

Chapter PSC 135

GAS SAFETY

PSC 135.01	Character of construction, maintenance, and operation	PSC 135.08	Corrosion control
PSC 135.02	Facilities, inspection and repairs	PSC 135.081	Exemption from corrosion control
PSC 135.03	Application of rules	PSC 135.082	Over-pressure protection
PSC 135.04	Interference with public service facilities	PSC 135.09	Report of proposed construction
PSC 135.05	Protection of utility facilities	PSC 135.10	Adoption of code for gas transmission and distribution piping systems
PSC 135.06	Leak survey reports		
PSC 135.07	Report to the commission		

History: Chapter PSC 135 as it existed on February 29, 1968 was repealed and a new chapter PSC 135 was created effective March 1, 1968.

PSC 135.01 Character of construction, maintenance, and operation. All gas transmission, distribution, and utilization equipment and facilities shall be constructed, installed, operated, and maintained in a reasonably adequate and safe manner and as a minimum more specifically provided for herein.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.02 Facilities, inspection and repairs. All facilities shall be cleaned when necessary and inspected at such intervals as experience has shown to be necessary. Any facilities known to be defective so as to endanger life or property shall be promptly repaired, permanently disconnected, or isolated until repairs can be made. Construction, repairs, additions, and changes to gas transmission and distribution facilities shall be made by qualified persons only.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.03 Application of rules. Every gas utility or operating company as defined in 805.72 (see section PSC 135.10 (3) for the meaning of this type of numbers) that operate gas transmission or distribution facilities in the state shall comply with the rules in this chapter and the application of these rules shall be as provided in 804.6 as revised.

(1) **WAIVING RULES.** The rules may be modified or waived by the public service commission. They may be so modified or waived in particular cases wherever shown to be impracticable for special reasons or where the advantage of uniformity with existing construction is greater than the advantage of construction in compliance with the rules providing the existing construction is reasonably safe or if equivalent or safer construction is secured in other ways.

(2) **TEMPORARY INSTALLATIONS.** It will sometimes be necessary to modify or waive certain of the rules in case of temporary installations or installations which are shortly to be dismantled or reconstructed. Such temporary construction may be used for a reasonable length of time provided it is under competent supervision while it

Register, February, 1968, No. 146

or adjoining equipment is under pressure or if it is protected by suitable barriers or warning signs when accessible to any person, without fully complying with this code; but all such construction shall be made reasonably safe.

(3) **EMERGENCY.** In case of emergency or pending decision of the public service commission, the person responsible for the installation may decide as to modification or waiver of any rule or order, subject to review by the public service commission.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.04 Interference with public service facilities. (1) No utility or operating company having any work upon, over, along, or under any public street or highway or upon, over, along, or under any private property shall interfere with, destroy, or disturb the facilities of any other public service corporation or railroad encountered in the performance of such work so as to interrupt, impair, or affect the public service for which such facilities may be used, without first reaching an agreement concerning the location and the nature of the proposed work.

(2) A utility or operating company shall exercise care when working in close proximity of existing facilities. When the facilities are underground and are to be exposed or possibly may be exposed, hand-digging shall be employed. In these cases, such support as may be reasonably necessary for protection of the facilities shall be provided in and near the construction area. When backfilling an excavation, such procedures and materials shall be employed to provide reliable support for existing underground facilities in and near the construction area.

(3) A utility or operating company shall, in the absence of working arrangements, give at least 3 days' written notice (not counting Saturdays, Sundays, and legal holidays) to all utilities, operating companies, or railroads and to those who may have facilities in and near the construction area which may be affected by the proposed work. The utility or operating company proposing to work shall obtain from the affected party the location of the existing facilities determined to be affected or to be in and near the construction area.

(4) A utility or operating company upon receiving a notice of proposed construction shall furnish in 3 days detailed information relative to location and type of facilities that are present in the proposed construction area. In those cases where the facilities are underground, they shall be marked physically in the field relative to location.

(5) Nothing in the above shall prevent a utility or operating company from proceeding as quickly as possible with any emergency construction work which might interfere with existing facilities. However, all reasonable precautions shall be taken to avoid or minimize damage or interference to the other facilities and notification shall be given as soon as possible to the utilities or operating company which have facilities in the construction area.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.05 Protection of utility facilities. A public utility or operating company upon receipt of written notice as required by section Register, February, 1968, No. 146

66.047 (2), Wis. Stats., from the property owner or from a contractor of work which may affect its facilities used for serving the public:

(1) Shall investigate and decide what action, if any, must reasonably be taken to protect or alter facilities, in order to protect service to the public and to avoid unnecessary damage, such as identifying in a suitable manner the location of any underground facilities which may be affected by the work.

(2) The utility or operating company shall take such action as is reasonably and legally necessary to protect, remove, alter, or reconstruct its facilities, and shall perform such work with reasonable dispatch taking into account the conditions to be met, provided that nothing in this rule shall be deemed to affect any right which the utility or operating company may have to require advance payment or adequate assurance of payment of the reasonable cost thereof to the utility or operating company by the property owner or contractor.

(3) The utility or operating company may, in order to protect its interests, require that the owner or contractor perform certain work upon that part of the service piping or wiring on or being removed from the property upon which the excavating, building, or wrecking operations are being performed.

(4) This rule is not intended to affect the responsibility of the contractor or owner, or the liability or legal rights of any party.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.06 Leak survey reports. On or before April 15 of each year all gas utilities shall report to the commission a summary of the results of the leak surveys made during the previous calendar years. The report shall contain at least the following information:

(1) The number and type of leak surveys which were made by the utility during the previous calendar year.

(2) The number of leaks, both inside and outside, which were found, by either a survey or complaint, in the utility's service area during the previous calendar year.

(3) The number of leaks found during the previous calendar year which were repaired the same year.

(4) The number of leaks found in earlier years which were repaired during the year for which this report is being filed.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.07 Report to the commission. (1) Every utility or operating company transmitting or distributing gas by any pipeline or distribution main intended to be subjected to pressures in excess of 100 p.s.i.g. shall:

(a) Within 180 days from the date of publication of the rules, file with the public service commission a statement verified by an officer setting forth a description of the pipeline and distribution facilities in operation as of the date of publication. Such description shall be based upon the records of the utility or operating company including records of tests, specifications, identification of national codes if followed, or other available data. This verified statement shall include a statement of the operation and maintenance practices that were followed during the life of the existing facilities and further whether or not in the officer's opinion said facilities are suitable for continued operation.

