PACIFIC GAS AND ELECTRIC COMPANY

CALIFORNIA GAS TRANSMISSION
GAS SYSTEM MAINTENANCE & TECHNICAL SUPPORT
SYSTEM INTEGRITY SECTION
Risk Management

Procedure for Risk Management

Procedure No. RMP-08

Identification, Location, and Documentation of High Consequence Areas (HCAs)

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4					

material redacted

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1.0 PURPOSE

The purpose of this procedure is to provide the requirements used to identify, locate, document, and retain records for High Consequence Areas (HCAs), as defined within this procedure. This procedure is written to meet the requirements of CGT Procedure RMP-06 and 49 CFR Part 192 Subpart O.

2.0 SCOPE

This procedure is applicable to all of CGT's gas transmission pipeline facilities, including line pipe and regulating station facilities. At this time, the scope of this procedure is not applicable to the following:

- Gas Gathering Facilities

The Risk Management Program (RMP) is responsible for managing the identification, location, documentation, and record retention activities associated with this procedure for CGT. The RMP shall establish and manage the activities associated with this procedure by utilizing industry and regulatory accepted methodologies appropriate for PG&E's CGT facilities and shall be in conformance with this procedure. The Lead Risk Management Engineer shall be responsible for compliance with this procedure.

3.0 INTRODUCTION

High Consequence Areas (HCAs) are areas in proximity to CGT pipelines that have the added consequence of larger population densities or structures that contain people who would have a greater difficulty in evacuating if a failure were to occur. (A detailed definition of HCAs is provided in RMP-06). The accurate identification, location, documentation, and record retention of information regarding HCAs is necessary to reliably and accurately assess the risk of CGT facilities and to be in compliance with federal regulations. The presence of an HCA is a significant factor in the consequence portion of CGT's risk algorithm and is vital in the identification of Integrity Management Areas (IMA) required by Federal Regulations.

Data Quality and Integration is the key to reliably and accurately identifying, recording, and maintaining HCAs. Parcel data, aerial photography, pipeline information, GPS information of the pipeline and surrounding structures, responses from public safety officials, personal knowledge, and feedback from integrity assessment teams shall all be used in the identification of HCAs. This procedure provides the methodology.

4.0 Roles and Responsibility

Specific responsibilities for ensuring compliance with this procedure are as follows:

Title	Reports to:	Responsibilities
Lead Risk Management Engineer	Director System Integrity	• Parcel Data Procurement • Supervise completion of work (schedule/quality) • Monitor compliance to procedure – take corrective actions as necessary. • Assign qualified individuals • Ensure Training of assigned individuals
Sr. GIS Specialist	Supervisor, GIS and Field Data Services	• Develop and maintain Automated PIC Tool program. • Run PIC Tool program using parcel data and pipeline data as supplied by RM
Engineers	Lead Risk Management Engineer	• Review and determine land use based on parcel data and aerial photos per this procedure as assigned. • Review and determine HCAs based on automated PIC tool data, parcel data and aerial photos per this procedure as assigned. • Check pipe segments codes as "Z" as assigned.

5.0 Training and Qualifications

Specific training to ensure compliance with this procedure is as follows:

Position	Type of Training:	How Often
Engineer	Procedure Review	• Upon initial assignment • Annually • As changes are made to the procedure

6.0 Definitions

High Consequence Area is defined by 49 CFR Part 192 Subpart O § 192.903) as:

"High Consequence area means an area established by one of the methods described in paragraphs (1) or (2) as follows:

(1) An area defined as --
(i) A Class 3 location under § 192.5; or
(ii) A Class 4 location under § 192.5; or
(iii) Any area outside a Class 3 or Class 4 location where the potential impact radius is greater than 660 feet (200 meters), and the area within a potential impact circle contains 20 or more buildings intended for human occupancy; or
(iv) The area within a potential impact circle containing an identified site.
(2) The area within a potential impact circle containing
(i) 20 or more buildings intended for human occupancy, unless the exception in paragraph (4) applies; or
(ii) An identified site."

