Saudi K-KEM
NDT & Inspection Services

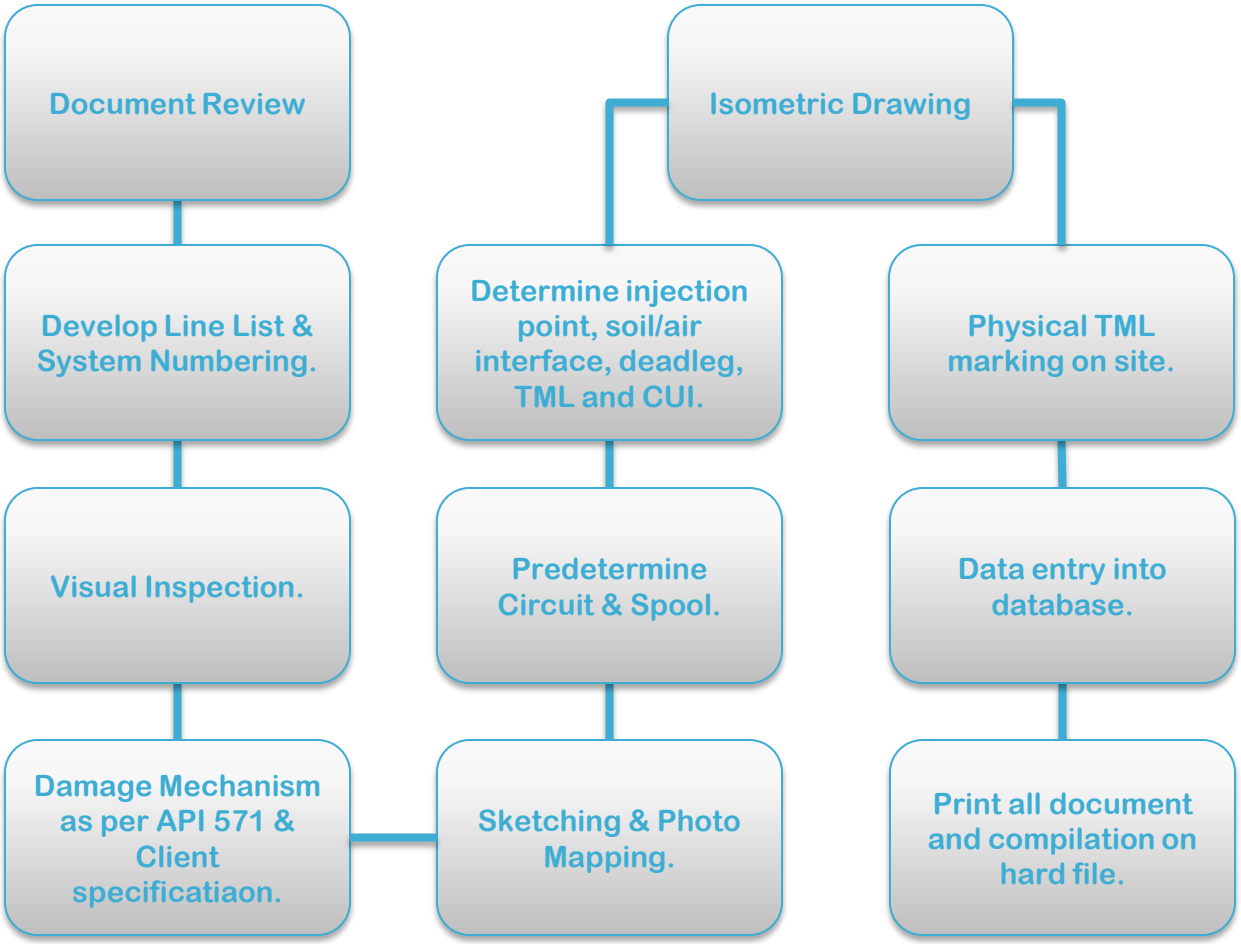
Saudi K-KEM NDT & Inspection Services

The Developments Of Piping Corrosion Circuit as per API 570 , API 571

by

Saudi K-KEM
NDT & Inspection Services

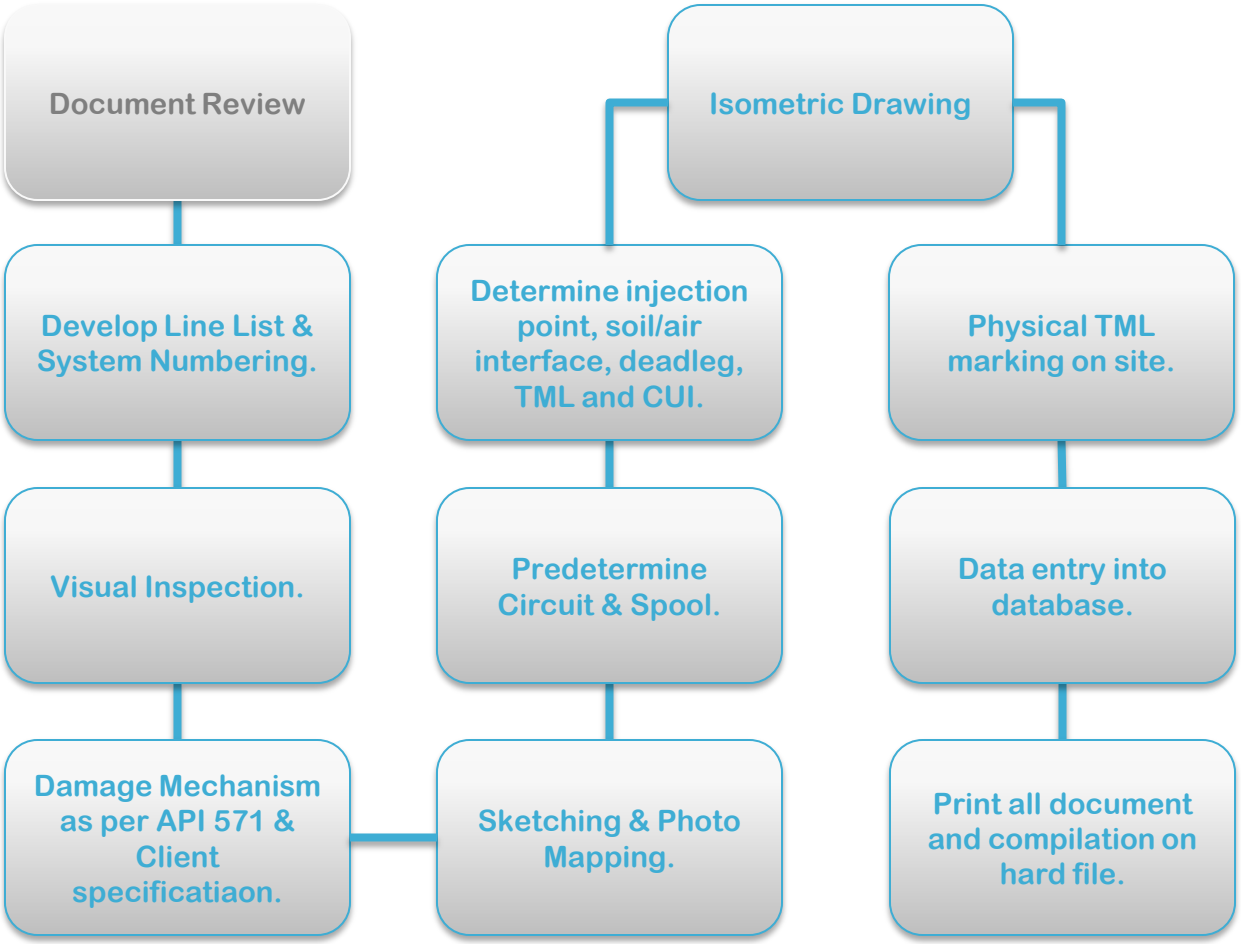
- To create a comprehensive database for the newly constructed piping system.
- The database created will be able to have a good and efficient inspection program in order to monitor the piping integrity and finally to help the maintenance department for its preventive and support RBI program maintenance schedule effectively.
- By having this program it perhaps will reduce the unplanned shutdown.


