NIM's Research Progress on Flue Gas Flowrate Metrology

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# Abstract

The point source greenhouse gases emissions direct measurement approach is an effective complement to Chinese carbon trading market accounting methods. The main source of uncertainty in greenhouse gas emissions direct measurement is flue gas flowrate measurement. China does not have flue gas flowrate standard facility, moreover flue gas flow measurement method needs to be improved. In order to study flue gas flowrate accurate measurement methods and calibration methods, NIM built a Smoke Stack Simulator(SMSS). This facility can generate different swirls to simulate stack gas flow field, which can be used to study flue gas flowrate measurement method. This facility can also be used for standard pitot tube calibration. Early in the design, Computational Fluid Dynamics (CFD) numerical simulation was used to evaluate the effect of environmental conditions on the performance of the SMSS. The structure and function of main parts of SMSS were described in detail. NIM is also preparing to carry out field tests in a natural gas power plant and a coal-fired power plant, and verify flue gas flowrate measuring methods in real stacks. NIM will install 6-path ultrasonic flowmeters(USM) in two power plants and compare its performance with pitot tubes.