(b) In each instance where any utility or operating company required by section PSC 135.07 (1) (a) to file a verified statement claims that it is not possible or practicable to obtain the necessary data to prepare the same, a verified statement setting forth such claim shall nevertheless be filed within the period required by section PSC 135.07 (1) (a), and the basis for such claim shall be set forth in such statement.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.08 Corrosion control. Corrosion control is required by 841.173 and 849.21 (e) and shall apply to all facilities. Within 180 days of publication of these rules each utility or operating company shall file with the commission its plans for corrosion protection of the existing facilities.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.081 Exemption from corrosion control. Whenever any operating utility or operating company finds upon investigation that corrosion protection is not needed as required by 841.173 or 849.21 (e), such utility or operating company shall submit to the public service commission a request for exemption setting forth good and sufficient reasons why such protection is not required, such request to include the results of soil tests and other supporting data.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.082 Over-pressure protection. Over-pressure protection is required by 845.52 and 845.53 and shall apply to all installations. All present installations where such protection is not provided shall be changed so that 100% compliance will be attained by the end of the first testing cycle as provided in section PSC 134.30.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.09 Report of proposed construction. Prior to construction or reconstruction of any gas transmission line exceeding one mile in length or any gas main exceeding 1,000 feet in length intended to be subjected to pressures in excess of 100 p.s.i.g., a report shall be filed with the commission setting forth the specifications for such pipeline or main. This report shall contain at least the following information:

- (1) The necessary data to calculate the design pressure as set forth in 841.1.
- (2) The design pressure as determined by the utility or operating company.
- (3) The expected pressure which the pipeline or main will be operated.
- (4) The pressure to which the pipeline or main will be tested.

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.

PSC 135.10 Adoption of code for gas transmission and distribution piping systems. (1) The USA Standard Code for Pressure Piping—Gas Transmission and Distribution Piping Systems, USAS B31.8—1967, general provisions and definitions, chapters I through VII, inclusive, and index, subject to omissions, changes, and additions shown in subsection (3) of this section, is hereby adopted as a code for the design and construction of gas public utility systems in the state of Wisconsin. The USA Standard Code for Pressure Piping—Gas Trans-

Register, February, 1968, No. 146

mission and Distribution Piping Systems is periodically revised by its sponsors, but these revisions will have no effect in the state of Wisconsin until such time as this subsection is correspondingly revised to reflect those changes.

(2) Pursuant to section 227.025, Wis. Stats., the attorney general and the revisor of statutes have consented to the incorporation by reference in this section, of the standards, with certain exceptions shown in subsection (3), contained in USA Standard Code for Pressure Piping—Gas Transmission and Distribution Piping Systems, USAS B31.8—1967 which can be obtained through The American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, New York 10017. Copies of the aforementioned standard code are on file in the offices of the public service commission, the secretary of state, and the revisor of statutes.

(3) The following are changes or additions to the USAS B31.8—1967 Code. (The numbering system and sequence used in said USAS B31.8—1967 code are here used for convenience and clarity. The word "Change" following the number means that the corresponding wording of the USAS B31.8—1967 Code has been changed and that the new wording is substituted at the appropriate location. The word "Addition" following the number means that a new requirement is incorporated in the USAS B31.8—1967 code and that the new requirement is inserted at the appropriate location.)

**WISCONSIN CODE CHANGES AND ADDITIONS
TO
USA STANDARD CODE FOR PRESSURE PIPING
GAS TRANSMISSION AND DISTRIBUTION PIPING
SYSTEMS, USAS B31.8—1967**

804.3 (c) (Change) Piping beyond the outlet of the customer's meter set assembly.

804.3 (d) (Change) Piping in oil refineries or natural gasoline extraction plants, gas treating plant piping other than main gas stream piping in dehydration, and all other processing plants installed as part of a gas transmission system, gas manufacturing plants, industrial plants, or mines.

804.3 (i) (Change) Liquid petroleum transportation piping systems.

804.6 (Change) Unless otherwise specifically provided for in a rule or special order, it is not intended that this code be applied retroactively to existing installations insofar as design, fabrication, installation, and testing at the time of construction are concerned. Further, it is not intended that this code be applied retroactively to established operating pressures of existing installations except as provided for in chapter V. It is intended, however, that the provisions of this code shall be applicable to operating and maintenance procedures of existing installations, and when existing installations are uprated.

As revisions of this code are published from time to time, they may contain new provisions with respect to the operation, maintenance, uprating, and confirmation of established operating pressures which may require changes in established procedures or actual physical alteration of facilities. When this becomes necessary, it is anticipated that

such procedural changes or physical alterations will be introduced or made in a systematic, methodical, and orderly manner. It is recognized, that in some cases, particularly when substantial construction programs may be involved or when service to customers may be directly affected, and when an immediate hazard does not exist, such changes or alterations may have to be introduced or made gradually over a period of years in order to prevent undue hardship or loss of service.

810.2 (Addition) Cast iron pipe shall not be used as a permanent part of any piping system constructed under this code except where it is used as a temporary installation or replacement of short sections of existing cast iron pipe because of maintenance or relocation. In those cases where cast iron pipe is used it shall be designed, installed, and operated in accordance with the applicable sections of this code.

811.221 (Change) By petitioning the public service commission for approval. If possible, the material shall be identified with a comparable material, and it should be stated that the material will comply with that specification except as noted. Complete information as to chemical composition and physical properties shall be supplied to the public service commission, and its approval shall be obtained before this material may be used.

814 (Change) Materials for use in cold climates. Some of the materials conforming to specifications approved for use under this code may not have properties suitable for the lower portion of the temperature band covered by this code. Engineers are cautioned to give attention to the low-temperature properties of the materials used for facilities to be exposed to unusually low ground temperatures or low atmospheric temperatures. All pipe intended for installation in accordance with this code shall meet specifications set forth in this code. When substantial quantities of pipe are acquired, certified reports of chemical composition and physical properties shall be obtained; when the quantity of pipe involved is so limited that this requirement would be impractical, a certified statement shall be obtained setting forth the specification under which the pipe was manufactured. Pipe manufactured from steel made by the Bessemer process shall not be used. The chemical composition of the various elements shall not exceed the maximums set forth in the specification.

Within one year of the date of publication of this code, the operating companies shall submit a report to the public service commission of Wisconsin giving the low-temperature fracture-toughness standard, the method of testing for such toughness, and the results of applying this method to available pipe.

Within 6 months of the publication of this code, the operating companies shall submit data on the low-temperature fracture-toughness of large diameter pipe.

821.3 (Change) Each utility shall establish and qualify a welding procedure for sound and ductile welds. In applying these standards, the welder is required to qualify under the procedure employed. These standards establish the groupings of materials that can be welded under a procedure which has been qualified with any one of the materials included in the group. The changes in material, filler metal,

process, or procedure that require requalification of either welding procedure or welder are set out in 824.21 (a), (b), and (c).

826.1 (Change) Carbon steels having a carbon content in excess of 0.32% (ladle analysis) or a carbon equivalent ($C + \frac{1}{4} Mn.$) in excess of 0.65% (ladle analysis) shall be preheated as prescribed in ASME Boiler and Pressure Vessel Code, section VIII. Preheating also is required for steels having lower carbon or carbon equivalent, when conditions exist that either limit the welding technique that can be used, or that tend to adversely affect the quality of the weld.

827.1 (Change) Carbon steels having a carbon content in excess of 0.32% (ladle analysis) or a carbon equivalent ($C + \frac{1}{4} Mn.$) in excess of 0.65% (ladle analysis) shall be stress relieved as prescribed in ASME Boiler and Pressure Vessel Code, section VIII. Stress-relieving also is required for steels having lower carbon or carbon equivalent when adverse conditions exist which too rapidly cool the weld.

