

research on the standard measuring devices and its performance was verified with a numerical analysis prior to the fabrication. The requirement of the tare load system was derived together with the ADD and the design was done by applying the improvement method.

During the second year of this research, standard measuring devices for the total pressure and total temperature as well the tare load system were manufactured and the performance test was carried out. In order to measure the recovery rate of the standard measuring devices, probes for the total pressure and the total temperature calibrated at the Aeroprobe were purchased. For the advancement of the measurement system, some of the improvement methodologies developed during the first year were applied, and the equations estimating the measurement uncertainties were improved in collaboration with the KRISS and the ADD. The improvement methods for the control system were derived based on the performance analysis of the first year's study, and some of them was applied resulting in the enhancement of the control system to a certain degree. As a consequence, the improvement target of the control system was achieved by securing the control performance within $\pm 0.5\%$ based on the pressure at the front and rear side of the test article (ASME PTC 55-2013).

In the third year, the incomplete scope of the improvement methods developed during the second year was carried out. The measurement of the fuel for test articles of the turbo-fan and turbo-jet engines was enhanced with redundancy, and the research was performed on the non-uniformity of the pressure measurement at the slip joint according to the request of ADD. The upper limit of the measurement of the simulated velocity for an air flow rate of the standard measuring devices was enhanced from Mach 0.15 to 0.2, and the simulated velocity concerning the measurement of the recovery rate of the total temperature rake was increased to Mach 0.2. By applying all the developed improvement methods, the improvement of the control performance was verified, and consequently the improvement of the facility model was accomplished.