Identified site is defined by 49 CFR Part 192 Subpart O § 192.903) as:

"Identified site means each of the following areas:
(a) An outside area or open structure that is occupied by twenty (20) or more persons on at least 50 days in any twelve (12)-month period. (The days need not be consecutive.) Examples include but are not limited to, beaches, playgrounds, recreational facilities, camping grounds, outdoor theaters, stadiums, recreational areas near a body of water, or areas outside a rural building such as a religious facility); or
(b) A building that is occupied by twenty (20) or more persons on at least five (5) days a week for ten (10) weeks in any twelve (12) month period. (The days and weeks need not be consecutive.) Examples include, but are not limited to, religious facilities, office buildings, community centers, general stores, 4-H facilities, or roller skating rinks); or
(c) A facility occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate. Examples include but are not limited to hospitals, prisons, schools day-care facilities, retirement facilities or assisted-living facilities."

Use code descriptions in parcel data information shall be used as the primary source of information to define identified sites. All of the following uses shall be considered as "identified sites" unless verification is performed to determine that there are fewer than 20 people that occupy a building or to re-define the building use:

Airport terminals/Hangers[1]	Food Processing[1]	Prisons/Calif. Youth Facilities[1]
Auto/Sales Repair[1]	Hotels/Motels[1]	Restaurants[1]
Cannery[1]	Indoor Recreational[1]	Retirement or Assisted Living Facilities[1]
Church[1]	Hospitals[1]	Schools (Elementary, Middle, High)[2]
Club/Lodge[1]	Manufacturing Facilities[1]	Shopping Centers[1]
College/University[1]	Nursing/Convalescent Homes[1]	Stores[1]
Day-Care Facilities[2]	Office Building[1]	Supermarkets[1]
	Parks/Playgrounds/Camp Grounds Outdoor Gathering Areas[2]	Theaters (In-Door)[1]
Amusement Park/Auditorium[2]	Post Office[1]	Wholesale[1]
Financial[1]	Professional Building[1]	

Note:
1 Identified Site consists of Building Structure.
2 Identified Site consists of Property boundary.

In addition to the information contained in parcel data, third party data contained in the theme "HCS2003" shall be considered as identified sites. (HCS2003 contains information obtained from a variety of third party sources as to the location of churches, Day Car Centers, Schools, Community Centers, Care Homes, Country Clubs, Hospitals, Fairgrounds, Museums, Halls/Theaters, Zoos, Prisons, and Health Maintenance Facilities and is located on the Risk Management Shared Directory (WalnutCrk01\Mapping\RiskMgmt\HCAs\hcs2003). Information obtained from Public Safety Officials regarding these facilities and other Outdoor Gathering Areas are also maintained in this theme.) Aerial photography shall also be used to verify exclusion of pipeline segments from the integrity management rule and to identify sites that may have been missed by all of the different data sources. Items to consider include size of building, number of vehicles/ spaces available at the facility (Note that the time/day/season the aerial photo was taken may affect the number of vehicles observed and should be taken into consideration. Recreational sites that have been missed by all of the different data souses can be identified by careful observation as to the number of vehicles in the vicinity of the pipeline.) Finally, feedback from assessment teams and personal knowledge shall be used to define HCAs.

Potential Impact Circle (PIC) is defined as:

"Potential impact circle is a circle of radius equal to the potential impact radius (PIR).
Potential impact radius (PIR) means the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property.

$$PIR = 0.69 * (P * OD^2)^{1/2}$$

Where, *PIR* = *Potential Impact Radius in feet.*
P = *MOP (Maximum Operating Pressure psi, which, for CGT utilization is equivalent to Regulation required MAOP or Maximum Allowable Operating Pressure)*
OD = Outside Diameter of Pipe Segment (in.)

[Note: the above formula was based on ASME B31.8S-2001 Para. 3.2. It is the same as required by 49 CFR Part 192 Subpart O §192.903(c) (issued after ASME B31.8S) with the exception that this formula requires Outside Diameter and §192.903(c) specifies nominal diameter. The difference is small and this formula is more conservative. It will therefore continue to be used to establish PIRs.]

Transmission Line is defined by CFR Part 192 Subpart A § 192.3 Definitions) as:

"Transmission line means a pipeline, other than a gathering line, that:

(d) Transports gas from a gathering line or storage facility to a distribution center, storage facility to a distribution center, storage facility, or large volume customer that is not downstream from a distribution center;
(e) Operates at a hoop stress of 20 percent or more of SMYS; or
(f) Transports gas within a storage field. A large volume customer may receive similar volumes of gas as a distribution center, and includes factories, power plants, and institutional users of gas."