828.1 (Change) Inspection of welds on piping systems intended to operate at both less than 100 p.s.i. and less than 20% of the specified minimum yield strength. The quality of welding shall be checked visually or subjected to a non-destructive test on at least a 30% sampling basis, and if there is any reason to believe that the weld is defective, it shall be removed from the line and tested in accordance with the specification or may be subjected to a non-destructive test as outlined in 828.2.

828.2 (Change) Inspection and tests of welds on piping systems intended to operate at both 100 p.s.i. or more and 20% or more of the specified minimum yield strength. (a) The quality of welding shall be checked by non-destructive inspection. Non-destructive inspection may consist of radiographic examination, magnetic particle testing, or other acceptable methods. The trepanning method of non-destructive testing is prohibited.

(b) The following minimum number of field butt welds shall be selected by the operating company from each day's construction for inspection. The welds selected for inspection may include welds selected on a random basis and/or welds in which defects may be indicated. Each weld so selected shall be examined over its entire circumference, or an equivalent length of welding if portions of the circumference are examined. The same minimum percentages shall be examined for double ending at railhead or yard:

- 10% of welds in class 1 locations
- 15% of welds in class 2 locations
- 40% of welds in class 3 locations
- 75% of welds in class 4 locations
- 100% of welds at major or navigable river crossings, major highway crossings, railroad crossings, and all tie-in sections if practicable, but in no case less than 90%. In addition, all welds within 500 feet of buildings intended for human occupancy shall be examined.

If one weld in any random sample is found to be unacceptable as determined by 829, then the minimum percentage of welds selected for examination will be that of the next higher class location. If a

second weld is found to be unacceptable or if 2 or more welds are found to be unacceptable in the original random sample, then 100% of the welds shall be inspected if practicable, but in no case less than 90% of the welds in that day's construction.

(c) When radiographic examination is employed, a procedure meeting the requirements of API Standard 1104 (Standard for Welding of Pipelines and Related Facilities), shall be followed.

(d) When pipe has a nominal diameter of less than 6 inches or when the construction project involves such a limited number of welds that non-destructive inspection would be impractical and the pipe is intended to operate at 40% or less of the specified minimum yield strength, then 828.2 (a) and (b) above are not mandatory, provided the welding is inspected in accordance with 828.1 by a qualified welding inspector.

(e) In addition to non-destructive inspection requirements outlined above, there shall be continual control of the quality of welding by qualified personnel.

841.016 (Change) When classifying locations for the purposes of determining the type of pipeline construction and testing that should be prescribed, due consideration shall be given to the possibility of future development of the area. If, at the time of planning a new pipeline this future development appears likely to be sufficient to change the class location, this shall be taken into consideration in the design and testing of the proposed pipeline.

841.15 (Change) Protection of pipelines and mains from hazards. When pipelines and mains must be installed where they will be subjected to natural hazards, such as washouts, floods, unstable soil, land slides, or other conditions which may cause serious movement of, or abnormal loads on, the pipeline, reasonable precaution shall be taken to protect the pipeline, such as increasing the wall thickness, constructing revetments, erosion prevention, installing anchors, etc. Where pipelines and mains are exposed, such as at spans, trestles, and bridge crossings, the pipelines and mains shall be reasonably protected by distance or barricades from accidental damage by vehicular traffic or other causes. Where pipelines and mains are located outside urban areas, their location shall be marked (recognizable to the public) at each fence line, road crossing, railroad crossing, river, lake, stream, or drainage ditch crossing and wherever it is considered necessary to identify the location of a pipeline to reduce the possibility of damage or interference.

841.161 (Change) Cover requirements for pipelines and mains. (a) All buried pipelines, mains, and casings when used, shall be installed with a minimum cover of 24 inches unless otherwise provided herein.

(b) Buried pipelines and mains installed in areas where farming or other operations might result in deep plowing, or in thoroughfares or other locations where grading is done, or where the area is subject to erosion, shall be provided with a cover of 30 inches or more.

(c) Casing requirements of highway authorities shall be followed; however, construction type shall not be any less than provided by this code.

(d) Where it is impractical to comply with the provisions of 841.161

(a) and it is necessary to prevent damage from external loads, the pipe shall be cased or bridged.

841.163 (Change) Clearance between pipelines or mains and other underground structures. When conditions permit, there shall be at least 6 inches' separation of well-tamped earth between any gas main piping and any other parallel underground structure not used in conjunction with the pipeline or main. They may be as close as 2 inches where they cross provided suitable precautions are taken to protect the pipe, such as installation of insulating material, installation of casing, etc. If the structure is a public building where people assemble or in areas such as playground, assembly ground, or park, wherever possible the clearance shall be at least 100 feet if the main is operated at more than 100 p.s.i. but less than 500 p.s.i. and shall be at least 150 feet if operated at 500 p.s.i. or more. If these clearances cannot be maintained, then the next higher type of construction shall be used except such construction may be pressure-tested the same as the remainder of the line. No gas main or pipeline shall be installed under buildings.

841.173 (Change) Corrosion control. (a) Every operating company shall make a proper investigation to determine whether new and existing facilities require corrosion protection and if not exempted by the commission under section PSC 135.081, shall employ recognized methods of corrosion control. In new construction, corrosion control shall consist of coating with protective material, application of cathodic protection, and the electrical bonding or insulation by sections. Corrosion control of existing facilities shall at least consist of cathodic protection and the electrical bonding or insulation by sections.

(b) Whenever pipe coating is applied, the following additional precautions shall be taken:

(1) Tests and inspections shall be made before backfill to insure that the coating is adequate and satisfactory.

(2) During backfill, precautions shall be taken to insure that the coating is not damaged.

(3) On completion of backfill, proper tests shall be made to ascertain that the coating is adequate and satisfactory.

(c) In addition to the foregoing, every operating company shall make periodic inspections and tests of all facilities or at reasonable intervals to determine whether or not the facilities are adequately protected against corrosion.

(d) Operating companies shall promote cooperative efforts on the part of all agencies having underground facilities toward the reduction of corrosion.

841.222 (Change) The installation inspection provisions for pipelines and other facilities to operate at hoop stresses of 20% or more of the specified minimum yield strength shall be adequate to make possible the following inspections at sufficiently frequent intervals and to do other things that will assure good quality of workmanship.

841.241 (a) (Change) The field inspection provided on each job shall be suitable to reduce to an acceptable minimum the chances that gouged or grooved pipe will get into the finished pipeline or main.

Inspection for this purpose just ahead of the coating operation and during the lowering in and backfill operation is required.

841.246 (Addition) Pipe surface and installation provisions for pipelines and mains to operate at hoop stresses of less than 20% of the specified minimum yield strength. Due primarily to climate conditions, gouges, grooves, notches, and dents have been found to be an important cause of steel pipe failures and an attempt shall be made to prevent or eliminate harmful defects of this nature. 841.222 and 841.24 pertain to pipelines and mains intended to operate at hoop stresses of 20% or more of the specified minimum yield strength. However, applicable portions of these paragraphs should also be applied to facilities intended to operate below this hoop stress level. Particular attention should be given to 841.222, 841.222 (a) and (b), 841.241, 841.242, and 841.243.

