Gas Technology Institute
Gas Distribution Model
Physical Oracle Representation

Version 1. DRAFT
Revised: 12/22/2010

General Notes

- A RECORD_ID is provided as the primary key field for each table. During physical model development we will determine if this field will be a GUID field or a numeric ID.
- Status is addressed through a field called OPERATIONAL_STATUS_CL that will allow a feature to be in a status of Uncommissioned, Active, Idled, Retired, or Abandoned. In addition, the model provides separate tables for abandoned facilities, providing an alternative approach for modeling abandoned facilities.
- For those entities that are spatial, the model provides a single, vendor-neutral field called GEOMETRY_FIELD to store geometry or geography of the item.

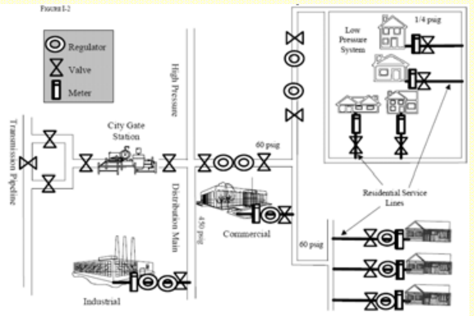
Conventions Used

- CL = Code List table (provides list of valid values only for this field)
- UOM = Units of Measure
- UOM_CL = Global Code List with units of measure (e.g., inches, feet, PSI, IPS, etc.)
- LEGACY_ID = Field provided to link to source or prior system entity.
- RECORD_SOURCE_CL= Field provided to identify source or prior system.
- <Table Name>_FOREIGN_KEY = Field provided to link child record to a parent record. (This may be abbreviated to <Table_Name>_FK.)

Key Concepts

Pressure System

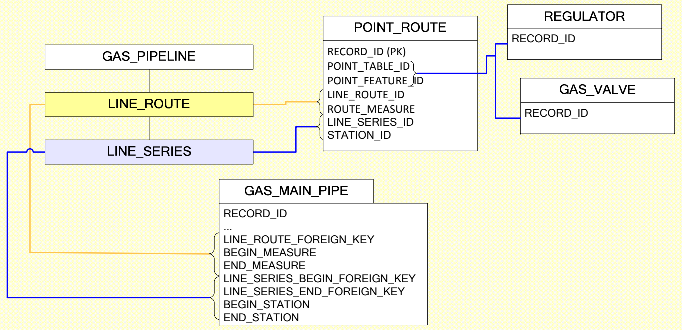
- The model includes a non-graphic entity to represent Pressure Systems.
- Pressure systems (or pressure districts) represent a system of mains and facilities that is fed by one or more regulators that control the pressure for the system or district.
- The model assumes the pressure system has an MAOP that is calculated based on the MAOP of individual piping, facilities, and pipe joins within the system.
- The model assumes the pressure system has a standard or set operating pressure.
- Pressure systems may feed other pressure systems but they are separated by regulating stations.
- Rather than store system-applicable information on individual pipe and device records, the model uses an approach where facilities within a pressure system contain a foreign key (FK) reference to the pressure system.



PHMSA Diagram Showing Pressure Systems

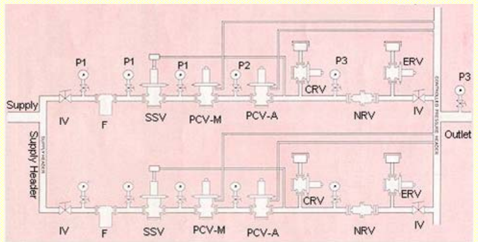
Linear Referencing and PODS Compatibility

- The GDM addresses stationing for two principle reasons:
  - A common concern raised by distribution companies is the reclassification of pipe from transmission to distribution or from distribution to transmission when the operating pressure, and thus percent SMYS, for a pipe segment is changed due to system reconfiguration or seasonal adjustments.
  - In addition, the GDM Steering Committee has stated the GDM should support a vertical gas model that includes PODS.
- These two considerations drive the need for support for stationing or linear referencing in the GDM.
- The approach taken by the GDM is as follows:
  - Support line hierarchy components used by PODS–these are Line, Route, and Series, plus a new table called EventRangeIndex.
  - Include fields on entities in the model where appropriate to allow them to relate to a Route and to store measure values (begin and end measure for lines, just one measure value for points). A distribution operator may elect to use one route for every main segment. Transmission operators, in contrast, commonly have many pipeline segments associated to a route.
  - Entities represented by point geometry that are associated to a pipe will relate to the corresponding route through a foreign key and a measure value. Since a point may represent a device that acts as a boundary (such as a valve or a regulator), a point will be able to link to multiple routes. A fitting (such as a 3- or 4-way tee) may be at the junction of several lines so the relationship between points and routes is many-to-many.
  - Entities in the GDM that are not related to a location on a pipe (for example, a rectifier cable or bond wire) are not directly associated to a route.
  - Stationing will not be required but can be stored in the model. The model will include optional fields on entities that will allow them to relate to a Series and store Stationing values. (These are only used if a station equation exists on the line.)
  - The relationships are illustrated in the diagram at right. The tables for the hierarchy are included in the model.
- The approach taken by the GDM does imply certain implementation specifics, such as how the relationship between entities and the associated routes will be maintained during editing operations. Individual GIS vendors may approach the issue in any number of ways, including building the route tables and relationships when the data is required.
- Note: An additional table, called EventRangeIndex, is also included in the model. This table is designed to be maintained outside the user environment and will translate stationed values to measure values for those sections of line where a station equation exists. This table eliminates the need to use the Event and EventRange tables, used in PODS for a similar purpose.



Regulators and Regulator Stations

- The model includes a graphic entity to represent a Regulator Station.
- A regulator station typically contains multiple “cuts” or runs and may contain multiple regulators performing different functions (monitor, control). The station also contains gas main, control valves, pressure relief valves, sensing lines, fittings, and other devices and piping.
- Utility companies will differ on the level of detail that is to be contained within this data model for a regulator station. Some will prefer to represent the station as a regulating point and only model the station as a single location that provides an inlet and outlet pressure. Other utilities will want to model the station facility plus some level of detail for the piping and equipment inside the station.
- The approach adopted by the model is to provide the station and allow the utility to use 0 to many regulators. If the utility uses only the station as the regulating point, then the foreign key relationship to the up- and down-stream Pressure System provides the inlet and outlet pressure information for the station.



Sample Regulator Station Schematic

IV - Isolating valve
F - Filter
P - Pressure Gauge
SSV - Slam Shut Off Valve
PCV-M - Monitor Pressure Regulator
PCV-A - Active Pressure Regulator
CRV - Creep Relief Valve
ERV - Emergency Relief Valve
NRV - Non Return Valve

Service Points and Meters

- Utilities have many ways of linking delivery locations to CIS/billing systems and to meter records. The reasons for this include:
  1. An active service point may have one meter or multiple meters.
  2. A customer account may include one meter or multiple meters.
  3. A utility may not have GIS data for service pipe or for service points.
  4. A service pipe may be a branch service, feeding more than one service point.
- Requirements for modeling service points are driven by the following:
  1. Customer usage data for the network is typically provided from CIS so a means (either direct or indirect) of tying CIS data to the distribution network is required.
  2. CIS implementations demonstrate variety in how accounts are modeled.
  3. Delivery points may have multiple meters.
  4. Any single meter may get removed or changed out over time.
- To address these requirements, the model adopts the following approach:
  1. A DeliveryPoint entity defines the point where gas is delivered and, presumably, metered.
  2. The DeliveryPoint table will include one field to identify the record to the CIS. (This field may contain a foreign key that points to a premise or CIS identifier.)
  3. An additional entity, MeterDevice, will store information about the meter, such as the type (Diaphragm, Displacement, Orifice, Rotary, Turbine, Ultrasonic, etc.), and properties of the meter such as manufacturer, model, and serial number. The MeterDevice will also include a field for linking to the CIS and a foreign key field to link the meter to the DeliveryPoint.

Tracking History

- The GDM Steering Committee has indicated the model needs to support the tracking of historical data and changes over time.
- *The approach is discussed in a separate Background Paper.*
- The approach taken uses non In-Line historical data.

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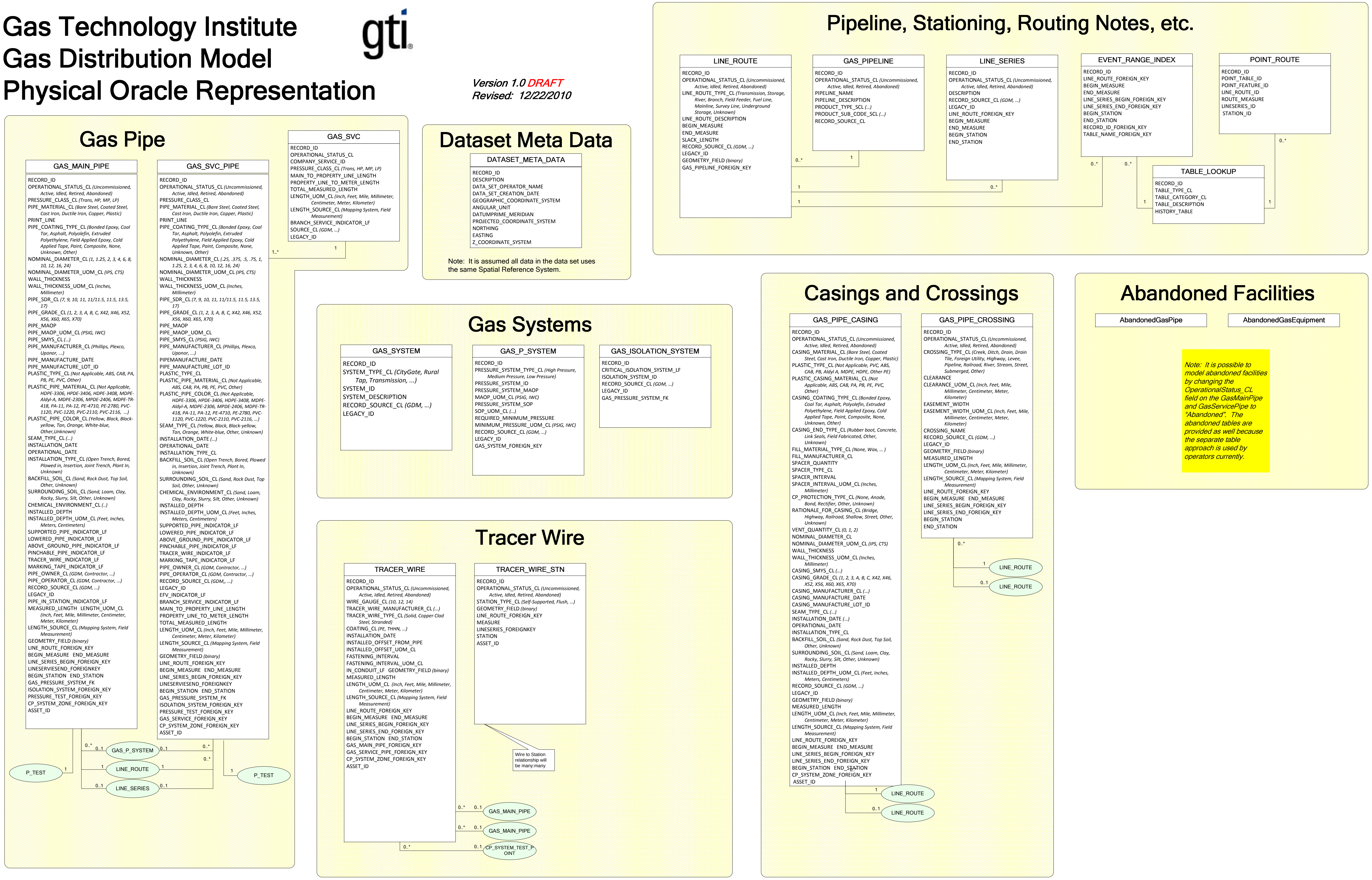

Gas Pipe

GAS_MAIN_PIPE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
PRESSURE_CLASS_CL *(Trans, HP, MP, LP)*
PIPE_MATERIAL_CL *(Bare Steel, Coated Steel, Cast Iron, Ductile Iron, Copper, Plastic)*
PRINT_LINE
PIPE_COATING_TYPE_CL *(Bonded Epoxy, Coal Tar, Asphalt, Polyolefin, Extruded Polyethylene, Field Applied Epoxy, Cold Applied Tape, Paint, Composite, None, Unknown, Other)*
NOMINAL_DIAMETER_CL *(1, 1.25, 2, 3, 4, 6, 8, 10, 12, 16, 24)*
NOMINAL_DIAMETER_UOM_CL *(IPS, CTS)*
WALL_THICKNESS
WALL_THICKNESS_UOM_CL *(Inches, Millimeter)*
PIPE_SDR_CL *(7, 9, 10, 11, 11/11.5, 11.5, 13.5, 17)*
PIPE_GRADE_CL *(1, 2, 3, A, B, C, X42, X46, X52, X56, X60, X65, X70)*
PIPE_MAOP
PIPE_MAOP_UOM_CL *(PSIG, IWC)*
PIPE_SMYS_CL *(…)*
PIPE_MANUFACTURER_CL *(Phillips, Plexco, Uponor, ...)*
PIPE_MANUFACTURE_DATE
PIPE_MANUFACTURE_LOT_ID
PLASTIC_TYPE_CL *(Not Applicable, ABS, CAB, PA, PB, PE, PVC, Other)*
PLASTIC_PIPE_MATERIAL_CL *(Not Applicable, HDPE-3306, HPDE-3406, HDPE-3408, MDPE-Aldyl-A, MDPE-2306, MPDE-2406, MDPE-TR-418, PA-11, PA-12, PE-4710, PE-2780, PVC-1120, PVC-1220, PVC-2110, PVC-2116, …)*
PLASTIC_PIPE_COLOR_CL *(Yellow, Black, Black-yellow, Tan, Orange, White-blue, Other,Unknown)*
SEAM_TYPE_CL *(…)*
INSTALLATION_DATE
OPERATIONAL_DATE
INSTALLATION_TYPE_CL *(Open Trench, Bored, Plowed in, Insertion, Joint Trench, Plant In, Unknown)*
BACKFILL_SOIL_CL *(Sand, Rock Dust, Top Soil, Other, Unknown)*
SURROUNDING_SOIL_CL *(Sand, Loam, Clay, Rocky, Slurry, Silt, Other, Unknown)*
CHEMICAL_ENVIRONMENT_CL *(..)*
INSTALLED_DEPTH
INSTALLED_DEPTH_UOM_CL *(Feet, Inches, Meters, Centimeters)*
SUPPORTED_PIPE_INDICATOR_LF
LOWERED_PIPE_INDICATOR_LF
ABOVE_GROUND_PIPE_INDICATOR_LF
PINCHABLE_PIPE_INDICATOR_LF
TRACER_WIRE_INDICATOR_LF
MARKING_TAPE_INDICATOR_LF
PIPE_OWNER_CL *(GDM, Contractor, …)*
PIPE_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
PIPE_IN_STATION_INDICATOR_LF
MEASURED_LENGTH LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
GEOMETRY_FIELD *(binary)*
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
LINESERVIESEND_FOREIGNKEY
BEGIN_STATION END_STATION
GAS_PRESSURE_SYSTEM_FK
ISOLATION_SYSTEM_FOREIGN_KEY
PRESSURE_TEST_FOREIGN_KEY
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

GAS_SVC_PIPE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
PRESSURE_CLASS_CL
PIPE_MATERIAL_CL *(Bare Steel, Coated Steel, Cast Iron, Ductile Iron, Copper, Plastic)*
PRINT_LINE
PIPE_COATING_TYPE_CL *(Bonded Epoxy, Coal Tar, Asphalt, Polyolefin, Extruded Polyethylene, Field Applied Epoxy, Cold Applied Tape, Paint, Composite, None, Unknown, Other)*
NOMINAL_DIAMETER_CL *(.25, .375, .5, .75, 1, 1.25, 2, 3, 4, 6, 8, 10, 12, 16, 24)*
NOMINAL_DIAMETER_UOM_CL *(IPS, CTS)*
WALL_THICKNESS
WALL_THICKNESS_UOM_CL *(Inches, Millimeter)*
PIPE_SDR_CL *(7, 9, 10, 11, 11/11.5, 11.5, 13.5, 17)*
PIPE_GRADE_CL *(1, 2, 3, A, B, C, X42, X46, X52, X56, X60, X65, X70)*
PIPE_MAOP
PIPE_MAOP_UOM_CL
PIPE_SMYS_CL *(PSIG, IWC)*
PIPE_MANUFACTURER_CL *(Phillips, Plexco, Uponor, ...)*
PIPEMANUFACTURE_DATE
PIPE_MANUFACTURE_LOT_ID
PLASTIC_TYPE_CL
PLASTIC_PIPE_MATERIAL_CL *(Not Applicable, ABS, CAB, PA, PB, PE, PVC, Other)*
PLASTIC_PIPE_COLOR_CL *(Not Applicable, HDPE-3306, HPDE-3406, HDPE-3408, MDPE-Aldyl-A, MDPE-2306, MPDE-2406, MDPE-TR-418, PA-11, PA-12, PE-4710, PE-2780, PVC-1120, PVC-1220, PVC-2110, PVC-2116, …)*
SEAM_TYPE_CL *(Yellow, Black, Black-yellow, Tan, Orange, White-blue, Other, Unknown)*
INSTALLATION_DATE *(…)*
OPERATIONAL_DATE
INSTALLATION_TYPE_CL
BACKFILL_SOIL_CL *(Open Trench, Bored, Plowed in, Insertion, Joint Trench, Plant In, Unknown)*
SURROUNDING_SOIL_CL *(Sand, Rock Dust, Top Soil, Other, Unknown)*
CHEMICAL_ENVIRONMENT_CL *(Sand, Loam, Clay, Rocky, Slurry, Silt, Other, Unknown)*
INSTALLED_DEPTH
INSTALLED_DEPTH_UOM_CL *(Feet, Inches, Meters, Centimeters)*
SUPPORTED_PIPE_INDICATOR_LF
LOWERED_PIPE_INDICATOR_LF
ABOVE_GROUND_PIPE_INDICATOR_LF
PINCHABLE_PIPE_INDICATOR_LF
TRACER_WIRE_INDICATOR_LF
MARKING_TAPE_INDICATOR_LF
PIPE_OWNER_CL *(GDM, Contractor, …)*
PIPE_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM,, …)*
LEGACY_ID
EFV_INDICATOR_LF
BRANCH_SERVICE_INDICATOR_LF
MAIN_TO_PROPERTY_LINE_LENGTH
PROPERTY_LINE_TO_METER_LENGTH
TOTAL_MEASURED_LENGTH
LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
GEOMETRY_FIELD *(binary)*
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
LINESERVIESEND_FOREIGNKEY
BEGIN_STATION END_STATION
GAS_PRESSURE_SYSTEM_FK
ISOLATION_SYSTEM_FOREIGN_KEY
PRESSURE_TEST_FOREIGN_KEY
GAS_SERVICE_FOREIGN_KEY
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

GAS_SVC

RECORD_ID
OPERATIONAL_STATUS_CL
COMPANY_SERVICE_ID
PRESSURE_CLASS_CL *(Trans, HP, MP, LP)*
MAIN_TO_PROPERTY_LINE_LENGTH
PROPERTY_LINE_TO_METER_LENGTH
TOTAL_MEASURED_LENGTH
LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
BRANCH_SERVICE_INDICATOR_LF
SOURCE_CL *(GDM, …)*
LEGACY_ID

Dataset Meta Data

DATASET_META_DATA

RECORD_ID
DESCRIPTION
DATA_SET_OPERATOR_NAME
DATA_SET_CREATION_DATE
GEOGRAPHIC_COORDINATE_SYSTEM
ANGULAR_UNIT
DATUMPRIME_MERIDIAN
PROJECTED_COORDINATE_SYSTEM
NORTHING
EASTING
Z_COORDINATE_SYSTEM

Note: It is assumed all data in the data set uses the same Spatial Reference System.

