

Engineering Design **Maintenance, Operation, & Construction**

 Issuing Department: GAS SYSTEM MAINTENANCE AND TECHNICAL SUPPORT
 Manager: XXXXXXXXXX

 Effective Date: 1 Feb 2000
 Review Date: 1 Feb 2002

SUBJECT: Class Location Determination, Compliance, and Maintenance
Objective

This Standard establishes procedures for class location determination, compliance, and maintenance per 49 CFR Part 192 requirements.

Scope

The requirements of this Standard apply to all CGT-owned transmission pipeline facilities operating at or over 20% SMYS.

Applies To

GSM&TS District Superintendents, DCS Operating Supervisors, GSM&TS: Mapping, Pipeline Engineering, and Estimating Sections

Rescission

Replaces CGT Standard S 4127, Rev. 1 “Responsibility for Class Location Determination, Compliance, and Maintenance”.

Related Standard

DCS/GTS Standard D-S0352/S4111, “Patrolling Pipelines and Mains”
 DCS/GTS Standard D-S0430/S4125, “Maximum Allowable Operating Pressure, Requirements for Distribution Systems and Transmission and Gathering Lines”

Originator

Gas System Maintenance & Technical Support (GSM&TS) - System Integrity

Business Risk

Non-compliance with this Standard could result in improper determination of class location boundaries and failure to identify and address class location changes within mandated time limits, subjecting the company to regulatory violations and possible fines.

Responsibility for Implementation

GSM&TS Area Superintendents and the DCS OM&C Area Managers, or their designated representatives, are responsible for ensuring compliance with this Standard.

References

49 CFR Part 192.609 and 611

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Appendices and Exhibits

Appendix A, "Class Location Change Flow Diagram"
Appendix B, "Class Location Study Requirements For Pipelines Operating Over 40% SMYS"
Appendix C, Form F4127, "Report of New Construction Along Pipeline"

Contact for Further Information

GSM&TS, [REDACTED].

Deviations

Approval to deviate from the requirements of this standard must be obtained in writing from the director, System Integrity, GSM&TS.

Approvals and Authorizations

[REDACTED]

1/24/00

[REDACTED]

Date

Manager, Gas System Maintenance & Technical Support

Definitions

Class Location: An area defined and classified by criteria set forth in 49 CFR Part 192.5, which reads as follows:

“(a) This section classifies pipeline locations for purposes of this part. The following criteria apply to classifications under this section.

- (1) A “**class location unit**” is an onshore area that extends 220 yards on either side of the centerline of any continuous 1 mile length of pipeline.
 - (2) Each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.
- (b) Except as provided in paragraph (c) of this section, pipeline locations are classified as follows:
- (1) **A Class 1 location** is:
 - (i) An offshore area; or
 - (ii) Any class location unit that has 10 or fewer buildings intended for human occupancy.
 - (2) **A Class 2 location** is any class location unit that has more than 10 but fewer than 46 buildings intended for human occupancy.
 - (3) **A Class 3 location** is:
 - (i) Any class location unit that has 46 or more buildings intended for human occupancy; or
 - (ii) An area where the pipeline lies within 100 yards of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12 month period. (The days and weeks need not be consecutive).

Definitions (cont.)

(4) **A Class 4 location** is any class location unit where buildings with four or more stories above ground are prevalent.

(c) The length of class locations 2, 3, and 4 may be adjusted as follows:

(1) A class 4 location ends 220 yards from the nearest building with four or more stories above ground.

(2) When a cluster of buildings intended for human occupancy requires a class 2 or 3 location, the class location ends 220 yards from the nearest building in the cluster.”

Class Location Change occurs when the building count or the other factors described in the Class Location definition in 49 CFR Part 192.5, exceed the limit set for the existing class location.

Class 4 Location is interpreted by PG&E as occurring when application of the “sliding mile” shows that 50% or more of the buildings are four stories or taller. The class 4 location ends 220 yards from the nearest four story or taller building.