841.271 (Change) Handling, hauling, and stringing. Care shall be taken in the selection of the handling equipment and in handling, hauling, unloading, and placing the pipe so as not to damage the pipe.

841.272 (Change) Installation of pipe in the ditch. On pipes operating at stresses of 20% or more of the specified minimum yield strength, it is important that stresses induced into the pipe by construction be minimized. This includes grading the ditch so that the pipe has a firm, substantially continuous bearing on the bottom of the ditch. The pipe shall fit the ditch without the use of external force to hold it in place until the backfill is completed. When long sections of pipe that have been welded alongside the ditch are lowered in, care shall be exercised so as not to jerk the pipe or impose any strains that may kink or put a permanent bend in the pipe. Slack loops are not prohibited by this paragraph where laying conditions render their use advisable.

841.283 (Change) No welding or acetylene cutting shall be done on a pipeline, main, or auxiliary apparatus that contains air if it is connected to a source of gas, unless a suitable means has been provided to prevent the leakage of gas into the pipeline or mains.

841.284 (Change) In situations where welding or cutting must be done on facilities which are filled with air and connected to a source of gas and the precautions recommended above cannot be taken, one or more of the precautions, depending upon the circumstances at the job are required.

841.285 (e) (Addition) No pipeline, main, or service shall be purged into any building or confined space.

841.286 (d) (Change) Provide fire extinguishers of appropriate size and type in accordance with the department of industry, labor and human relations' requirements.

841.31 (Change) General provisions. All pipelines, mains, and service lines shall be tested after construction except as follows:

TIE-INS. Because it is sometimes necessary to divide a pipeline or main into sections and install test heads, connecting pipe, and other

necessary appurtenances for testing, it is not required that the tie-in sections of pipe be tested. However, welds on tie-in sections of pipe shall be inspected and tested as set forth in 828.

841.412 (e) (Addition) Test pressures shall be maintained until the pressure has stabilized in all portions of the test sections. In no event shall the duration of the test be less than 24 hours following such stabilization except that, in the case of a short length of pipeline, main, or pipe which has not been backfilled prior to the test where, throughout its entire length, its entire circumference can be readily examined visually for the detection of leakage, the duration of the test shall not be less than 4 hours following such stabilization.

841.412 (f) (Addition) Where water is utilized as the test medium, proper authorization shall be obtained from the department of natural resources and adequate provisions shall be made for disposal of the water and steps shall be taken to guard against contamination of local water supply.

841.412 (g) (Addition) Except in freezing weather or when water is not available, pipelines or mains larger than 6 inches in diameter, installed in class locations 1, 2, or 3, shall be hydrostatically tested in place to at least 90% of the specified minimum yield strength.

841.42 (Change) Test required to prove strength for pipelines and mains to operate at less than 30% of the specified minimum yield strength of the pipe, but in excess of 100 p.s.i. Steel piping that is to be operated at stresses less than 30% of the specified minimum yield strength shall be tested in accordance with Table 841.412 (d), except that gas or air may be used as the test medium with the maximum limits set in Table 841.421.

**TABLE 841.421
MAXIMUM HOOP STRESS PERMISSIBLE DURING TEST**

Class Location Test Medium	Per cent of Specified Minimum Yield Strength			
	1	2	3	4
Air	75	75	50	40
Gas	30	30	30	30

841.431 (Change) Each pipeline and main shall be tested after construction and before being placed in operation to demonstrate that it does not leak. If the test indicates that a leak exists, the leak or leaks shall be located and eliminated.

842.15 (a) (Change) Caulked bell and spigot joints. Dimensions for caulked bell and spigot joints shall conform to USA standards A 21.3, A 21.7, A 21.9, and A 21.10. This type of joint shall not be used unless reinforced with mechanical clamps.

842.162 (Change) Underground cast iron pipe shall be installed with the cover requirements of 841.161 (a) and (b) unless prevented by other underground structures.

842.167 (Addition) Cast iron shall not be installed under buildings.

842.215 (b) (Change) Other joints. Ductile iron pipe may be furnished with other types of joints provided they are properly qualified and meet the appropriate provisions of this code. Such joints shall be assembled in accordance with applicable standards or in accordance with the manufacturers' written recommendations. However, no caulked bell and spigot joints shall be used unless reinforced with mechanical clamps.

842.222 (Change) Underground ductile iron pipe shall be installed with the cover requirements of 841.161 (a) and (b) unless prevented by other underground structures. Where sufficient cover cannot be provided to protect the pipe from external loads or damage and the pipe is not designed to withstand such external loads, the pipe shall be cased or bridged to protect the pipe. Ductile iron pipe shall not be installed under buildings.

842.37 (Change) Cover and casing requirements. The requirements for plastic piping shall conform to the applicable provisions of 841.161 and 841.162.

842.423 (Change) Skillful application of qualified techniques and use of proper materials and equipment in good condition are required to achieve sound joints in plastic piping by the solvent cement, adhesive, or heat-fusion methods. The quality of the joints shall be checked visually on at least a 30% sampling basis and if there is any reason to believe the joint is defective, it shall be removed and replaced.

842.43 (d) (Addition) A plastic pipe main shall not be installed under buildings.

842.431 (g) (Change) An electrically conductive wire shall be installed with the pipe to facilitate locating it with an electronic pipe locator. Other suitable material or means for accomplishing this purpose may be employed.

842.616 (Addition) Copper pipe or tubing shall be installed in accordance with applicable provisions for the installation of plastic pipe and tubing and shall be tested after construction in accordance with the provisions of 841.44.

843.12 (Change) Building construction. All compressor station buildings shall be constructed of non-combustible materials as defined by the Wisconsin state building code administered by the department of industry, labor and human relations.

843.13 (Change) Exits. Exits shall be provided in compliance with the requirements of the Wisconsin state building code administered by the department of industry, labor and human relations. Ladders shall not be used for exits.

843.2 (Change) Electrical facilities. All electrical equipment and wiring installed in gas transmission and distribution compressor stations shall conform to the requirements of the Wisconsin state electrical code.

843.42 (Change) Fire protection. Fire-protection facilities shall be provided as specifically directed by the department of industry, labor and human relations and the local fire department. The operation of fire-protection facilities, such as pumps, shall not be affected by an emergency shutdown.

843.472 (Change) Building ventilation. Ventilation shall be sufficient so that employes are not endangered under normal operating conditions (or such abnormal conditions as a blown gasket, packing gland, etc.) by accumulations of hazardous concentrations of flammable or noxious vapors or gases in rooms, sumps, attics, pits, or similarly enclosed places, or in other portions thereof. There shall be compliance with the department of industry, labor and human relations' heating, ventilation, and air conditioning code.

843.57 (Change) Hydraulic piping. All hydraulic power piping within gas compressing stations shall be constructed in accordance with USAS code for pressure piping—petroleum refinery piping, USAS B31.3.