Gas Systems

GAS_SYSTEM

RECORD_ID
SYSTEM_TYPE_CL *(CityGate, Rural Tap, Transmission, ...)*
SYSTEM_ID
SYSTEM_DESCRIPTION
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID

GAS_P_SYSTEM

RECORD_ID
PRESSURE_SYSTEM_TYPE_CL *(High Pressure, Medium Pressure, Low Pressure)*
PRESSURE_SYSTEM_ID
PRESSURE_SYSTEM_MAOP
MAOP_UOM_CL *(PSIG, IWC)*
PRESSURE_SYSTEM_SOP
SOP_UOM_CL *(…)*
REQUIRED_MINIMUM_PRESSURE
MINIMUM_PRESSURE_UOM_CL *(PSIG, IWC)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GAS_SYSTEM_FOREIGN_KEY

GAS_ISOLATION_SYSTEM

RECORD_ID
CRITICAL_ISOLATION_SYSTEM_LF
ISOLATION_SYSTEM_ID
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GAS_PRESSURE_SYSTEM_FK

Tracer Wire

TRACER_WIRE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
WIRE_GAUGE_CL *(10, 12, 14)*
TRACER_WIRE_MANUFACTURER_CL *(…)*
TRACER_WIRE_TYPE_CL *(Solid, Copper Clad Steel, Stranded)*
COATING_CL *(PE, THHN, …)*
INSTALLATION_DATE
INSTALLED_OFFSET_FROM_PIPE
INSTALLED_OFFSET_UOM_CL
FASTENING_INTERVAL
FASTENING_INTERVAL_UOM_CL
IN_CONDUIT_LF GEOMETRY_FIELD *(binary)*
MEASURED_LENGTH
LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
LINE_SERIES_END_FOREIGN_KEY
BEGIN_STATION END_STATION
GAS_MAIN_PIPE_FOREIGN_KEY
GAS_SERVICE_PIPE_FOREIGN_KEY
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

TRACER_WIRE_STN

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
STATION_TYPE_CL *(Self-Supported, Flush, …)*
GEOMETRY_FIELD *(binary)*
LINE_ROUTE_FOREIGN_KEY
MEASURE
LINESERIES_FOREIGNKEY
STATION
ASSET_ID

Wire to Station relationship will be many:many

Pipeline, Stationing, Routing Notes, etc.

LINE_ROUTE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
LINE_ROUTE_TYPE_CL *(Transmission, Storage, River, Branch, Field Feeder, Fuel Line, Mainline, Survey Line, Underground Storage, Unknown)*
LINE_ROUTE_DESCRIPTION
BEGIN_MEASURE
END_MEASURE
SLACK_LENGTH
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
GAS_PIPELINE_FOREIGN_KEY

GAS_PIPELINE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
PIPELINE_NAME
PIPELINE_DESCRIPTION
PRODUCT_TYPE_SCL *(…)*
PRODUCT_SUB_CODE_SCL *(…)*
RECORD_SOURCE_CL

LINE_SERIES

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
DESCRIPTION
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE
END_MEASURE
BEGIN_STATION
END_STATION

EVENT_RANGE_INDEX

RECORD_ID
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE
END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
LINE_SERIES_END_FOREIGN_KEY
BEGIN_STATION
END_STATION
RECORD_ID_FOREIGN_KEY
TABLE_NAME_FOREIGN_KEY

POINT_ROUTE

RECORD_ID
POINT_TABLE_ID
POINT_FEATURE_ID
LINE_ROUTE_ID
ROUTE_MEASURE
LINESERIES_ID
STATION_ID

TABLE_LOOKUP

RECORD_ID
TABLE_TYPE_CL
TABLE_CATEGORY_CL
TABLE_DESCRIPTION
HISTORY_TABLE

Casings and Crossings

GAS_PIPE_CASING

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
CASING_MATERIAL_CL *(Bare Steel, Coated Steel, Cast Iron, Ductile Iron, Copper, Plastic)*
PLASTIC_TYPE_CL *(Not Applicable, PVC, ABS, CAB, PB, Aldyl A, MDPE, HDPE, Other PE)*
PLASTIC_CASING_MATERIAL_CL *(Not Applicable, ABS, CAB, PA, PB, PE, PVC, Other)*
CASING_COATING_TYPE_CL *(Bonded Epoxy, Coal Tar, Asphalt, Polyolefin, Extruded Polyethylene, Field Applied Epoxy, Cold Applied Tape, Paint, Composite, None, Unknown, Other)*
CASING_END_TYPE_CL *(Rubber boot, Concrete, Link Seals, Field Fabricated, Other, Unknown)*
FILL_MATERIAL_TYPE_CL *(None, Wax, …)*
FILL_MANUFACTURER_CL
SPACER_QUANTITY
SPACER_TYPE_CL
SPACER_INTERVAL
SPACER_INTERVAL_UOM_CL *(Inches, Millimeter)*
CP_PROTECTION_TYPE_CL *(None, Anode, Bond, Rectifier, Other, Unknown)*
RATIONALE_FOR_CASING_CL *(Bridge, Highway, Railroad, Shallow, Street, Other, Unknown)*
VENT_QUANTITY_CL *(0, 1, 2)*
NOMINAL_DIAMETER_CL
NOMINAL_DIAMETER_UOM_CL *(IPS, CTS)*
WALL_THICKNESS
WALL_THICKNESS_UOM_CL *(Inches, Millimeter)*
CASING_SMYS_CL *(…)*
CASING_GRADE_CL *(1, 2, 3, A, B, C, X42, X46, X52, X56, X60, X65, X70)*
CASING_MANUFACTURER_CL *(…)*
CASING_MANUFACTURE_DATE
CASING_MANUFACTURE_LOT_ID
SEAM_TYPE_CL *(…)*
INSTALLATION_DATE *(…)*
OPERATIONAL_DATE
INSTALLATION_TYPE_CL
BACKFILL_SOIL_CL *(Sand, Rock Dust, Top Soil, Other, Unknown)*
SURROUNDING_SOIL_CL *(Sand, Loam, Clay, Rocky, Slurry, Silt, Other, Unknown)*
INSTALLED_DEPTH
INSTALLED_DEPTH_UOM_CL *(Feet, Inches, Meters, Centimeters)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
MEASURED_LENGTH
LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
LINE_SERIES_END_FOREIGN_KEY
BEGIN_STATION END_STATION
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

GAS_PIPE_CROSSING

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
CROSSING_TYPE_CL *(Creek, Ditch, Drain, Drain Tile, Foreign Utility, Highway, Levee, Pipeline, Railroad, River, Stream, Street, Submerged, Other)*
CLEARANCE
CLEARANCE_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
EASEMENT_WIDTH
EASEMENT_WIDTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
CROSSING_NAME
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
MEASURED_LENGTH
LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
LINE_SERIES_END_FOREIGN_KEY
BEGIN_STATION
END_STATION

Abandoned Facilities

AbandonedGasPipe

AbandonedGasEquipment

Note: It is possible to model abandoned facilities by changing the OperationalStatus_CL field on the GasMainPipe and GasServicePipe to "Abandoned". The abandoned tables are provided as well because the separate table approach is used by operators currently.
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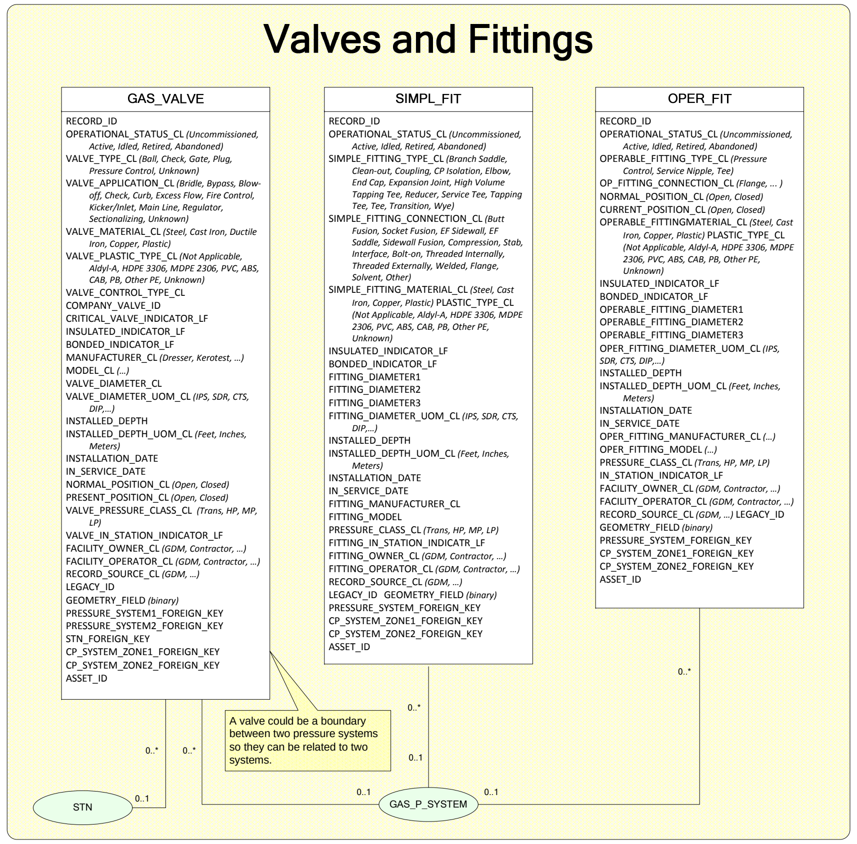
Valves and Fittings



GAS_VALVE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
VALVE_TYPE_CL *(Ball, Check, Gate, Plug, Pressure Control, Unknown)*
VALVE_APPLICATION_CL *(Bridle, Bypass, Blow-off, Check, Curb, Excess Flow, Fire Control, Kicker/Inlet, Main Line, Regulator, Sectionalizing, Unknown)*
VALVE_MATERIAL_CL *(Steel, Cast Iron, Ductile Iron, Copper, Plastic)*
VALVE_PLASTIC_TYPE_CL *(Not Applicable, Aldyl-A, HDPE 3306, MDPE 2306, PVC, ABS, CAB, PB, Other PE, Unknown)*
VALVE_CONTROL_TYPE_CL
COMPANY_VALVE_ID
CRITICAL_VALVE_INDICATOR_LF
INSULATED_INDICATOR_LF
BONDED_INDICATOR_LF
MANUFACTURER_CL *(Dresser, Kerotest, …)*
MODEL_CL *(…)*
VALVE_DIAMETER_CL
VALVE_DIAMETER_UOM_CL *(IPS, SDR, CTS, DIP,…)*
INSTALLED_DEPTH
INSTALLED_DEPTH_UOM_CL *(Feet, Inches, Meters)*
INSTALLATION_DATE
IN_SERVICE_DATE
NORMAL_POSITION_CL *(Open, Closed)*
PRESENT_POSITION_CL *(Open, Closed)*
VALVE_PRESSURE_CLASS_CL *(Trans, HP, MP, LP)*
VALVE_IN_STATION_INDICATOR_LF
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM1_FOREIGN_KEY
PRESSURE_SYSTEM2_FOREIGN_KEY
STN_FOREIGN_KEY
CP_SYSTEM_ZONE1_FOREIGN_KEY
CP_SYSTEM_ZONE2_FOREIGN_KEY
ASSET_ID

A valve could be a boundary between two pressure systems so they can be related to two systems.

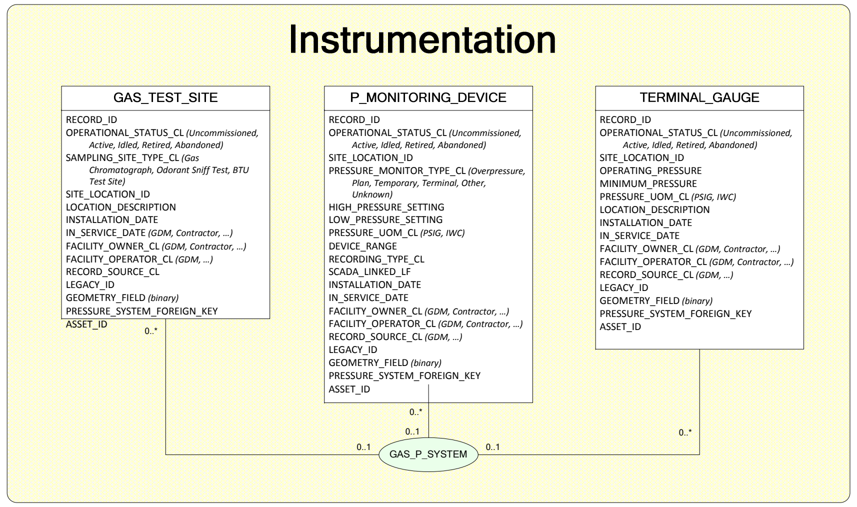
SIMPL_FIT

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
SIMPLE_FITTING_TYPE_CL *(Branch Saddle, Clean-out, Coupling, CP Isolation, Elbow, End Cap, Expansion Joint, High Volume Tapping Tee, Reducer, Service Tee, Tapping Tee, Tee, Transition, Wye)*
SIMPLE_FITTING_CONNECTION_CL *(Butt Fusion, Socket Fusion, EF Sidewall, EF Saddle, Sidewall Fusion, Compression, Stab, Interface, Bolt-on, Threaded Internally, Threaded Externally, Welded, Flange, Solvent, Other)*
SIMPLE_FITTING_MATERIAL_CL *(Steel, Cast Iron, Copper, Plastic)* PLASTIC_TYPE_CL *(Not Applicable, Aldyl-A, HDPE 3306, MDPE 2306, PVC, ABS, CAB, PB, Other PE, Unknown)*
INSULATED_INDICATOR_LF
BONDED_INDICATOR_LF
FITTING_DIAMETER1
FITTING_DIAMETER2
FITTING_DIAMETER3
FITTING_DIAMETER_UOM_CL *(IPS, SDR, CTS, DIP,…)*
INSTALLED_DEPTH
INSTALLED_DEPTH_UOM_CL *(Feet, Inches, Meters)*
INSTALLATION_DATE
IN_SERVICE_DATE
FITTING_MANUFACTURER_CL
FITTING_MODEL
PRESSURE_CLASS_CL *(Trans, HP, MP, LP)*
FITTING_IN_STATION_INDICATR_LF
FITTING_OWNER_CL *(GDM, Contractor, …)*
FITTING_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
CP_SYSTEM_ZONE1_FOREIGN_KEY
CP_SYSTEM_ZONE2_FOREIGN_KEY
ASSET_ID

