instrument piping: all piping, valves, and fittings used to connect instruments to main piping, to other instruments and apparatus, or to measuring equipment.

production facility: piping or equipment used in production, extraction, recovery, lifting, stabilization, separation, treating, associated measurement, field compression, gas lift, gas injection, or fuel gas supply. Production facility piping or equipment must be used in extracting petroleum liquids or natural gas from the ground and preparing it for transportation by pipeline.

sample piping: all piping, valves, and fittings used to collect samples of gas, steam, water, or oil.

803.6 Meters, Regulators, and Pressure Relief Stations

customer’s meter: a meter that measures gas delivered to a customer for consumption on the customer’s premises.

terrier set assembly: the piping and fittings installed to connect the inlet side of the meter to the gas service line and the outlet side of the meter to the customer’s fuel line.

monitoring regulator: a pressure regulator installed in series with another pressure regulator that automatically assumes control of the pressure downstream of the station, in case that pressure exceeds a set maximum.

pressure-limiting station: consists of equipment that under abnormal conditions will act to reduce, restrict, or shut off the supply of gas flowing into a system to prevent the gas pressure from exceeding a predetermined value. While normal pressure conditions prevail, the pressure-limiting station may exercise some degree of control of the flow of the gas or may remain in the wide open position. Included in the station are piping and auxiliary devices, such as valves, control instruments, control lines, the enclosure, and ventilating equipment, installed in accordance with the pertinent requirements of this Code.

pressure-regulating station: consists of equipment installed for automatically reducing and regulating the pressure in the downstream pipeline or main to which it is connected. Included are piping and auxiliary devices such as valves, control instruments, control lines, the enclosure, and ventilation equipment.

terrier relief station: consists of equipment installed to vent gas from a system being protected to prevent the gas pressure from exceeding a predetermined limit. The gas may be vented into the atmosphere or into a lower pressure system capable of safely absorbing the gas being discharged. Included in the station are piping and auxiliary devices, such as valves, control instruments, control lines, the enclosure, and ventilating equipment, installed in accordance with the pertinent requirements of this Code.

service regulator: a regulator installed on a gas service line to control the pressure of the gas delivered to the customer.

803.7 Valves

block: a valve installed for the purpose of blocking or stopping the flow of gas in a pipe.

check valve: a valve designed to permit flow in one direction and to close automatically to prevent flow in the reverse direction.

curb valve: a stop valve installed below grade in a service line at or near the property line, accessible through a curb box or standpipe, and operable by a removable key or wrench for shutting off the gas supply to a building. This valve is also known as a curb shutoff or curb cock.

excess flow valve: a valve designed to automatically stop or limit the flow in a gas service line when the gas flow exceeds the maximum anticipated flow during normal operations.

service line valve: a stop valve readily operable and accessible for the purpose of shutting off the gas to the customer’s fuel line. The stop valve should be located in the service line ahead of the service regulator or ahead of the meter, if a regulator is not provided. The valve is also known as a service line shutoff, service line cock, or meter stop.

stop valve: see block valve.

803.8 Gas Storage Equipment

bottle: as used in this Code, is a gas-tight structure completely fabricated from pipe with integral drawn, forged, or spun end closures and tested in the manufacturer’s plant.

bottle-type holder: any bottle or group of interconnected bottles installed in one location and used only for storing gas.

pipe-type holder: any pipe container or group of interconnected pipe containers installed at one location and used only for storing gas.

804 PIPING SYSTEMS COMPONENT DEFINITIONS

804.1 Plastic Terms and Definitions

plastic (noun): a material that contains as an essential ingredient an organic substance of high to ultrahigh molecular weight, is solid in its finished state, and at some stage of its manufacture or processing, can be shaped by flow. The two general types of plastic referred to in this Code are thermoplastic and thermostetting.

thermoplastic: a plastic that is capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature.
NONMANDATORY APPENDIX R
ESTIMATING STRAIN IN DENTS

R-1 STRAIN

Strain in dents may be estimated using data from deformation in-line inspection (ILI) tools or from direct measurement of the deformation contour. Direct measurement techniques may consist of any method capable of describing the depth and shape terms needed to estimate strain. The strain estimating techniques may differ depending on the type of data available. Interpolation or other mathematical techniques may be used to develop surface contour information from ILI or direct measurement data. Although a method for estimating strain is described herein, it is not intended to preclude the use of other strain estimating techniques (see also Figure R-1).

The user is cautioned that analysis of surface curvatures for the purpose of determining local strains of deformation can be significantly affected by random error inherent with all geometric measurement techniques. Suitable data smoothing techniques should be employed to minimize the effect of such errors. The user is also cautioned that the strain analysis described here only addresses the potential for metal failure due to excessive local strain. It does not address concerns for the effects of fatigue or other degradation mechanisms. Where detailed profile measurement methods are used, the maximum component strains may not be coincident. The conservative approach would be to assume that they are. The dent shape may be affected by the internal pressure conditions present at the time of measurement, which may in turn affect estimates of local strains.

R-2 ESTIMATING STRAIN

$R_0$ is the initial pipe surface radius, equal to one-half the nominal pipe O.D. As shown by the transverse profiles in Figure R-1, the indentation may be non-reentrant or reentrant. When the indentation is non-reentrant, the curvature of the pipe surface is in the same direction as the original surface curvature, and $R_1$ takes a positive value. When the indentation is reentrant, the curvature of the pipe wall is reversed, and $R_1$ takes a negative value.

Determine the radius of curvature in a longitudinal plane through the indentation shown as $R_2$ in Figure R-1, illustration (c). Other dimensional terms are the wall thickness, $t$; the dent depth, $d$; and the dent length, $L$.

(a) Calculate the bending strain in the circumferential direction as

$$\varepsilon_1 = \frac{t}{2} \left( \frac{1}{R_0} - \frac{1}{R_1} \right)$$

At the dent apex, the term $\varepsilon_1$ is negative representing compression at the outside pipe surface and positive representing tension on the inside pipe surface.

(b) Calculate the bending strain in the longitudinal direction as

$$\varepsilon_2 = \frac{t}{2R_2}$$

At the dent apex, the term $\varepsilon_2$ is negative representing compression at the outside pipe surface and positive representing tension on the inside pipe surface.

(c) Calculate the extensional strain in the longitudinal direction as