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

Document Review.

Collect the following document/ data from client for review;

1. Isometric as built drawing
2. Piping and Instrument Diagram (P&ID)
3. Mechanical Flow Diagram (MFD)
4. Line List
5. Piping Specification


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

Develop Line List & System Numbering.

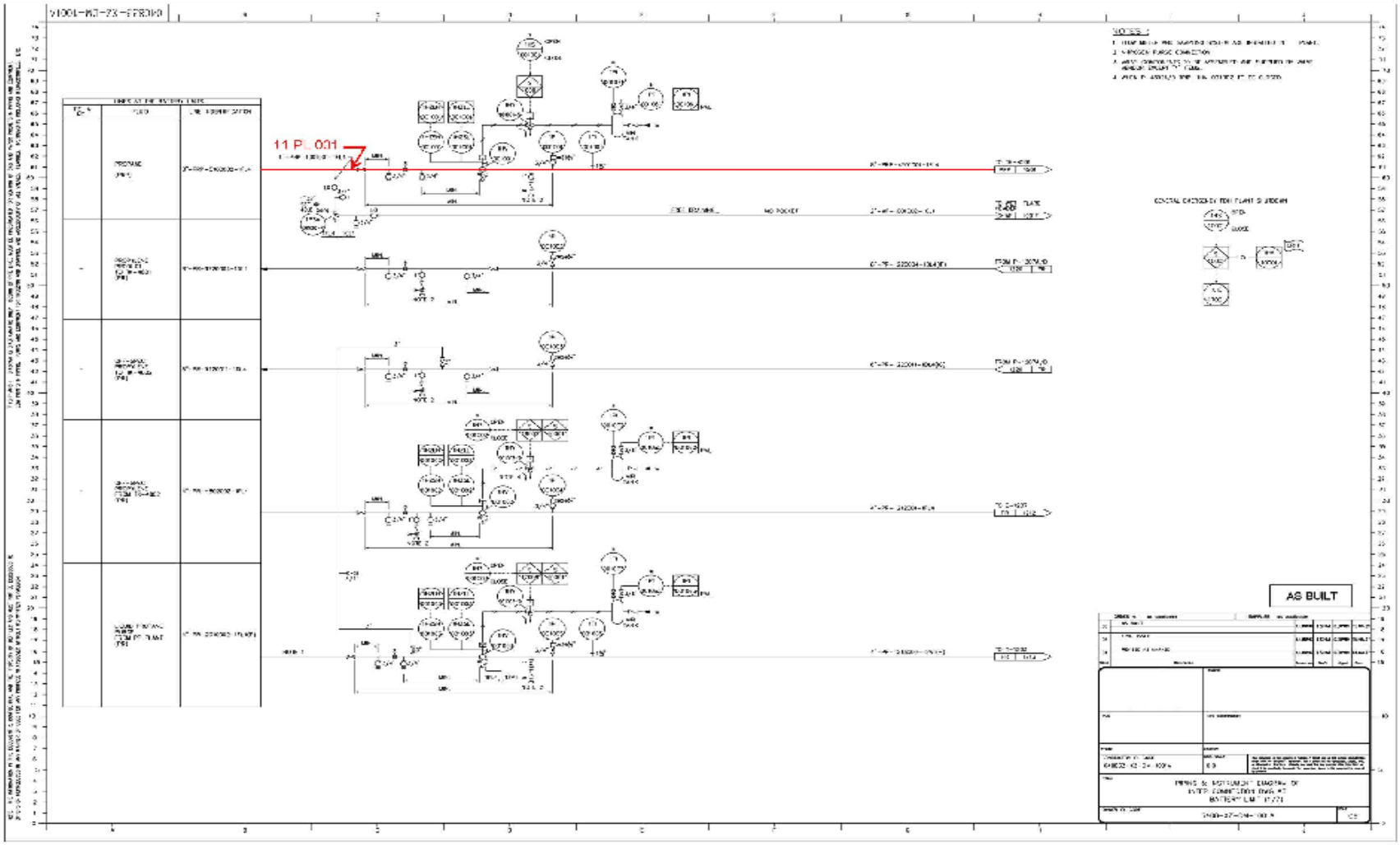
To classify all piping. Production group input is required.

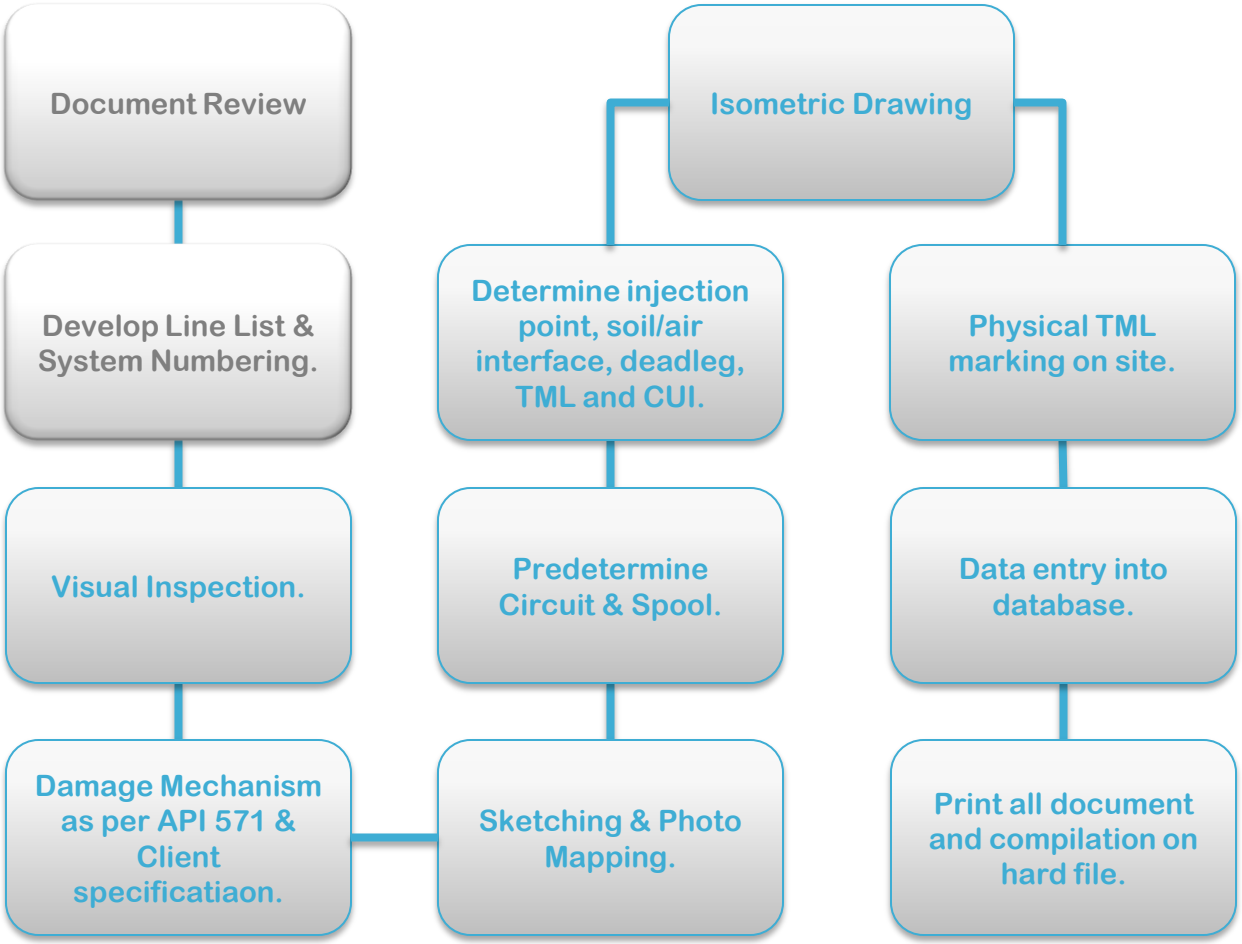
Determine if the line falls within the scope of API 570.