When calculating a class 4 area, a multiple dwelling unit in the same four-story or taller structure counts as one building.

Maximum Allowable Operating Pressure (MAOP) is the maximum pressure at which a pipeline, pipeline segment, or component is qualified to operate in accordance with the requirements of 49 CFR Part 192.

Sliding Mile is a PG&E method used to count the number of buildings within a “class location unit.” See Appendix B, page 13.

Specified Minimum Yield Strength (SMYS) is the minimum yield strength in psi prescribed by the specification under which pipe is purchased from the manufacturer or as specified in 49 CFR Part 192.

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Requirements

1. **Pipelines operating at or over 20% and up to 40% SMYS:**
Whenever an increase in the building count or the other factors described in the Class Location definition in 49 CFR Part 192.5 indicate a change in class location, the new class location shall be determined and the maintenance frequencies (e.g., patrolling, leak survey, etc.) updated to be commensurate with the new class location.
2. **Pipelines operating over 40% SMYS:**
Whenever an increase in the building count or the other factors described in the Class Location definition in 49 CFR Part 192.5 indicate a change in class location, a study shall be conducted in accordance with 49 CFR Part 192.609 and 611. Confirmation or revision of the maximum allowable operating pressure that is required as a result of the study must be completed within 18 months of the change in class location. (*See Appendix B for class location study requirements*)
3. All class location changes shall be evaluated and documented according to the process diagrammed in Appendix A.

Responsibility

(Refer to Appendix A)

GSM&TS District Superintendent and DCS Operating Supervisors

1. Are responsible for addressing class location changes and ensuring that any work required to make the pipeline commensurate with the new class location designation is performed.
2. Observe, on a continuing basis, new construction taking place within 220 yards on either side of the pipeline and 100 yards on either side of the pipeline for small, well defined outdoor areas (see the definition of "class location" on page 3). This observation should be done in conjunction with scheduled patrols. *Note: Areas experiencing a lot of planned development may require more frequent patrols.*
3. Report new construction on either side of the pipeline, as required in 3a & 3b below, on the Form F4127 "Report of New Construction Along Pipeline", (see Appendix C on page 14). Send the form to GSM&TS Mapping in Walnut Creek within 10 working days of the finding.
 - a. Report all new construction along pipelines that are in Class 1 or 2 areas as indicated on the pipeline survey sheet.
 - b. Report only new construction of buildings with four or more stories along pipelines that are in Class 3 area as indicated on the pipeline survey sheet.
4. When GSM&TS Mapping sends back the Form F4127 stating

Responsibility

(cont.)

that there is no class location change, review the total house count noted on the form to ensure accuracy.

5. After a class location study is conducted at the direction of the Pipeline Engineer (only pipelines over 40% SMYS), the District Superintendent and DCS Operating Supervisors shall:
 - a. Within 5 working days, review and concur with the Pipeline Engineer's recommended action(s) to be taken to confirm, reconfirm, change, or reestablish the MAOP of each section of pipeline affected.
 - b. Track the scheduled date(s) of the recommended action(s) to ensure the work is completed within the required time frame.
 - c. Document the completion date and the actual work done to the affected sections of pipeline. Communicate this to Mapping, the Pipeline Engineer, and others as necessary.
6. When the current class location changes, ensure that the maintenance management program is updated to reflect any changes in the maintenance frequencies of the pipeline to correspond with the new class location.
7. Retain completed Forms, F4127, "Report of New Construction" and written communications pertaining to a class location study and/or class location changes shall be kept in the field office "Class Location" file.

GSM&TS Mapping

1. Within 10 working days of receipt of Form F4127, post the information received from the field (Form F4127) to the Geographic Information System (GIS) and review the data to determine the following:
 - a. There is no class location change. The Form F4127 is filled out indicating this and sent back to the District Superintendent/DCS Operating Supervisors.
 - b. There is a potential class location change. The Form F4127 is filled out and sent with a preliminary density survey drawing to the Pipeline Engineer.