845.23 (c) (Change) In no case shall the maximum allowable operating pressure of a pipeline be raised to a value higher than would be permitted by this code for a new line constructed of the same materials and in the same locations. However, this does not preclude the continued operation of pipelines or mains at established maximum allowable operating pressures as provided in 850.5.

The rate of pressure increase to the new maximum allowable operating pressure shall be gradual so as to allow sufficient time for periodic observation of the pipeline.

845.32 (Change) In addition to the pressure-regulating devices prescribed in 845.31, a suitable method shall be provided to prevent accidental overpressuring of a high-pressure distribution system and prevent the pressure from exceeding the maximum allowable operating pressure plus 10%.

Suitable types of protective devices to prevent overpressuring of high-pressure distribution systems include:

845.33 (b) (Change) Sixty p.s.i.g. in individual distribution systems or portions thereof. The intercity or supply mains for these distribution systems may be operated at higher pressures provided by this code if the number of services supplied from these mains are limited and these mains are not an integral part of the distribution system. The pressure and the services supplied from these higher pressure intercity and supply mains shall be limited to 60 p.s.i.g. unless the service lines are equipped with series regulators or other pressure-limiting devices as prescribed in 845.53.

845.33 (c) (Change) Twelve inches of water column in cast iron systems having unreinforced bell and spigot joints as prescribed in 842.15 (a) except as provided by section PSC 135.03 and 804.06. However, the maximum allowable operating pressure under any circumstances shall not exceed 15 p.s.i.g.

845.33 (e) (Change) Low pressure as defined by 805.65 unless the distribution system is equipped with service regulators meeting the

requirements of 845.51 and have an over-pressure protective device as defined in 845.52.

In some cases the operating company will consider the maximum pressure to which a system should be subjected is less than the pressure obtained by applying the applicable limits in 845.33 (a), (b), (c), (d) or (e). Systems that are known to be corroded and that have been operated for years at lower pressures than these limits fall into this category. In such cases, the operating company shall decide the maximum pressure it considers safe, and shall install over-pressure protection devices to prevent accidentally exceeding this maximum pressure if there is a reasonable possibility that the pressure will be exceeded.

845.34 (a) (Change) Before increasing the maximum allowable operating pressure of a high-pressure distribution system, that has been operating at less than the applicable maximum pressure stated in 845.33, to a new maximum allowable operating pressure equal to or less than the maximum applicable pressure in 845.33, the following factors shall be taken into consideration:

845.34 (b) (Change) Before increasing the pressure, the following steps shall be taken:

845.34 (b) (1) (Change) Make a leak survey and repair leaks found.

845.42 (Change) In addition to the pressure-regulating device prescribed in 845.41, a suitable device shall be provided to prevent accidental overpressuring and to prevent the system from developing pressures in excess of 1½ p.s.i.g. or would cause the unsafe operation of any connected or properly adjusted gas-burning equipment. Suitable types of protective devices to prevent overpressuring of low-pressure distribution systems include:

845.43 (b) (Change) A pressure in excess of that provided by section PSC 134.23 (1).

845.44 (a) (Change) Before converting a low-pressure distribution system to a high-pressure system, the following factors shall be taken into consideration:

845.44 (b) (Change) Before increasing the pressure, the following steps (not necessarily in sequence shown) shall be taken:

845.44 (b) (1) (Change) Make a leakage survey and repair leaks found.

845.44 (c) (Change) The pressure in the system being converted shall be increased by steps, with a period to check the effect of the previous increase before making the next increase. The desirable magnitude of each increase and the length of the checked period may vary depending upon conditions. The objective of this procedure is to afford an opportunity to discover, before excessive pressures are reached, any unknown open and unregulated connections to adjacent low-pressure systems or to individual customers.

845.5 (Change) Control and limiting of the pressure of gas delivered
Register, February, 1968, No. 146

to domestic, small commercial, and small industrial customers from high-pressure distribution systems.

Note: When the pressure of the gas and the demand by the customer are greater than that which is applicable under the provisions of 845.5, the requirements for control and limiting of the pressure of gas delivered are included in 845.1. In those cases where 845.5 is applicable, the requirements for control and limiting of pressure of gas delivered are included in section PSC 134.23.

845.51 (Change) If the maximum actual operating pressure of the distribution system is greater than low pressure as defined by 805.65 but equal to or less than 60 p.s.i.g., a service regulator having the characteristics listed below is required:

845.51 (e) (Change) The regulator must be of a type that is capable under normal operating conditions of regulating the downstream pressure within the limits of section PSC 134.23 and of limiting the build-up of pressure under no-flow conditions to 50% or less of the discharge pressure maintained under flow conditions.

845.52 (Change) If the maximum actual operating pressure of the distribution system is greater than low pressure as defined by 805.65 and is equal to or less than 60 p.s.i.g., a suitable protective device shall be installed to prevent unsafe overpressuring of the customers' appliances should the service regulator fail. Some of the suitable types of protective devices to prevent overpressuring of customers' appliances are:

- (a) A monitoring regulator.
- (b) A relief valve.
- (c) An automatic shut-off device.

These devices may be installed as an integral part of the service regulator or as a separate unit.

845.53 (Change) If the maximum actual operating pressure of the distribution main system, intercity main, or supply main (see 845.33 (b)) exceeds 60 p.s.i.g., suitable methods shall be used to regulate and limit, to the maximum safe value, the pressure of gas delivered to the customer, such as the following:

845.62 (Change) Breather vents and discharge stacks shall be provided on all pressure-relief devices located inside buildings, pits, and confined spaces. The discharge stacks, vents, or outlet ports of all pressure-relief devices shall terminate outside buildings, pits, and confined spaces in rain-proof, insect-proof fittings where gas can be discharged into the atmosphere without undue hazard. Consideration should be given to the specific gravity of the gas being discharged to the atmosphere to prevent accumulation of gases after discharge. Additional consideration should be given to all exposures in the immediate vicinity including windows or locations where gas can enter confined areas.

845.67 (Addition) Breather vents shall be provided on all service regulators and such vents shall terminate outside buildings, pits, and confined spaces in rain-proof, insect-proof fittings.

846.22 (a) (Change) A valve shall be installed on the inlet piping of each regulator station controlling the flow or pressure of gas in

a distribution system. These valves shall be in accessible locations not closer than 25 feet and preferably not more than 1,500 feet distant from each regulator station. Records shall be maintained to show specific valve locations and such records shall be made continuously accessible for use under emergency conditions. Such valves shall be inspected at least once each year and maintained in operating condition. It is intended that the distance between the valve and the regulator or regulators shall be sufficient to permit the operation of the valve during an emergency, such as a large gas leak or a fire in the station.

847.4 (c) (Change) Electrical equipment in vaults shall conform to the applicable requirements of the Wisconsin state electrical code.

849.11 (a) (Change) Service lines shall be installed at a depth which will protect them from excessive external loadings and local activities such as gardening. Whenever conditions permit, service pipes shall be laid with a cover of not less than 18 inches above the top of pipe. Where this cannot be done to existing structures, etc., less cover is permitted provided, however, that where such service lines are subject to excessive superimposed loads, those portions of the service line shall be cased or bridged to avoid harmful additional loads on the pipe or strengthened to resist them.

