The Evolution of Vacuum Research and Service at NIST

Jay H. Hendricks
National Institute of Standards and Technology, Gaithersburg, MD 20899, USA

This presentation provides a brief introduction to the early work on pressure and vacuum research and service at NIST. Initially, some of the earliest research supported aircraft engine development. In the early days of the National Bureau of Standards (NBS), a "high-altitude chamber" was built to simulate the high-altitude environment encountered at 35,000 feet, where reduced pressures (one-third of atmospheric pressure) and cold temperatures caused numerous engine performance issues. This pioneering facility was used to test the performance of various components, including carburetors, radiators, fuels, oils, and ceramics.

By the 1960s, a group within the Mechanics Division was responsible for both “pressure and vacuum” research and standards. Although the groups were separated, they were later recombined under the leadership of Charles Tilford in the early 1990s. In 1996, when I joined the institution, it was already known as the National Institute of Standards and Technology (NIST), having been renamed from NBS.

Over the past 30 years, NIST has supported pressure metrology for 15 decades through classical primary standards. More recently, over the past 15 years, the institution has made significant advancements in cutting-edge, quantum-based methods through research and development. This presentation will explore the research, services, and people that have contributed to the growth and development of this program into what it is today and sets the tone for where the program plans to go in the future.