For the purpose of classifying all of CGT's pipelines, the Risk Management Program has defined the following as transmission:

Any pipeline segment, (other than Gas Gathering) that:

(a) Is a numbered Transmission Pipelines; or
(b) Operates at a stress (at MOP) of equal to or greater than 20% SMYS or has a downstream segment operating at 20% SMYS or more; or
(c) Transports gas to a large volume customer. (These customers are identified in GIS in the theme "All_Ncore_0903" on shared drive (Cgt on 'WalnutCrk01\ENG\LIBRARY\GISDATA\PDR\Ncorecust\All_Ncore_0903))

Pipeline Segments meeting this criteria are identified in GIS in the Pipeline Theme, (Trans_Def Field) as: "T" (meets transmission definition based on function or operating stress), "TI" (may meet transmission definition, further investigation needed), "TC" (meets transmission definition based on function as service to large volume customer), or "TP" (defined as transmission based on stress of a pipe segment downstream operating at 20% or more SMYS.) New pipelines segments shall be coded as "X" by the Mapping Dept. until they can be reviewed and defined by the RMP.

7.0 HCA Determination

CGT shall use the Potential Impact Circle (PIC) method to identify HCAs (Method 2 of CFR Part 192 Subpart O § 192.903 (see Definitions). HCAs will be determined by calculating the PIC for each pipeline segment and superimposing that circle on Parcel Data and aerial photographs to determine the potential impact of the pipeline on structures contained in the circle. The process shall be performed as follows: (Note that a flowchart showing the process details is included on page 11 of this procedure.)

7.1 Parcel Data within the PIC shall be obtained for all CGT transmission pipelines from appropriate county officials. Transmission pipelines shall be defined by a Risk Management Engineer and identified in GIS as described in 6.0 Definitions – Transmission Lines.

7.2 A join of high consequence structures and the parcel data will be performed based on street address. (Note: Although a complete match is not anticipated and a visual review is performed per Para. 7.6, any structures identified at this early stage will be helpful in providing additional assurance that these structures and sites are not inadvertently omitted from the program.)

7.3 Parcel Data within the PIC of the pipe shall be reviewed by a Risk Management Engineer to ensure that is of sufficient quality to be used for determining HCAs. The review shall consist of ensuring that the parcels within the PIC have been provided, that land use codes are specified for each parcel, and that the use codes are sufficiently clear to make a determination as to the site use so that a structure count

or identified site determination can be made. Parcels without a land use code or having an ambiguous land use code shall be field inspected or inspected using aerial photographs to make a determination as to the land use. Where a determination cannot be made, conservative assumptions shall be made. Assumptions made as to site use or structure counts per land use code shall be recorded in a excel spreadsheet and filed electronically in the same folder as the parcel data. Four fields shall be added to the parcel data layer to record identified sites, structure counts, descriptions, and whether the parcel is in the PIC.

7.4 A Risk Management Engineer shall provide codes for whether the parcel is within the PIC, for identified sites (See Definitions), and the number of structures per use code in the parcel data shape file. Coding for identified sites and number of structures shall be consistent with the excel spreadsheet prepared per Para 7.3 above. An identified site shall be coded as "20" in the ID Site Field. The number of structures field shall be entered, as appropriate, based on the land use. Where, in the opinion of the Risk Management Engineer, it would be advantageous to provide notes regarding the parcel, they may be added to the description field. The layer file shall be stored electronically in the Risk Management Shared Directory (WalnutCrk01\Mapping\RiskMgmt\Integrity Management Plans\HCA determination\Parcels_in_PIC_by_County).

7.5 The Potential Impact Circle (PIC) shall be superimposed on the Parcel Data and a count shall be performed to determine the number of structures intended for human occupancy or identified sites. If there are 20 or more structures intended for human occupancy or an identified site within the PIC, the portion of the segment within the PIC shall be identified as an HCA. As a first pass, the process shall be automated through the use of a GIS Script prepared for this task and shall be run by county. Results shall be electronically stored by county as a layer file in the Risk Management Shared Directory (WalnutCrk01\Mapping\RiskMgmt\Integrity Management Plans\HCA determination\HCAs_per_PICTool_by_County). (Because the automated structure count process uses parcel boundaries and not structures for determining the extent of an HCA, manual structure counts may occasionally be necessary in making the final HCA identification and avoid undue conservatism.)