To initiate any changes or correction to the line class, however this shall be made upon client approval.

Develop a Line List which is start from the main streams and end with other streams, based on their design condition i.e pressure and temperature.

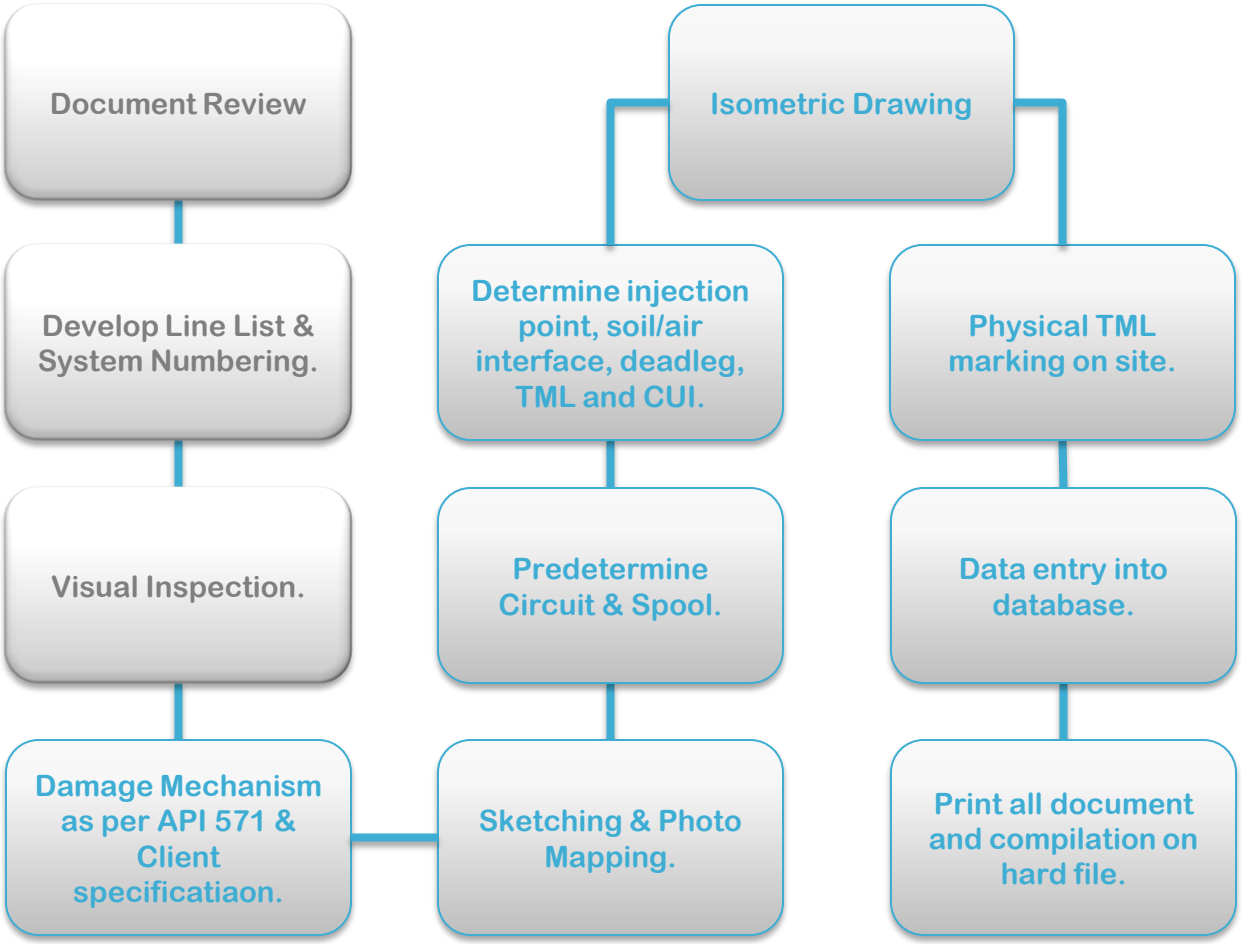
Assign a system number for each line.


AS BUILT


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

Visual Inspection.

To carry out visual inspection for the designated line. The inspector is responsible to physically visualize the line against the as built isometric drawing.


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

Damage Mechanism as per API 571

Report No.: NDTSKKEM / SRP / DM / 035 / 2010 /

TS NDT & Inspection Services
(K-KEM Engineering Services Sdn. Bhd.)

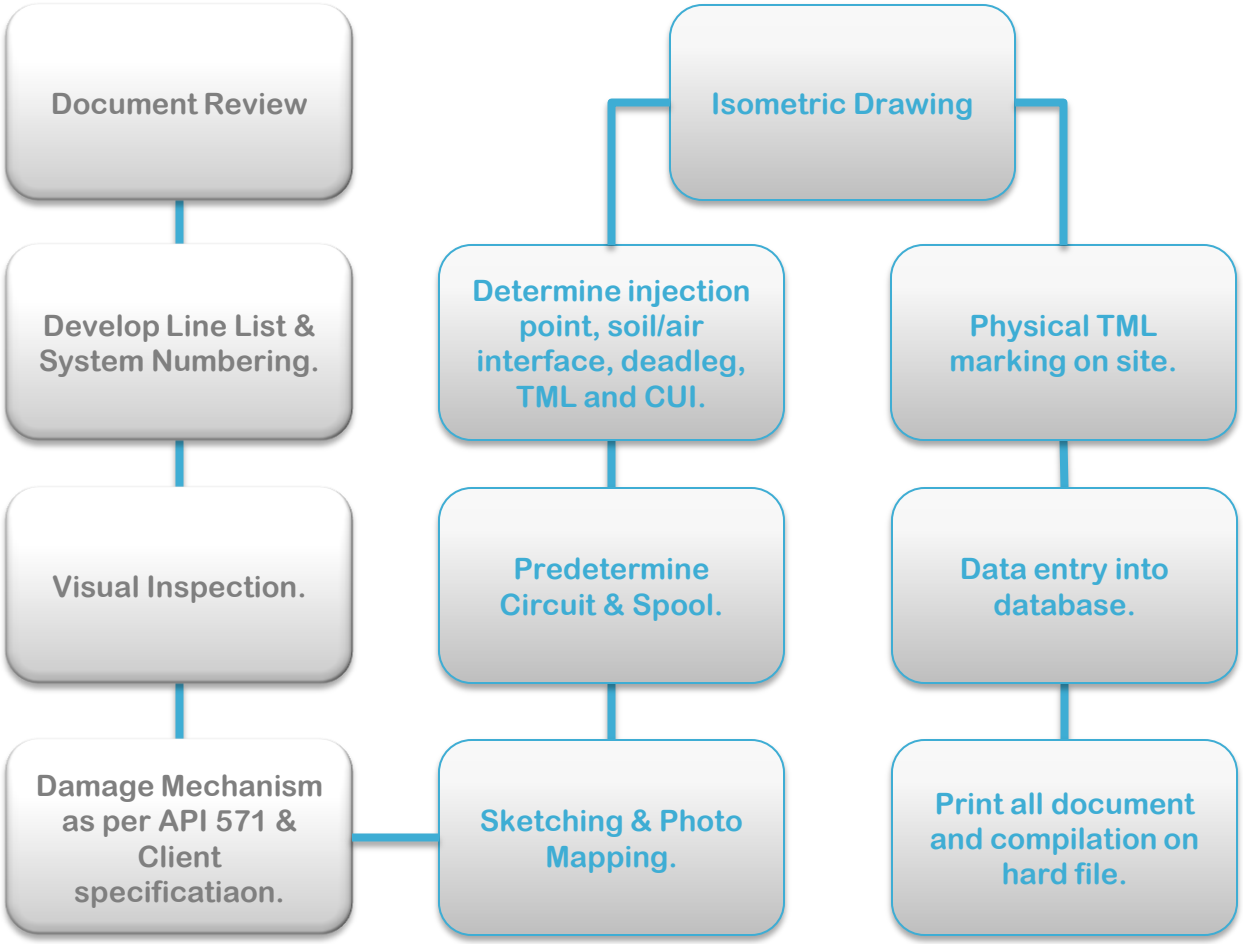
Client : SAHARA PETROCHEMICAL COMPANY
Project Name : SAHARA RELIABILITY PROJECT (SRP) - MERIDIUM SOFTWARE
Plant : AL WAHA