OPER_FIT

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
OPERABLE_FITTING_TYPE_CL *(Pressure Control, Service Nipple, Tee)*
OP_FITTING_CONNECTION_CL *(Flange, …)*
NORMAL_POSITION_CL *(Open, Closed)*
CURRENT_POSITION_CL *(Open, Closed)*
OPERABLE_FITTINGMATERIAL_CL *(Steel, Cast Iron, Copper, Plastic)* PLASTIC_TYPE_CL *(Not Applicable, Aldyl-A, HDPE 3306, MDPE 2306, PVC, ABS, CAB, PB, Other PE, Unknown)*
INSULATED_INDICATOR_LF
BONDED_INDICATOR_LF
OPERABLE_FITTING_DIAMETER1
OPERABLE_FITTING_DIAMETER2
OPERABLE_FITTING_DIAMETER3
OPER_FITTING_DIAMETER_UOM_CL *(IPS, SDR, CTS, DIP,…)*
INSTALLED_DEPTH
INSTALLED_DEPTH_UOM_CL *(Feet, Inches, Meters)*
INSTALLATION_DATE
IN_SERVICE_DATE
OPER_FITTING_MANUFACTURER_CL *(…)*
OPER_FITTING_MODEL *(…)*
PRESSURE_CLASS_CL *(Trans, HP, MP, LP)*
IN_STATION_INDICATOR_LF
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)* LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
CP_SYSTEM_ZONE1_FOREIGN_KEY
CP_SYSTEM_ZONE2_FOREIGN_KEY
ASSET_ID

Instrumentation



GAS_TEST_SITE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
SAMPLING_SITE_TYPE_CL *(Gas Chromatograph, Odorant Sniff Test, BTU Test Site)*
SITE_LOCATION_ID
LOCATION_DESCRIPTION
INSTALLATION_DATE
IN_SERVICE_DATE *(GDM, Contractor, …)*
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, …)*
RECORD_SOURCE_CL
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

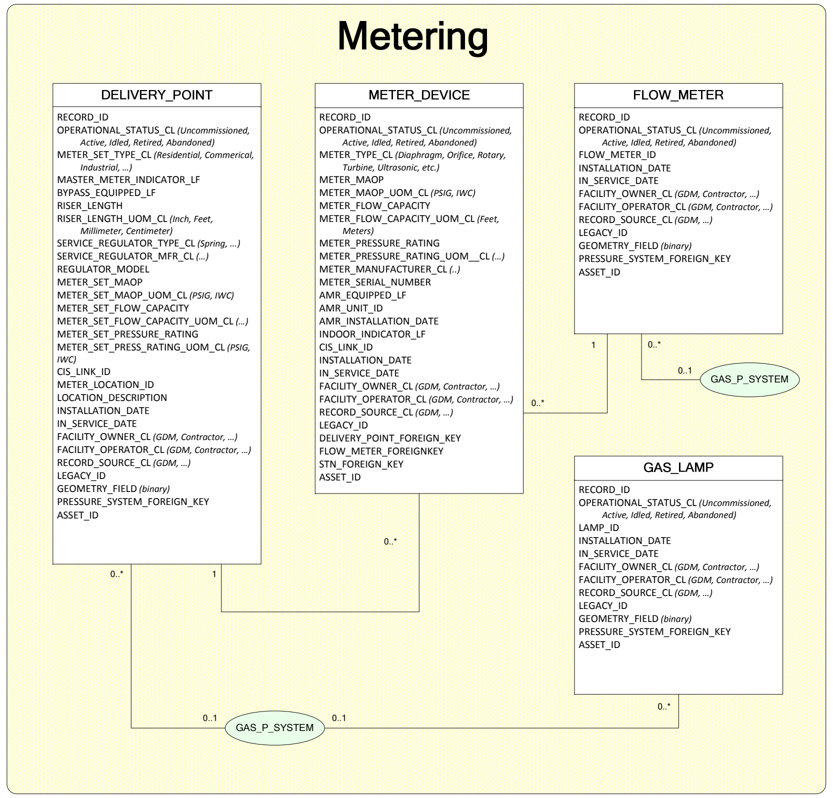
P_MONITORING_DEVICE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
SITE_LOCATION_ID
PRESSURE_MONITOR_TYPE_CL *(Overpressure, Plan, Temporary, Terminal, Other, Unknown)*
HIGH_PRESSURE_SETTING
LOW_PRESSURE_SETTING
PRESSURE_UOM_CL *(PSIG, IWC)*
DEVICE_RANGE
RECORDING_TYPE_CL
SCADA_LINKED_LF
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

TERMINAL_GAUGE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
SITE_LOCATION_ID
OPERATING_PRESSURE
MINIMUM_PRESSURE
PRESSURE_UOM_CL *(PSIG, IWC)*
LOCATION_DESCRIPTION
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

Metering



DELIVERY_POINT

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
METER_SET_TYPE_CL *(Residential, Commerical, Industrial, …)*
MASTER_METER_INDICATOR_LF
BYPASS_EQUIPPED_LF
RISER_LENGTH
RISER_LENGTH_UOM_CL *(Inch, Feet, Millimeter, Centimeter)*
SERVICE_REGULATOR_TYPE_CL *(Spring, …)*
SERVICE_REGULATOR_MFR_CL *(…)*
REGULATOR_MODEL
METER_SET_MAOP
METER_SET_MAOP_UOM_CL *(PSIG, IWC)*
METER_SET_FLOW_CAPACITY
METER_SET_FLOW_CAPACITY_UOM_CL *(…)*
METER_SET_PRESSURE_RATING
METER_SET_PRESS_RATING_UOM_CL *(PSIG, IWC)*
CIS_LINK_ID
METER_LOCATION_ID
LOCATION_DESCRIPTION
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

METER_DEVICE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
METER_TYPE_CL *(Diaphragm, Orifice, Rotary, Turbine, Ultrasonic, etc.)*
METER_MAOP
METER_MAOP_UOM_CL *(PSIG, IWC)*
METER_FLOW_CAPACITY
METER_FLOW_CAPACITY_UOM_CL *(Feet, Meters)*
METER_PRESSURE_RATING
METER_PRESSURE_RATING_UOM__CL *(…)*
METER_MANUFACTURER_CL *(..)*
METER_SERIAL_NUMBER
AMR_EQUIPPED_LF
AMR_UNIT_ID
AMR_INSTALLATION_DATE
INDOOR_INDICATOR_LF
CIS_LINK_ID
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
DELIVERY_POINT_FOREIGN_KEY
FLOW_METER_FOREIGNKEY
STN_FOREIGN_KEY
ASSET_ID

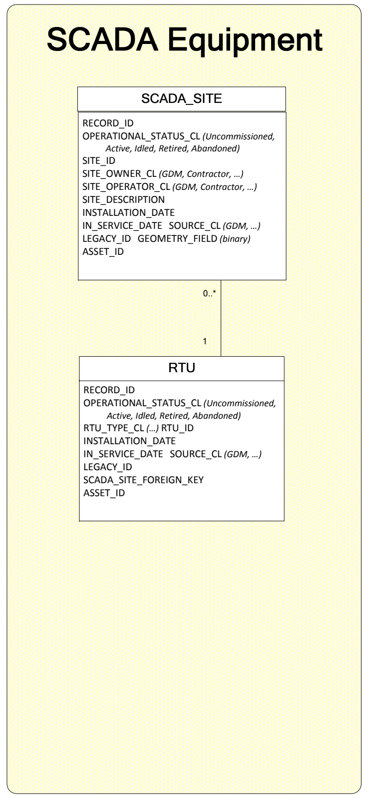
FLOW_METER

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
FLOW_METER_ID
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

GAS_LAMP

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
LAMP_ID
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

SCADA Equipment



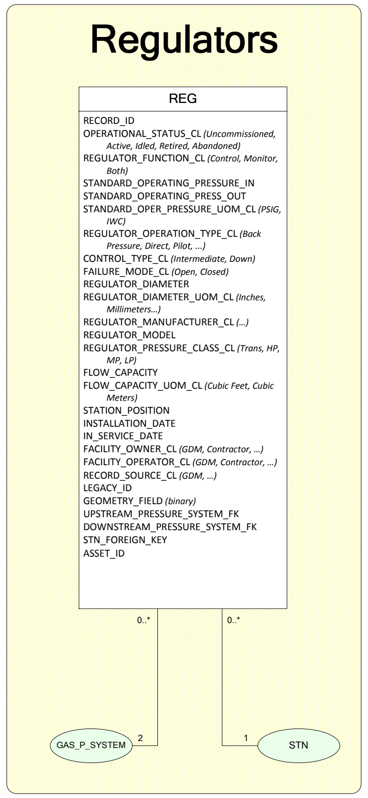
SCADA_SITE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
SITE_ID
SITE_OWNER_CL *(GDM, Contractor, …)*
SITE_OPERATOR_CL *(GDM, Contractor, …)*
SITE_DESCRIPTION
INSTALLATION_DATE
IN_SERVICE_DATE SOURCE_CL *(GDM, …)*
LEGACY_ID GEOMETRY_FIELD *(binary)*
ASSET_ID

RTU

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
RTU_TYPE_CL *(…)* RTU_ID
INSTALLATION_DATE
IN_SERVICE_DATE SOURCE_CL *(GDM, …)*
LEGACY_ID
SCADA_SITE_FOREIGN_KEY
ASSET_ID

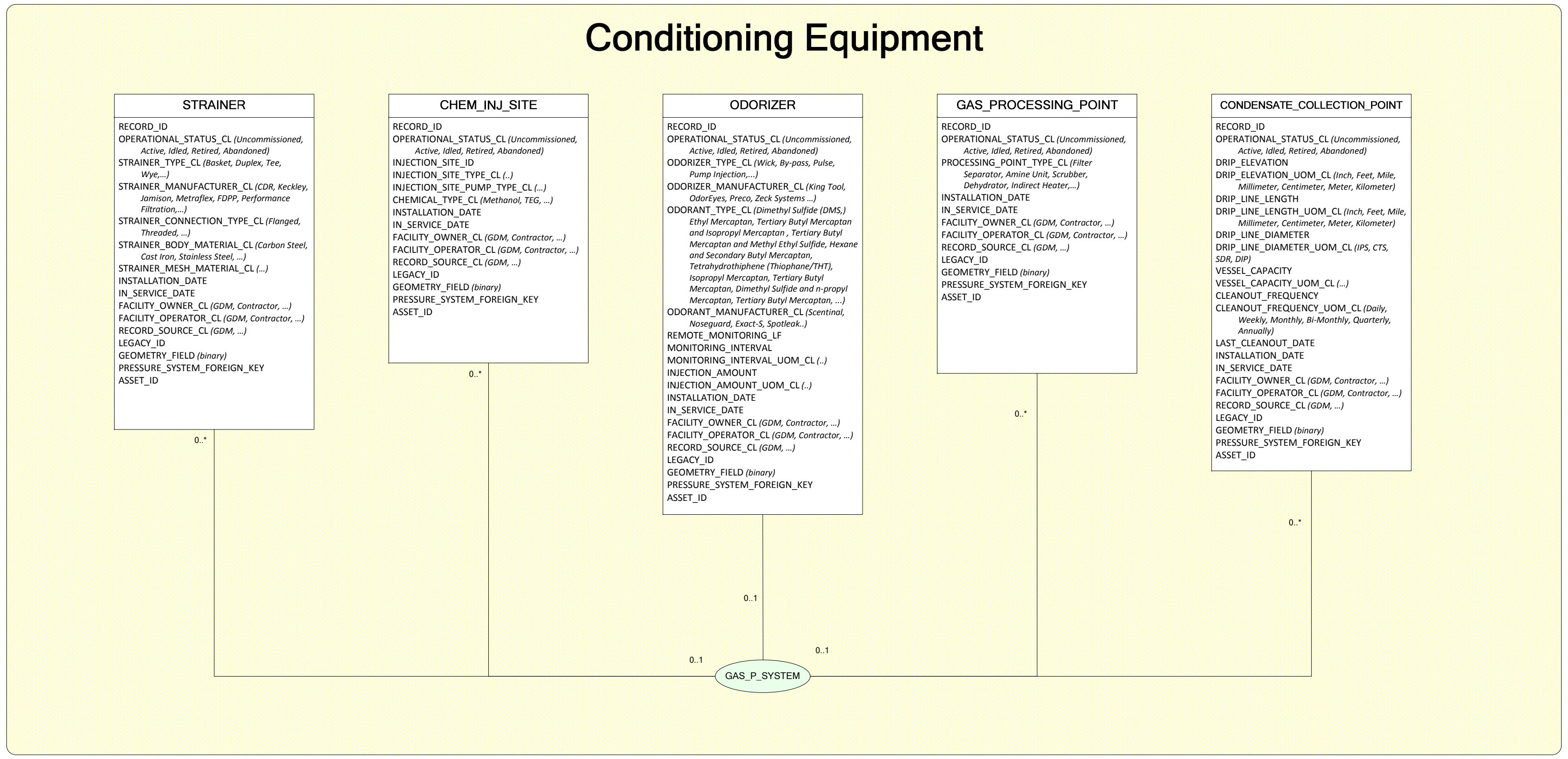
Regulators



REG

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
REGULATOR_FUNCTION_CL *(Control, Monitor, Both)*
STANDARD_OPERATING_PRESSURE_IN
STANDARD_OPERATING_PRESS_OUT
STANDARD_OPER_PRESSURE_UOM_CL *(PSIG, IWC)*
REGULATOR_OPERATION_TYPE_CL *(Back Pressure, Direct, Pilot, ...)*
CONTROL_TYPE_CL *(Intermediate, Down)*
FAILURE_MODE_CL *(Open, Closed)*
REGULATOR_DIAMETER
REGULATOR_DIAMETER_UOM_CL *(Inches, Millimeters…)*
REGULATOR_MANUFACTURER_CL *(…)*
REGULATOR_MODEL
REGULATOR_PRESSURE_CLASS_CL *(Trans, HP, MP, LP)*
FLOW_CAPACITY
FLOW_CAPACITY_UOM_CL *(Cubic Feet, Cubic Meters)*
STATION_POSITION
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
UPSTREAM_PRESSURE_SYSTEM_FK
DOWNSTREAM_PRESSURE_SYSTEM_FK
STN_FOREIGN_KEY
ASSET_ID

Conditioning Equipment



STRAINER

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
STRAINER_TYPE_CL *(Basket, Duplex, Tee, Wye,…)*
STRAINER_MANUFACTURER_CL *(CDR, Keckley, Jamison, Metraflex, FDPP, Performance Filtration,…)*
STRAINER_CONNECTION_TYPE_CL *(Flanged, Threaded, …)*
STRAINER_BODY_MATERIAL_CL *(Carbon Steel, Cast Iron, Stainless Steel, …)*
STRAINER_MESH_MATERIAL_CL *(…)*
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

CHEM_INJ_SITE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
INJECTION_SITE_ID
INJECTION_SITE_TYPE_CL *(..)*
INJECTION_SITE_PUMP_TYPE_CL *(…)*
CHEMICAL_TYPE_CL *(Methanol, TEG, …)*
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

ODORIZER

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
ODORIZER_TYPE_CL *(Wick, By-pass, Pulse, Pump Injection,...)*
ODORIZER_MANUFACTURER_CL *(King Tool, OdorEyes, Preco, Zeck Systems …)*
ODORANT_TYPE_CL *(Dimethyl Sulfide (DMS,) Ethyl Mercaptan, Tertiary Butyl Mercaptan and Isopropyl Mercaptan , Tertiary Butyl Mercaptan and Methyl Ethyl Sulfide, Hexane and Secondary Butyl Mercaptan, Tetrahydrothiphene (Thiophane/THT), Isopropyl Mercaptan, Tertiary Butyl Mercaptan, Dimethyl Sulfide and n-propyl Mercaptan, Tertiary Butyl Mercaptan, ...)*
ODORANT_MANUFACTURER_CL *(Scentinal, Noseguard, Exact-S, Spotleak..)*
REMOTE_MONITORING_LF
MONITORING_INTERVAL
MONITORING_INTERVAL_UOM_CL *(..)*
INJECTION_AMOUNT
INJECTION_AMOUNT_UOM_CL *(..)*
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

GAS_PROCESSING_POINT

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
PROCESSING_POINT_TYPE_CL *(Filter Separator, Amine Unit, Scrubber, Dehydrator, Indirect Heater,…)*
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

