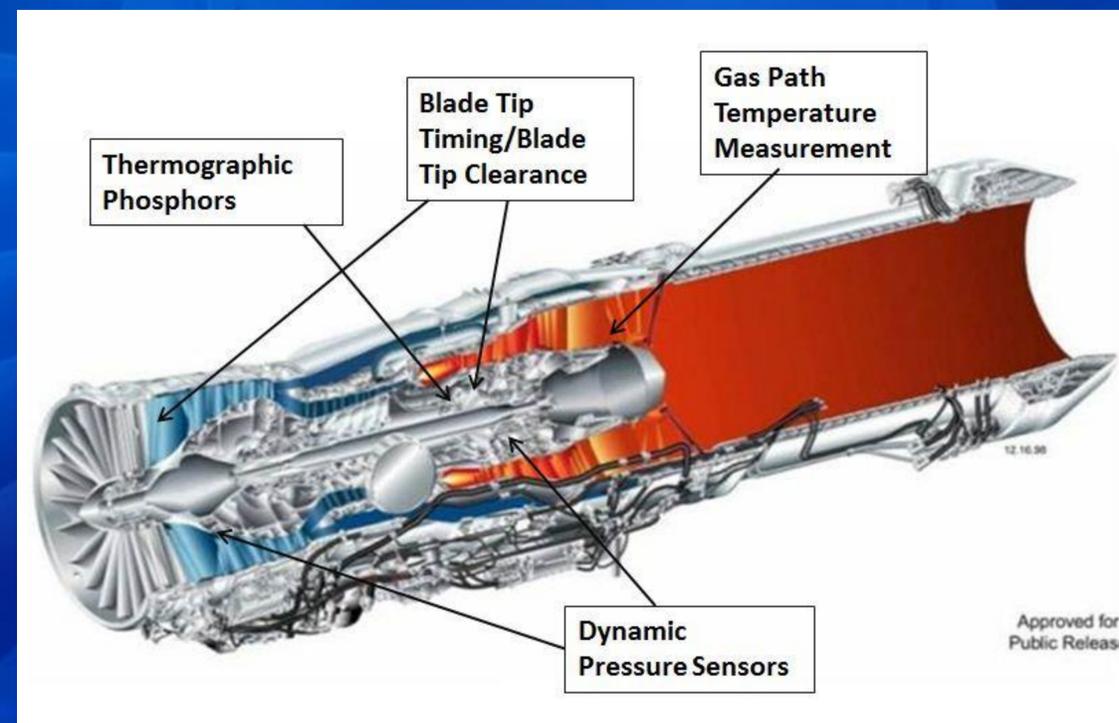
- Identifying common sensor and measurement needs and requirements
- Creating and implementing a common strategy and vision to guide future research and development
- Providing a consensus voice to represent the gas turbine test cell instrumentation industry
- Identifying and pursuing instrumentation development efforts

## PIWG Organization

- Leadership team of propulsion and power OEMs, DOD, NASA, DOE
- Co-chairs Harvey Niska, Honeywell; Tom Serbowicz, Williams International
- Strategic Advisory Board (SAB) of sensor vendors and universities
- Program Manager, Carol Cash, OAI

## Areas of Interest/Research

- **Blade Tip Timing/Blade Tip Clearance (BTT/BTC) Transition to Engine Health Monitoring (EHM):** Monitor fan rotor components and detect anomalies in blades
- **Blade Tip Timing Hot Section Sensor(s):** Through a collaborative team, develop specifications and design/test reliable high temperature BTT and/or BTC sensor(s)
- **Thermographic Phosphor and Thermal Barrier Coating Sensing:** Exploit luminescence sensing for three approaches: engine coating health, turbine vane temperature, turbine blade temperature.
- **High Temperature Dynamic Pressure Sensors for Gas Turbine Engine Propulsion Systems:** Advance high temperature, uncooled dynamic pressure transducers in order to achieve the next generation of intelligent propulsion systems.
- **Gas Path Temperature Measurement:** Develop sensors to measure the turbine inlet temperature to minimize fuel consumption and maximize turbine life.



## Standards

Under the auspices of the International Society of Automation (ISA), PIWG and its sister organization European Virtual Institute/Gas Turbine Instrumentation (EVI-GTI) is developing standards, recommended practices and technical reports on measurement techniques. There are currently five standards subcommittees:

- ISA 107.1 – Tip Timing for Use in Gas Turbine Engines
- ISA 107-2 – Thermographic Phosphor Temperature Standard
- ISA 107.3 – Non-Contact Clearance Measurement Systems for use in Gas Turbines
- ISA 107.4 – Wireless Standards for Turbine Engine Test Stands
- ISA 107.5 – Dynamic pressure Standards for Turbine Engine Testing

## Future Direction

PIWG is currently developing a series of strategic technical roadmaps in their areas of interest. These roadmaps will show a **continuum of technology development/testing through transition to EHM**. PIWG seeks to work cooperatively and collaboratively with similar groups such as ASWG and DECWG to transition and implement these technologies.

**For additional information, visit [www.PIWG.org](http://www.PIWG.org)**



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