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**Responsibility
(cont.)****All Pipelines
Operating over
20% SMYS**

2. Provide an updated density survey drawing to the Pipeline Engineer within 5 working days of receipt of field density survey data from Engineering Estimating (only pipelines over 40% SMYS).
3. Within 5 working days of receipt of final approval from the Pipeline Engineer, update the GIS data base to reflect new class location information for affected pipeline segments, and issue new copies of density survey sheets and pipeline survey sheets to the District Superintendent/DCS Operating Supervisors.
4. Maintain records indicating present class location.

GSM&TS Pipeline Engineering/Estimating

1. Pipeline Engineer analyzes the information on the density survey drawing received from Mapping for accuracy and notifies the District Superintendent/DCS Operating Supervisors of the status within 5 working days.
2. Pipeline Engineer may schedule a field density survey with Engineering Estimating. If requested, the Engineering Estimator conducts and analyzes the field density survey and transmits the information to GSM&TS Mapping within 20 working days.
3. Pipeline Engineer reviews the updated density survey drawing, which includes the information from the field density survey, and within 10 working days notifies the District Superintendent/DCS Operating Supervisors and Mapping of one of the following results:
 - a. No change in class location. No further action is required by the field or Mapping. Complete Form F4127 and send copies according to the distribution list on the form.
 - b. The class location has changed; however, the pipeline is commensurate with the new class location. Notify Mapping, complete Form F4127, and send copies according to the distribution list on the form.
 - c. The class location has changed and the pipeline is not commensurate with the new class location. A class location study is required (see paragraph 4 below).

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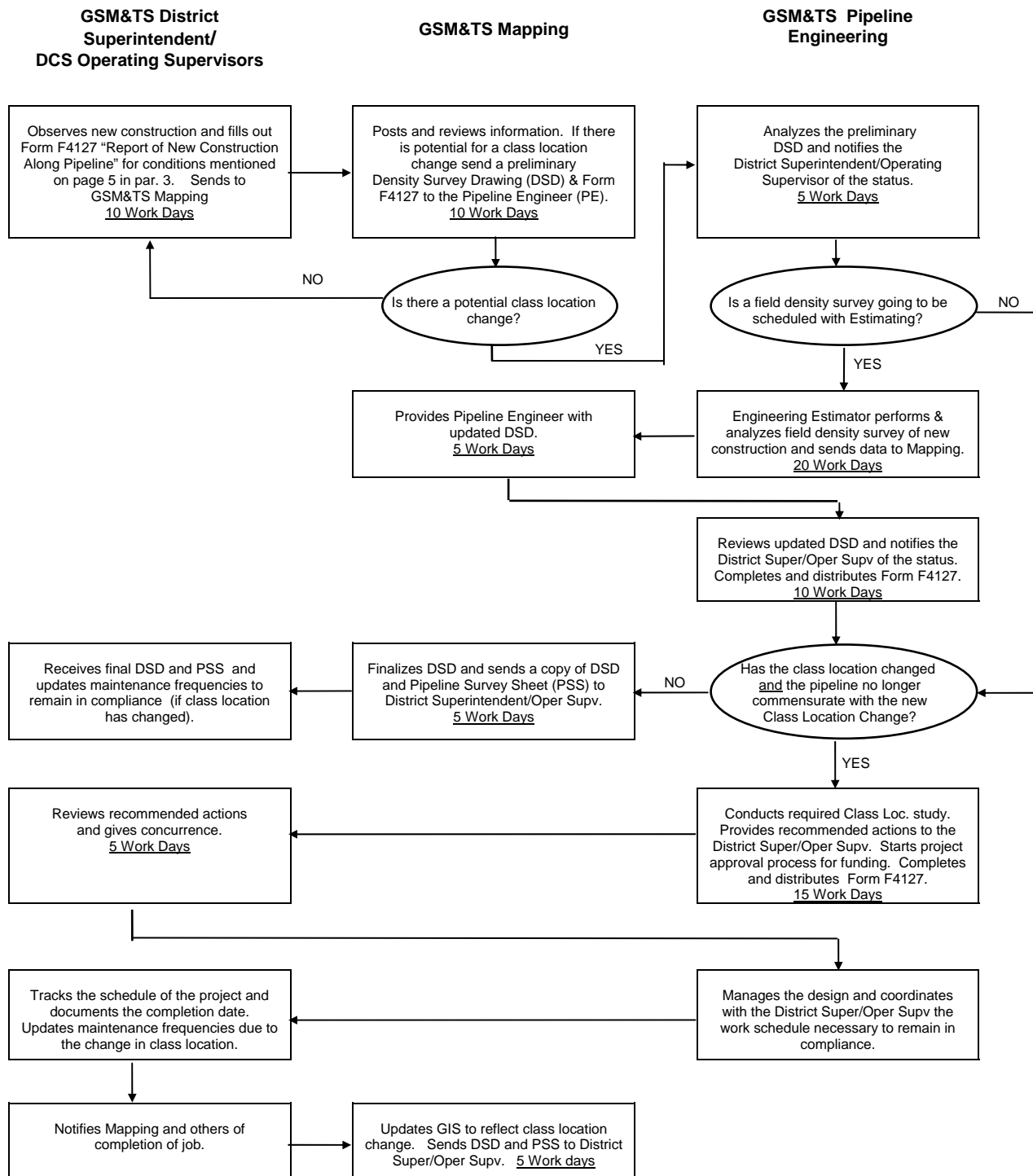
**Responsibility
(cont.)****Only Pipelines
Operating over
40% SMYS**