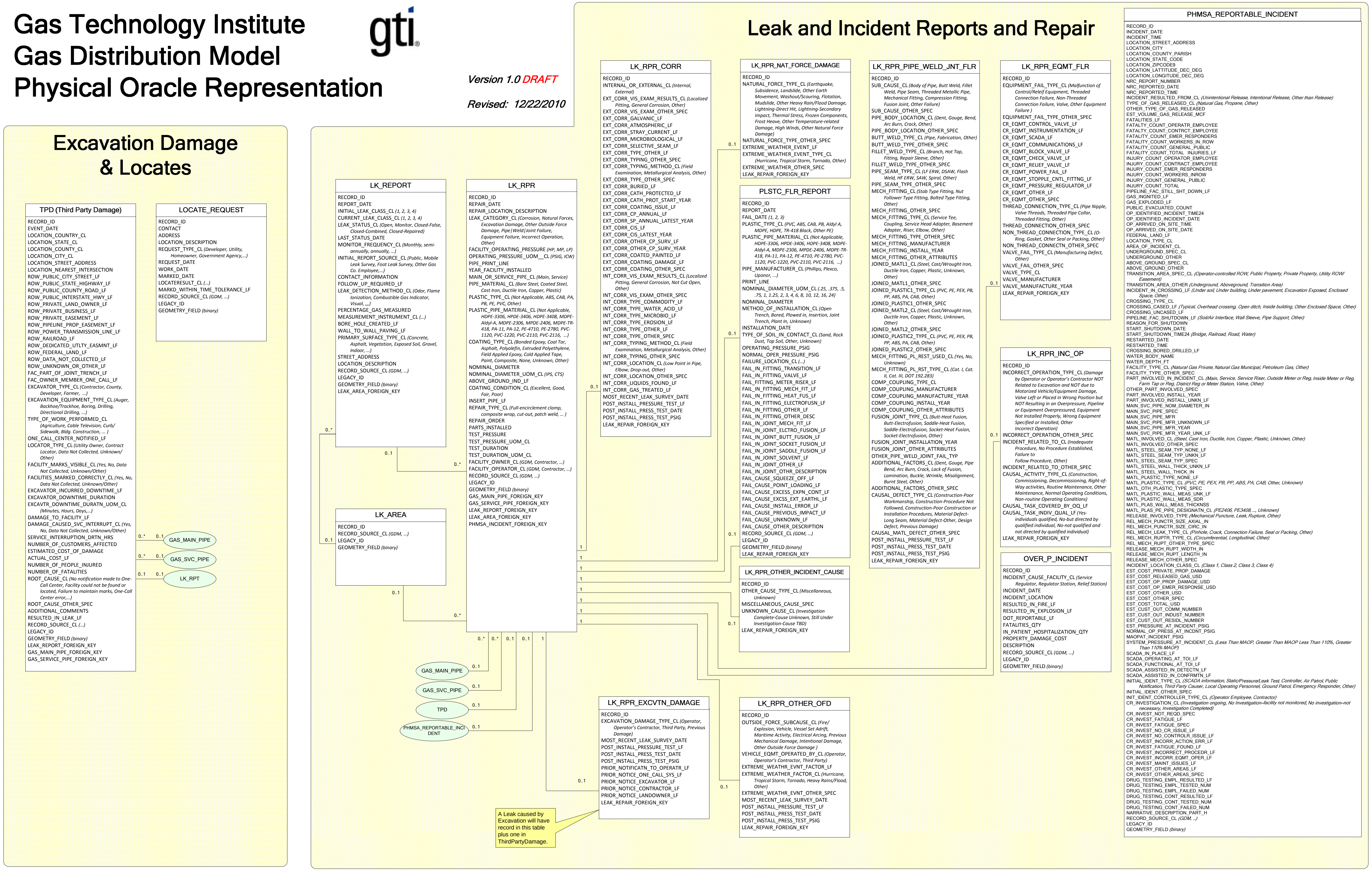
CONDENSATE_COLLECTION_POINT

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
DRIP_ELEVATION
DRIP_ELEVATION_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
DRIP_LINE_LENGTH
DRIP_LINE_LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
DRIP_LINE_DIAMETER
DRIP_LINE_DIAMETER_UOM_CL *(IPS, CTS, SDR, DIP)*
VESSEL_CAPACITY
VESSEL_CAPACITY_UOM_CL *(…)*
CLEANOUT_FREQUENCY
CLEANOUT_FREQUENCY_UOM_CL *(Daily, Weekly, Monthly, Bi-Monthly, Quarterly, Annually)*
LAST_CLEANOUT_DATE
INSTALLATION_DATE
IN_SERVICE_DATE
FACILITY_OWNER_CL *(GDM, Contractor, …)*
FACILITY_OPERATOR_CL *(GDM, Contractor, …)*
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
PRESSURE_SYSTEM_FOREIGN_KEY
ASSET_ID

Gas Technology Institute
Gas Distribution Model
Physical Oracle Representation

Version 1.0 DRAFT

Revised: 12/22/2010



Excavation Damage & Locates

TPD (Third Party Damage)

- RECORD_ID
- EVENT_DATE
- LOCATION_COUNTRY_CL
- LOCATION_STATE_CL
- LOCATION_COUNTY_CL
- LOCATION_CITY_CL
- LOCATION_STREET_ADDRESS
- LOCATION_NEAREST_INTERSECTION
- ROW_PUBLIC_CITY_STREET_LF
- ROW_PUBLIC_STATE_HIGHWAY_LF
- ROW_PUBLIC_COUNTY_ROAD_LF
- ROW_PUBLIC_INTERSTATE_HWY_LF
- ROW_PRIVATE_LAND_OWNER_LF
- ROW_PRIVATE_BUSINESS_LF
- ROW_PRIVATE_EASEMENT_LF
- ROW_PIPELINE_PROP_EASEMENT_LF
- ROW_POWER_TRANSMISSION_LINE_LF
- ROW_RAILROAD_LF
- ROW_DEDICATED_UTLTY_EASMNT_LF
- ROW_FEDERAL_LAND_LF
- ROW_DATA_NOT_COLLECTED_LF
- ROW_UNKNOWN_OR_OTHER_LF
- FAC_PART_OF_JOINT_TRENCH_LF
- FAC_OWNER_MEMBER_ONE_CALL_LF
- EXCAVATOR_TYPE_CL *(Contractor, County, Developer, Farmer, ...)*
- EXCAVATION_EQUIPMENT_TYPE_CL *(Auger, Backhoe/Trackhoe, Boring, Drilling, Directional Drilling, ...)*
- TYPE_OF_WORK_PERFORMED_CL *(Agriculture, Cable Television, Curb/Sidewalk, Bldg. Construction, ...)*
- ONE_CALL_CENTER_NOTIFIED_LF
- LOCATOR_TYPE_CL *(Utility Owner, Contract Locator, Data Not Collected, Unknown/Other)*
- FACILITY_MARKS_VISIBLE_CL *(Yes, No, Data Not Collected, Unknown/Other)*
- FACILITIES_MARKED_CORRECTLY_CL *(Yes, No, Data Not Collected, Unknown/Other)*
- EXCAVATOR_INCURRED_DOWNTIME_LF
- EXCAVATOR_DOWNTIME_DURATION
- EXCAVTR_DOWNTIME_DURATN_UOM_CL *(Minutes, Hours, Days,...)*
- DAMAGE_TO_FACILITY_LF
- DAMAGE_CAUSED_SVC_INTERRUPT_CL *(Yes, No, Data Not Collected, Unknown/Other)*
- SERVICE_INTERRUPTION_DRTN_HRS
- NUMBER_OF_CUSTOMERS_AFFECTED
- ESTIMATED_COST_OF_DAMAGE
- ACTUAL_COST_LF
- NUMBER_OF_PEOPLE_INJURED
- NUMBER_OF_FATALITIES
- ROOT_CAUSE_CL *(No notification made to One-Call Center, Facility could not be found or located, Failure to maintain marks, One-Call Center error,...)*
- ROOT_CAUSE_OTHER_SPEC
- ADDITIONAL_COMMENTS
- RESULTED_IN_LEAK_LF
- RECORD_SOURCE_CL *(...)*
- LEGACY_ID
- GEOMETRY_FIELD *(binary)*
- LEAK_REPORT_FOREIGN_KEY
- GAS_MAIN_PIPE_FOREIGN_KEY
- GAS_SERVICE_PIPE_FOREIGN_KEY

LOCATE_REQUEST

- RECORD_ID
- CONTACT
- ADDRESS
- LOCATION_DESCRIPTION
- REQUEST_TYPE_CL *(Developer, Utility, Homeowner, Government Agency,...)*
- REQUEST_DATE
- WORK_DATE
- MARKED_DATE
- LOCATERESULT_CL *(...)*
- MARKD_WITHIN_TIME_TOLERANCE_LF
- RECORD_SOURCE_CL *(GDM, ...)*
- LEGACY_ID
- GEOMETRY_FIELD *(binary)*

Leak and Incident Reports and Repair

LK_REPORT

- RECORD_ID
- REPORT_DATE
- INITIAL_LEAK_CLASS_CL *(1, 2, 3, 4)*
- CURRENT_LEAK_CLASS_CL *(1, 2, 3, 4)*
- LEAK_STATUS_CL *(Open, Monitor, Closed-False, Closed-Combined, Closed-Repaired)*
- LAST_STATUS_DATE
- MONITOR_FREQUENCY_CL *(Monthly, semi-annually, annually, ...)*
- INITIAL_REPORT_SOURCE_CL *(Public, Mobile Leak Survey, Foot Leak Survey, Other Gas Co. Employee,...)*
- CONTACT_INFORMATION
- FOLLOW_UP_REQUIRED_LF
- LEAK_DETECTION_METHOD_CL *(Odor, Flame Ionization, Combustible Gas Indicator, Visual, ,,,)*
- PERCENTAGE_GAS_MEASURED
- MEASUREMENT_INSTRUMENT_CL *(...)*
- BORE_HOLE_CREATED_LF
- WALL_TO_WALL_PAVING_LF
- PRIMARY_SURFACE_TYPE_CL *(Concrete, Asphalt, Vegetation, Exposed Soil, Gravel, Indoor, ...)*
- STREET_ADDRESS
- LOCATION_DESCRIPTION
- RECORD_SOURCE_CL *(GDM, ...)*
- LEGACY_ID
- GEOMETRY_FIELD *(binary)*
- LEAK_AREA_FOREIGN_KEY

LK_AREA

- RECORD_ID
- RECORD_SOURCE_CL *(GDM, ...)*
- LEGACY_ID
- GEOMETRY_FIELD *(binary)*

LK_RPR

- RECORD_ID
- REPAIR_DATE
- REPAIR_LOCATION_DESCRIPTION
- LEAK_CATEGORY_CL *(Corrosion, Natural Forces, Excavation Damage, Other Outside Force Damage, Pipe|Weld|Joint Failure, Equipment Failure, Incorrect Operation, Other)*
- FACILITY_OPERATING_PRESSURE *(HP, MP, LP)*
- OPERATING_PRESSURE_UOM__CL *(PSIG, ICW)*
- PIPE_PRINT_LINE
- YEAR_FACILITY_INSTALLED
- MAIN_OR_SERVICE_PIPE_CL *(Main, Service)*
- PIPE_MATERIAL_CL *(Bare Steel, Coated Steel, Cast Iron, Ductile Iron, Copper, Plastic)*
- PLASTIC_TYPE_CL *(Not Applicable, ABS, CAB, PA, PB, PE, PVC, Other)*
- PLASTIC_PIPE_MATERIAL_CL *(Not Applicable, HDPE-3306, HPDE-3406, HDPE-3408, MDPE-Aldyl-A, MDPE-2306, MPDE-2406, MDPE-TR-418, PA-11, PA-12, PE-4710, PE-2780, PVC-1120, PVC-1220, PVC-2110, PVC-2116, ...)*
- COATING_TYPE_CL *(Bonded Epoxy, Coal Tar, Asphalt, Polyolefin, Extruded Polyethylene, Field Applied Epoxy, Cold Applied Tape, Paint, Composite, None, Unknown, Other)*
- NOMINAL_DIAMETER
- NOMINAL_DIAMETER_UOM_CL *(IPS, CTS)*
- ABOVE_GROUND_IND_LF
- COATING_CONDITION_CL *(Excellent, Good, Fair, Poor)*
- INSERT_PIPE_LF
- REPAIR_TYPE_CL *(Full-encirclement clamp, composite wrap, cut-out, patch weld, ...)*
- REPAIR_ORDER
- PARTS_INSTALLED
- TEST_PRESSURE
- TEST_PRESSURE_UOM_CL
- TEST_DURATION
- TEST_DURATION_UOM_CL
- FACILITY_OWNER_CL *(GDM, Contractor, ...)*
- FACILITY_OPERATOR_CL *(GDM, Contractor, ...)*
- RECORD_SOURCE_CL *(GDM, ...)*
- LEGACY_ID
- GEOMETRY_FIELD *(binary)*
- GAS_MAIN_PIPE_FOREIGN_KEY
- GAS_SERVICE_PIPE_FOREIGN_KEY
- LEAK_REPORT_FOREIGN_KEY
- LEAK_AREA_FOREIGN_KEY
- PHMSA_INCIDENT_FOREIGN_KEY

LK_RPR_CORR

- RECORD_ID
- INTERNAL_OR_EXTERNAL_CL *(Internal, External)*
- EXT_CORR_VIS_EXAM_RESULTS_CL *(Localized Pitting, General Corrosion, Other)*
- EXT_CORR_VIS_EXAM_OTHER_SPEC
- EXT_CORR_GALVANIC_LF
- EXT_CORR_ATMOSPHERIC_LF
- EXT_CORR_STRAY_CURRENT_LF
- EXT_CORR_MICROBIOLOGICAL_LF
- EXT_CORR_SELECTIVE_SEAM_LF
- EXT_CORR_TYPE_OTHER_LF
- EXT_CORR_TYPING_OTHER_SPEC
- EXT_CORR_TYPING_METHOD_CL *(Field Examination, Metallurgical Analysis, Other)*
- EXT_CORR_TYPE_OTHER_SPEC
- EXT_CORR_BURIED_LF
- EXT_CORR_CATH_PROTECTED_LF
- EXT_CORR_CATH_PROT_START_YEAR
- EXT_CORR_COATING_ISSUE_LF
- EXT_CORR_CP_ANNUAL_LF
- EXT_CORR_SP_ANNUAL_LATEST_YEAR
- EXT_CORR_CIS_LF
- EXT_CORR_CIS_LATEST_YEAR
- EXT_CORR_OTHER_CP_SURV_LF
- EXT_CORR_OTHER_CP_SURV_YEAR
- EXT_CORR_COATED_PAINTED_LF
- EXT_CORR_COATING_DAMAGE_LF
- EXT_CORR_COATING_OTHER_SPEC
- INT_CORR_VIS_EXAM_RESULTS_CL *(Localized Pitting, General Corrosion, Not Cut Open, Other)*
- INT_CORR_VIS_EXAM_OTHER_SPEC
- INT_CORR_TYPE_COMMODITY_LF
- INT_CORR_TYPE_WATER_ACID_LF
- INT_CORR_TYPE_MICROBIO_LF
- INT_CORR_TYPE_EROSION_LF
- INT_CORR_TYPE_OTHER_LF
- INT_CORR_TYPE_OTHER_SPEC
- INT_CORR_TYPING_METHOD_CL *(Field Examination, Metallurgical Analysis, Other)*
- INT_CORR_TYPING_OTHER_SPEC
- INT_CORR_LOCATION_CL *(Low Point in Pipe, Elbow, Drop-out, Other)*
- INT_CORR_LOCATION_OTHER_SPEC
- INT_CORR_LIQUIDS_FOUND_LF
- INT_CORR_GAS_TREATED_LF
- MOST_RECENT_LEAK_SURVEY_DATE
- POST_INSTALL_PRESSURE_TEST_LF
- POST_INSTALL_PRESS_TEST_DATE
- POST_INSTALL_PRESS_TEST_PSIG
- LEAK_REPAIR_FOREIGN_KEY

LK_RPR_NAT_FORCE_DAMAGE

- RECORD_ID
- NATURAL_FORCE_TYPE_CL *(Earthquake, Subsidence, Landslide, Other Earth Movement, Washout/Scouring, Flotation, Mudslide, Other Heavy Rain/Flood Damage, Lightning-Direct Hit, Lightning-Secondary Impact, Thermal Stress, Frozen Components, Frost Heave, Other Temperature-related Damage, High Winds, Other Natural Force Damage)*
- NATURAL_FORCE_TYPE_OTHER_SPEC
- EXTREME_WEATHER_EVENT_LF
- EXTREME_WEATHER_EVENT_TYPE_CL *(Hurricane, Tropical Storm, Tornado, Other)*
- EXTREME_WEATHER_OTHER_SPEC
- LEAK_REPAIR_FOREIGN_KEY

PLSTC_FLR_REPORT

- RECORD_ID
- REPORT_DATE
- FAIL_DATE *(1, 2, 3)*
- PLASTIC_TYPE_CL *(PVC, ABS, CAB, PB, Aldyl A, MDPE, HDPE, TR-418 Black, Other PE)*
- PLASTIC_PIPE_MATERIAL_CL *(Not Applicable, HDPE-3306, HPDE-3406, HDPE-3408, MDPE-Aldyl-A, MDPE-2306, MPDE-2406, MDPE-TR-418, PA-11, PA-12, PE-4710, PE-2780, PVC-1120, PVC-1220, PVC-2110, PVC-2116, ...)*
- PIPE_MANUFACTURER_CL *(Phillips, Plexco, Uponor, ...)*
- PRINT_LINE
- NOMINAL_DIAMETER_UOM_CL *(.25, .375, .5, .75, 1, 1.25, 2, 3, 4, 6, 8, 10, 12, 16, 24)*
- NOMINAL_DIAMETER
- METHOD_OF_INSTALLATION_CL *(Open Trench, Bored, Plowed in, Insertion, Joint Trench, Plant In, Unknown)*
- INSTALLATION_DATE
- TYPE_OF_SOIL_IN_CONTACT_CL *(Sand, Rock Dust, Top Soil, Other, Unknown)*
- OPERATING_PRESSURE_PSIG
- NORMAL_OPER_PRESSURE_PSIG
- FAILURE_LOCATION_CL *(...)*
- FAIL_IN_FITTING_TRANSITION_LF
- FAIL_IN_FITTING_VALVE_LF
- FAIL_FITTING_METER_RISER_LF
- FAIL_IN_FITTING_MECH_FIT_LF
- FAIL_IN_FITTING_HEAT_FUS_LF
- FAIL_IN_FITTING_ELECTROFUSN_LF
- FAIL_IN_FITTING_OTHER_LF
- FAIL_IN_FITTING_OTHER_DESC
- FAIL_IN_JOINT_MECH_FIT_LF
- FAIL_IN_JOINT_ELCTRO_FUSION_LF
- FAIL_IN_JOINT_BUTT_FUSION_LF
- FAIL_IN_JOINT_SOCKET_FUSION_LF
- FAIL_IN_JOINT_SADDLE_FUSION_LF
- FAIL_IN_JOINT_SOLVENT_LF
- FAIL_IN_JOINT_OTHER_LF
- FAIL_IN_JOINT_OTHR_DESCRIPTION
- FAIL_CAUSE_SQUEEZE_OFF_LF
- FAIL_CAUSE_POINT_LOADING_LF
- FAIL_CAUSE_EXCESS_EXPN_CONT_LF
- FAIL_CAUSE_EXCSS_EXT_EARTHL_LF
- FAIL_CAUSE_INSTALL_ERROR_LF
- FAIL_CAUSE_PREVIOUS_IMPACT_LF
- FAIL_CAUSE_UNKNOWN_LF
- FAIL_CAUSE_OTHER_DESCRIPTION
- RECORD_SOURCE_CL *(GDM, ...)*
- LEGACY_ID
- GEOMETRY_FIELD *(binary)*
- LEAK_REPAIR_FOREIGN_KEY