849.11 (d) (Addition) It is recommended that service to one customer and/or one building be supplied through one service and one shut-off valve.

849.14 (Change) Location of service line connections to main piping. Services shall be connected to either the top or the side of the main. The connection to the top of the main is preferred in order to minimize the possibility of dust and moisture being carried from the main into the service.

849.152 (a) (Change) Service lines to operate at a pressure between 0 and 40 p.s.i.g. shall be given a stand-up air or gas pressure test at not less than 50 p.s.i.g. for at least 5 minutes before being placed in service. Maximum test pressure for plastic service lines, however, shall not exceed 3 times the design pressure.

849.152 (f) (Addition) All service lines shall be tested after construction and before being placed in operation to determine that they do not leak.

849.21 (b) (Change) Steel service pipe shall be designed in accordance with the requirements of 841.1 through 841.14. Where pressure is less than 100 p.s.i.g., the steel service pipe shall be designed for at least 100 p.s.i.g. pressure.

849.21 (c) (Change) Corrosion protection. Any steel pipe used in service lines shall be protected from external corrosion as provided in 841.173 (a).

849.21 (f) (Change) All services shall be electrically insulated near or within the building so as to eliminate possible galvanic corrosion. This is especially important in areas where stray current electrolysis

is prevalent or where copper or lead water services are used. The services shall be protected from corrosion as provided in 841.173.

850.1 (Change) Because of many variables, it is not possible to prescribe in a code a set of operating and maintenance procedures that will be adequate from the standpoint of public safety in all cases without being burdensome and impractical.

850.2 (Change) It is possible, however, for each operating company to develop operating and maintenance procedures based on experience, knowledge of its facilities, and conditions under which they are operated, which will be entirely adequate from the standpoint of public safety.

850.3 (Change) Basic requirement. Each operating company having gas transmission or distribution facilities within the scope of this code shall:

(a) Have a plan covering operating and maintenance procedures in accordance with the purpose of this code.

(b) Operate and maintain its facilities in conformance with this plan.

(c) Keep records necessary to administer the plan properly.

(d) Modify the plan from time to time as experience with it dictates and as exposure of the public to the facilities and changes in operating conditions require.

(e) Operate its existing unreinforced bell and spigot-jointed cast iron pipe distribution systems at low pressure unless it can be proved to the commission that they can be satisfactorily operated at a higher pressure. However, the maximum allowable operating pressure for such system under any circumstances shall not exceed 15 p.s.i.g.

850.4 (Change) Essential features of the plan. The plan prescribed in 850.3 (a) above should include:

(a) Detailed plans and instructions to employees covering operating and maintenance procedures for gas facilities during normal operations and repairs and during emergency.

(b) Items recommended for inclusion in the plan for specific classes of facilities are given in 851 to 858, inclusive.

(c) Particular attention should be given to those portions of the facilities presenting the greatest hazard to the public in the event of an emergency or because of construction of extraordinary maintenance requirements.

(d) Set up an emergency plan to be implemented in the event of facility failures or other emergencies.

(1) Assure that appropriate maintenance and operating employees are acquainted with the operation of the applicable portions of the plan.

(2) Establish liaison with respect to this emergency plan with appropriate public officials, such as police departments, fire departments, etc.

850.5 (Addition) Changes in class location.

850.51 (Addition) Where observed increases in population density in the vicinity of existing steel pipelines or mains operating at hoop stress in excess of 40% of specified minimum yield strength indicate a change in class location since the original installation, or where

detailed population index surveys or other studies indicate that the hoop stress corresponding to the established maximum allowable operating pressure for a section of existing pipeline or main is not commensurate with the existing class location, a study shall be made to determine the following:

(a) The existing class location for the section of pipeline or main involved.

(b) The design, construction, and testing procedures followed in the original construction and a comparison of such procedures with the applicable provisions of this code.

(c) The physical condition of the pipeline or main to the extent that this can be ascertained from available records.

(d) Operating and maintenance history of the pipeline or main.

(e) The maximum actual operating pressure and the corresponding operating hoop stress taking pressure gradient into account in the section of the pipeline or main directly affected by the class location change.

(f) The actual area affected by the observed population density increase and physical barriers or other factors which may limit the further expansion of the more densely populated area.

850.52 (Addition) If the study described in 850.51 indicates that the hoop stress corresponding to the established maximum allowable operating pressure of a section of pipeline or main is not commensurate with the existing class locations 2, 3, or 4 and such section is in satisfactory physical condition, the maximum allowable operating pressure of that section shall be confirmed or revised as follows:

(a) If the section involved has been previously tested in place to at least 90% of its specified minimum yield strength for a period of not less than 8 hours, the maximum allowable operating pressure shall be confirmed or reduced so that the corresponding hoop stress will not exceed 72% of specified minimum yield strength of the pipe in class 2 locations, 60% of the specified minimum yield strength of the pipe in class 3 locations, or 50% of the specified minimum yield strength in class 4 locations.

(b) If the section involved has not been previously tested in place as described in 850.52 (a) above, the maximum allowable operating pressure shall be reduced so that the corresponding hoop stress will be equal to or less than that permitted in this code for new pipelines or mains in the existing class location.

(c) If the provisions of 850.52 and its parts (a) or (b) above are not used to qualify the section involved for operation, then such section of pipeline or main shall be hydrostatically tested for a period of not less than 8 hours. The maximum allowable operating pressure shall then be established so as to be equal to or less than shown in Table 850.521.

The maximum allowable operating pressure confirmed or revised in accordance with 850.52 shall not exceed the maximum allowable operating pressure established under this code, or previously established under applicable editions of the B31 code, prior to the confirmation or revision, and the corresponding hoop stress shall not exceed 72% of the specified minimum yield strength in class 2 locations, 60% of the specified minimum yield strength of the pipe in class 3 locations, or 50% of the specified minimum yield strength of the pipe in class 4

locations. No confirmation or revision of the maximum allowable operating pressure of a section of pipeline or main in accordance with 850.52 shall preclude the application of 845.23.

TABLE 850.521
MAXIMUM ALLOWABLE OPERATING PRESSURES
AFTER REQUALIFICATION TEST

Existing Class Location	Maximum Allowable Operating Pressure After Test
2	<u>Test Pressure</u> 1.25
3	<u>Test Pressure</u> 1.50
4	<u>Test Pressure</u> 1.80

850.53 (Addition) Where the maximum allowable operating pressure of a section of pipeline or main is revised in accordance with 850.52 and becomes less than the maximum allowable working pressure of the pipeline or main of which it is a part, a suitable pressure-relieving or pressure-limiting device shall be installed in accordance with provisions of 845.1, 845.2, and 845.21.

850.6 (Addition) Continuing surveillance of pipeline and distribution systems. As a means of maintaining the integrity of a pipeline or distribution system, each operating company shall have a procedure for continuing surveillance of its facilities. A study shall be initiated and appropriate action taken when unusual operating and maintenance conditions occur, such as failures, leakage history, drop in flow efficiency due to internal corrosion, or substantial changes in cathodic protection requirements.