4. When a class location study is required the Pipeline Engineer shall complete the following within 15 working days:
 - a. Conduct a study as required by 49 CFR 192.609 (Appendix B, "Class Location Study Requirements: Pipelines Operating Over 40% SMYS.")
 - b. If there is a potential change in class location send written notification including recommendations to the District Superintendent/DCS Operating Supervisor. Send copies of completed Form F4127 according to the distribution list.
 - c. The recommendations in the report shall identify the actions to be taken to confirm, reconfirm, change, or reestablish the MAOP of each section of pipeline affected. Start the necessary project approval process for funding. **Note: If the MAOP needs to be revised, follow the requirements of DCS/GTS Standard D-S0430/S4125, "Maximum Allowable Operating Pressure, Requirements for Distribution Systems and Transmission and Gathering Lines".**
5. Pipeline Engineer shall manage the design and coordinate the work with the field to complete the recommended action. Include a schedule of dates that the District Superintendent/DCS Operating Supervisors can use to track the work and ensure that the 18 month compliance time frame is met.

Documentation

1. Completed Forms, F4127, "Report of New Construction", shall be kept in the field office "Class Location" file.
2. Written communications of a class location study and/or change in class location shall be kept in the field office "Class Location" file.
3. Original records (e.g. charts, strength test pressure reports, etc.) shall be kept in the job file.

CLASS LOCATION CHANGE FLOW DIAGRAM



CLASS LOCATION STUDY REQUIREMENTS: PIPELINES OPERATING OVER 40% SMYS**Requirement**

Whenever an increase in the building count or the other factors described in the Class Location definition in 49 CFR Part 192.5 indicate a change in class location, a study shall be conducted in accordance with 49 CFR Part 192.609 and 611. Confirmation or revision of the maximum allowable operating pressure required as a result of the study must be completed within 18 months of the change in class location.

