Ottawa, Ontario

March 2, 1978

G6635-A164

SPECIAL APPROVAL

Granted to: Alberta Gas Trunk Line Company Limited
Calgary, Alberta
T2P 2N6

Attention: Mr. Ken Law,
Engineer, Measurement Department

Subject: Utilization of Electro-Mechanical Readout on Turbine Meters and Associated Correcting Devices

AGTL's system consists of a turbine meter, a standard index, Mercor III P integrating device and a VPT full scallop recorder. Additions to this conventional system are the Reed Switch, and two (2) Totaprinters.

The standard method of the gas volume calculation upon which the weekly billing is based, is as follows:
The weekly volume of gas corrected to base pressure is obtained from one (1) of the two (2) Totaprinters which is electrically connected to the Gordos Micro Switch which in turn is mechanically coupled to Merco III P. Further corrections for temperature and compressibility are achieved by using the information on the VPT chart and the N_2 and CO_2 contents of the gas. The result is the weekly flow of gas corrected to standard conditions and used for custody transfer purposes.

The uncorrected volume is also recorded by the second Totaprinter which is electrically connected to the Honeywell Reed Switch which in turn is mechanically coupled to the standard index. The record of this second Totaprinter is not approved to be used for billing purposes.

Special approval has been granted by the Legal Metrology Branch for custody transfer of natural gas based on pressure corrected readings from the Totaprinter directly linked to Mercor III P. However, the readings from the Totaprinter are required to be further corrected for temperature and supercompressibility at line conditions prior to billing taking place.

Equipment Specification:

(A) Meter: Rockwell Series G, Turbo-Meter, model T-60, turbine flow meter with 1,000 cu. ft/rev. output shaft rotation rate.

(B) Auxiliary Equipment:

(1) Mercury Instruments, model Mercor III P pressure correcting integrator:
- Pressure range: 200-1200 psig
- Corrected counter multiplier: 1,000
- Uncorrected counter multiplier: 100

(2) Mercury Instruments, VPT; volume, pressure, temperature recorder, Model 1238:
- Full scallop chart, 12 inch size
- Pressure range: 0-1500 psig
- Capacity per scallop: 100,000 cu. ft.
- Temperature range: 0-150 F
- Seven (7) day chart

(3) Mercury Instruments, Universal mounting bracket, including pulse output switch with contact closure for every rotation of meter wriggler and amphenol type plug connector, and including a digital index.

(4) Honeywell Micro-Switch:
- Installed in universal mounting bracket.
- CSA approved
- Explosion proof housing, no. EX-AR 1619
- Switch no. BZ-2RW-84321-P2
- Contact rating: 125V DC@½A
  250V DC@¼A

(5) Gordos LF Contact Switch:
- Installed in the Mercor III P and connected to pressure corrected counter gear.
- Type MR307 SPST need switch, with amphenol type plug connector to provide switch closure for each counter digit increase.
- Maximum current 0.5A
- Maximum Voltage 200V DC

(6) Tejas Instrument Engineers, Totaprinter model RP701, 2 only:
- Complete with manual override print-command switch, 12V lead acid gel cell battery, 120V 60Hz AC power supply and 6-digit output.

The electro-mechanical printout in conjunction with the correcting device on the turbine meter will print out the corrected volumetric reading at pre-set hour intervals.

Location of the stations utilizing the measurement system as described are:

(a) Suffield Sales
W. 1/2, Sec. [illegible], Twp. 14, Rg.6, W4 Meridian

(b) Cousins A
N.W., Sec.14, Twp.13, Rg.6,W4 Meridian

(c) Cousins B
N.W., Sec.14, Twp.13, Rg.6, W4 Meridian

(d) Goddondale
S.W., Sec.12, Twp.79, Rg. 12, W6 Meridian

For field test procedure refer to the attached Appendix "A".

D. L. Smith
Chief, Electricity and Gas Division

c.c. L. Hewit
District Inspector, E&G
Calgary

APPENDIX "A"

Ref: Special Approval SPS-243 2-3-78

FIELD TEST PROCEDURE

The verification test procedure to be followed for the conventional devices in the system, such as the turbine meter, standard index, Mercor III P and VPT, shall conform to instructions as delineated in Part VIB of the Departmental Instructions for Inspection of Gas Meters and Auxiliary Devices.

The procedure for verifying the additional equipment used in billing, iee. the remotely located Totaprinter, as well as the Micro Switch mechanically coupled to the Mercor III P, is as follows:

Compare the readings taken off the Totaprinter of the accumulated volume, corrected to base pressure only, taken over a certain interval of time with the readings corrected to base pressure off the Mercor III P accumulated over the same interval of time. The two readings should exactly agree with each other, for the Totaprinter and Mercor III P are directly linked vial electrical and mechanical coupling.

Note: Concern in verifying the system should only be with one (1) of the two (2) Totaprinters, the Totaprinter which is linked to the Mercor III P and whose polume readings are further processed for billing purposes.