7.6 HCA Identification results based on the superposition of Potential Impact Circles on Parcel Data shall be reviewed by a Risk Management Engineer to verify the results of the HCA identification through the automated process (Paragraph 7.5). The review shall consist of superimposing Potential Impact Zones, Parcel Data, HCS2003 Information, and HCA Identification results on Aerial photos and reviewing the reasonableness of the results based on observable land and structure features. (Special attention should be given to ensure that all identified sites have been correctly identified. The HCS2003 layer containing Daycares, Schools, Churches, etc., building size, and observed parking or traffic surrounding a structure or site are useful tools in the review process. Consideration as to the date, season, and time the aerial photo was taken can also be of value in understanding expected site usage. For example, an aerial photo taken on a weekend may show recreation or shopping sites at a maximum, but work sites may be at a minimum and vice versa.) The review shall be done at a sufficient magnification such that details as to possible structure or land usage can be observed without being blurred. Typically this would require scanning each pipeline identified as being transmission from beginning to end at a 1:1000 to 1:5000 projection. Because the automated HCA process utilizes

parcel boundaries rather distances to a structure, some portions of a pipeline may have been identified as being within an HCA that are not. These segments of the pipeline may be excluded from an HCA provided a manual measurement of the distance from an identified site to the pipeline is greater than the PIC or if a manual count of the number of structures within the PIC is less than 20. If a HCA is to be excluded based on distance from the structure to the pipeline, the following distance shall be added to the PIC to account for tolerances in the location of the pipeline/imagery:

100' – Pipeline in open country
40' – Pipeline in urban areas within Right of Way/Franchise Area or Street (Note that, except for pipeline services to an identified site, the added tolerance need not exceed the space available for potential pipeline location error. For example, if an identified site is on the north side of the street and the pipeline is shown in the franchise area on the north side of the street, the tolerance need not exceed the distance from the pipeline to the north edge of the franchise area.)
5' – Pipeline GPSed

Results of the review shall be recorded by pipeline segment in the Pipeline Layer Theme (HCA_ID field) as follows:

A - HCA based on structure Count (20 or more structures intended for human occupancy within the PIC)
B - HCA based on both Identified Site and Structure Count
I - HCA based on Identified Site
N - Not an HCA (Note: When a pipe segment is identified as NOT being within a HCA, the Risk Management Engineer shall place a uniquely assigned number following the "N". The Lead Risk Management Engineer shall assign unique numbers to each engineer conducting the review. Documentation of such shall be retained in the RMP Files.)
Z - Not an HCA based on distance from the identified site to the pipeline, based on a manual structure count, or based on a reconsideration of a land use definition. (Note: these are typically where there is a conflict with the automated definition of an HCA, however, they can also be at locations where the Risk Management Engineer would like a second opinion on the exclusion of a pipe segment from the integrity management program.) Uniquely assigned numbers shall added following the "Z" as is required by "N" above[1].

7.7 Pipeline segments shall be edited, as necessary, to define the extents of HCA boundaries. The length of the HCA shall be established per 49 CFR Part 192 Subpart O § 192.903 as

1. The review of pipelines provides a quality assurance check of the automated GIS Tool used as a preliminary screening tool to identify covered and non-covered pipeline segments and is a check of the parcel data. Providing codes for the non-covered pipeline segments demonstrates that a quality assurance check was performed.

the "length of pipeline from the outermost edge of the first potential impact circle that contains either an identified site or 20 or more buildings intended for human occupancy to the outermost edge of the last contiguous potential impact circle that contains either an identified site or 20 or more buildings intended for human occupancy."

