

ODORANT MEASUREMENT FOR NATURAL GAS TRANSMISSION AND DISTRIBUTION COMPANIES

Background: As a result of stringent Federal and State regulations and an increasing number of court cases involving gas companies, it is absolutely necessary to maintain an effective odorization program. An effective program is one that constantly monitors the gas flow, computes and injects the proper dosage of odorant, and most importantly records this activity.

Typically, state regulations dictate the minimum odorant concentration. Since these odorants (mercaptan organosulphurs being the most common) are expensive, there are economic concerns regarding excessive dosing.

The odor threshold of mercaptans is approximately one part per billion. Typical mercaptan doses are in the range of 2 - 4 ppm (by volume, to gas); this translates to about 1 - 200 cc/min, depending on pipeline size and natural gas velocity.

Sophisticated flow monitoring equipment is essential to ensure proper dosing; low flow accuracy and repeatability are required as well as easily-integrated (via computer, P.C. and/or telemetry interface) signals.

MAX Equipment Specified: The *MAX-213* meter is used when the minimum dosage rate (averaged out on an instantaneous basis) falls below 40 cc/min; the 214 meter is used when the minimum rate is over 40 cc/min or the maximum rate is over 1500 cc/min. Typical applications are either in the 1 - 10 cc/min or in the 50 - 200 cc/min ranges. The *MAX-286* transmitters are usually required because of low flow and sudden on-off conditions usually associated with mercaptan injections (since plunger-type pumps typically are used, intermittent and/or pulsating flow rates are the rule).

Without a steady flow signal, true instantaneous-type information (rate indication/analog output) is seldom useful without mechanical or electronic damping in the system. Thus, *MAX-120* totalizers are usually specified in mercaptan monitoring applications.

Note: Closed-loop feedback can only be achieved with microprocessor-based equipment. The desired total injection of odorant is integrated over a time-base and compared with the actual amount injected (via frequency signal from a *MAX Meter*); a control signal is fed back to the pumping system to make up the differential, if any, or reduces the total required on the next dose.

Users: *MAX* equipment is used and specified (to systems houses) by Columbia Gas Transmission Company, Cincinnati Gas & Electric, Public Service of Colorado, Northern Illinois Gas, Commonwealth Gas Company, Pacific Gas & Electric and many others.