If such studies indicate that the facility is not in satisfactory condition but an imminent hazard does not exist requiring immediate action, a planned program to recondition or phase out such facility shall be initiated. If such facility cannot be reconditioned or phased out, the maximum allowable operating pressure shall be reduced commensurate with the requirements described in 845.22 (c) of this code.

850.7 (Addition) Pipeline and distribution failure investigation. Each operating company shall establish procedures to analyze all failures and accidents for the purpose of determining the cause and to minimize the possibility of recurrence. This plan shall include a procedure to select samples of the failed facility or equipment for laboratory examination.

850.8 (Addition) Repair procedures for steel pipelines or mains operating at or above 40% of the specified minimum yield strength. For pipelines operating at or above 40% of the specified minimum yield strength of the pipe, if inspections at any time reveal an injurious defect, gouge, groove, dent, or leak, immediate temporary measures shall be employed to protect the property and the public, if it is not feasible to make a permanent repair at the time of discovery. As soon as feasible, permanent repairs shall be made as described herein. The use of a welded patch as repair method is prohibited except as provided in 850.83 (d).

850.81 (Addition) Permanent field repairs of gouges, grooves, and dents. (a) Injurious gouges, grooves, and dents shall be removed or reinforced.

(b) Gouges and grooves of lesser depth than 10% of the nominal wall thickness of the pipe may be removed by grinding out to a smooth contour provided the grinding does not reduce the remaining wall thickness to less than the minimum prescribed by this code for the conditions of use.

(c) If feasible, gouges, grooves, and dents shall be removed by taking the pipeline out of service and cutting out a cylindrical piece of pipe and replacing same with pipe of similar or greater wall thickness and grade.

(d) If not feasible to take the pipe out of service or operate at a reduced pressure, a full-encirclement welded split-sleeve shall be applied over injurious gouges, grooves, and dents.

(e) All repairs performed under 850.81 (c) and (d) shall pass a non-destructive inspection and tests as provided in 850.91 and 850.92.

(f) If the pipe is not taken out of service, the operating pressure of same shall be reduced to a level which will provide safety during the repair operations.

850.82 (Addition) Permanent field repair of welds having injurious defects. (a) All welds found during maintenance inspection to have injurious defects shall be repaired in accordance with requirements of 829.9 provided the pipe can be taken out of service. Repairs on welds may be made while the pipe is in service provided: the weld is not leaking and the pressure in the pipe has been reduced to that which will not produce a stress in excess of 20% of the specified minimum yield of the pipe, and grinding of the defective area can be limited so that there will remain at least $\frac{1}{8}$ inch thickness in the pipe weld.

(b) Defective welds which cannot be repaired under 850.82 (a) above, and where it is not feasible to remove the defect from the pipe by replacement, may be repaired by the installation of a full-encirclement welded split-sleeve.

(c) All repairs performed under 850.82 (a) and (b) above shall be tested and inspected as provided in 850.91 and 850.92.

850.83 (Addition) Permanent field repair of leaks. (a) If feasible, the pipe shall be taken out of service and repaired by cutting out a cylindrical piece of pipe and replacing same with pipe of similar or greater wall thickness and grade.

(b) If not feasible to take the pipe out of service, repairs shall be made by the installation of a full-encirclement welded split-sleeve.

(c) If the leak is due to a corrosion pit, the repair may be made by the installation of a properly designed bolt-on leak clamp.

(d) If the leak is due to a corrosion pit and on pipe of not more than 40,000 p.s.i. specified minimum yield strength, a steel plate patch with rounded corners and with dimensions not in excess of one-half the diameter of the pipe may be fillet-welded over the pitted area. The thickness of the plate shall be the same or greater than the pipe.

(e) All repairs performed under 850.83 (a), (b), and (d) above shall be tested and inspected as provided in 850.91 and 850.92.

850.9 (Addition) Testing repairs to steel pipelines or mains operating at hoop stress levels at or above 40% of the specified minimum yield strength.

850.91 (Addition) Testing of replacement pipe sections.

850.911 (Addition) When a scheduled repair to a pipeline or main is made by cutting out the damaged portion of the pipe as a cylinder and replacing it with another section, the replacement section of a pipe shall be subjected to a pressure test. The replacement section of pipe shall be tested to the pressure required for a new pipeline or main installed in the same location. The tests may be made on the pipe prior to use, provided non-destructive tests are made on all girth butt-welds after installation.

850.92 (Addition) Testing of repaired gouges, grooves, dents, and welds.

850.921 (Addition) If gouges or grooves are repaired by grinding to a smooth contour in accordance with the provisions of 850.81 (a), no pressure testing is required of the repaired section of pipe.

850.922 (Addition) If gouges, grooves, dents, or welds are repaired by welding in accordance with the provisions of 850.81, 850.82, and 850.83, the welding shall be visually inspected by a qualified inspector.

850.10 (Addition) Repair procedures for steel pipe operating below 40% of the specified minimum yield strength. Due primarily to climate conditions gouges, grooves, notches, and dents have been found to be an important cause of steel pipe failures. If inspections at any time reveal an injurious defect, gouge, groove, dent, or leak, immediate temporary measures shall be employed to protect the property and the public if it is not feasible to make permanent repair at time of discovery. As soon as feasible, permanent repair shall be made using recognized methods of repair.

851.1 (Change) Pipeline patrolling. Each operating company shall maintain a periodic pipeline patrol program to observe surface conditions on and adjacent to the pipeline right-of-way, indications of leaks, construction activity other than performed by the company, and any other factors affecting the safety and operation of the pipeline. Weather, terrain, size of line, operating pressure, class location, and other conditions will be factors in determining the frequency of patrol. Main highways and railroad crossings shall be inspected with greater frequency and more closely than pipelines in open country.

851.3 (Change) Internal corrosion of pipelines. When active corrosive agents are known to be present in the gas being transmitted, or if evidence of internal corrosion is discovered, the gas shall be periodically analyzed to determine the concentration of any destructive agent and precautions taken, if necessary, to prevent the development of a hazardous condition. Whenever a pipeline is cut for any reason, the internal surface shall be carefully inspected for evidence of internal corrosion.

851.7 (Addition) Abandoning of transmission facilities. Each oper-

ating company shall have a plan in its operating and maintenance procedures for abandoning transmission facilities. The plan shall include the following provisions:

(a) Facilities to be abandoned shall be disconnected from all sources and supplies of gas such as other pipelines, mains, cross-over piping, meter stations, control lines, and other appurtenances.

(b) Facilities to be abandoned in place shall be purged of gas with an inert material and the ends sealed, except as provided in 851.7 (c).

(c) If precautions are taken to insure that no liquid hydrocarbons remain in the facilities to be abandoned, then such facilities may be purged with air. If the facilities are purged with air, then precautions must be taken to insure that a combustible mixture is not present after purging. (See 841.285.)