LK_RPR_OTHER_INCIDENT_CAUSE

- RECORD_ID
- OTHER_CAUSE_TYPE_CL *(Miscellaneous, Unknown)*
- MISCELLANEOUS_CAUSE_SPEC
- UNKNOWN_CAUSE_CL *(Investigation Complete-Cause Unknown, Still Under Investigation-Cause TBD)*
- LEAK_REPAIR_FOREIGN_KEY

LK_RPR_PIPE_WELD_JNT_FLR

- RECORD_ID
- SUB_CAUSE_CL *(Body of Pipe, Butt Weld, Fillet Weld, Pipe Seam, Threaded Metallic Pipe, Mechanical Fitting, Compression Fitting, Fusion Joint, Other Failure)*
- SUB_CAUSE_OTHER_SPEC
- PIPE_BODY_LOCATION_CL *(Dent, Gouge, Bend, Arc Burn, Crack, Other)*
- PIPE_BODY_LOCATION_OTHER_SPEC
- BUTT_WELD_TYPE_CL *(Pipe, Fabrication, Other)*
- BUTT_WELD_TYPE_OTHER_SPEC
- FILLET_WELD_TYPE_CL *(Branch, Hot Tap, Fitting, Repair Sleeve, Other)*
- FILLET_WELD_TYPE_OTHER_SPEC
- PIPE_SEAM_TYPE_CL *(LF ERW, DSAW, Flash Weld, HF ERW, SAW, Spiral, Other)*
- PIPE_SEAM_TYPE_OTHER_SPEC
- MECH_FITTING_CL *(Stab Type Fitting, Nut Follower Type Fitting, Bolted Type Fitting, Other)*
- MECH_FITTING_OTHER_SPEC
- MECH_FITTING_TYPE_CL *(Service Tee, Coupling, Service Head Adapter, Basement Adapter, Riser, Elbow, Other)*
- MECH_FITTING_TYPE_OTHER_SPEC
- MECH_FITTING_MANUFACTURER
- MECH_FITTING_INSTALL_YEAR
- MECH_FITTING_OTHER_ATTRIBUTES
- JOINED_MATL1_CL *(Steel, Cast/Wrought Iron, Ductile Iron, Copper, Plastic, Unknown, Other)*
- JOINED_MATL1_OTHER_SPEC
- JOINED_PLASTIC1_TYPE_CL *(PVC, PE, PEX, PB, PP, ABS, PA, CAB, Other)*
- JOINED_PLASTIC1_OTHER_SPEC
- JOINED_MATL2_CL *(Steel, Cast/Wrought Iron, Ductile Iron, Copper, Plastic, Unknown, Other)*
- JOINED_MATL2_OTHER_SPEC
- JOINED_PLASTIC2_TYPE_CL *(PVC, PE, PEX, PB, PP, ABS, PA, CAB, Other)*
- JOINED_PLASTIC2_OTHER_SPEC
- MECH_FITTING_PL_REST_USED_CL *(Yes, No, Unknown)*
- MECH_FITTING_PL_RST_TYPE_CL *(Cat. I, Cat. II, Cat. III, DOT 192.283)*
- COMP_COUPLING_TYPE_CL
- COMP_COUPLING_MANUFACTURER
- COMP_COUPLING_MANUFACTURE_YEAR
- COMP_COUPLING_INSTALL_YEAR
- COMP_COUPLING_OTHER_ATTRIBUTES
- FUSION_JOINT_TYPE_CL *(Butt-Heat Fusion, Butt-Electrofusion, Saddle-Heat Fusion, Saddle-Electrofusion, Socket-Heat Fusion, Socket-Electrofusion, Other)*
- FUSION_JOINT_INSTALLATION_YEAR
- FUSION_JOINT_OTHER_ATTRIBUTES
- OTHER_PIPE_WELD_JOINT_FAIL_TYP
- ADDITIONAL_FACTORS_CL *(Dent, Gouge, Pipe Bend, Arc Burn, Crack, Lack of Fusion, Lamination, Buckle, Wrinkle, Misalignment, Burnt Steel, Other)*
- ADDITIONAL_FACTORS_OTHER_SPEC
- CAUSAL_DEFECT_TYPE_CL *(Construction-Poor Workmanship, Construction-Procedure Not Followed, Construction-Poor Construction or Installation Procedures, Material Defect-Long Seam, Material Defect-Other, Design Defect, Previous Damage)*
- CAUSAL_MATL_DEFECT_OTHER_SPEC
- POST_INSTALL_PRESSURE_TEST_LF
- POST_INSTALL_PRESS_TEST_DATE
- POST_INSTALL_PRESS_TEST_PSIG
- LEAK_REPAIR_FOREIGN_KEY

LK_RPR_EQMT_FLR

- RECORD_ID
- EQUIPMENT_FAIL_TYPE_CL *(Malfunction of Control/Releif Equipment, Threaded Connection Failure, Non-Threaded Connection Failure, Valve, Other Equipment Failure)*
- EQUIPMENT_FAIL_TYPE_OTHER_SPEC
- CR_EQMT_CONTROL_VALVE_LF
- CR_EQMT_INSTRUMENTATION_LF
- CR_EQMT_SCADA_LF
- CR_EQMT_COMMUNICATIONS_LF
- CR_EQMT_BLOCK_VALVE_LF
- CR_EQMT_CHECK_VALVE_LF
- CR_EQMT_RELIEF_VALVE_LF
- CR_EQMT_POWER_FAIL_LF
- CR_EQMT_STOPPLE_CNTL_FITTNG_LF
- CR_EQMT_PRESSURE_REGULATOR_LF
- CR_EQMT_OTHER_LF
- CR_EQMT_OTHER_SPEC
- THREAD_CONNECTION_TYPE_CL *(Pipe Nipple, Valve Threads, Threaded Pipe Collar, Threaded Fitting, Other)*
- THREAD_CONNECTION_OTHER_SPEC
- NON_THREAD_CONNECTION_TYPE_CL *(O-Ring, Gasket, Other Seal or Packing, Other)*
- NON_THREAD_CONNECTN_OTHER_SPEC
- VALVE_FAIL_TYPE_CL *(Manufacturing Defect, Other)*
- VALVE_FAIL_OTHER_SPEC
- VALVE_TYPE_CL
- VALVE_MANUFACTURER
- VALVE_MANUFACTURE_YEAR
- LEAK_REPAIR_FOREIGN_KEY

LK_RPR_INC_OP

- RECORD_ID
- INCORRECT_OPERATION_TYPE_CL *(Damage by Operator or Operator's Contractor NOT Related to Excavation and NOT due to Motorized Vehicle/Equipment Damage, Valve Left or Placed in Wrong Position but NOT Resulting in an Overpressure, Pipeline or Equipment Overpressured, Equipment Not Installed Properly, Wrong Equipment Specified or Installed, Other Incorrect Operation)*
- INCORRECT_OPERATION_OTHER_SPEC
- INCIDENT_RELATED_TO_CL *(Inadequate Procedure, No Procedure Established, Failure to Follow Procedure, Other)*
- INCIDENT_RELATED_TO_OTHER_SPEC
- CAUSAL_ACTIVITY_TYPE_CL *(Construction, Commissioning, Decommissioning, Right-of-Way activities, Routine Maintenance, Other Maintenance, Normal Operating Conditions, Non-routine Operating Conditions)*
- CAUSAL_TASK_COVERED_BY_OQ_LF
- CAUSAL_TASK_INDIV_QUAL_LF *(Yes-individuals qualified, No-but directed by qualified individual, No-not qualified and not directed by qualified individual)*
- LEAK_REPAIR_FOREIGN_KEY

OVER_P_INCIDENT

- RECORD_ID
- INCIDENT_CAUSE_FACILITY_CL *(Service Regulator, Regulator Station, Relief Station)*
- INCIDENT_DATE
- INCIDENT_LOCATION
- RESULTED_IN_FIRE_LF
- RESULTED_IN_EXPLOSION_LF
- DOT_REPORTABLE_LF
- FATALITIES_QTY
- IN_PATIENT_HOSPITALIZATION_QTY
- PROPERTY_DAMAGE_COST
- DESCRIPTION
- RECORD_SOURCE_CL *(GDM, ...)*
- LEGACY_ID
- GEOMETRY_FIELD *(binary)*

PHMSA_REPORTABLE_INCIDENT

- RECORD_ID
- INCIDENT_DATE
- INCIDENT_TIME
- LOCATION_STREET_ADDRESS
- LOCATION_CITY
- LOCATION_COUNTY_PARISH
- LOCATION_STATE_CODE
- LOCATION_ZIPCODE9
- LOCATION_LATTITUDE_DEC_DEG
- LOCATION_LONGITUDE_DEC_DEG
- NRC_REPORT_NUMBER
- NRC_REPORTED_DATE
- NRC_REPORTED_TIME
- INCIDENT_RESULTED_FROM_CL *(Unintentional Release, Intentional Release, Other than Release)*
- TYPE_OF_GAS_RELEASED_CL *(Natural Gas, Propane, Other)*
- OTHER_TYPE_OF_GAS_RELEASED
- EST_VOLUME_GAS_RELEASE_MCF
- FATALITIES_LF
- FATALTY_COUNT_OPERATR_EMPLOYEE
- FATALTY_COUNT_CONTRCT_EMPLOYEE
- FATALITY_COUNT_EMER_RESPONDERS
- FATALITY_COUNT_WORKERS_IN_ROW
- FATALITY_COUNT_GENERAL_PUBLIC
- FATALITY_COUNT_TOTAL INJURIES_LF
- INJURY_COUNT_OPERATOR_EMPLOYEE
- INJURY_COUNT_CONTRACT_EMPLOYEE
- INJURY_COUNT_EMER_RESPONDERS
- INJURY_COUNT_WORKERS_INROW
- INJURY_COUNT_GENERAL_PUBLIC
- INJURY_COUNT_TOTAL
- PIPELINE_FAC_STILL_SHT_DOWN_LF
- GAS_INGNITED_LF
- GAS_EXPLODED_LF
- PUBLIC_EVACUATED_COUNT
- OP_IDENTIFIED_INCIDENT_TIME24
- OP_IDENTIFIED_INCIDENT_DATE
- OP_ARRIVED_ON_SITE_TIME
- OP_ARRIVED_ON_SITE_DATE
- FEDERAL_LAND_LF
- LOCATION_TYPE_CL
- AREA_OF_INCIDENT_CL
- UNDERGROUND_SPEC_CL
- UNDERGROUND_OTHER
- ABOVE_GROUND_SPEC_CL
- ABOVE_GROUND_OTHER
- TRANSITION_AREA_SPEC_CL *(Operator-controlled ROW, Public Property, Private Property, Utility ROW/Easement)*
- TRANSITION_AREA_OTHER *(Underground, Aboveground, Transition Area)*
- INCIDENT_IN_CROSSING_LF *(Under soil, Under building, Under pavement, Excavation Exposed, Enclosed Space, Other)*
- CROSSING_TYPE_CL
- CROSSING_CASED_LF *(Typical, Overhead crossing, Open ditch, Inside building, Other Enclosed Space, Other)*
- CROSSING_UNCASED_LF
- PIPELINE_FAC_SHUTDOWN_LF *(Soil/Air Interface, Wall Sleeve, Pipe Support, Other)*
- REASON_FOR_SHUTDOWN
- START_SHUTDOWN_DATE
- START_SHUTDOWN_TIME24 *(Bridge, Railroad, Road, Water)*
- RESTARTED_DATE
- RESTARTED_TIME
- CROSSING_BORED_DRILLED_LF
- WATER_BODY_NAME
- WATER_DEPTH_FT
- FACILITY_TYPE_CL *(Natural Gas Private, Natural Gas Municipal, Petroleum Gas, Other)*
- FACILITY_TYPE_OTHER_SPEC
- PART_INVOLVED_IN_INCIDENT_CL *(Main, Service, Service Riser, Outside Meter or Reg, Inside Meter or Reg, Farm Tap or Reg, District Reg or Meter Station, Valve, Other)*
- OTHER_PART_INVOLVED_SPEC
- PART_INVOLVED_INSTALL_YEAR
- PART_INVOLVED_INSTALL_UNKN_LF
- MAIN_SVC_PIPE_NOM_DIAMETER_IN
- MAIN_SVC_PIPE_SPEC
- MAIN_SVC_PIPE_MFR
- MAIN_SVC_PIPE_MFR_UNKNOWN_LF
- MAIN_SVC_PIPE_MFR_YEAR
- MAIN_SVC_PIPE_MFR_YEAR_UNK_LF
- MATL_INVOLVED_CL *(Steel, Cast Iron, Ductile, Iron, Copper, Plastic, Unknown, Other)*
- MATL_INVOLVED_OTHER_SPEC
- MATL_STEEL_SEAM_TYP_NONE_LF
- MATL_STEEL_SEAM_TYP_UNKN_LF
- MATL_STEEL_SEAM_TYP_SPEC
- MATL_STEEL_WALL_THICK_UNKN_LF
- MATL_STEEL_WALL_THICK_IN
- MATL_PLASTIC_TYPE_NONE_LF
- MATL_PLASTIC_TYPE_CL *(PVC, PE, PEX, PB, PP, ABS, PA, CAB, Other, Unknown)*
- MATL_OTH_PLASTIC_TYPE_SPEC
- MATL_PLASTIC_WALL_MEAS_UNK_LF
- MATL_PLASTIC_WALL_MEAS_SDR
- MATL_PLAS_WALL_MEAS_THICKNSS
- MATL_PLAS_PE_PIPE_DESIGNATN_CL *(PE2406, PE3408, ..., Unknown)*
- RELEASE_INVOLVED_TYPE *(Mechanical Puncture, Leak, Rupture, Other)*
- REL_MECH_PUNCTR_SIZE_AXIAL_IN
- REL_MECH_PUNCTR_SIZE_CIRC_IN
- REL_MECH_LEAK_TYPE_CL *(Pinhole, Crack, Connection Failure, Seal or Packing, Other)*
- REL_MECH_RUPTR_TYPE_CL *(Circumferential, Longitudinal, Other)*
- REL_MECH_RUPT_OTHER_TYPE_SPEC
- RELEASE_MECH_RUPT_WIDTH_IN
- RELEASE_MECH_RUPT_LENGTH_IN
- RELEASE_MECH_OTHER_SPEC
- INCIDENT_LOCATION_CLASS_CL *(Class 1, Class 2, Class 3, Class 4)*
- EST_COST_PRIVATE_PROP_DAMAGE
- EST_COST_RELEASED_GAS_USD
- EST_COST_OP_PROP_DAMAGE_USD
- EST_COST_OP_EMER_RESPONSE_USD
- EST_COST_OTHER_USD
- EST_COST_OTHER_SPEC
- EST_COST_TOTAL_USD
- EST_CUST_OUT_COMM_NUMBER
- EST_CUST_OUT_INDUST_NUMBER
- EST_CUST_OUT_RESIDL_NUMBER
- EST_PRESSURE_AT_INCIDENT_PSIG
- NORMAL_OP_PRESS_AT_INCDNT_PSIG
- MAOPAT_INCIDENT_PSIG
- SYSTEM_PRESSURE_AT_INCIDENT_CL *(Less Than MAOP, Greater Than MAOP Less Than 110%, Greater Than 110% MAOP)*
- SCADA_IN_PLACE_LF
- SCADA_OPERATING_AT_TOI_LF
- SCADA_FUNCTIONAL_AT_TOI_LF
- SCADA_ASSISTED_IN_DETECTN_LF
- SCADA_ASSISTED_IN_CONFRMTN_LF
- INITIAL_IDENT_TYPE_CL *(SCADA information, Static/Pressure/Leak Test, Controller, Air Patrol, Public Notification, Third Party Causer, Local Operating Personnel, Ground Patrol, Emergency Responder, Other)*
- INITIAL_IDENT_OTHER_SPEC
- INIT_IDENT_CONTROLLER_TYPE_CL *(Operator Employee, Contractor)*
- CR_INVESTIGATION_CL *(Investigation ongoing, No Investigation–facility not monitored, No investigation–not necessary, Investigation Completed)*
- CR_INVEST_NOT_REQD_SPEC
- CR_INVEST_FATIGUE_LF
- CR_INVEST_FATIGUE_SPEC
- CR_INVEST_NO_CR_ISSUE_LF
- CR_INVEST_NO_CONTROLR_ISSUE_LF
- CR_INVEST_INCORR_ACTION_ERR_LF
- CR_INVEST_FATIGUE_FOUND_LF
- CR_INVEST_INCORRECT_PROCEDR_LF
- CR_INVEST_INCORR_EQMT_OPER_LF
- CR_INVEST_MAINT_ISSUES_LF
- CR_INVEST_OTHER_AREAS_LF
- CR_INVEST_OTHER_AREAS_SPEC
- DRUG_TESTING_EMPL_RESULTED_LF
- DRUG_TESTING_EMPL_TESTED_NUM
- DRUG_TESTING_EMPL_FAILED_NUM
- DRUG_TESTING_CONT_RESULTED_LF
- DRUG_TESTING_CONT_TESTED_NUM
- DRUG_TESTING_CONT_FAILED_NUM
- NARRATIVE_DESCRIPTION_PART_H
- RECORD_SOURCE_CL *(GDM, ...)*
- LEGACY_ID
- GEOMETRY_FIELD *(binary)*

LK_RPR_EXCVTN_DAMAGE

- RECORD_ID
- EXCAVATION_DAMAGE_TYPE_CL *(Operator, Operator's Contractor, Third Party, Previous Damage)*
- MOST_RECENT_LEAK_SURVEY_DATE
- POST_INSTALL_PRESSURE_TEST_LF
- POST_INSTALL_PRESS_TEST_DATE
- POST_INSTALL_PRESS_TEST_PSIG
- PRIOR_NOTIFICATN_TO_OPERATR_LF
- PRIOR_NOTICE_ONE_CALL_SYS_LF
- PRIOR_NOTICE_EXCAVATOR_LF
- PRIOR_NOTICE_CONTRACTOR_LF
- PRIOR_NOTICE_LANDOWNER_LF
- LEAK_REPAIR_FOREIGN_KEY

A Leak caused by Excavation will have record in this table plus one in ThirdPartyDamage.