Evaluating An Increase In Population Density

1. Use the latest version density survey drawing from the GSM&TS Mapping group will be used when analyzing a potential class location change for the pipeline segment involved.
2. Look at all data on the density survey drawing and from the field that could indicate future growth and is pertinent to class location determination. This should include locations of other permanent references, such as streets, roads, rivers, railroads, bridges, etc., that cross or are within the survey strip with respect to the built-up area and the pipeline. If there are additional impacts you may consider testing of additional footage, if it appears there will be future growth.
3. Count any structure having either a gas or an electric service connected to it is to be counted as a building intended for human occupancy, even though the building may be uninhabited at the time of the survey. This applies to barns, homestead shacks, and other structures which have visible evidence of usage as a residence.
4. Count as one building intended for human occupancy: Each unit in a motel or hotel, each unit in an apartment house, and each space in a trailer park that is occupied or connected to gas or electric service.
5. Note the presence of buildings, places of public assembly, and well-defined outside areas that are occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period and are within 100 yards of the pipeline segment involved (the days and weeks need not be consecutive). Some examples of these types of facilities are indoor or outdoor theaters, hotels, hospitals, playgrounds, recreation areas, driving range/club house at golf courses, commercial buildings, restaurants, RV parks, race tracks, stadiums, schools, etc.
6. For unusual circumstances where determining exact class location change is questionable, contact the System Integrity Section for assistance.
7. If it is necessary to verify the class location change, use the sliding mile method described on page 13.

Required Study
(49CFR Part 192.609)

The required class location study must include review and documentation of the following elements (use the checklist below as a guide):

1. The current (and originally installed) class location for the segment of pipeline involved.
2. The design, construction, and testing procedures followed in the original pipeline construction. Compare these with the current requirements for the new class location.
3. The operating and maintenance history of the pipeline segment, including the physical condition, based on available records.
4. The maximum actual operating pressure and the corresponding operating hoop stress, taking pressure gradient changes into account, for the segment of pipeline involved. (For example: "This pipeline has a 600 psig MAOP, however this segment only has 500 psig MOP")
5. The characteristic of the actual area affected by the population density increase including physical barriers or other factors which may limit further expansion of the more densely populated area.

