PACIFIC GAS AND ELECTRIC COMPANY
San Bruno Gas Transmission Line Incident
Data Response

PG&E Data Request No.:	NTSB_027-001		
PG&E File Name:	San Bruno GT Line Incident_DR_NTSB_027-001		
Request Date:	September 30, 2010	Requesting Party:	NTSB
Date Sent:	October 8, 2010	Requestor:	NTSB (Sunil Shori)

QUESTION 1

On the pre-assessment documentation (ECDA - Phase 1, Section 5.2, Operating Stress Levels, of Data Element Check Sheet) for the Line 132-2008 N-Seg ECDA, various segments are identified as having 76.1035% SMYS at the Maximum Operating Pressure (MOP) of Line 132 (375 psig). These are: Line 132 from M.P. 37.83 - 43.74; DFDS3633 M.P. 0-0; and 0805-01 from M.P. 2.26 - 2.26. Please provide GIS version of the Pipeline Survey sheet as well as a copy of the original pipeline survey sheet for these locations and any others on Line 132 that are at, or exceed 72% SMYS at MOP, MAOP, or any other pressure. Also, please provide information (GIS version of the Pipeline Survey sheet as well as a copy of the original pipeline survey sheet) for any PG&E transmission pipeline, which at the pipeline's MOP, MAOP, or any other pressure, operates above: 72% SMYS in a class 1 location; 60% SMYS in a class 2 location; 50% SMYS in a class 3 location, or above 40% SMYS in a class 4 location.

ANSWER 1

None of the listed pipeline segments are operating above the 50% MOP/SMYS Class 3 allowance.

Federal pipeline regulations, 49 CFR Subpart O, prescribe requirements for Integrity Management Programs ("IMP") on all segments of gas transmission lines in High Consequence Areas (“HCAs"). Operators must identify potential threats to pipeline integrity (49 CFR 192.917(a)), including possible internal or external corrosion, fabrication or construction defects, possible third party or other damage. To complete this threat assessment, operators must gather and integrate existing data and information on the entire pipeline that could be relevant to the covered segments (49 CFR 192.917(a)) including, for example, corrosion controls records, patrolling records, maintenance history and all other conditions specific to each pipeline. Operators must complete a Baseline Assessment of all threats for those covered segments using one of the three approved methods: in-line assessment, pressure testing or External Corrosion Direct Assessment ("ECDA"). 49 CFR 192.921(a). Section 192.925(b) describes the requirements for using ECDA -- the operator must develop and implement a direct assessment plan including four steps (1) preassessment, (2) indirect examination, (3) direct examination, and (4) post-assessment.

Pursuant to 49 CFR 192.925(b)(1), the pre-assessment analysis must follow the requirements in ASME/ANSI B31.8S ("Managing System Integrity of Gas Pipelines") section 6.4 to integrate facilities data and current and historical field inspections and tests with the physical characteristics of a pipeline and NACE RP 0502-2002 ("Standard Recommended Practice: Pipeline External Corrosion Direct Assessment Methodology"), section 3. Specifically, Section 3 of the NACE Standard directs that "the objectives of the Pre-Assessment Step are to determine whether ECDA is feasible for the pipeline to be evaluated, select indirect inspection tools, and identify ECDA regions."

To document the pre-assessment process as set forth in the federal regulations, ASME and NACE, PG&E engineers complete a Preassessment Package. For Line 132, PG&E and its consultant, Kiefner & Associates, prepared the 2008 ECDA Program NSEG 132-2008 for all pipeline segments (47.36 miles) of L-132. This pre-assessment package grouped pipeline segments to provide an overview that would determine whether ECDA was appropriate, feasible and, specifically what locations should be exposed and what assessment tools should be used. In making this determination, PG&E and its consultant considered physical characteristics like pipeline lengths, diameter and seam type, the year of pipe manufacture and installation, unusual conditions or girth welds, casing locations, unusual site conditions like fault or river crossings, proximity to electric transmission lines, railroads or foreign pipelines, surrounding development and pipeline class, CP system conditions and history, coating condition, pipeline temperature and stress level, pipeline excavation and repair history, leak and third-party damage history, past hydro tests, internal liquid or MIC test results, soil characteristics and topography, location of major pipeline appurtenances such as taps,valves and regulator stations along with the location and year of each installation. The result of this pre-assessment was a 38-page summary of available and assumed data regarding physical pipeline characteristics, field inspections and tests, corrosion control records and maintenance histories which helps PG&E determine whether ECDA is feasible and to identify ECDA locations. (Please see Attachment A).

Data on the Data Element Check Sheets is manually input from the Pipeline Survey Sheets by PG&E's pipeline engineer or contractor, Kiefner Associates. Data on the Pipeline Survey Sheets is taken directly from GIS and PG&E's threat assessment program. Therefore, data on the Pipeline Survey Sheets is as complete and up-to-date as the GIS data itself while data on the Data Element Check Sheets is subject to possible random coding errors. However, as the Data Element Check Sheets are only used to provide an overview of ECDA feasibility as part of the NACE pre-assessment process, there is no need to ensure perfection. (PG&E sets MOP and MAOP based on the MAOP list and the original as-built drawings.)