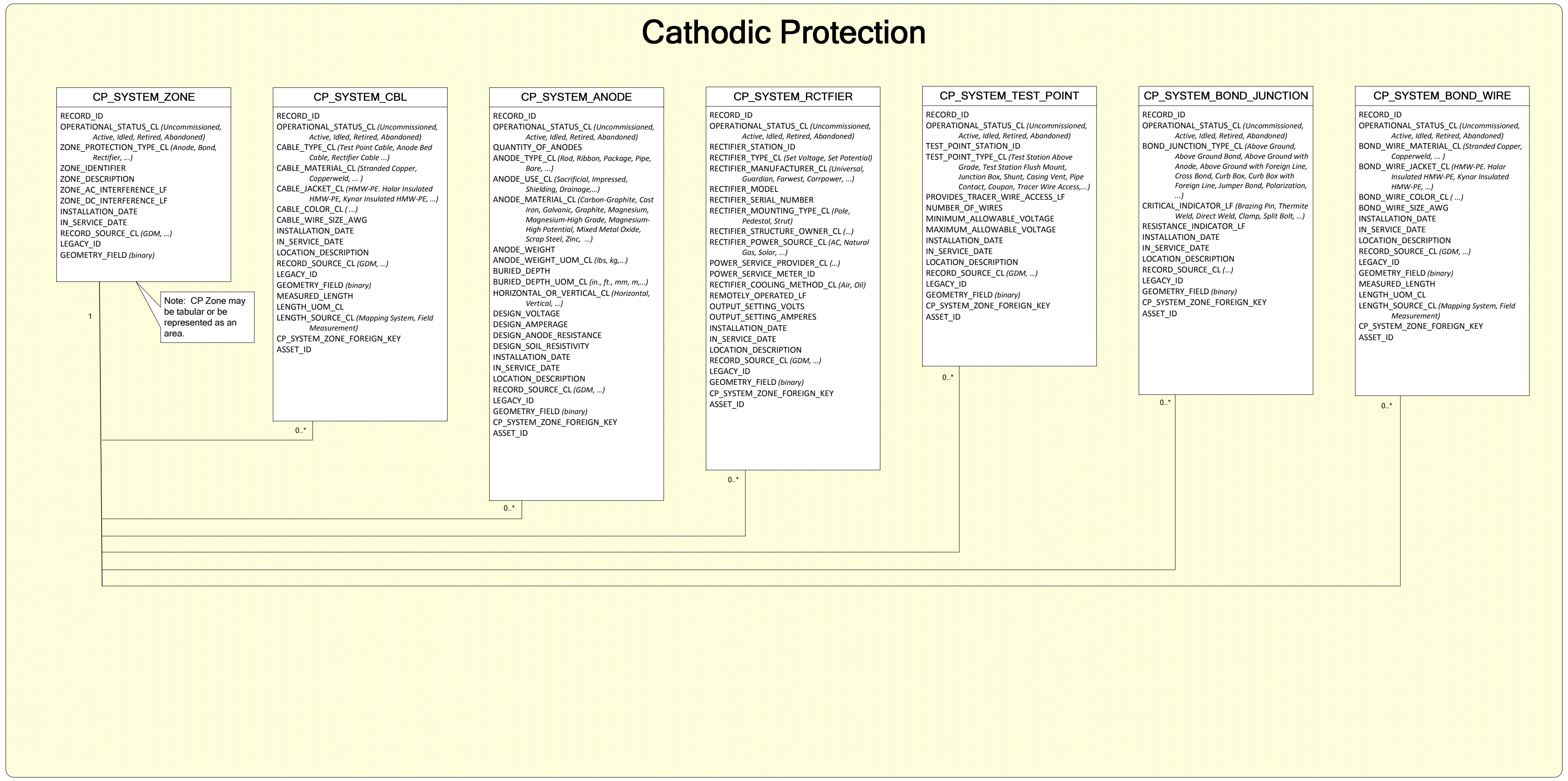
LK_RPR_OTHER_OFD

- RECORD_ID
- OUTSIDE_FORCE_SUBCAUSE_CL *(Fire/Explosion, Vehicle, Vessel Set Adrift, Maritime Activity, Electrical Arcing, Previous Mechanical Damage, Intentional Damage, Other Outside Force Damage)*
- VEHICLE_EQMT_OPERATED_BY_CL *(Operator, Operator's Contractor, Third Party)*
- EXTREME_WEATHR_EVNT_FACTOR_LF
- EXTREME_WEATHER_FACTOR_CL *(Hurricane, Tropical Storm, Tornado, Heavy Rains/Flood, Other)*
- EXTREME_WEATHR_EVNT_OTHER_SPEC
- MOST_RECENT_LEAK_SURVEY_DATE
- POST_INSTALL_PRESSURE_TEST_LF
- POST_INSTALL_PRESS_TEST_DATE
- POST_INSTALL_PRESS_TEST_PSIG
- LEAK_REPAIR_FOREIGN_KEY

Gas Technology Institute
Gas Distribution Model
Physical Oracle Representation

Version 1.0 DRAFT
Revised: 12/22/2010

Cathodic Protection



CP_SYSTEM_ZONE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
ZONE_PROTECTION_TYPE_CL *(Anode, Bond, Rectifier, ...)*
ZONE_IDENTIFIER
ZONE_DESCRIPTION
ZONE_AC_INTERFERENCE_LF
ZONE_DC_INTERFERENCE_LF
INSTALLATION_DATE
IN_SERVICE_DATE
RECORD_SOURCE_CL *(GDM, ...)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*

Note: CP Zone may be tabular or be represented as an area.

CP_SYSTEM_CBL

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
CABLE_TYPE_CL *(Test Point Cable, Anode Bed Cable, Rectifier Cable ...)*
CABLE_MATERIAL_CL *(Stranded Copper, Copperweld, ...)*
CABLE_JACKET_CL *(HMW-PE. Halar Insulated HMW-PE, Kynar Insulated HMW-PE, ...)*
CABLE_COLOR_CL *(...)*
CABLE_WIRE_SIZE_AWG
INSTALLATION_DATE
IN_SERVICE_DATE
LOCATION_DESCRIPTION
RECORD_SOURCE_CL *(GDM, ...)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
MEASURED_LENGTH
LENGTH_UOM_CL
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

CP_SYSTEM_ANODE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
QUANTITY_OF_ANODES
ANODE_TYPE_CL *(Rod, Ribbon, Package, Pipe, Bare, ...)*
ANODE_USE_CL *(Sacrificial, Impressed, Shielding, Drainage,...)*
ANODE_MATERIAL_CL *(Carbon-Graphite, Cast Iron, Galvanic, Graphite, Magnesium, Magnesium-High Grade, Magnesium-High Potential, Mixed Metal Oxide, Scrap Steel, Zinc, ...)*
ANODE_WEIGHT
ANODE_WEIGHT_UOM_CL *(lbs, kg,...)*
BURIED_DEPTH
BURIED_DEPTH_UOM_CL *(in., ft., mm, m,...)*
HORIZONTAL_OR_VERTICAL_CL *(Horizontal, Vertical, ...)*
DESIGN_VOLTAGE
DESIGN_AMPERAGE
DESIGN_ANODE_RESISTANCE
DESIGN_SOIL_RESISTIVITY
INSTALLATION_DATE
IN_SERVICE_DATE
LOCATION_DESCRIPTION
RECORD_SOURCE_CL *(GDM, ...)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

CP_SYSTEM_RCTFIER

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
RECTIFIER_STATION_ID
RECTIFIER_TYPE_CL *(Set Voltage, Set Potential)*
RECTIFIER_MANUFACTURER_CL *(Universal, Guardian, Farwest, Corrpower, ...)*
RECTIFIER_MODEL
RECTIFIER_SERIAL_NUMBER
RECTIFIER_MOUNTING_TYPE_CL *(Pole, Pedestal, Strut)*
RECTIFIER_STRUCTURE_OWNER_CL *(...)*
RECTIFIER_POWER_SOURCE_CL *(AC, Natural Gas, Solar, ...)*
POWER_SERVICE_PROVIDER_CL *(...)*
POWER_SERVICE_METER_ID
RECTIFIER_COOLING_METHOD_CL *(Air, Oil)*
REMOTELY_OPERATED_LF
OUTPUT_SETTING_VOLTS
OUTPUT_SETTING_AMPERES
INSTALLATION_DATE
IN_SERVICE_DATE
LOCATION_DESCRIPTION
RECORD_SOURCE_CL *(GDM, ...)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

CP_SYSTEM_TEST_POINT

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
TEST_POINT_STATION_ID
TEST_POINT_TYPE_CL *(Test Station Above Grade, Test Station Flush Mount, Junction Box, Shunt, Casing Vent, Pipe Contact, Coupon, Tracer Wire Access,...)*
PROVIDES_TRACER_WIRE_ACCESS_LF
NUMBER_OF_WIRES
MINIMUM_ALLOWABLE_VOLTAGE
MAXIMUM_ALLOWABLE_VOLTAGE
INSTALLATION_DATE
IN_SERVICE_DATE
LOCATION_DESCRIPTION
RECORD_SOURCE_CL *(GDM, ...)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

CP_SYSTEM_BOND_JUNCTION

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
BOND_JUNCTION_TYPE_CL *(Above Ground, Above Ground Bond, Above Ground with Anode, Above Ground with Foreign Line, Cross Bond, Curb Box, Curb Box with Foreign Line, Jumper Bond, Polarization, ...)*
CRITICAL_INDICATOR_LF *(Brazing Pin, Thermite Weld, Direct Weld, Clamp, Split Bolt, ...)*
RESISTANCE_INDICATOR_LF
INSTALLATION_DATE
IN_SERVICE_DATE
LOCATION_DESCRIPTION
RECORD_SOURCE_CL *(...)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

CP_SYSTEM_BOND_WIRE

RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
BOND_WIRE_MATERIAL_CL *(Stranded Copper, Copperweld, ...)*
BOND_WIRE_JACKET_CL *(HMW-PE. Halar Insulated HMW-PE, Kynar Insulated HMW-PE, ...)*
BOND_WIRE_COLOR_CL *(...)*
BOND_WIRE_SIZE_AWG
INSTALLATION_DATE
IN_SERVICE_DATE
LOCATION_DESCRIPTION
RECORD_SOURCE_CL *(GDM, ...)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
MEASURED_LENGTH
LENGTH_UOM_CL
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
CP_SYSTEM_ZONE_FOREIGN_KEY
ASSET_ID

Easements and ROW

ESMT_AND_ROW

RECORD_ID
ROW_TYPE_CL *(Company-Acquired ROW, Public Utility Easement, Foreign Utility Easement, Lease,...)*
DOCUMENT_ID
DOCUMENT_LOCATOR
EXPIRATION_DATE
LEGAL_WIDTH
LEGAL_WIDTH_UOM_CL *(Feet, Miles, Acres, Meters, Kilometers...)*
ASSIGNABLE_LF
GEOMETRY_FIELD *(binary)*
RECORD_SOURCE_CL *(GDM, ...)*
LEGACY_ID

Class and HCA

CLASS_LOCATION

RECORD_ID
IN_HCA_INDICATOR_LF
PIPE_INSTALLATION_CLASS_CL *(1,2,3,4)*
ASSIGNMENT_DATE
GEOMETRY_FIELD *(binary)*
MEASURED_LENGTH
LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
RECORD_SOURCE_CL *(GDM, ...)*
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE
END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
LINE_SERIES_END_FOREIGN_KEY
BEGIN_STATION
END_STATION

ACTIVITY_ZONE

RECORD_ID
ZONE_TYPE_CL
ASSIGNMENT_DATE
GEOMETRY_FIELD *(binary)*
MEASURED_LENGTH
LENGTH_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
LENGTH_SOURCE_CL *(Mapping System, Field Measurement)*
RECORD_SOURCE_CL *(GDM, ...)*
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE
END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
LINE_SERIES_END_FOREIGN_KEY
BEGIN_STATION END_STATION

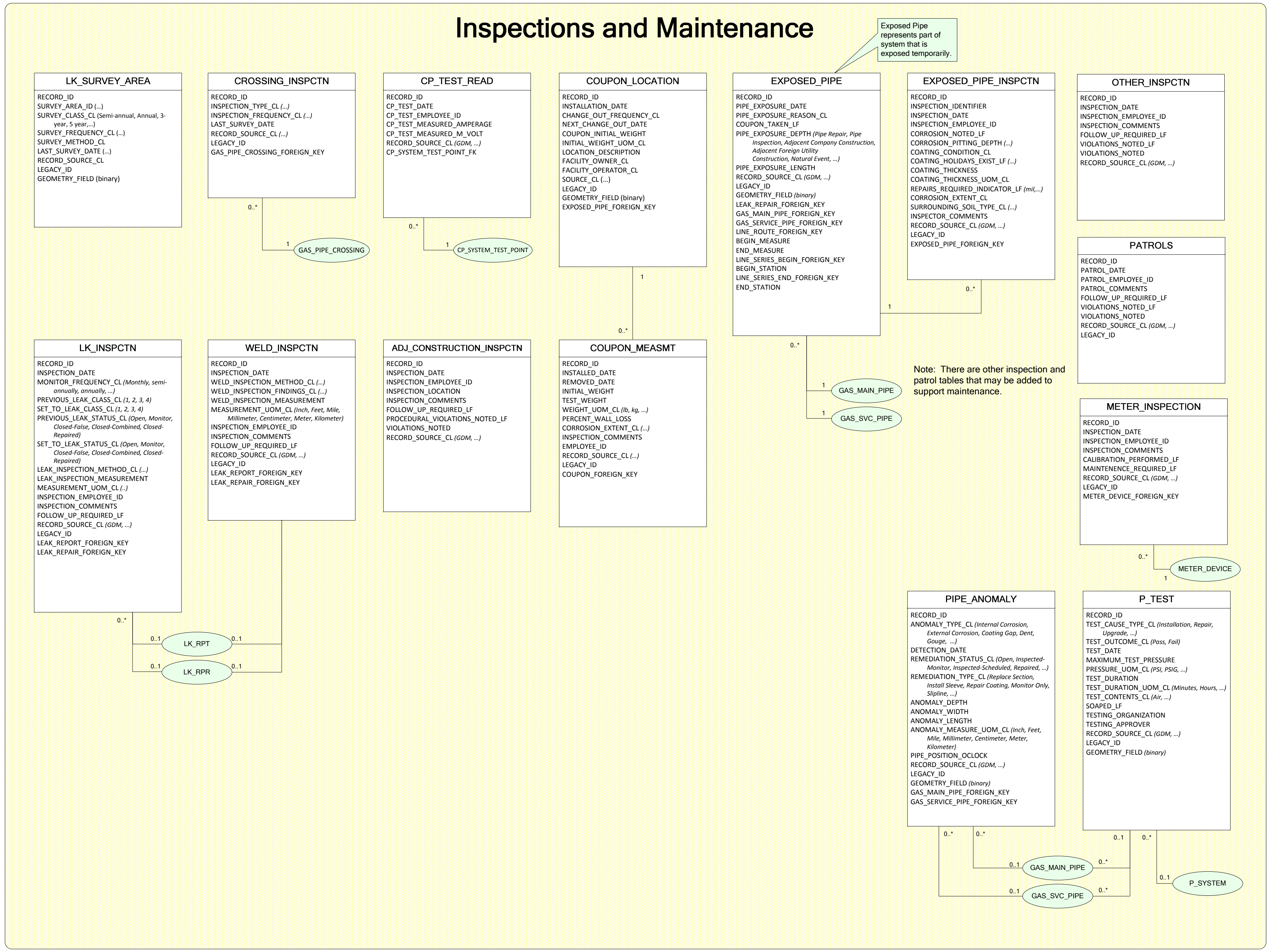
Facility Markers

PIPE_MARKERS_AND_SIGNS

RECORD_ID
MARKER_TYPE_CL *(Warning Sign, Casing Marker,...)*
LOCATION_DESCRIPTION
INSTALLATION_DATE
LAST_CHECKED_DATE
RECORD_SOURCE_CL *(GDM, ...)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
ASSET_ID

Gas Technology Institute
Gas Distribution Model
Physical Oracle Representation

Version 1.0 DRAFT
Revised: 12/22/2010



Inspections and Maintenance

Exposed Pipe represents part of system that is exposed temporarily.