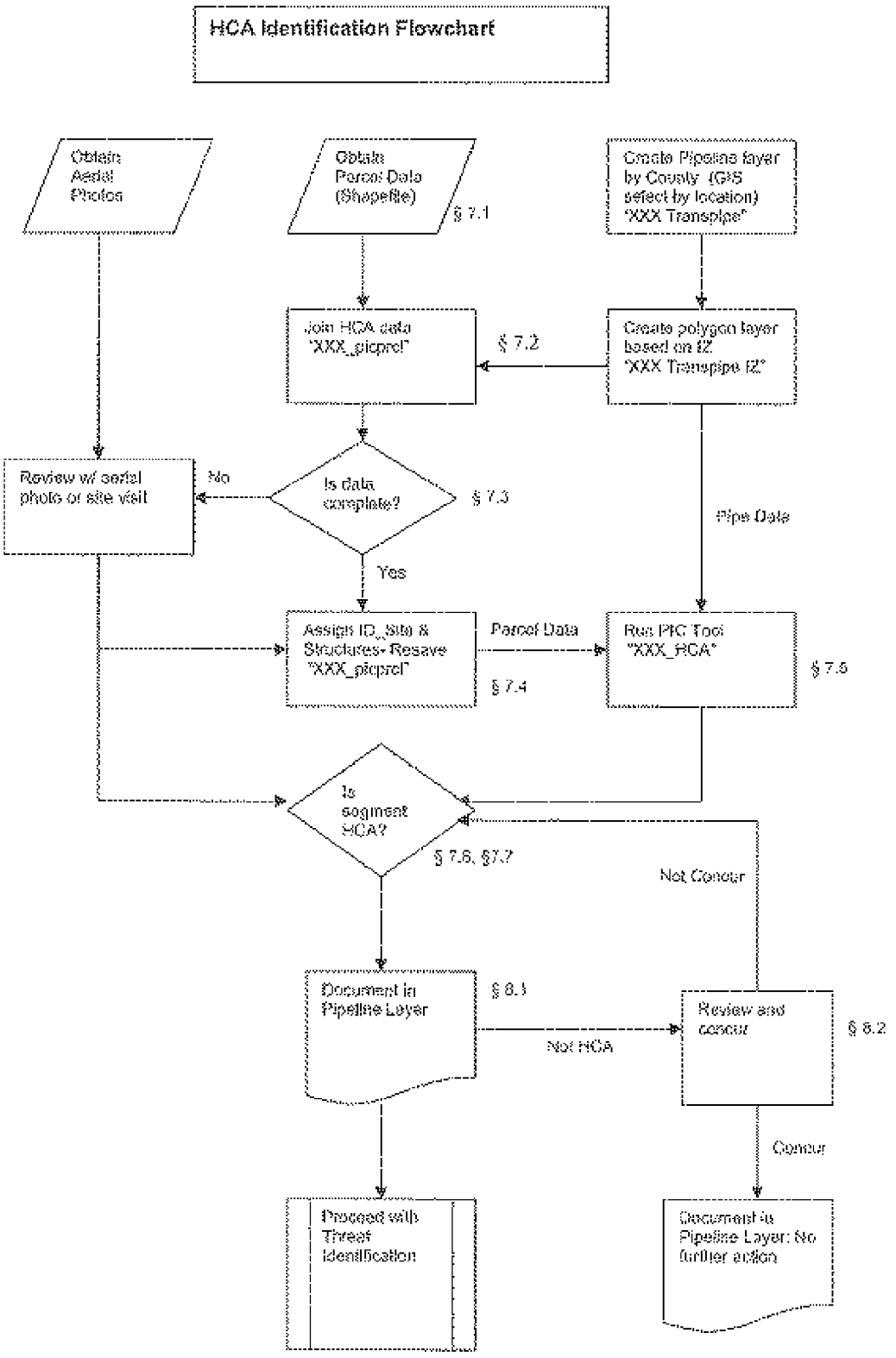
8.0 HCA Data Verification, Integration and Record Retention

8.1 HCA identification shall be maintained in the Pipeline theme for as long as the pipeline is active.

8.2 Pipelines excluded from the Integrity Management Rule coded as "Z" in the HCA_ID Field of the Pipeline Theme shall be independently reviewed and verified by a Risk Management Engineer. Verification shall be documented by placing a unique number assigned to the engineer after the "Zx". (Example "Z21", where the number 2 represents the individual who determined that the pipeline segment was NOT within an HCA and the number 1 represents the individual that verified that the segment was not within an HCA.) This requirement provides a quality check of pipelines to be excluded from the Integrity Management Rule and is a further check of the automated GIS Tool used as a preliminary screening tool to identify covered and non-covered pipeline segments and parcel data. Providing reviewer codes for the non-covered pipeline segments demonstrates that this quality assurance check was performed.

8.3 HCAs will be re-verified as required by RMP-06. Factors that shall be included in the re-verification include the following:

- New Pipelines
- Relocated Pipelines (either physically or in GIS based on more accurate geospacial information such as GPS)
- New Parcel Data (either new parcels or changes in Land Use)
- Modification to the pipeline that my affect the PIC such as Outside Diameter (OD) or Maximum Operating Pressure (MOP)



Note: XXX in the file name refers to a county abbreviation