DAMAGE MECHANISM REPORT

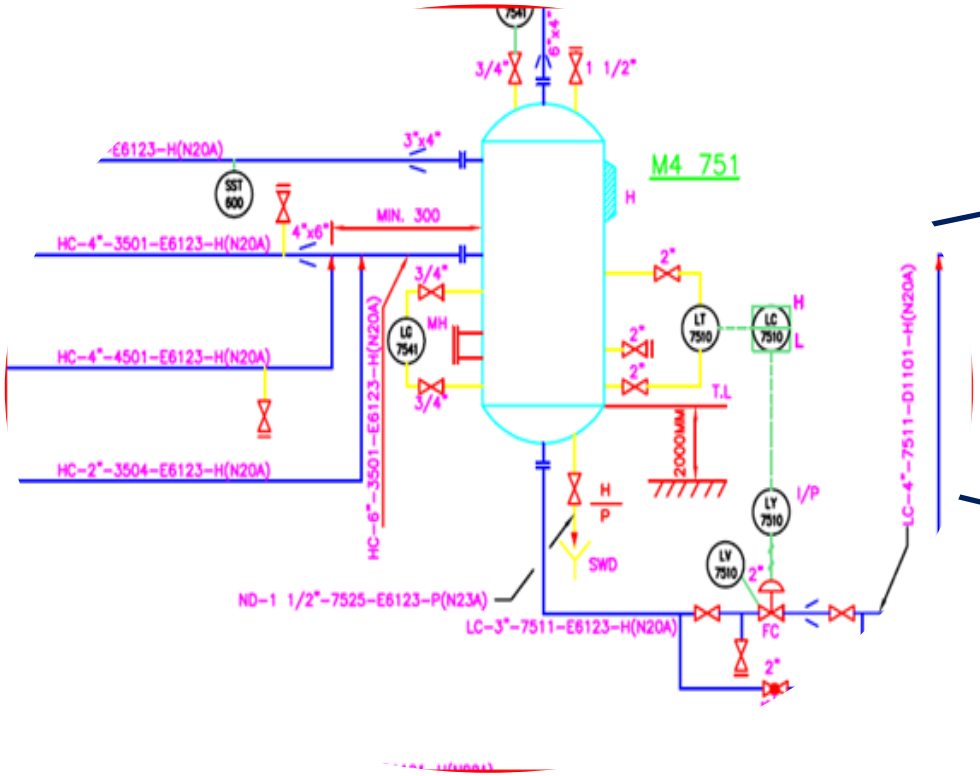
IDENTIFICATION	
1. System Number: 12 PL 035	6. Operating Temperature: 50°C / 100°C
2. Isometric Number: 12 PL 035	7. Operating Pressure: 40 BarG
3. Medium: ET / Gas	8. Line Routing From: E-2710
4. Piping Spec: 1FC4	9. Line Routing To: E-2711
5. Insulation Type: IB	10. Others (if any): N/A

DM #	Damage Mechanism	API 571 Fig. #
46	Corrosion Under Insulation (CUI)	N/A

Prepared by (Document Controller) :	Reviewed by (Inspector) :	Approved by (Inspector Supervisor) :	Reviewed and Approved by (Client) :
Name : Noorazam Date : 29/3/10	Name :M. RASHID Date : 30/3/10	Name : RAFIZAM Date 29/03/2010	Name : Date :

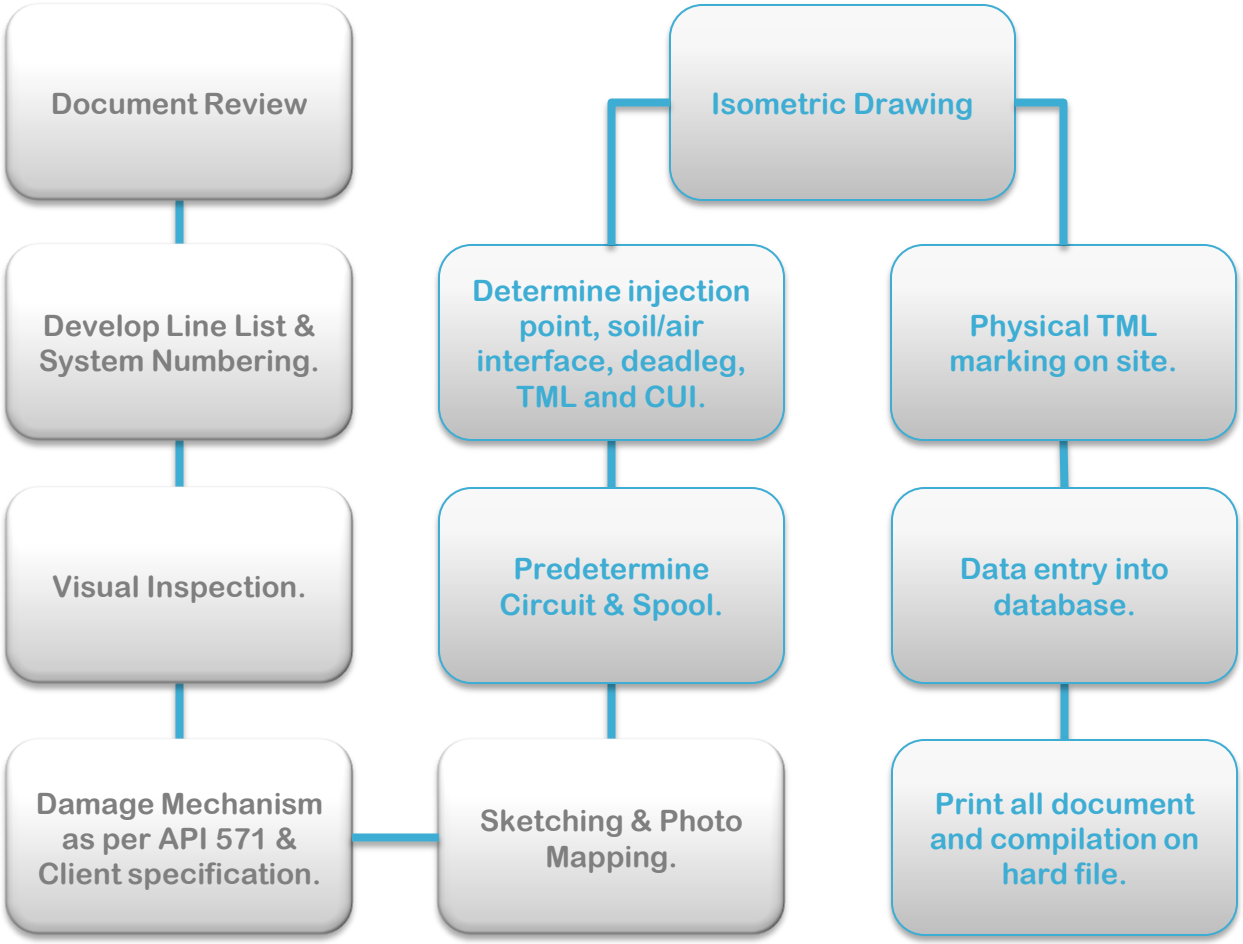

Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

Sketching and Photo Mapping.

