

## **Gathering and Protecting Physical Evidence to Assure an Effective Failure Analysis**

- 1. Take multiple photos of the undisturbed failure scene and/or the failed part in-place.**
- 2. Make and retain notes that refer to each photo if the facts are not obvious, e.g., ‘this is the 12 o’clock position on the pipe’, ‘this is the north end of the heat exchanger’, etc.**
- 3. Carefully handle removed, failed parts from the overall piece of equipment. Be particularly careful not to touch the fracture surfaces and do not attempt to fit them together.**
- 4. Preserve each removed, failed part or fractured piece by carefully wrapping it in a clean, dry cotton rag. This preserves separate pieces and prevents damage to adjacent parts. Label each wrapped part with duct tape and a Magic Marker if its identity or location is not obvious. Store all parts together in a clean, dry and protected location.**
- 5. If the failed part cannot be removed from the larger piece of equipment quickly, protect it from further damage and/or the weather by moving the entire assembly to a safe, protected location. If this is impossible, carefully cover and protect the overall piece of equipment where it is.**
- 6. If corrosion likely had a role in the failure:**
  - a) Retain and preserve all possible solid corrosion products, i.e., the loose rust if the material is an iron-based alloy. Do not attempt to remove corrosion product adhering to the failed part but keep both wrapped together in a clean, dry cotton rag.**
  - b) If it is safe and practical, get one or more samples of the process liquid to which the failed part was exposed. Store the liquid samples in air-tight, glass containers labeled as needed.**
  - c) Store these samples in a clean, dry and protected location.**
- 7. If wear likely had a role in the failure:**
  - a) Do not attempt to clean the worn surface(s) but preserve all possible loose wear debris by placing it in clean envelopes or air-tight glass containers. Label as needed.**
  - b) If a lubricant was being used for the failed part, get samples of it (oil or grease) from at or nearby the failure site. Preserve these samples in air-tight, glass containers.**
  - c) Store these samples in a clean, dry and protected location.**