PROCEDURE FOR HANDLING PIPE FAILURES PRIOR TO INVESTIGATION

Getting the materials to the investigator in a preserved, undamaged condition is an important first step in a successful failure examination. For failures involving small components or short lengths of pipe, e.g. 40 feet, consider sending all the components involved. For larger failures, the pipeline operator may need to identify the origin and remove sufficient adjacent material to perform a full analysis. Assistance in locating the origin of large failures can be provided by KAI personnel. The following steps should be followed when selecting material to submit for analysis.

1. A photograph should be taken or a sketch made of the specimen in place before disturbing it. Photographs should also be taken after the pipe is removed from the ditch. It is a good idea to mark each photograph with test section and failure number, as well as the date and time the photograph was taken.

2. Steel surfaces can flash rust quickly when exposed to the atmosphere and moisture (within 15 minutes). As soon as is practical after excavation or exposure of the failure segment, the fracture surfaces should be coated with a light, water-dispersing oil, such as WD-40, motor oil or Vaseline.

3. It is essential to avoid damaging the fracture surfaces. Do not to clean the fracture surfaces, other than to remove mud with water. The surfaces should not be rubbed, brushed, sandblasted or otherwise contacted. Avoid damaging the fracture surfaces during handling.

4. Extreme care should be exercised during excavation to prevent digging tool contact with the pipe in the vicinity of the failure surface. In handling the pipe, no hooks, chains, slings or similar metal devices are to contact the pipe at a failure location. Sometimes, the origins of pipe ruptures are on a flap that protrudes from the pipe body, making it prone to being damaged during handling. Damage to the origin can obscure or destroy important information that may be critical to the examination

5. Small leaks or flaws should be indicated by paint marker with care being taken not to get paint or ink on the failure. Mark all materials to indicate their position/orientation in the pipeline prior to failure. On all failures requiring cutout, mark the top of the pipe (12 o'clock position), direction of flow (arrow pointing downstream) and a "North" arrow with a paint marker or other indelible marker.

6. Hydrostatic test failures should be identified sequentially by test section, failure number, milepost and/or station number. The name of the person and company gathering the pipe specimen, the station number, test section and failure numbers should be written on the pipe.

7. After the failed segment of pipe has been removed from the line and treated as described above, the segment should be wrapped and taped in a water resistant film such as polyethylene to prevent contamination during transport and storage. The plastic film should be positioned on the failure segment to permit access to the failure surfaces for examination or reapplication of the oil coating.

8. Prepare the materials for shipment by a method that will immobilize the samples and prevent damage due to rolling into other objects. If the materials need to be cut to accommodate shipment, avoid cutting within 6 inches of the failure origin or any other fracture surface, if possible. When handling the materials, avoid using metal tie-down straps, chains, or hooks near the origin. Most items can be strapped onto a wood pallet with banding straps. If bands must be located near the origin, first cover the origin with several layers of cardboard and secure them to assure they will not move during transit. Smaller pieces may fall off a pallet and become lost, so use a box or crate to ship them.

9. The attached form should be filled out with and provided to the investigator by the pipeline operator for each leak or rupture type failure being analyzed.

10. The pressure to be reported is the calculated failure pressure at the location of the failure considering elevation. Under "description of failure," it should be reported whether the failure was a leak or a rupture and whether it was in the longitudinal weld, girth weld or pipe body. A short written description of the event is very helpful in adding completeness to the final investigation report. Not all data fields are always applicable. Complete it to the extent information is available.

Our shipping address for materials is:

Attn: {Associate's Name}
KAI Materials Test Facility
6384 Proprietors Road
Worthington, OH 43085

Phone: (614) 888-8220
Fax: (614) 888-8271

KIEFNER AND ASSOCIATES, INC.

PIPELINE INCIDENT BACKGROUND DATA

Thank you for selecting Kiefner & Associates to investigate your pipeline incident, anomaly, or material specimen. In order for us to make a thorough evaluation and to write a factually correct report, we need certain basic background information.

Please provide the following data to the best of your available information. Not all data fields will be applicable to your system or may be known.

1. Operating Company:
2. Product:
3. Line Name and Number and/or System Name:
4. Survey Station and Mile Post:
5. Date of Failure/Incident/Anomaly:
6. How was the Failure/Incident/Anomaly found:
7. State, county, and closest city or town:
8. Pipe nominal outside diameter:
9. Pipe nominal wall thickness:
10. Pipe grade:
11. Pipe seam type and joint length (if not 40 feet):
12. Pipe manufacturer:
13. Year of installation:
14. Coating type:
15. Cathodic protection type and year installed:
16. Distance to nearest rectifier or anode bed:
17. Terrain and soil conditions:
18. Distance to upstream and downstream compressor or pumping stations:
    Upstream: Downstream:
19. Distance to upstream and downstream girth welds:
    Upstream: Downstream:
20. Position of failure or anomaly on pipe circumference:
21. Pressure at time and location of failure/incident/anomaly:
22. Normal operating pressure at location of failure/incident/anomaly:
23. MOP, MAOP, Design Factor, and/or Location Class:
24. Date, Test Pressure, and Duration of most recent hydrostatic test:
25. Hydrostatic test pressure at location of failure/incident/anomaly:
26. Other comments and/or observations:

27. Contact information if we need further information (if not the addressee):

Thank you. When completed, please return this form by fax, email, or regular mail to the technical staff individual you are working with at:

Kiefner & Associates, Inc.
585 Scherers Ct.
Worthington, OH 43085
(fax) 614-888-7323