852.2 (Change) Leakage surveys and routine procedures. Every gas utility shall maintain a gas leak-detection program and shall maintain records of operation under the program. The program shall consist of not less than the following:

(a) In principal business districts (as shown by maps filed with the public service commission by each utility) a reasonable street-opening survey shall be conducted twice annually by making tests with combustible gas indicators in street openings such as telephone and electric vaults and manholes, catch basins and sewer system manholes, and gas system openings.

(b) In each principal business district a building survey shall be conducted once a year. The piping from the entrance to the meter outlet and metering and regulating equipment shall be tested for gas leakage in those buildings that have gas service.

(c) A survey of all buildings used for public gatherings such as schools, churches, hospitals, and theaters shall be conducted once each year. The piping from the service entrance to the meter outlet and metering and regulating equipment shall be tested for gas leakage.

(d) In residential areas, in addition to a survey of public buildings, the vegetation shall be checked. At least 3 barhole tests shall be made in each block; at least one street opening shall be checked if one exists in each block or at each intersection; and on streets where system is operating at a pressure of more than 10 p.s.i.g., all street openings shall be checked. (See 852.21 (a) above for types of street openings.) The utility may substitute for the barhole tests a ground surface survey with a hand-operated, continuous-sampling instrument capable of detecting combustible gas in air concentrations of 100 parts per million. The utility may substitute for all the tests required by this section above a survey by mobile flame ionization or infrared gas detection units, provided that a method be included to check individual services. The tests required by this section shall be made once each year.

(e) Along lines in rural areas, the vegetation shall be checked annually.

(f) When a leak complaint is received and the odor of gas indicates that there is a leak in or near the premises, a search shall be carried to conclusion until such leak is found.

852.22 (Change) When a leak is found and repaired, a further check shall be made in the vicinity of the repaired leak to determine if there is any other source of migrant gas in the neighborhood.

852.3 (Change) Abandoning of distribution facilities. Each operating company shall have a plan in its operating and maintenance procedure for sealing off the supply of gas to all distribution facilities for which there is no planned use, including service lines, mains, control lines, equipment, and appurtenances. Special efforts shall be made to include services which have not been used for 2 years in a way that will remove gas from the customers' premises. The plan shall include the following provisions:

(a) If the facilities are abandoned in place, they shall be physically disconnected from the piping system. The open ends of all abandoned facilities shall be capped, plugged, or otherwise effectively sealed.

In addition, the need for purging the abandoned facility to prevent the development of a potentially hazardous condition shall be considered. Air or inert gas may be used for purging, or the facility may be filled with water or other inert materials. (See 841.285.)

(b) In cases where a main is abandoned, together with the service lines connected to it, insofar as service lines are concerned, only the customers' end of such service lines need be sealed as stipulated above.

(c) When vaults are abandoned in place, the entire vault shall be filled with a suitable compacted material.

852.4 (Change) Testing of abandoned services and mains. Service lines and mains previously abandoned shall be tested in the same manner as new service lines before being reinstated. Service lines temporarily disconnected because of main renewals or other planned work shall be tested from the point of disconnection to the service line valve in the same manner as new service lines before reconnecting. If, however, provisions are made to maintain continuous service, such as by installation of a bypass, any portion of the original service line used to maintain continuous service need not be tested.

852.5 (Addition) When street is paved or repaved. Whenever a road or street is paved or repaved with permanent pavement, the utility shall:

(a) Check for leaks along all mains and services in the streets and abutting property. This check shall be conducted by testing with a combustible gas indicator air samples taken from holes placed near the pipes.

(b) Determine condition of pipe and joints by sample visual examination.

(c) Place clamps on, reconstruct, or repair joints if they are likely to dry out or are leaking.

(d) Replace pipe if existing pipe is corroded to such an extent that it is likely to require replacement before the street is again resurfaced.

852.6 (Addition) Underground pipes. Whenever underground pipes are exposed in order to repair leaks, the utility shall record on the repair order the nature of the leak and possible cause from observation.

853.5 (Change) Storage of combustible materials. All flammable or combustible materials in quantities beyond those required for every-

day use, or other than those normally used in compressor buildings, shall be stored in a separate structure built of non-combustible material located at a suitable distance from the compressor building. All above-ground oil or gasoline storage tanks shall be constructed and protected in accordance with the applicable codes of the department of industry, labor and human relations.

855.1 (Change) All pressure-limiting stations, relief devices, and pressure-regulating stations and equipment shall be subjected to systematic periodic inspections and suitable tests to determine that they are:

- (a) In good mechanical condition.
- (b) Adequate from the standpoint of capacity and reliability of operation for the service in which they are employed.
- (c) Set to function at the correct pressure.
- (d) Properly installed and protected from dirt, liquids, or other conditions that might prevent proper operation.

In addition, all district regulators and associated safety devices shall be cleaned, lubricated, and checked for proper operation. Worn, damaged, or corroded parts shall be replaced and the entire installation checked to determine compliance with this code and rules of good practice. The inspection shall be made annually.

855.11 (Change) Company service regulators and associated safety devices on customers' premises shall be inspected and tested periodically to determine whether they are in proper operating condition. The above shall include testing of the set pressure of the regulator at a specific flow rate, determination of the lock-up pressure, and determine as to whether there are any leaks, internal or external, associated with the regulator. The test interval shall be the same as the interval between meter changes in the meter rotation program. (See section PSC 134.30.)

855.3 (Change) Whenever it is practicable to do so, pressure relief valves shall be tested in place to determine that they have sufficient capacity to limit the pressure on the facilities to which they are connected to the desired maximum pressure. If such tests are not feasible, periodic review and calculation of the required capacity of the relieving equipment at each station shall be made and this required capacity compared with the rate or experimentally determined relieving capacity of the installed equipment for the operating conditions under which it works. If it is determined that the relieving equipment is of insufficient capacity, steps shall be taken to install new or additional equipment to provide capacity.

856.2 (Change) Distribution system valves. Valves, the use of which may be necessary for the safe operation of a gas distribution system, shall be checked and serviced, including lubrication when necessary, at least once per year to be reasonably assured of their satisfactory operation. Inspection shall include checking of alignment to permit use of a key or wrench and clearing from the valve box or vault any debris which would interfere or delay the operation of the valve.

861 (Change) Odorization. Any gas distributed by distribution utilities to customers through intercity mains, distribution mains, or

services or used for domestic purposes in compressor plants shall have a distinctive odor of sufficient intensity to produce a detectable and recognizable odor at the most remote utilization equipment when the amount of gas in the air is 20% of the lower limit of combustibility. Whenever necessary to maintain this level of intensity, a suitable odorant shall be added in accordance with the following:

- (1) Odorants in the concentrations used shall be:
 - (a) Harmless to humans.
 - (b) Non-corrosive or harmful to steel, iron, brass, copper, plastic, and leather.
 - (c) Not soluble in water to an extent greater than 2.5 parts by weight of odorant to 100 parts by weight of water.
- (2) Odorizing equipment shall be designed to maintain uniform level of odor in the gas.

Appendix C (Addition) Add to the table the following:

Specification	Specified Minimum Yield Strength (p.s.i.)
API 5LX Grade X65 _____	65,000

History: Cr. Register, February, 1968, No. 146, eff. 3-1-68.