**SYSTEM FOR COMMERCIAL METERING OF NATURAL GAS**

**Description**
Payments from consumers (heat-power stations) to producers and transporters of natural gas are currently based on the volume and real calorific efficiency of gas estimated from its bulk component composition according to GOST 22667-82.

The Design Technological Institute of Digital Techniques presents a metering system, with a calculator of natural gas energy and consumption (CNGEC) as a basic unit (Fig.1), which allows correction of gas consumption as a function of its real physical properties estimated from the bulk composition according to GOST 30319.0-96 ÷ GOST 30319.3-96 (1997).

![Calculator for natural gas energy and consumption](image)

**Fig 2. Layout of natural gas metering system.**
CNGEC, a basic instrument used for commercial metering of natural gas (Fig. 2). The system includes three CNGEC calculators, a three-channel gas flux analyser (a Btu 8100 chromatograph), a retransmitter, and a PC with special software.

**Technical specifications**
- Hourly automatic sampling of recorded and calculated parameters of gas and its consumption; database maintenance.
- Visualising online data on user's demand.
- Generating and optional printing of daily reports.
- Warning signalling.

The software is designed to
- maintain communication between PC and CNGEC computers;
- read information from online records and database archives;
- image online data on mnemonic diagrams;
- tabulate gas composition and consumption data;
- register, print, and visualise errors;
- change and synchronise winter and summer time shifts;
- monitor the gas supply and the state of data acquisition systems;
- visualise and print data in a standard format.

Development and operation environment:
- Real time operating system QNX 4.25;
- Object-oriented visual programming environment Photon 1.13, language C++;
- System of database management Sybase SQL Anywhere 5.5.

Fig. 3. Example mnemonic diagram yielded by the system for commercial metering of natural gas used at Surgutskaya GRAS-1. GRAS-1 is connected to three large gas pipelines. Each pipeline is divided at gas-distributing points (GDP) into two thinner lines (A, B) equipped with flowmeters and transducers to transmit data to CNGEC. Then gas passes the system of pipelines and valves to enter the boilers. Pressure, temperature, and gas consumption data from each line are imaged in mnemonic diagrams in online mode.
Technical appraisal and economic benefits
Complete automation of:
• Data reading from CNGEC computers;
• Malfunction diagnosis of communications and computers;
• Sampling gas consumption at various intervals (hour, day, etc.);
• Data tabulation with compatible hourly and daily accounts of gas parameters and consumption.

Application areas
The system is used for payments between producers and consumers of natural gas (Transgas, heat-power stations, etc.) and as a subsystem for automatic control systems.

Development stage
The system is currently run at Surgutskaya GRES-1.

Patent situation
No patent.

Commercial offers
• Production and supply of custom-made systems;
• Investment;
• Joint production.

Estimated cost
About 7,000US$ for a ready-to-use unit.

Contacts
Gennady F. Versakov, Cand.Sc., Science Secretary.
Design Technological Institute of Digital Techniques, Siberian Branch of the Russian Academy of Sciences
6, Institutskaya St., Novosibirsk, 630090, Russia.
Phone: (383) 330-93-43
Fax: (383) 330-93-61
E-mail: gver@kti.nsc.ru
http://www.kti.nsc.ru