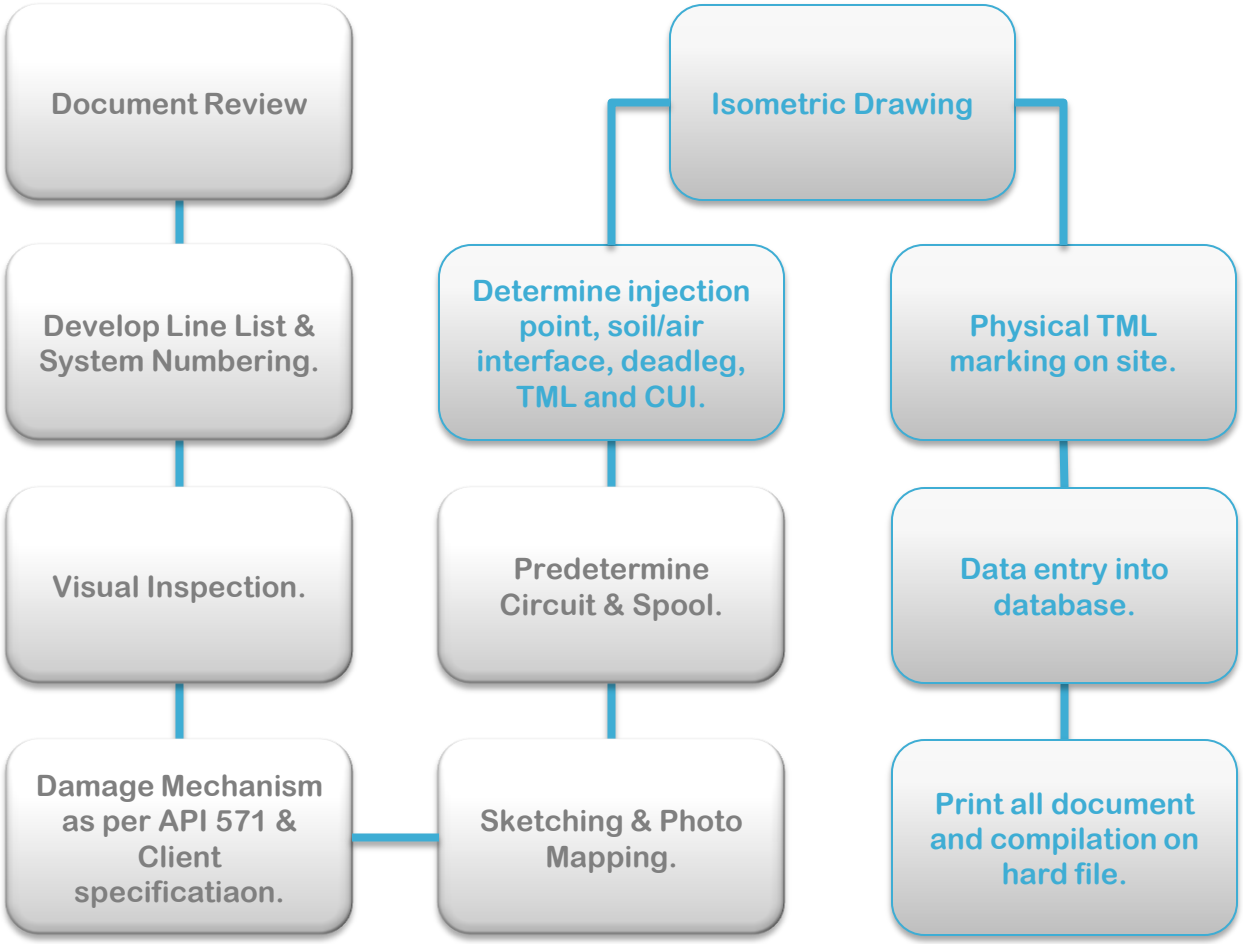


To manually sketch for the corrosion isometric. During the sketch, the inspector to indicate the line flow direction i.e from equipment to equipment. This to ensure the continuity of the line system.

The photo mapping is required in order to make the isometric drawing produce can be easily visualize.


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specification.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

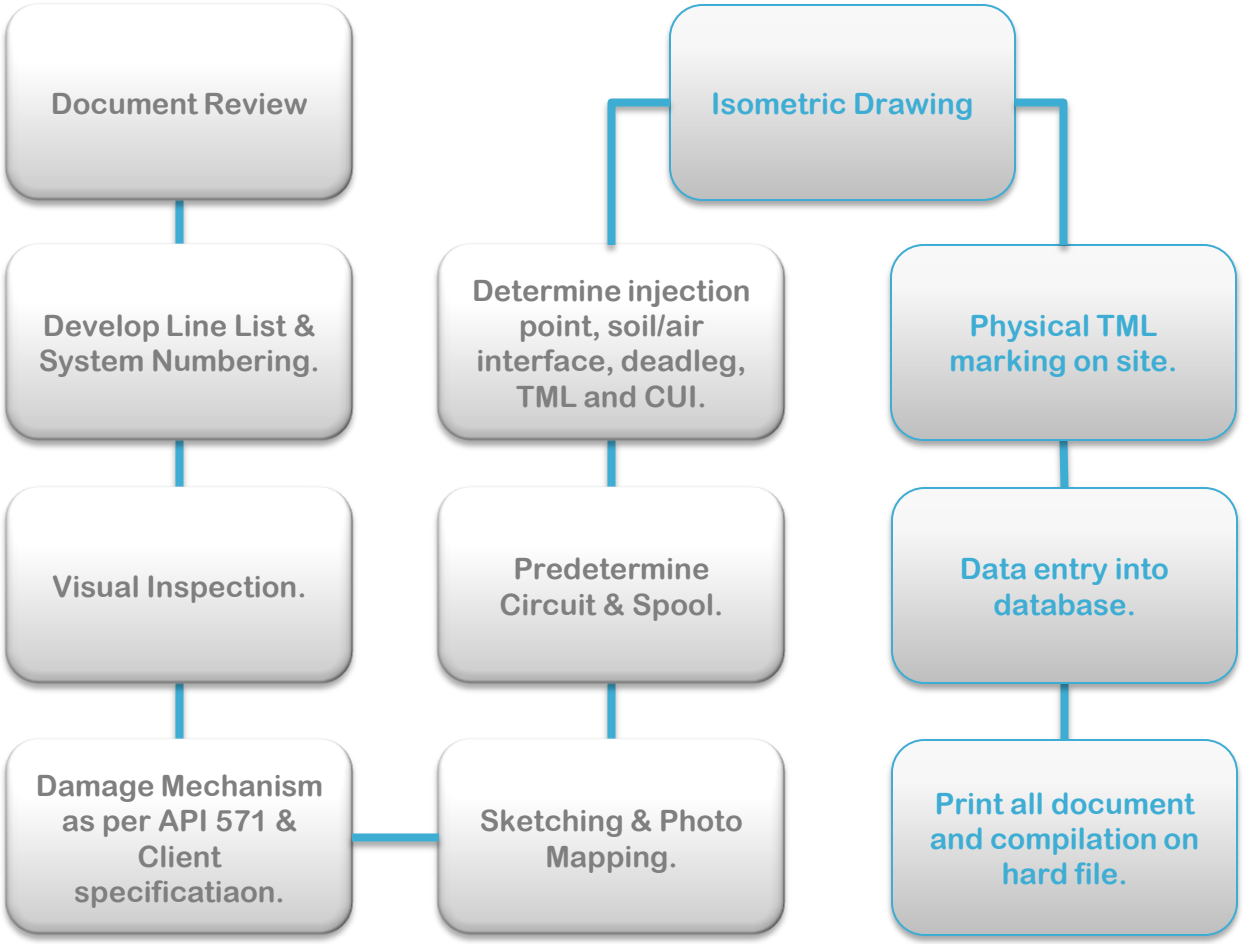
PREDETERMINE CIRCUIT AND SPOOL


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

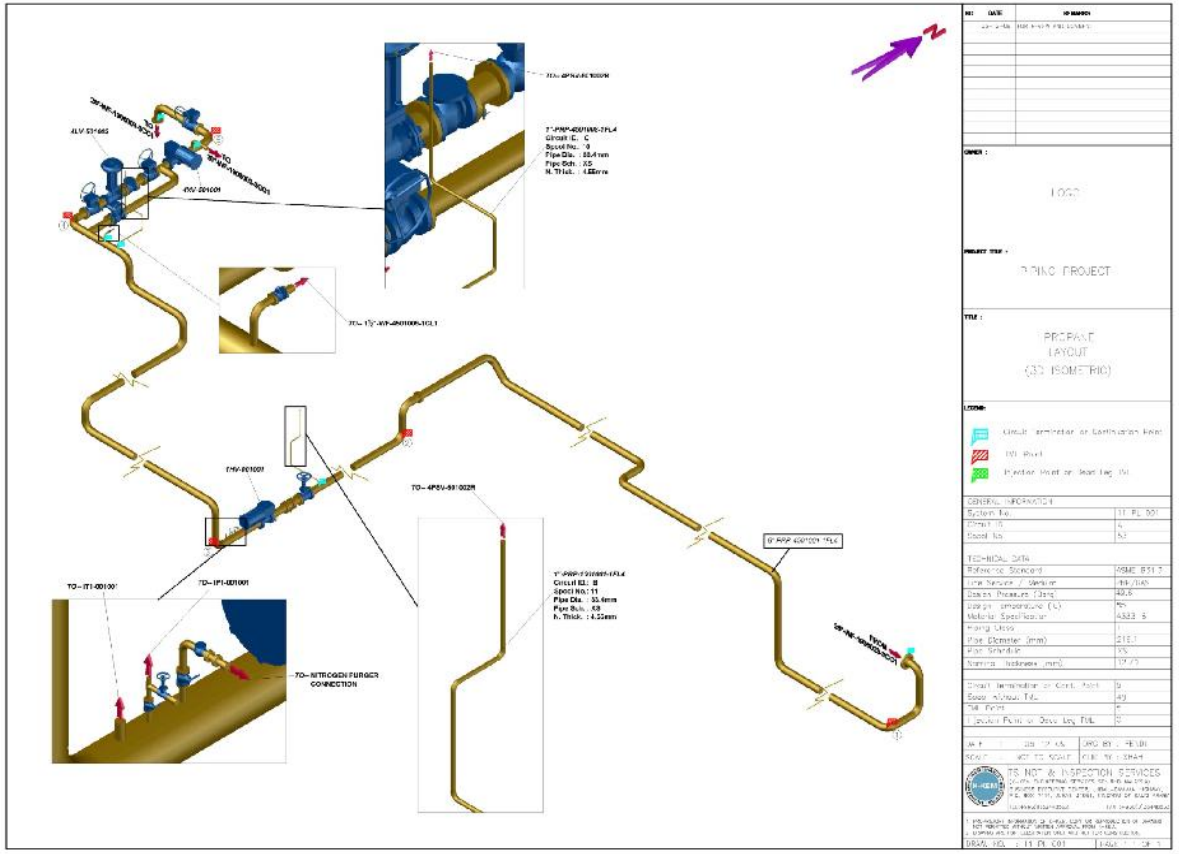
Determine injection point, soil/air interface, deadleg, TML and CUI

To indicate the existent of injection point, soil/air interface, dead leg as well as to mark up the MFD drawing for future references.

To determine the piping susceptible to CUI as indicated by client. Criteria will be shared. However, production group input is required.


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

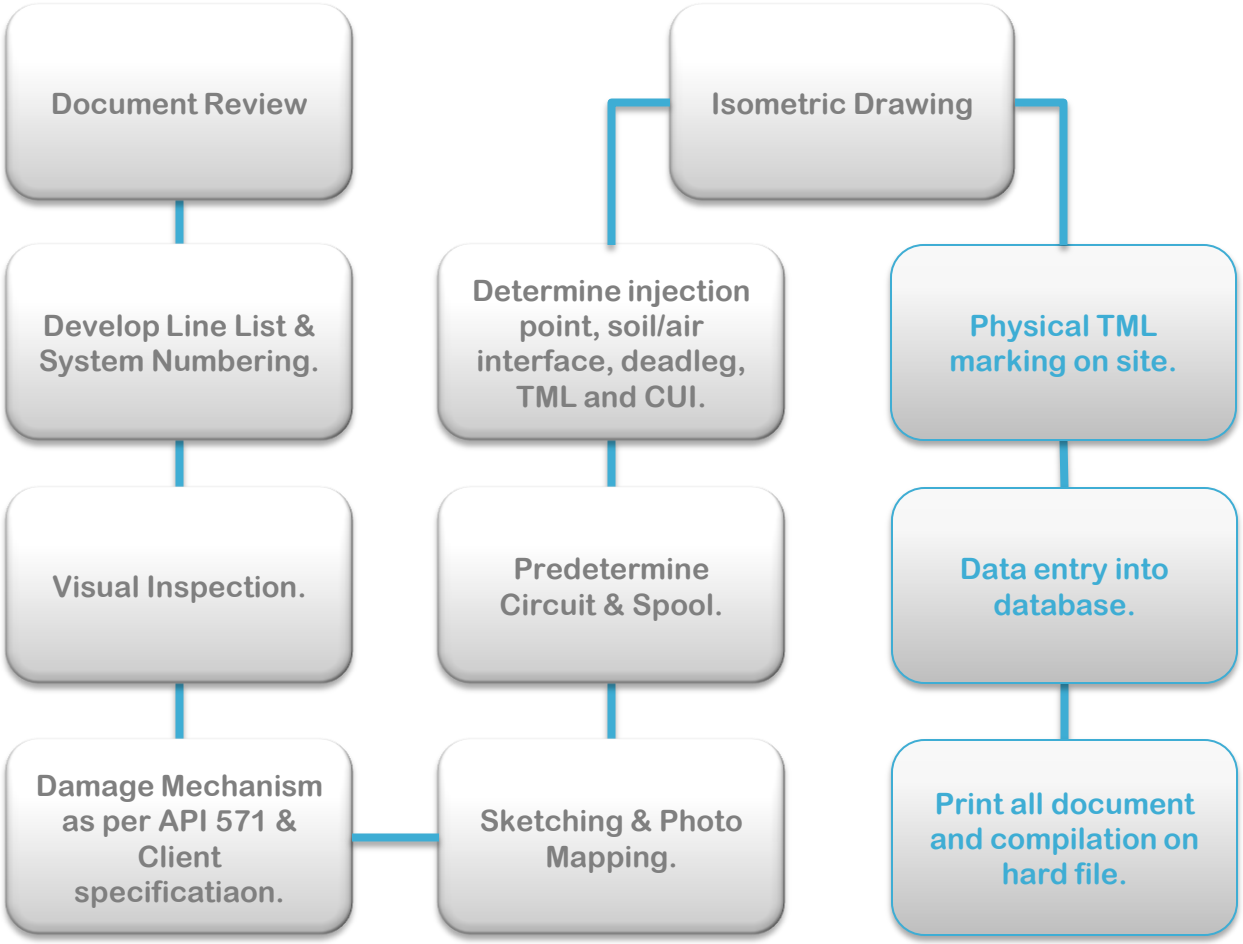
3D Isometric Drawings.



To develop Corrosion Isometric Drawing.

The drawing shows Circuit Termination and Continuation, TML Point, Injection Point or dead leg and Technical Data.

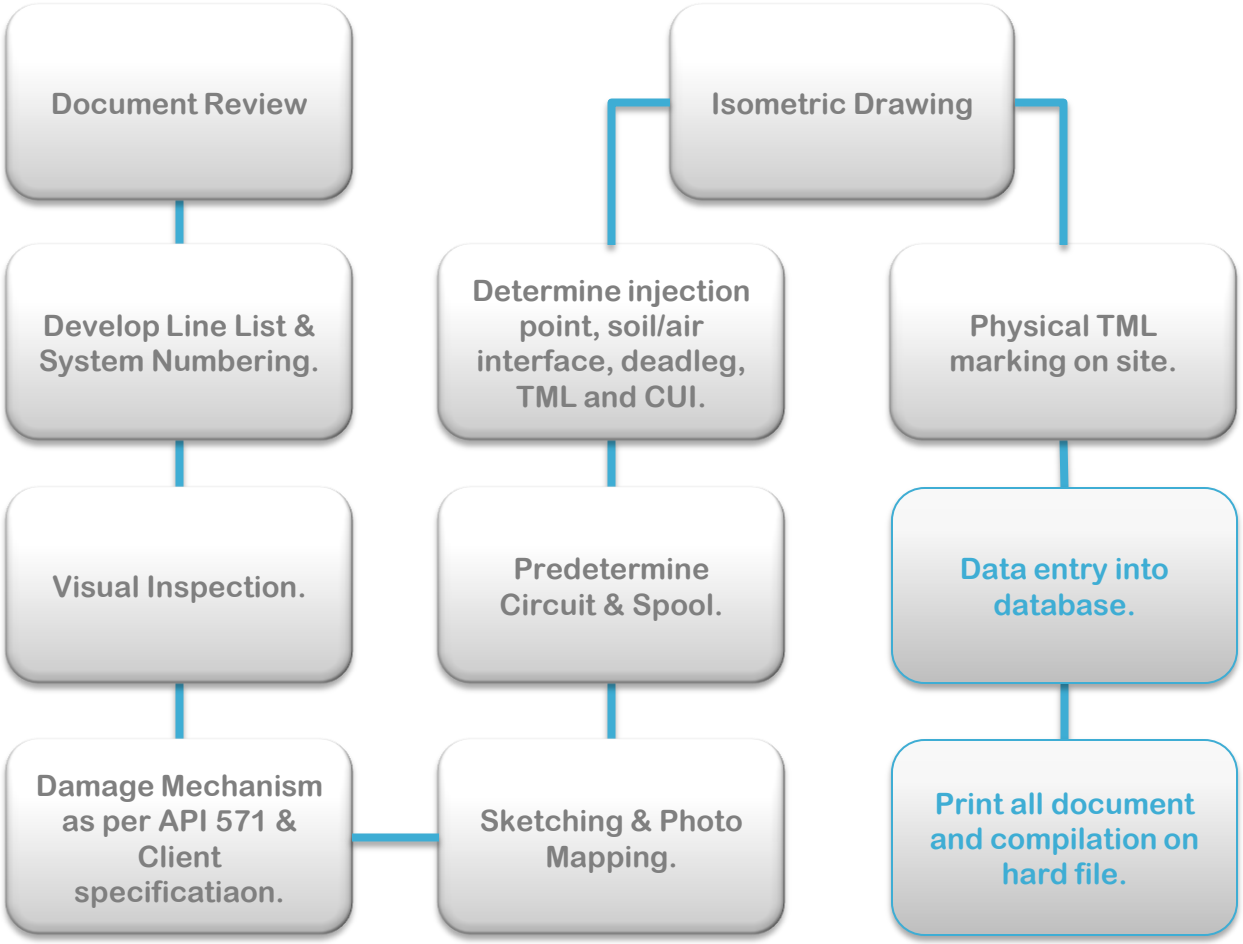
To indicate TML on the corrosion isometric drawing.


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

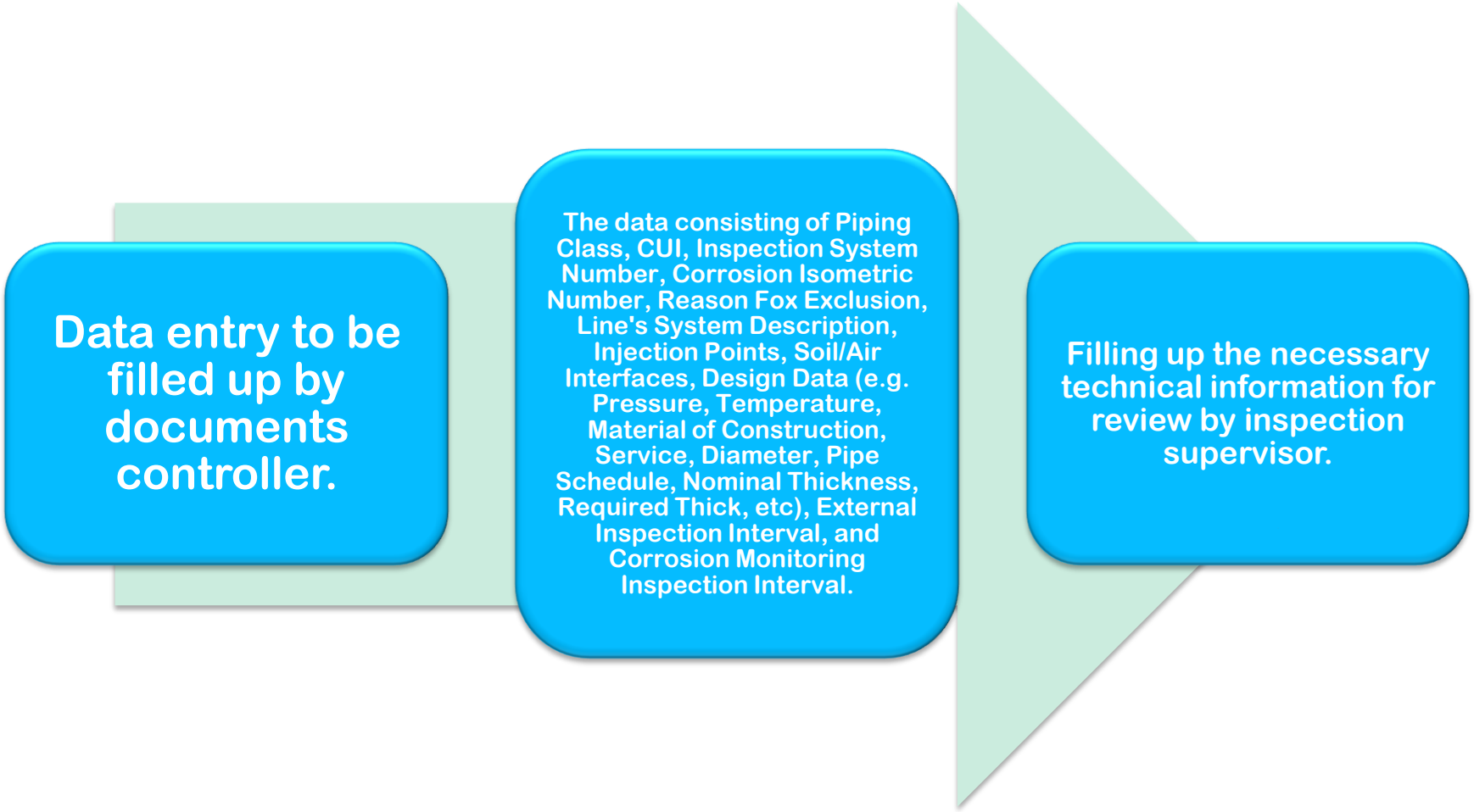
Physical TML marking on site.

To complete the TML number determinati on Sheet for each circuit.

To physically identify and marking on site for the TML.


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

Data entry into database.



Data entry into database (cont.)

To set the external inspection interval for each system and it should be carry out in accordance to API 570. Shorten interval should be considered for system with potential external corrosion problem.

Those system that fall under class # 4, the interval shall be suggested, reviewed and approved by the contractor and finally, again to be reviewed and approved by client.

To assess each system to determine if corrosion monitoring is required. If corrosion monitoring is not required for the system therefore it shall be document for the reason for excluding the system on the corrosion monitoring exclusion form. This shall be agreed by client. Production group input is required.

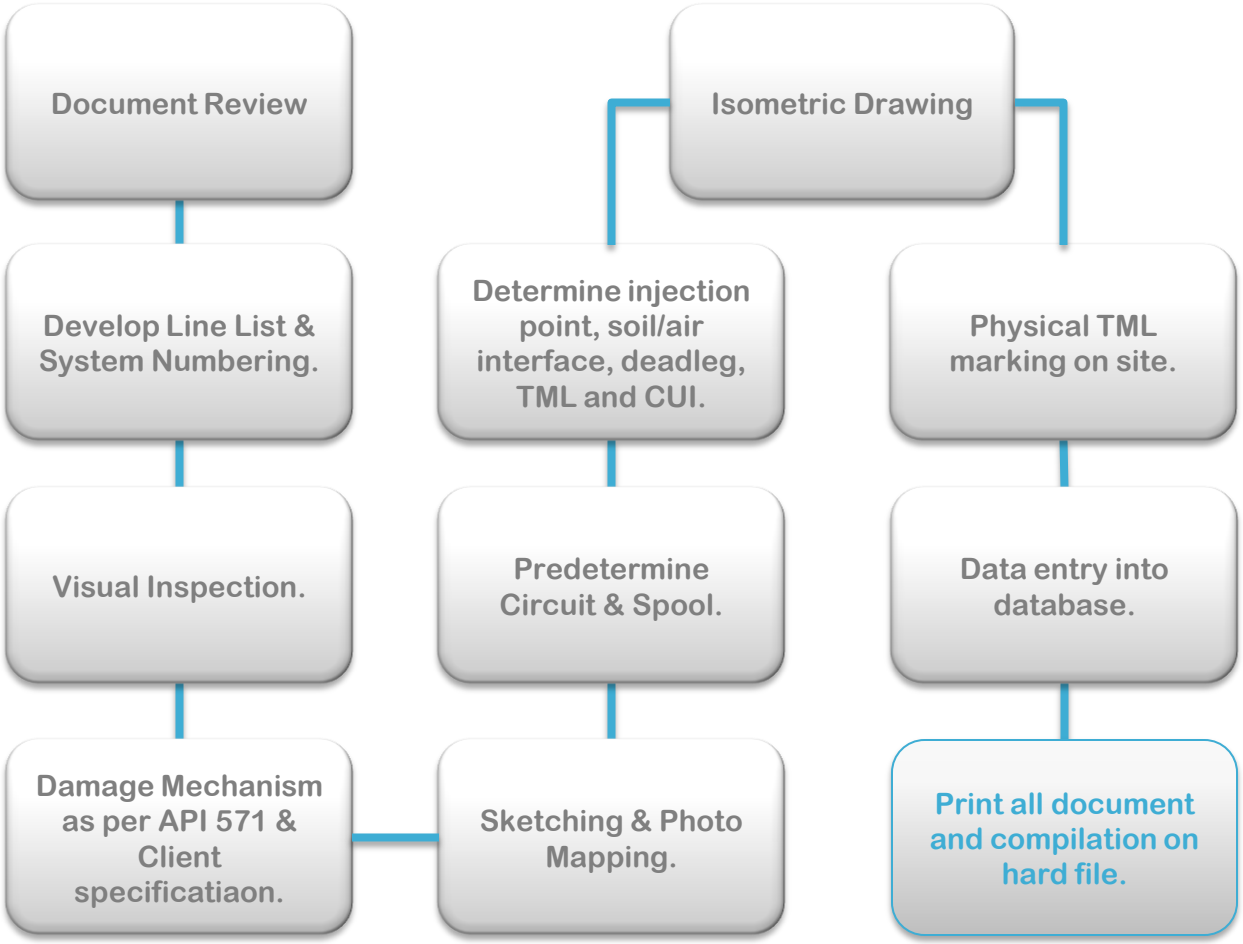
TYPICAL EXAMPLE – DATA BASE

TYPICAL EXAMPLE – PIPING/EQUIPMENT MERIDIUM TEMPLATE.

In addition to the above, we are currently engaged with SAHARA reliability Dept. in development of their corrosion circuit as per API570/571, i,e. to produce 3D ISO Drawing, TML identification, Dead Leg, circuit termination, spool as well as filing up all the data governed into the MERIDIUM Template.

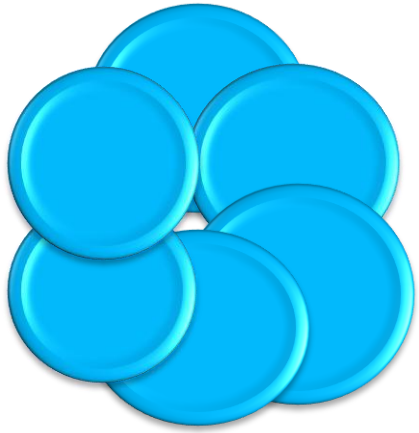
Our team as for this project consisting of K-KEM for the corrosion circuit development + MERIDIUM for the software.

The piping thickness base reading had been carried out using a data logger UT machine which is in complying to the MERIDIUM software. The machine used was OLYMPUS Panametric DL37 plus as recommended by MERIDIUM.


Document Review
Develop Line List & System Numbering.
Visual Inspection.
Damage Mechanism as per API 571 & Client specificatiaon.
Isometric Drawing
Determine injection point, soil/air interface, deadleg, TML and CUI.
Predetermine Circuit & Spool.
Sketching & Photo Mapping.
Physical TML marking on site.
Data entry into database.
Print all document and compilation on hard file.

Printing all document and compilation on hard file.

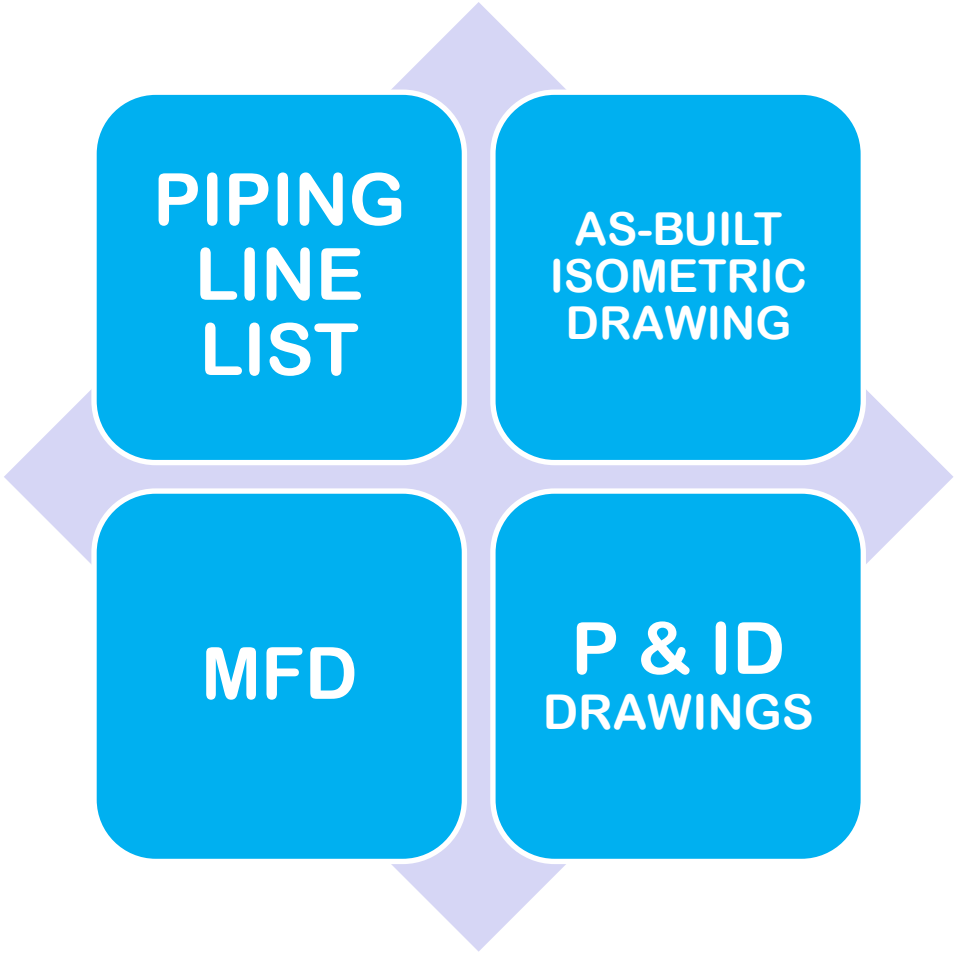
To provide the hard file for finalizing all document prepared.



Also to provide soft copy of all required document.

Printing all document and compilation of piping inspection set-up plan prior to submission to client.

OUR REQUIREMENTS.



Q & A SESSION.