CLASS LOCATION STUDY CHECKLIST FOR THE SEGMENT OF PIPELINE INVOLVED

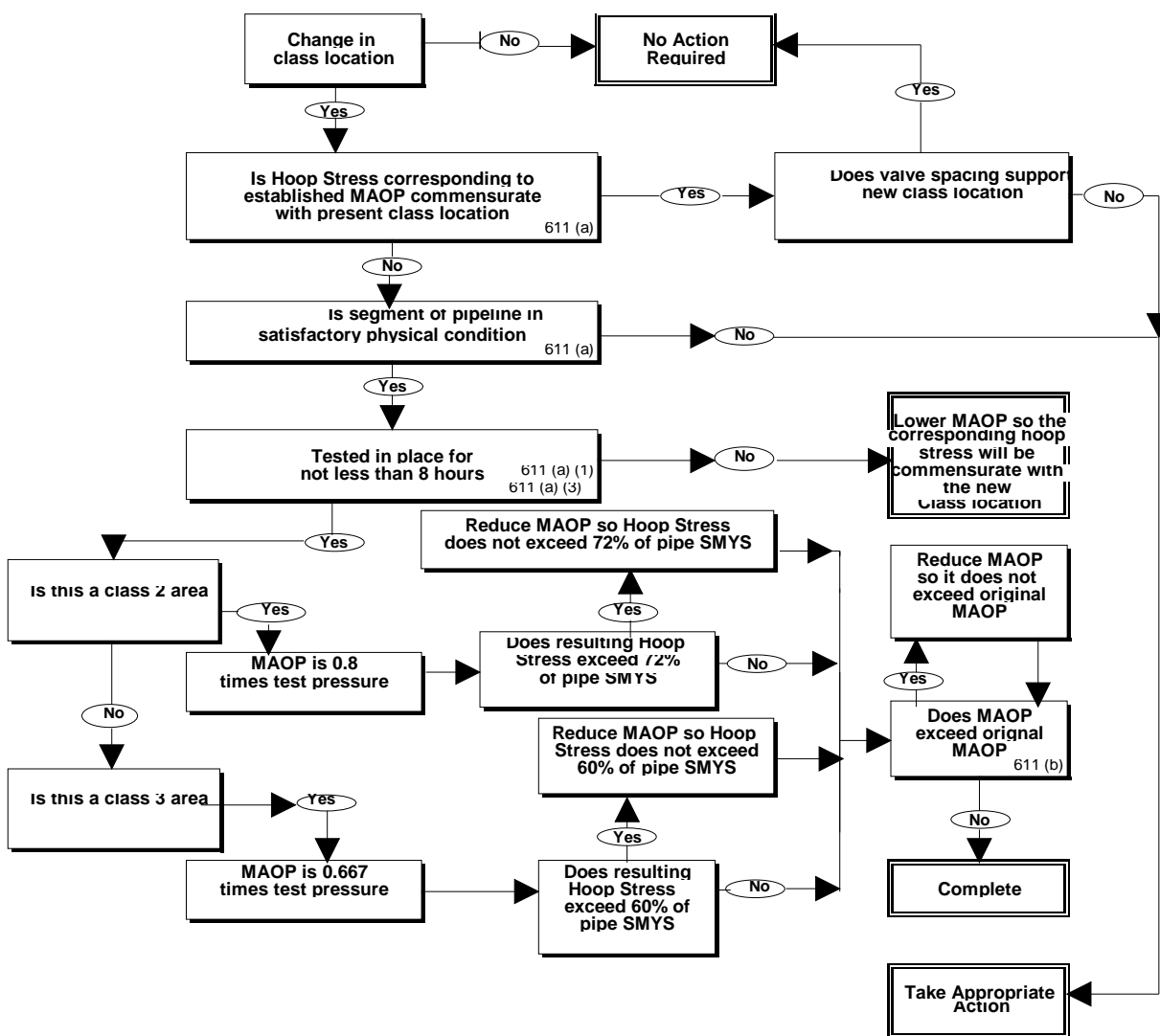
- Current class location
- Originally installed class location
- Strength test pressure report(s)
- Pipe specifications
- Valve spacing appropriate for proposed class location
- Leak survey data
- Leak history report
- Pipe condition reports
- Leak repair orders
- Patrol reports
- Cathodic protection records
- Input from field personnel on pipeline condition
- If line is tested, bring pipe supports up to Code.
- Other important items to consider: _____

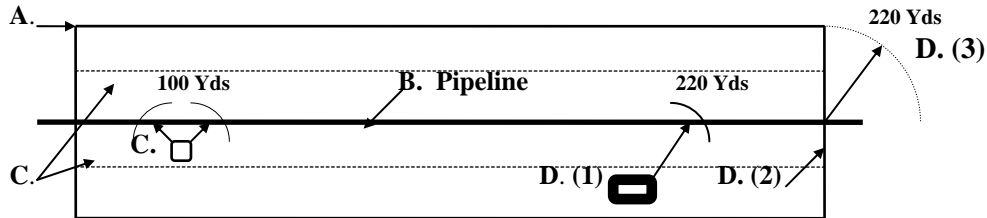
Note: This checklist is not all inclusive and does not preclude the use of additional documentation deemed necessary to complete the study.

Confirming or Revising MAOP for Change in Class Location
(49CFR Part 192.611)

If the hoop stress corresponding to the established maximum allowable operating pressure of a segment of pipeline is not commensurate with the present class location, and the segment of pipeline is in satisfactory physical condition, the MAOP of that segment of pipeline must be confirmed or revised. **The requirements illustrated in the flow chart below shall be followed to confirm or revise the MAOP.**

CHANGE IN CLASS LOCATION: CONFIRMATION OR REVISION OF MAOP(49CFR PART 92.611)



