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Project Title: Design and manufacturing of calibration system for calibration of natural gas flow meters in the range required by thermal power plants

Department:	Center for Technology Development, Operation, Maintenance and Repair of Power Plant Units	Employer:	Niroo Research Institute
Project/Program Manager:	Edvard Gharibian	Executor:	Mohammad Ebrahim Sarbandi Farahani
Project Financial Code:	125103	Project Quality Code:	PPOPN01
Type of Project/Program:	Applied and developmental	Assistant:	Deputy of Technology

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Keywords:

Calibration, Calibration laboratory, Flowmeter, Fuel flowmeter, Thermal power plant, natural gas, Gasoline, Hydrocarbon liquids

Project Necessity:

Increasing consumption of natural gas and gasoline, and in the same time increases in prices of these fuels, leads both suppliers and consumers of these fuels to look for a solution to be able to accurately measure the fuels and decrease measurement errors. Based on "Power industry detailed statistics report", in 2015, natural gas consumption was 58 billion cubic meter and gasoline consumption was 6 billion liter. Just a 1% error in measurement of flow, which is quite reasonable assumption for currently installed uncalibrated flow meters, will result in an error of 580 million cubic meter of natural gas and 60 million liter of gasoline. Considering current price of 600 Rials per cubic meter for natural gas and 1400 Rials per liter for gasoline, the cost of launching a flow calibration laboratory will be compensated by a few mounts of extra fuel consumption price. This highlight importance of launching an accountable laboratory to calibrate fuel flow meter, so that all parties and stakeholders can rely on, and hence netter protect the national resources. It should also be noted that for accurate measurement of power plant performance, which always has been a concern for energy ministry and power industry, accurate measurement of fuel flow is crucial. As an example, this is a vital parameter for power plant performance testing, which is completely ignored, due to the fact that no natural gas flow calibration facility is operating in the country, This fact alone, makes results of performance testing unreliable.

Project Goals:

The objectives of project is to lunch a traceable gas flow calibration reference laboratory, capable of both calibrating flow meters and running research and industrial projects for validating and diagnosis of flow meters up to 100000 standard cubic meter per hour flow, and with an uncertainty of $\wedge 0.35$ or better. The uncertainty budget specified for this secondary flow calibration lab is in accordance with international standards.

It is expected to run the project with a foreign experienced consultant, which would be responsible to prepare concept and detail design as well as control logic to achieve the target uncertainty and tractability requirements.

Abstract:

Concept and detail design, and launch and operation of gas fuel flow calibration laboratory

Steps and Methodologies:

Concept design of lab and specify required facilities.

Detail design and preparing equipment specifications

Purchase of equipment

Preparation and construction of laboratory building

Installation of equipment and commissioning of laboratory

Accreditation of laboratory

Main Results (technical outputs, patents, papers, books, reports, etc.):

Launch of reference gas fuel calibration laboratory