In addition to potential coding errors, the Data Element Check Sheets also include assumed values for certain appurtenances where exact specifications are unavailable. These assumed values are denoted by a minus "-" sign ("-16.0135") to

indicate that the value was calculated using conservative assumptions regarding pipe characteristics and other factors. This is consistent with the federal code; section 192.925 , ASME/ANSI B31.8S and NACE RP 0502-2002. which provide that where the operator is missing data, conservative assumptions shall be used when performing the risk assessment (B31.8S, A4.2). In cases where data is unavailable, PG&E assumes a conservative value based on historical analysis regarding materials and practices in use at the time of installation.

The Data Element Check Sheet for NSEG 132 represents those segments of Transmission Line-132 including all the connections to L-132 to serve customers ("DCUST"), connections to regulator stations ("DREG"), cross-ties ("X"), Dual Feeds from a single source ("DF"), Dual Feeds-Different Sources ("DFDS") and Distribution Feeder Mains ("DFM" or simply a six-digit line designation). Each segment is identified by a beginning and ending mile point on L-132 or the point at which the connections or cross-ties attach to L-132. Among all the data summarized in this ECDA pre-assessment is a summary of "Operating Stress Level" shown as "% SMYS MOP" (see pages 34-35 of 38). This data, summarized from the Pipeline Survey Sheets, shows that the operating stress is measured as a ratio of Maximum Operating Pressure ("MOP") to the Specified Minimum Yield Strength ("SMYS") of the pipe. As noted in the question, one page of the Data Element Check Sheet for 2008, page 34 of 38 ((2009 ECDA Binder 1 of 3), includes some pipeline segments with a listed % SMYS MOP above the 50% Maximum Allowable Operating Pressure ("MAOP") for a Class 3 pipe.

Of the three identified Mile Points ("MPs") or connections included on the referenced Data Element Check Sheet, none are operating out of class.

As noted in the question, three segments are shown in the Data Element Check Sheets with % SMYS exceeding the 50% MOP % SMYS limit for a Class 3 location. However, the % SMYS are shown with negative values, indicating that the calculation was performed using conservative, assumed values. The specifics of the three segments are summarized below.

1. The Data Element Check Sheet indicates that Line 132, between MPs 37.80 and 43.75 (31,258 feet), operates at a MOP / SMYS % between 9.69% and 76.1%. The 76.1% MOP % SMYS information is not accurate. As shown on the Pipeline Survey Sheet (ECDA Control Map L-132 MP: 37.80 - 46.77, Sheet 3 of 10), the highest recorded MOP / SMYS % within this pipeline segment is actually 38.5% -- well below the 50% class allowance. (Please see Attachment B)

2. The MOP % SMYS for Dual Feed-Different Sources (DFDS) 3633 was erroneously shown in the Data Element Check Sheet as operating at 76.1035%, when in fact, according to the Pipeline Survey Sheet and GIS, the maximum MOP % SMYS is 16.0135%. The Pipeline Survey Sheets located in the 2009 ECDA Binder (L-

132, MP 18.07 - 20.00, Sheet 2 of 2) contain the "% SMYS at MOP" for each individual segment. (Please see Attachment C). Note that the percentage is preceded by a minus "-" sign ("-16.0135") to indicate that the value was calculated using conservative assumptions regarding pipe characteristics and other factors. In this case, the threat assessment program assumed 1000 psig for this DFDS. In fact, the MOP of this line is only 375 psig so the actual MOP % SMYS would be even less but well within the 50% class allowance

3. The MOP % SMYS for Distribution Feeder Main (DFM) 0805-01 was erroneously shown in the Data Element Check Sheet as operating at 76.10%, 59.85% and 51.76%. According to GIS and the Pipeline Survey Sheet, DFM 0805-01 is a 12,920-foot line consisting of 25 individual segments. The Pipeline Survey Sheet (ECDA Binder, L- 0805-01, MP 0.00 - 2.39, Sheet 1, 2, and 3 of 3) shows that the MOP % SMYS for this line varies from 6.76% to -30.30%. (Please see Attachment D). Again, in some cases, the MOP % SMYS percentages are the result of calculations which rely on assumed , most conservative values available for pipe yield strength, wall thickness, pressure, et cetera. Specifically, the two segments with the highest MOP % SMYS percentage is -30.3030%; this is based on an assumption regarding the pipe strength and wall thickness. The bottom line is that all these segments are operating with the 50% class allowance.

Please see the original Pipe Line Survey Sheets for L-132 from MP 37.80-43.75 and MP 18.07-MP 20. (Attachment E). After a diligent search, PG&E cannot locate the original Pipeline Survey Sheet of L-0805-01, MP 0.00-2.39.