LK_SURVEY_AREA
RECORD_ID
SURVEY_AREA_ID (…)
SURVEY_CLASS_CL (Semi-annual, Annual, 3-year, 5 year,…)
SURVEY_FREQUENCY_CL (…)
SURVEY_METHOD_CL
LAST_SURVEY_DATE (…)
RECORD_SOURCE_CL
LEGACY_ID
GEOMETRY_FIELD (binary)

CROSSING_INSPCTN
RECORD_ID
INSPECTION_TYPE_CL *(…)*
INSPECTION_FREQUENCY_CL *(…)*
LAST_SURVEY_DATE
RECORD_SOURCE_CL *(…)*
LEGACY_ID
GAS_PIPE_CROSSING_FOREIGN_KEY

CP_TEST_READ
RECORD_ID
CP_TEST_DATE
CP_TEST_EMPLOYEE_ID
CP_TEST_MEASURED_AMPERAGE
CP_TEST_MEASURED_M_VOLT
RECORD_SOURCE_CL *(GDM, …)*
CP_SYSTEM_TEST_POINT_FK

COUPON_LOCATION
RECORD_ID
INSTALLATION_DATE
CHANGE_OUT_FREQUENCY_CL
NEXT_CHANGE_OUT_DATE
COUPON_INITIAL_WEIGHT
INITIAL_WEIGHT_UOM_CL
LOCATION_DESCRIPTION
FACILITY_OWNER_CL
FACILITY_OPERATOR_CL
SOURCE_CL (…)
LEGACY_ID
GEOMETRY_FIELD (binary)
EXPOSED_PIPE_FOREIGN_KEY

EXPOSED_PIPE
RECORD_ID
PIPE_EXPOSURE_DATE
PIPE_EXPOSURE_REASON_CL
COUPON_TAKEN_LF
PIPE_EXPOSURE_DEPTH *(Pipe Repair, Pipe Inspection, Adjacent Company Construction, Adjacent Foreign Utility Construction, Natural Event, …)*
PIPE_EXPOSURE_LENGTH
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
LEAK_REPAIR_FOREIGN_KEY
GAS_MAIN_PIPE_FOREIGN_KEY
GAS_SERVICE_PIPE_FOREIGN_KEY
LINE_ROUTE_FOREIGN_KEY
BEGIN_MEASURE
END_MEASURE
LINE_SERIES_BEGIN_FOREIGN_KEY
BEGIN_STATION
LINE_SERIES_END_FOREIGN_KEY
END_STATION

EXPOSED_PIPE_INSPCTN
RECORD_ID
INSPECTION_IDENTIFIER
INSPECTION_DATE
INSPECTION_EMPLOYEE_ID
CORROSION_NOTED_LF
CORROSION_PITTING_DEPTH *(…)*
COATING_CONDITION_CL
COATING_HOLIDAYS_EXIST_LF *(…)*
COATING_THICKNESS
COATING_THICKNESS_UOM_CL
REPAIRS_REQUIRED_INDICATOR_LF *(mil,…)*
CORROSION_EXTENT_CL
SURROUNDING_SOIL_TYPE_CL *(…)*
INSPECTOR_COMMENTS
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
EXPOSED_PIPE_FOREIGN_KEY

OTHER_INSPCTN
RECORD_ID
INSPECTION_DATE
INSPECTION_EMPLOYEE_ID
INSPECTION_COMMENTS
FOLLOW_UP_REQUIRED_LF
VIOLATIONS_NOTED_LF
VIOLATIONS_NOTED
RECORD_SOURCE_CL *(GDM, …)*

PATROLS
RECORD_ID
PATROL_DATE
PATROL_EMPLOYEE_ID
PATROL_COMMENTS
FOLLOW_UP_REQUIRED_LF
VIOLATIONS_NOTED_LF
VIOLATIONS_NOTED
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID

LK_INSPCTN
RECORD_ID
INSPECTION_DATE
MONITOR_FREQUENCY_CL *(Monthly, semi-annually, annually, …)*
PREVIOUS_LEAK_CLASS_CL *(1, 2, 3, 4)*
SET_TO_LEAK_CLASS_CL *(1, 2, 3, 4)*
PREVIOUS_LEAK_STATUS_CL *(Open, Monitor, Closed-False, Closed-Combined, Closed-Repaired)*
SET_TO_LEAK_STATUS_CL *(Open, Monitor, Closed-False, Closed-Combined, Closed-Repaired)*
LEAK_INSPECTION_METHOD_CL *(…)*
LEAK_INSPECTION_MEASUREMENT
MEASUREMENT_UOM_CL *(..)*
INSPECTION_EMPLOYEE_ID
INSPECTION_COMMENTS
FOLLOW_UP_REQUIRED_LF
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
LEAK_REPORT_FOREIGN_KEY
LEAK_REPAIR_FOREIGN_KEY

WELD_INSPCTN
RECORD_ID
INSPECTION_DATE
WELD_INSPECTION_METHOD_CL *(…)*
WELD_INSPECTION_FINDINGS_CL *(…)*
WELD_INSPECTION_MEASUREMENT
MEASUREMENT_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
INSPECTION_EMPLOYEE_ID
INSPECTION_COMMENTS
FOLLOW_UP_REQUIRED_LF
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
LEAK_REPORT_FOREIGN_KEY
LEAK_REPAIR_FOREIGN_KEY

ADJ_CONSTRUCTION_INSPCTN
RECORD_ID
INSPECTION_DATE
INSPECTION_EMPLOYEE_ID
INSPECTION_LOCATION
INSPECTION_COMMENTS
FOLLOW_UP_REQUIRED_LF
PROCEDURAL_VIOLATIONS_NOTED_LF
VIOLATIONS_NOTED
RECORD_SOURCE_CL *(GDM, …)*

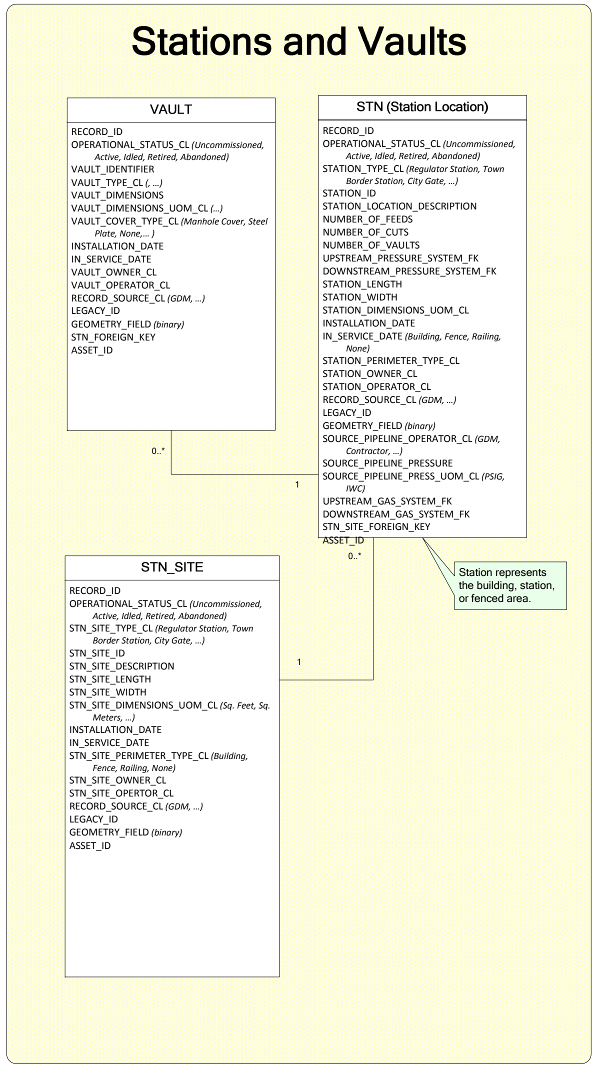
COUPON_MEASMT
RECORD_ID
INSTALLED_DATE
REMOVED_DATE
INITIAL_WEIGHT
TEST_WEIGHT
WEIGHT_UOM_CL *(lb, kg, …)*
PERCENT_WALL_LOSS
CORROSION_EXTENT_CL *(…)*
INSPECTION_COMMENTS
EMPLOYEE_ID
RECORD_SOURCE_CL *(…)*
LEGACY_ID
COUPON_FOREIGN_KEY

Note: There are other inspection and patrol tables that may be added to support maintenance.

METER_INSPECTION
RECORD_ID
INSPECTION_DATE
INSPECTION_EMPLOYEE_ID
INSPECTION_COMMENTS
CALIBRATION_PERFORMED_LF
MAINTENENCE_REQUIRED_LF
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
METER_DEVICE_FOREIGN_KEY

PIPE_ANOMALY
RECORD_ID
ANOMALY_TYPE_CL *(Internal Corrosion, External Corrosion, Coating Gap, Dent, Gouge, …)*
DETECTION_DATE
REMEDIATION_STATUS_CL *(Open, Inspected-Monitor, Inspected-Scheduled, Repaired, …)*
REMEDIATION_TYPE_CL *(Replace Section, Install Sleeve, Repair Coating, Monitor Only, Slipline, …)*
ANOMALY_DEPTH
ANOMALY_WIDTH
ANOMALY_LENGTH
ANOMALY_MEASURE_UOM_CL *(Inch, Feet, Mile, Millimeter, Centimeter, Meter, Kilometer)*
PIPE_POSITION_OCLOCK
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
GAS_MAIN_PIPE_FOREIGN_KEY
GAS_SERVICE_PIPE_FOREIGN_KEY

P_TEST
RECORD_ID
TEST_CAUSE_TYPE_CL *(Installation, Repair, Upgrade, …)*
TEST_OUTCOME_CL *(Pass, Fail)*
TEST_DATE
MAXIMUM_TEST_PRESSURE
PRESSURE_UOM_CL *(PSI, PSIG, …)*
TEST_DURATION
TEST_DURATION_UOM_CL *(Minutes, Hours, …)*
TEST_CONTENTS_CL *(Air, …)*
SOAPED_LF
TESTING_ORGANIZATION
TESTING_APPROVER
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*



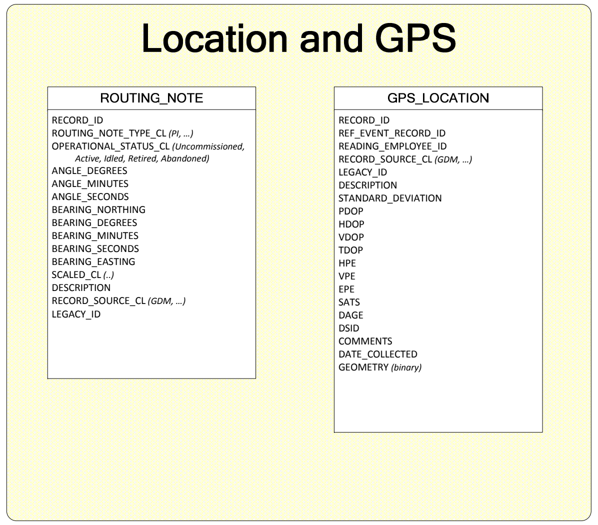
Stations and Vaults

VAULT
RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
VAULT_IDENTIFIER
VAULT_TYPE_CL *(, …)*
VAULT_DIMENSIONS
VAULT_DIMENSIONS_UOM_CL *(…)*
VAULT_COVER_TYPE_CL *(Manhole Cover, Steel Plate, None,…)*
INSTALLATION_DATE
IN_SERVICE_DATE
VAULT_OWNER_CL
VAULT_OPERATOR_CL
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
STN_FOREIGN_KEY
ASSET_ID

STN (Station Location)
RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
STATION_TYPE_CL *(Regulator Station, Town Border Station, City Gate, …)*
STATION_ID
STATION_LOCATION_DESCRIPTION
NUMBER_OF_FEEDS
NUMBER_OF_CUTS
NUMBER_OF_VAULTS
UPSTREAM_PRESSURE_SYSTEM_FK
DOWNSTREAM_PRESSURE_SYSTEM_FK
STATION_LENGTH
STATION_WIDTH
STATION_DIMENSIONS_UOM_CL
INSTALLATION_DATE
IN_SERVICE_DATE *(Building, Fence, Railing, None)*
STATION_PERIMETER_TYPE_CL
STATION_OWNER_CL
STATION_OPERATOR_CL
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
SOURCE_PIPELINE_OPERATOR_CL *(GDM, Contractor, …)*
SOURCE_PIPELINE_PRESSURE
SOURCE_PIPELINE_PRESS_UOM_CL *(PSIG, IWC)*
UPSTREAM_GAS_SYSTEM_FK
DOWNSTREAM_GAS_SYSTEM_FK
STN_SITE_FOREIGN_KEY
ASSET_ID

Station represents the building, station, or fenced area.

STN_SITE
RECORD_ID
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
STN_SITE_TYPE_CL *(Regulator Station, Town Border Station, City Gate, …)*
STN_SITE_ID
STN_SITE_DESCRIPTION
STN_SITE_LENGTH
STN_SITE_WIDTH
STN_SITE_DIMENSIONS_UOM_CL *(Sq. Feet, Sq. Meters, …)*
INSTALLATION_DATE
IN_SERVICE_DATE
STN_SITE_PERIMETER_TYPE_CL *(Building, Fence, Railing, None)*
STN_SITE_OWNER_CL
STN_SITE_OPERTOR_CL
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
GEOMETRY_FIELD *(binary)*
ASSET_ID



Location and GPS

ROUTING_NOTE
RECORD_ID
ROUTING_NOTE_TYPE_CL *(PI, …)*
OPERATIONAL_STATUS_CL *(Uncommissioned, Active, Idled, Retired, Abandoned)*
ANGLE_DEGREES
ANGLE_MINUTES
ANGLE_SECONDS
BEARING_NORTHING
BEARING_DEGREES
BEARING_MINUTES
BEARING_SECONDS
BEARING_EASTING
SCALED_CL *(..)*
DESCRIPTION
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID

GPS_LOCATION
RECORD_ID
REF_EVENT_RECORD_ID
READING_EMPLOYEE_ID
RECORD_SOURCE_CL *(GDM, …)*
LEGACY_ID
DESCRIPTION
STANDARD_DEVIATION
PDOP
HDOP
VDOP
TDOP
HPE
VPE
EPE
SATS
DAGE
DSID
COMMENTS
DATE_COLLECTED
GEOMETRY *(binary)*

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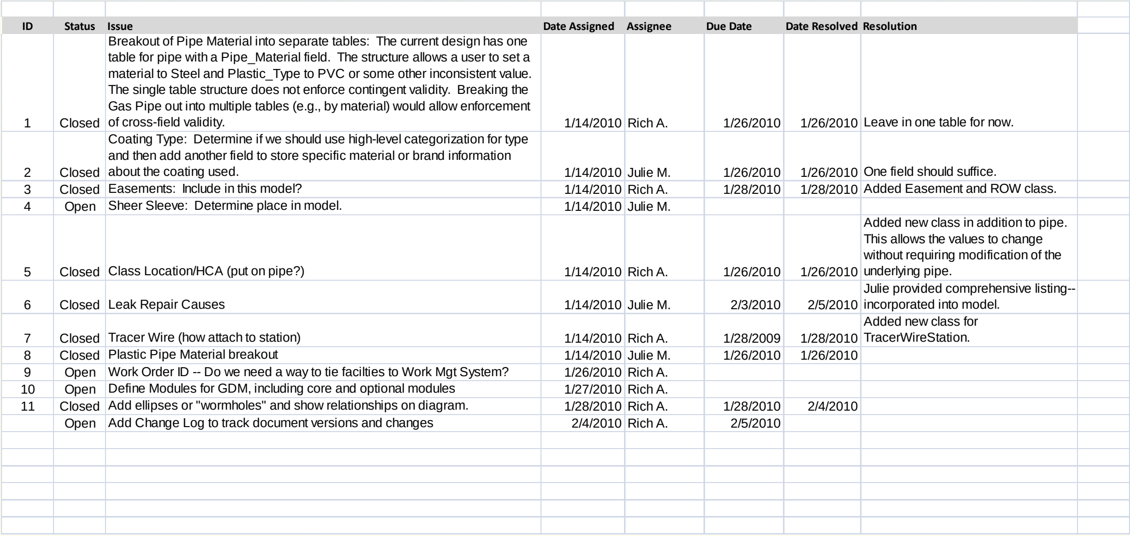
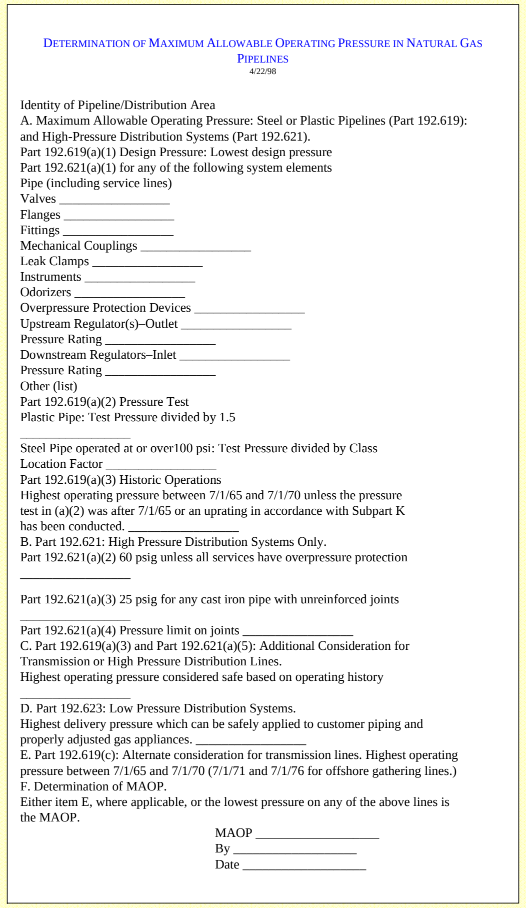
Revised: 12/22/2010