SLIDING MILE

1. When determining the number of buildings intended for human occupancy in any continuous 1-mile length of pipeline, the sliding mile concept must be used.
2. The 1-mile long segment must be positioned to obtain the maximum number of buildings in the segment. (NOTE: Dividing the pipeline into fixed 1-mile segments and counting the buildings in each segment will frequently result in a population density count which is less than that obtained using the sliding mile. Therefore, it is necessary to use the sliding mile when determining a class location.)
3. Create a “Mile Density Gauge” template transparency similar to the one shown above to the scale needed.
 - a) The solid line rectangle outlines 1 mile long by $\frac{1}{4}$ mile wide (220 yards to each side of the pipeline). The 220 yard boundary on each side of the pipeline is used to mark the Class 1,2,3, or 4 limit as determined by the dwelling count.
 - b) The centerline is positioned over the pipeline to maintain the quarter-mile corridor.
 - c) The parallel dashed lines are scaled at 100 yards (300 ft) from the pipeline as a limit for any building or area of 20 or more persons that fall within 100 yards of the pipeline, which would qualify by themselves as Class 3. To determine the boundary of the pipeline that would now be Class 3, draw a 100 - yard radius circle with the center point on the corners of the building or well defined area. The length of the new class 3 location is where the arc of the circle crosses the pipeline at two points.
 - d) If the last dwelling falls substantially shorter (more than 220 yards) before the end of the mile template, then the length of the class location change indicated by the sliding mile can be shortened by striking a 220 - yard radius arc from the corner of the last residence building to where it crosses the pipeline to determine the boundary of the class location change [see D.(1)]. If the last dwelling does not fall more than 220 yards from the end of the mile template, then the length of the class location change extends to the end of the mile template [see D.(2)]. The arc on the end is not part of the sliding mile change [see D.(3)]; however, it is provided as a convenience to be used as a pivot point for angles in the pipeline.

REPORT OF NEW CONSTRUCTION ALONG PIPELINE For Pipelines Operating at or over 20% SMYS

I. The following types of construction shall be reported:

1. Buildings intended for human occupancy within 220 yards of either side of the pipeline.
2. Buildings or small, well defined outside areas such as playgrounds, recreation areas, outdoor theaters, or other places of public assembly, any of which are to be occupied by 20 or more persons during normal use, and located within 100 yards of either side of the pipeline.

II. To be completed by GSM&TS District or DCS Area personnel:

1. Line No. _____

2. Location: Town _____ Milepoint with reference to pipeline _____

or *Global Positioning System
(GPS) coordinates _____

****(If using GPS skip steps 3 through 8)***

3. Description of building or area _____

4. Distance of building or area from pipeline _____

5. Is the building or area to be occupied by 20 or more people during normal use?

Yes _____ No _____ How Many? _____

6. Number of dwelling units _____ (Report each dwelling unit in a multiple unit dwelling)

7. Date of completion or occupancy _____ (Estimate if structure is still under construction)

8. Remarks _____

9. Field Checked by _____ Date _____

Report of New Construction Along the Pipeline (cont.)**III. To be completed by GSM&TS Mapping Department:**

1. Dwelling unit density count based on continuous sliding mile between _____
Mile Point _____ and Mile Point _____
Number of dwellings before new construction _____ Location Class _____
Number of dwellings after new construction _____ Location Class _____
2. Location class change? Yes _____ (if yes, complete form and send to Engineer) No _____ (if no, send form back to the field)
3. Design information
Pipe specification _____ O.D. _____ W.T. _____
Design pressure _____ MAOP _____
4. Strength test information
Date _____ Pressure _____ Test Medium _____
5. Recorded in GIS:
Mapper _____ Date _____

IV. GSM&TS Pipeline Engineering Review

Results:

- a. No Change in class location
- b. The class location has changed, however, the pipeline is commensurate with the new class location.
- c. The class location has changed and the pipeline is not commensurate with the new class location.

Pipeline Engineer _____ Date: _____

Distribution:
GSM&TS District Superintendent/DCS Operating Supervisors File
GSM&TS Mapping
GSM&TS Pipeline Engineer