Open Issues



ID	Status	Issue	Date Assigned	Assignee	Due Date	Date Resolved	Resolution
1	Closed	Breakout of Pipe Material into separate tables: The current design has one table for pipe with a Pipe_Material field. The structure allows a user to set a material to Steel and Plastic_Type to PVC or some other inconsistent value. The single table structure does not enforce contingent validity. Breaking the Gas Pipe out into multiple tables (e.g., by material) would allow enforcement of cross-field validity.	1/14/2010	Rich A.	1/26/2010	1/26/2010	Leave in one table for now.
2	Closed	Coating Type: Determine if we should use high-level categorization for type and then add another field to store specific material or brand information about the coating used.	1/14/2010	Julie M.	1/26/2010	1/26/2010	One field should suffice.
3	Closed	Easements: Include in this model?	1/14/2010	Rich A.	1/28/2010	1/28/2010	Added Easement and ROW class.
4	Open	Sheer Sleeve: Determine place in model.	1/14/2010	Julie M.			
5	Closed	Class Location/HCA (put on pipe?)	1/14/2010	Rich A.	1/26/2010	1/26/2010	Added new class in addition to pipe. This allows the values to change without requiring modification of the underlying pipe.
6	Closed	Leak Repair Causes	1/14/2010	Julie M.	2/3/2010	2/5/2010	Julie provided comprehensive listing--incorporated into model.
7	Closed	Tracer Wire (how attach to station)	1/14/2010	Rich A.	1/28/2009	1/28/2010	Added new class for TracerWireStation.
8	Closed	Plastic Pipe Material breakout	1/14/2010	Julie M.	1/26/2010	1/26/2010	
9	Open	Work Order ID -- Do we need a way to tie facilties to Work Mgt System?	1/26/2010	Rich A.			
10	Open	Define Modules for GDM, including core and optional modules	1/27/2010	Rich A.			
11	Closed	Add ellipses or "wormholes" and show relationships on diagram.	1/28/2010	Rich A.	1/28/2010	2/4/2010	
	Open	Add Change Log to track document versions and changes	2/4/2010	Rich A.	2/5/2010		

MAOP Determination



DETERMINATION OF MAXIMUM ALLOWABLE OPERATING PRESSURE IN NATURAL GAS PIPELINES

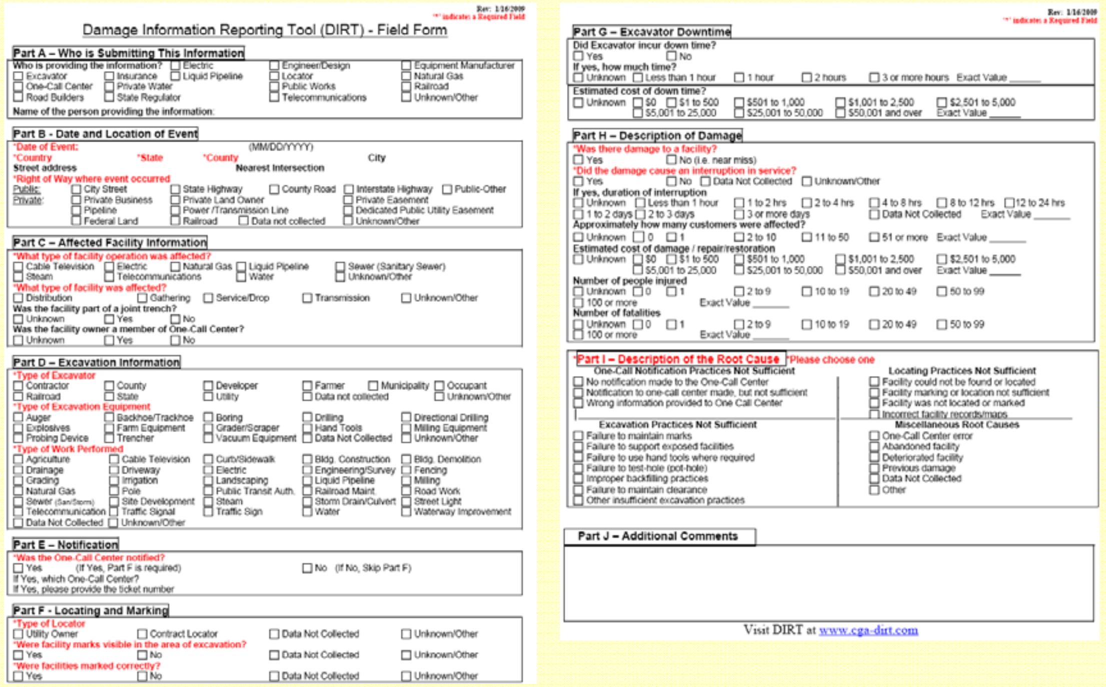
4/22/98

Identity of Pipeline/Distribution Area
A. Maximum Allowable Operating Pressure: Steel or Plastic Pipelines (Part 192.619): and High-Pressure Distribution Systems (Part 192.621).
Part 192.619(a)(1) Design Pressure: Lowest design pressure
Part 192.621(a)(1) for any of the following system elements
Pipe (including service lines)
Valves ________________
Flanges ________________
Fittings ________________
Mechanical Couplings ________________
Leak Clamps ________________
Instruments ________________
Odorizers ________________
Overpressure Protection Devices ________________
Upstream Regulator(s)–Outlet ________________
Pressure Rating ________________
Downstream Regulators–Inlet ________________
Pressure Rating ________________
Other (list)
Part 192.619(a)(2) Pressure Test
Plastic Pipe: Test Pressure divided by 1.5
____
Steel Pipe operated at or over100 psi: Test Pressure divided by Class Location Factor ________________
Part 192.619(a)(3) Historic Operations
Highest operating pressure between 7/1/65 and 7/1/70 unless the pressure test in (a)(2) was after 7/1/65 or an uprating in accordance with Subpart K has been conducted. ________________
B. Part 192.621: High Pressure Distribution Systems Only.
Part 192.621(a)(2) 60 psig unless all services have overpressure protection
____

Part 192.621(a)(3) 25 psig for any cast iron pipe with unreinforced joints
____
Part 192.621(a)(4) Pressure limit on joints ________________
C. Part 192.619(a)(3) and Part 192.621(a)(5): Additional Consideration for Transmission or High Pressure Distribution Lines.
Highest operating pressure considered safe based on operating history
____
D. Part 192.623: Low Pressure Distribution Systems.
Highest delivery pressure which can be safely applied to customer piping and properly adjusted gas appliances. ________________
E. Part 192.619(c): Alternate consideration for transmission lines. Highest operating pressure between 7/1/65 and 7/1/70 (7/1/71 and 7/1/76 for offshore gathering lines.)
F. Determination of MAOP.
Either item E, where applicable, or the lowest pressure on any of the above lines is the MAOP.

MAOP ________________
By ________________
Date ________________

CGA DIRT Report Form



Rev: 1/16/2009
"*" indicates a Required Field

Damage Information Reporting Tool (DIRT) - Field Form

Part A – Who is Submitting This Information
Who is providing the information? ☐ Electric ☐ Engineer/Design ☐ Equipment Manufacturer
☐ Excavator ☐ Insurance ☐ Liquid Pipeline ☐ Locator ☐ Natural Gas
☐ One-Call Center ☐ Private Water ☐ Public Works ☐ Railroad
☐ Road Builders ☐ State Regulator ☐ Telecommunications ☐ Unknown/Other
Name of the person providing the information:

Part B - Date and Location of Event
*Date of Event: (MM/DD/YYYY)
*Country *State *County City
Street address Nearest Intersection
*Right of Way where event occurred
Public: ☐ City Street ☐ State Highway ☐ County Road ☐ Interstate Highway ☐ Public-Other
Private: ☐ Private Business ☐ Private Land Owner ☐ Private Easement
☐ Pipeline ☐ Power /Transmission Line ☐ Dedicated Public Utility Easement
☐ Federal Land ☐ Railroad ☐ Data not collected ☐ Unknown/Other

Part C – Affected Facility Information
*What type of facility operation was affected?
☐ Cable Television ☐ Electric ☐ Natural Gas ☐ Liquid Pipeline ☐ Sewer (Sanitary Sewer)
☐ Steam ☐ Telecommunications ☐ Water ☐ Unknown/Other
*What type of facility was affected?
☐ Distribution ☐ Gathering ☐ Service/Drop ☐ Transmission ☐ Unknown/Other
Was the facility part of a joint trench?
☐ Unknown ☐ Yes ☐ No
Was the facility owner a member of One-Call Center?
☐ Unknown ☐ Yes ☐ No

Part D – Excavation Information
*Type of Excavator
☐ Contractor ☐ County ☐ Developer ☐ Farmer ☐ Municipality ☐ Occupant
☐ Railroad ☐ State ☐ Utility ☐ Data not collected ☐ Unknown/Other
*Type of Excavation Equipment
☐ Auger ☐ Backhoe/Trackhoe ☐ Boring ☐ Drilling ☐ Directional Drilling
☐ Explosives ☐ Farm Equipment ☐ Grader/Scraper ☐ Hand Tools ☐ Milling Equipment
☐ Probing Device ☐ Trencher ☐ Vacuum Equipment ☐ Data Not Collected ☐ Unknown/Other
*Type of Work Performed
☐ Agriculture ☐ Cable Television ☐ Curb/Sidewalk ☐ Bldg. Construction ☐ Bldg. Demolition
☐ Drainage ☐ Driveway ☐ Electric ☐ Engineering/Survey ☐ Fencing
☐ Grading ☐ Irrigation ☐ Landscaping ☐ Liquid Pipeline ☐ Milling
☐ Natural Gas ☐ Pole ☐ Public Transit Auth. ☐ Railroad Maint. ☐ Road Work
☐ Sewer (San/Storm) ☐ Site Development ☐ Steam ☐ Storm Drain/Culvert ☐ Street Light
☐ Telecommunication ☐ Traffic Signal ☐ Traffic Sign ☐ Water ☐ Waterway Improvement
☐ Data Not Collected ☐ Unknown/Other

Part E – Notification
*Was the One-Call Center notified?
☐ Yes (If Yes, Part F is required) ☐ No (If No, Skip Part F)
If Yes, which One-Call Center?
If Yes, please provide the ticket number

Part F - Locating and Marking
*Type of Locator
☐ Utility Owner ☐ Contract Locator ☐ Data Not Collected ☐ Unknown/Other
*Were facility marks visible in the area of excavation?
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other
*Were facilities marked correctly?
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

Rev: 1/16/2009
"*" indicates a Required Field

Part G – Excavator Downtime
Did Excavator incur down time?
☐ Yes ☐ No
If yes, how much time?
☐ Unknown ☐ Less than 1 hour ☐ 1 hour ☐ 2 hours ☐ 3 or more hours Exact Value ______
Estimated cost of down time?
☐ Unknown ☐ $0 ☐ $1 to 500 ☐ $501 to 1,000 ☐ $1,001 to 2,500 ☐ $2,501 to 5,000
☐ $5,001 to 25,000 ☐ $25,001 to 50,000 ☐ $50,001 and over Exact Value ______

Part H – Description of Damage
*Was there damage to a facility?
☐ Yes ☐ No (i.e. near miss)
*Did the damage cause an interruption in service?
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other
If yes, duration of interruption
☐ Unknown ☐ Less than 1 hour ☐ 1 to 2 hrs ☐ 2 to 4 hrs ☐ 4 to 8 hrs ☐ 8 to 12 hrs ☐ 12 to 24 hrs
☐ 1 to 2 days ☐ 2 to 3 days ☐ 3 or more days ☐ Data Not Collected Exact Value ______
Approximately how many customers were affected?
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 10 ☐ 11 to 50 ☐ 51 or more Exact Value ______
Estimated cost of damage / repair/restoration
☐ Unknown ☐ $0 ☐ $1 to 500 ☐ $501 to 1,000 ☐ $1,001 to 2,500 ☐ $2,501 to 5,000
☐ $5,001 to 25,000 ☐ $25,001 to 50,000 ☐ $50,001 and over Exact Value ______
Number of people injured
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value ______
Number of fatalities
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value ______

***Part I – Description of the Root Cause** *Please choose one

One-Call Notification Practices Not Sufficient
☐ No notification made to the One-Call Center
☐ Notification to one-call center made, but not sufficient
☐ Wrong information provided to One Call Center

Locating Practices Not Sufficient
☐ Facility could not be found or located
☐ Facility marking or location not sufficient
☐ Facility was not located or marked
☐ Incorrect facility records/maps

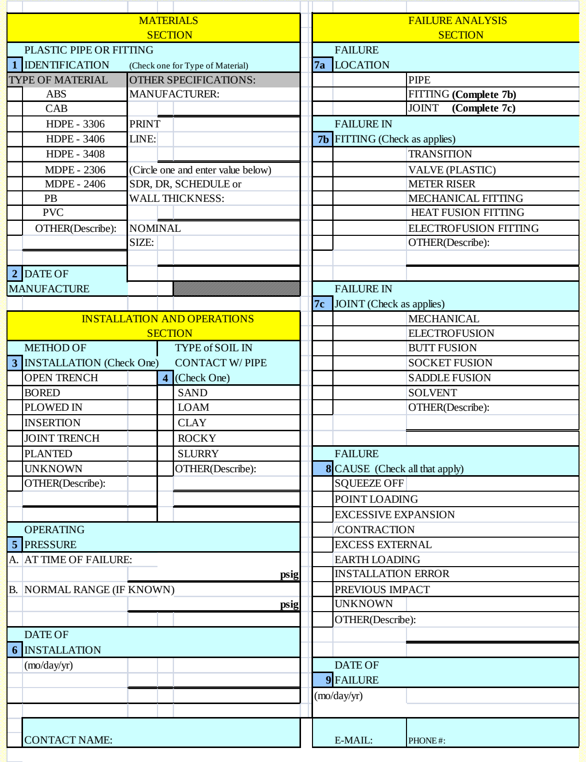
Excavation Practices Not Sufficient
☐ Failure to maintain marks
☐ Failure to support exposed facilities
☐ Failure to use hand tools where required
☐ Failure to test-hole (pot-hole)
☐ Improper backfilling practices
☐ Failure to maintain clearance
☐ Other insufficient excavation practices

Miscellaneous Root Causes
☐ One-Call Center error
☐ Abandoned facility
☐ Deteriorated facility
☐ Previous damage
☐ Data Not Collected
☐ Other

Part J – Additional Comments

Visit DIRT at www.cga-dirt.com

PPDC Incident Report



MATERIALS SECTION

1 PLASTIC PIPE OR FITTING IDENTIFICATION (Check one for Type of Material)

TYPE OF MATERIAL	OTHER SPECIFICATIONS:
ABS	MANUFACTURER:
CAB	
HDPE - 3306	PRINT
HDPE - 3406	LINE:
HDPE - 3408	
MDPE - 2306	(Circle one and enter value below)
MDPE - 2406	SDR, DR, SCHEDULE or
PB	WALL THICKNESS:
PVC	
OTHER(Describe):	NOMINAL SIZE:

2 DATE OF MANUFACTURE

INSTALLATION AND OPERATIONS SECTION

3 METHOD OF INSTALLATION (Check One)	4 TYPE of SOIL IN CONTACT W/ PIPE (Check One)
OPEN TRENCH	
BORED	SAND
PLOWED IN	LOAM
INSERTION	CLAY
JOINT TRENCH	ROCKY
PLANTED	SLURRY
UNKNOWN	OTHER(Describe):
OTHER(Describe):	

5 OPERATING PRESSURE
A. AT TIME OF FAILURE: psig
B. NORMAL RANGE (IF KNOWN) psig

6 DATE OF INSTALLATION
(mo/day/yr)

CONTACT NAME:

FAILURE ANALYSIS SECTION

7a FAILURE LOCATION
PIPE
FITTING **(Complete 7b)**
JOINT **(Complete 7c)**

7b FAILURE IN FITTING (Check as applies)
TRANSITION
VALVE (PLASTIC)
METER RISER
MECHANICAL FITTING
HEAT FUSION FITTING
ELECTROFUSION FITTING
OTHER(Describe):

7c FAILURE IN JOINT (Check as applies)
MECHANICAL
ELECTROFUSION
BUTT FUSION
SOCKET FUSION
SADDLE FUSION
SOLVENT
OTHER(Describe):

8 FAILURE CAUSE (Check all that apply)
SQUEEZE OFF
POINT LOADING
EXCESSIVE EXPANSION /CONTRACTION
EXCESS EXTERNAL EARTH LOADING
INSTALLATION ERROR
PREVIOUS IMPACT
UNKNOWN
OTHER(Describe):

9 DATE OF FAILURE
(mo/day/yr)

E-MAIL: PHONE #: