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NDT & Inspection Services

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

by

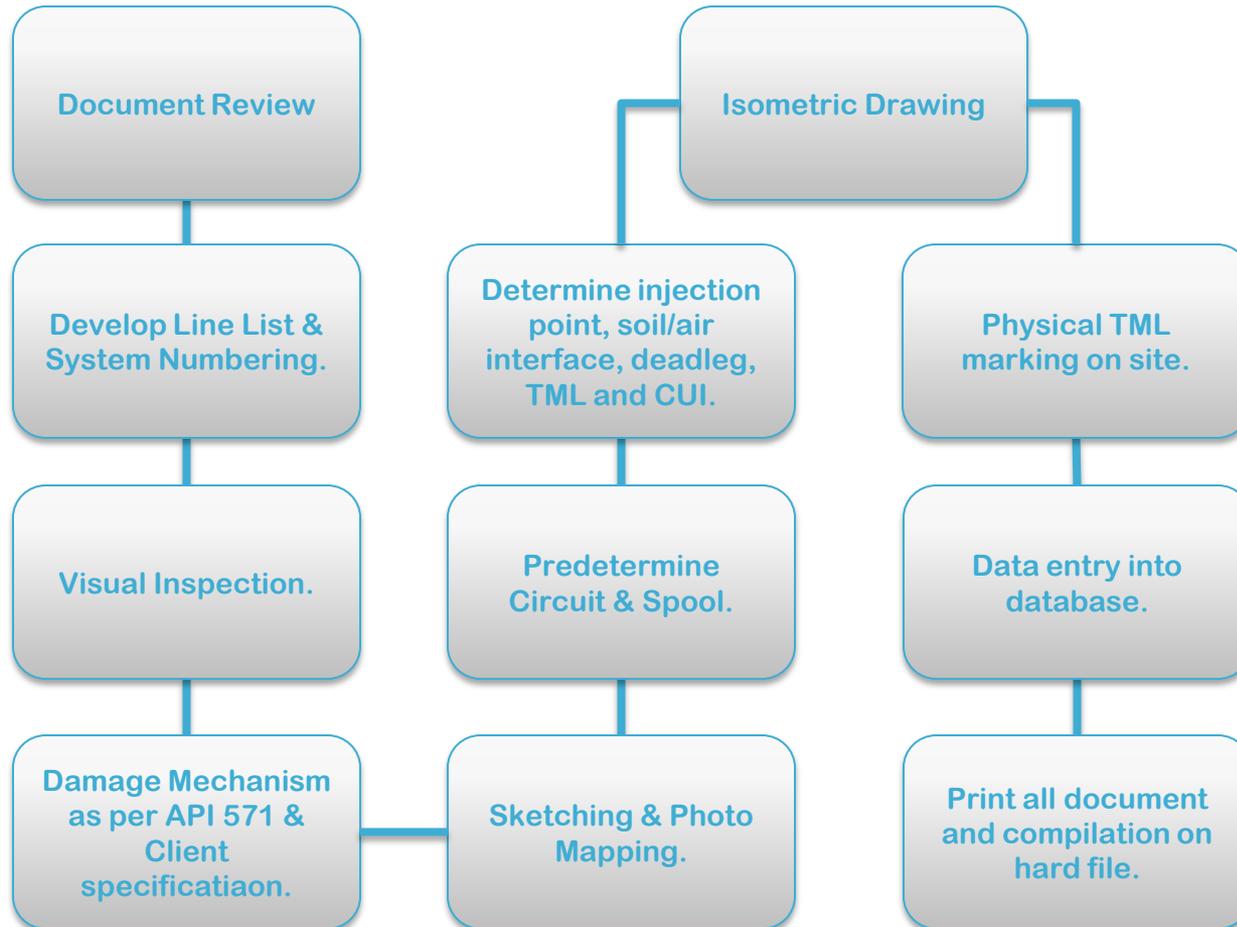


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- To create a comprehensive database for the newly constructed piping system.
- The database created will be able to have a good and efficient inspection program in order to monitor the piping integrity and finally to help the maintenance department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







Document Review.

Collect the following document/
data from client for review;



1. Isometric as built
drawing



2. Piping and Instrument
Diagram (P&ID)



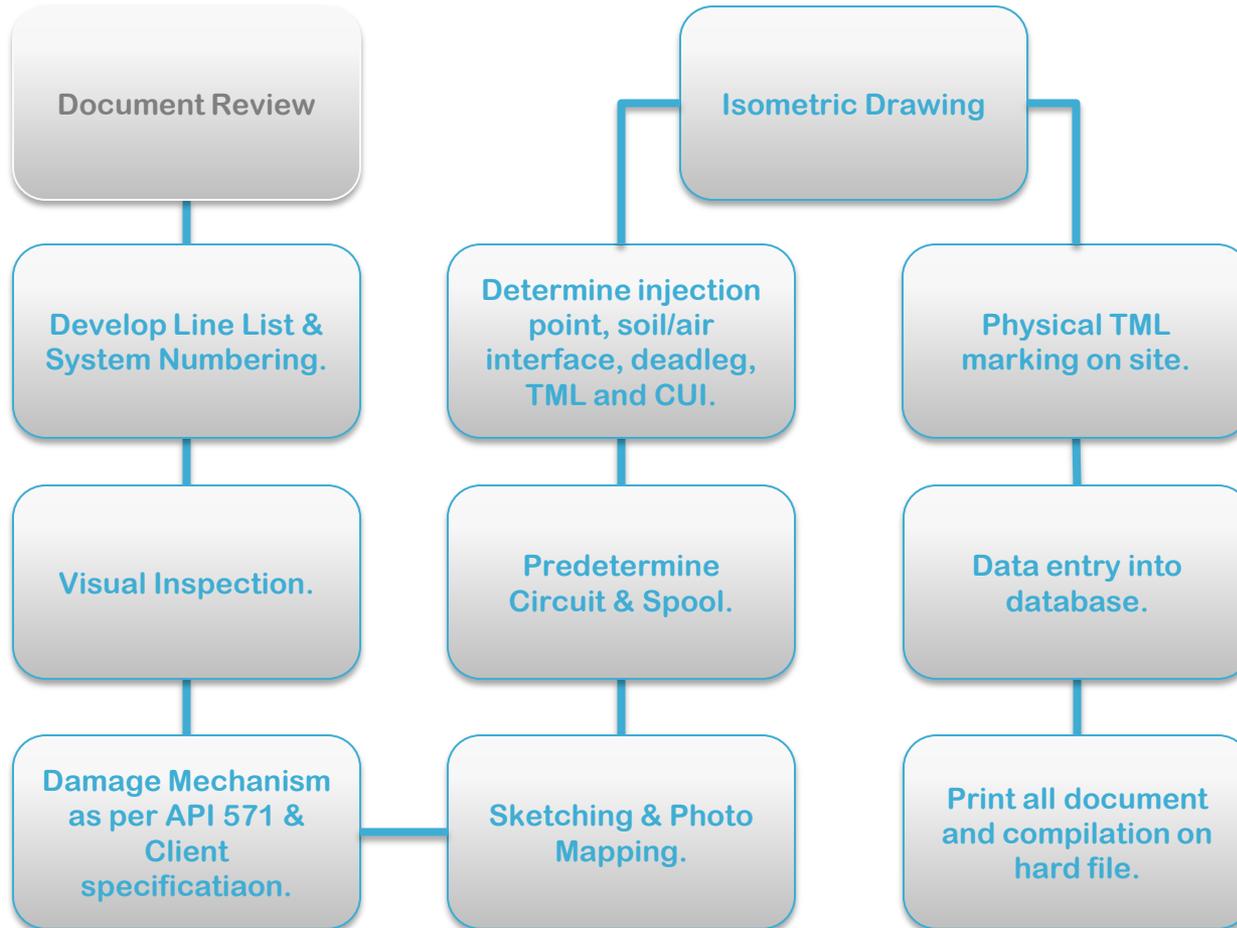
3. Mechanical Flow
Diagram (MFD)



4. Line List



5. Piping Specification



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.

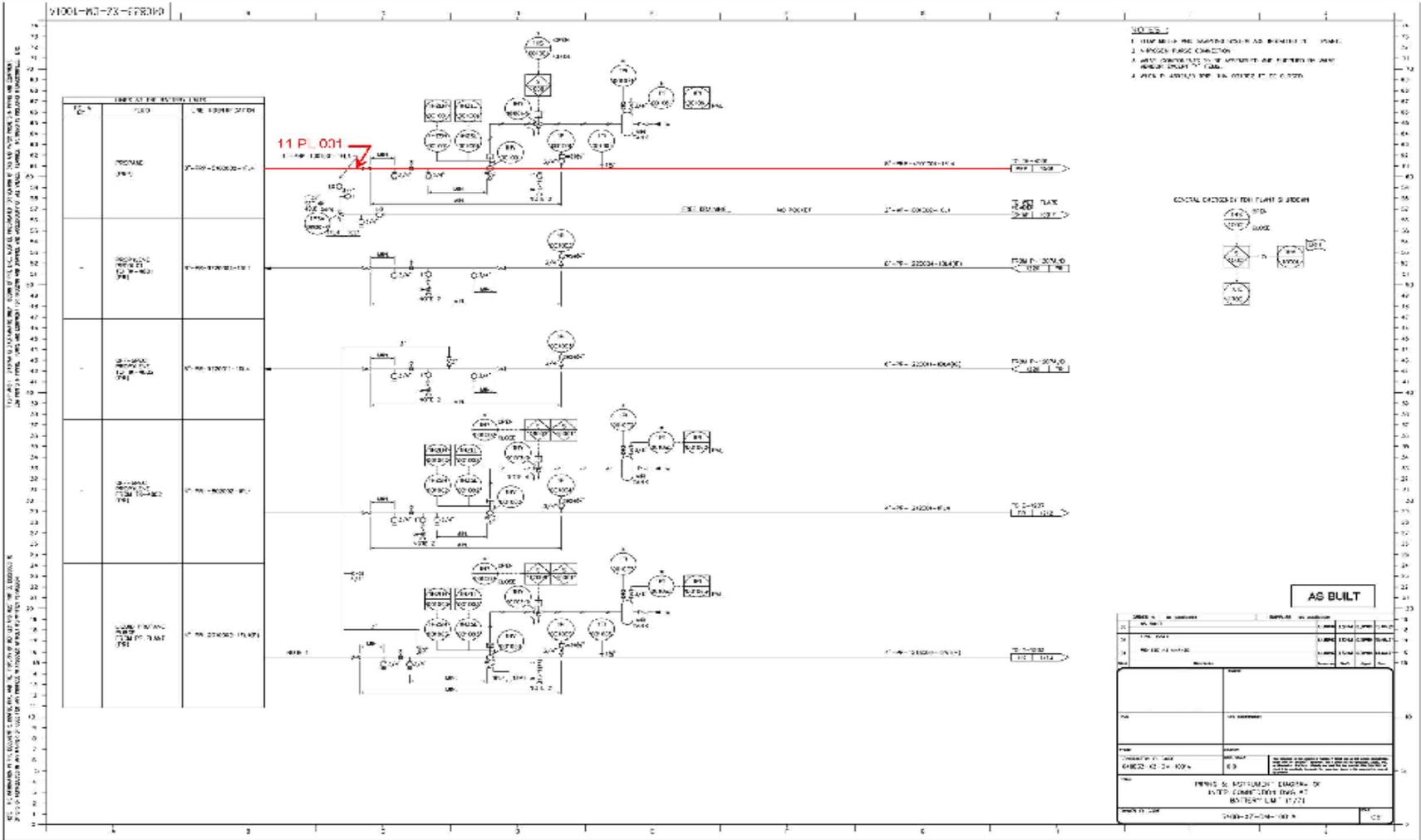
Develop a Line List which is start from the main streams and end with other streams, based on their design condition i.e pressure and temperature.

Assign a system number for each line.



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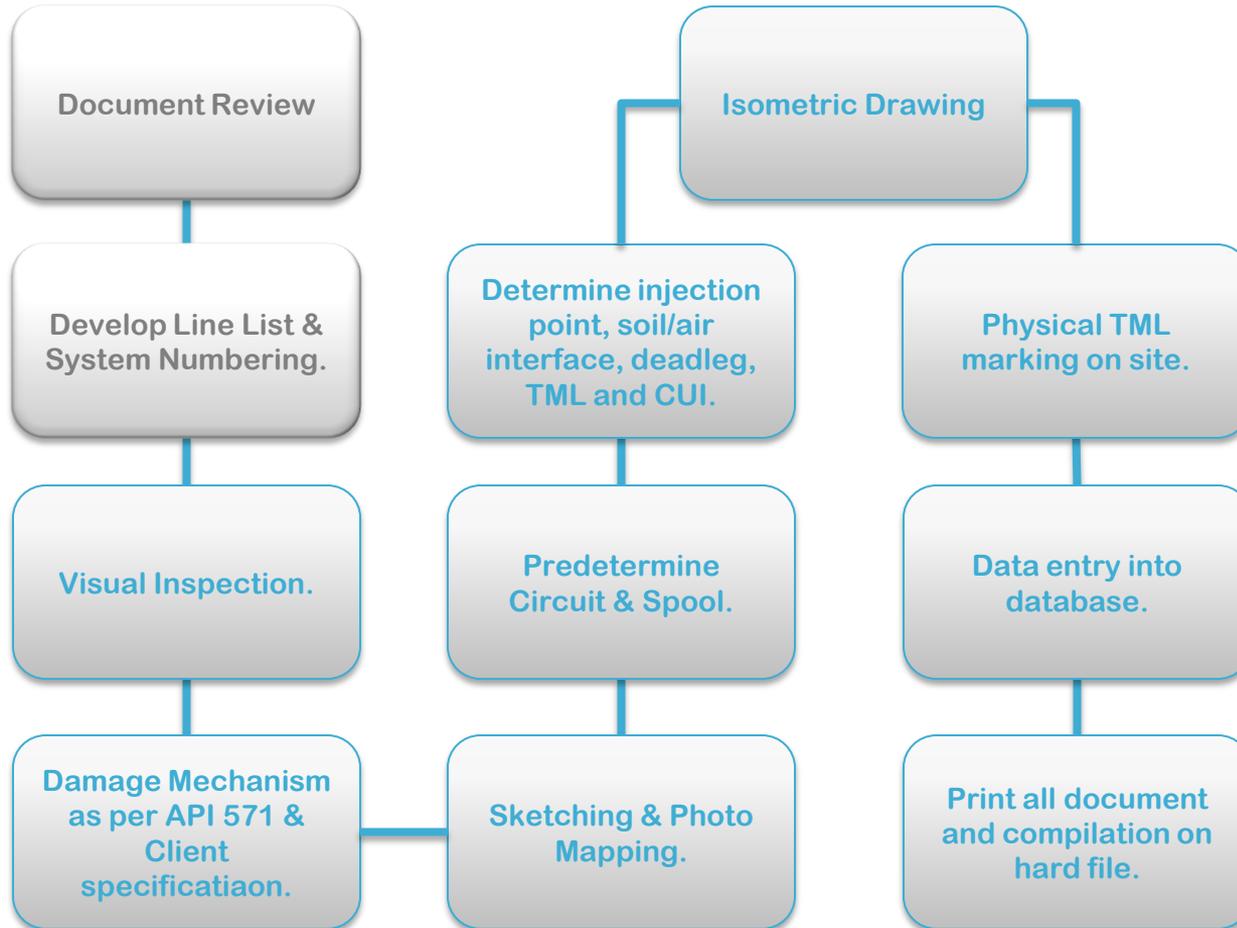
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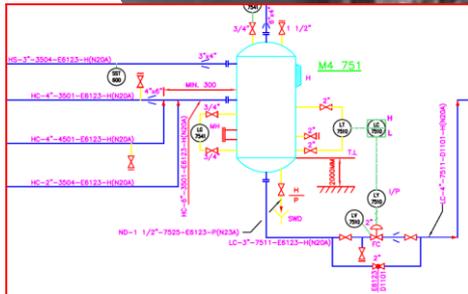
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Visual Inspection.

LC-4"-7511-D1101-H(N20A)

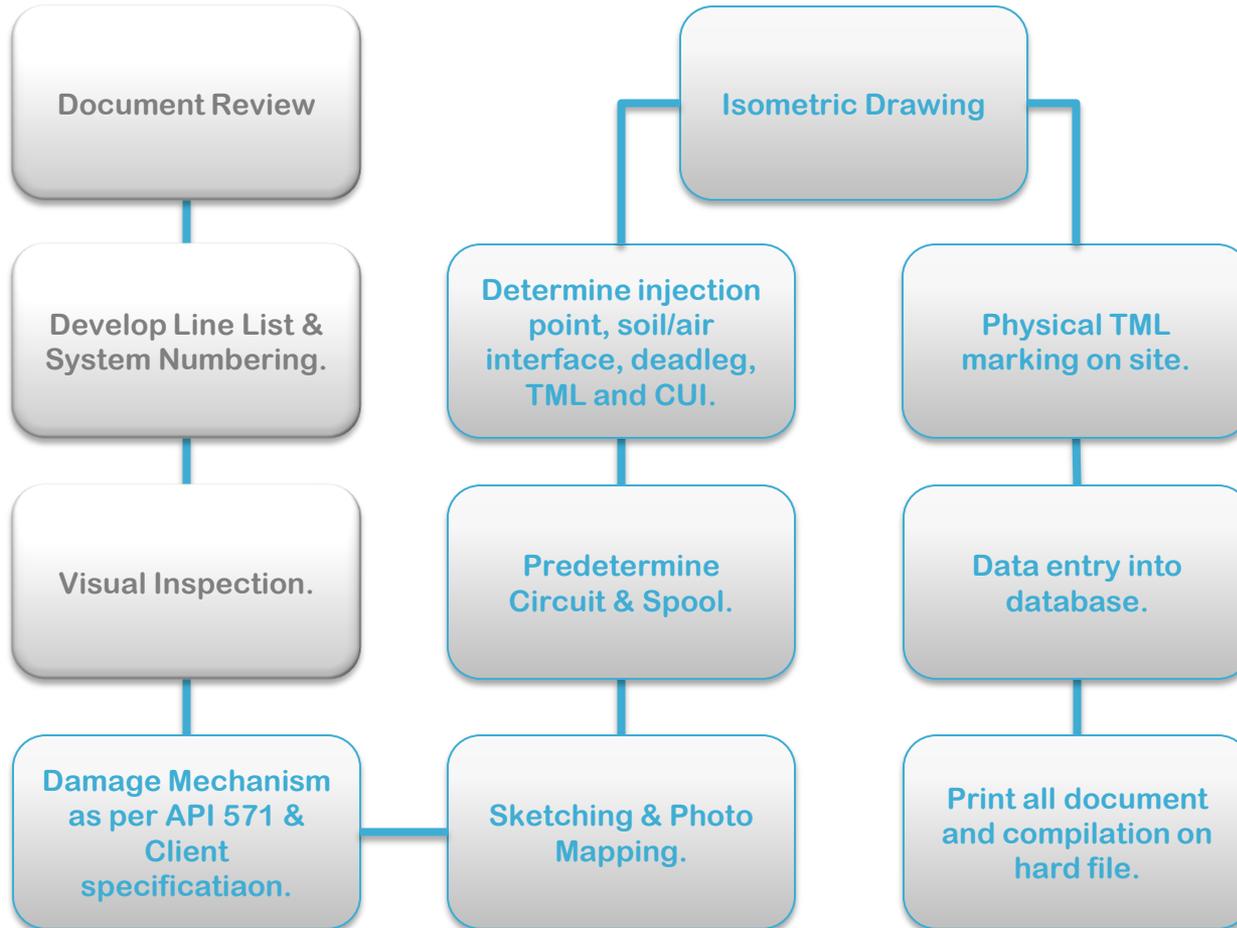


To carry out visual inspection for the designated line. The inspector is responsible to physically visualize the line against the as built isometric drawing.



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Damage Mechanism as per API 571

Report No.: NDTSKKEM / SRP / DM / 035 / 2010 / 1



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

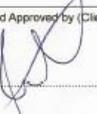


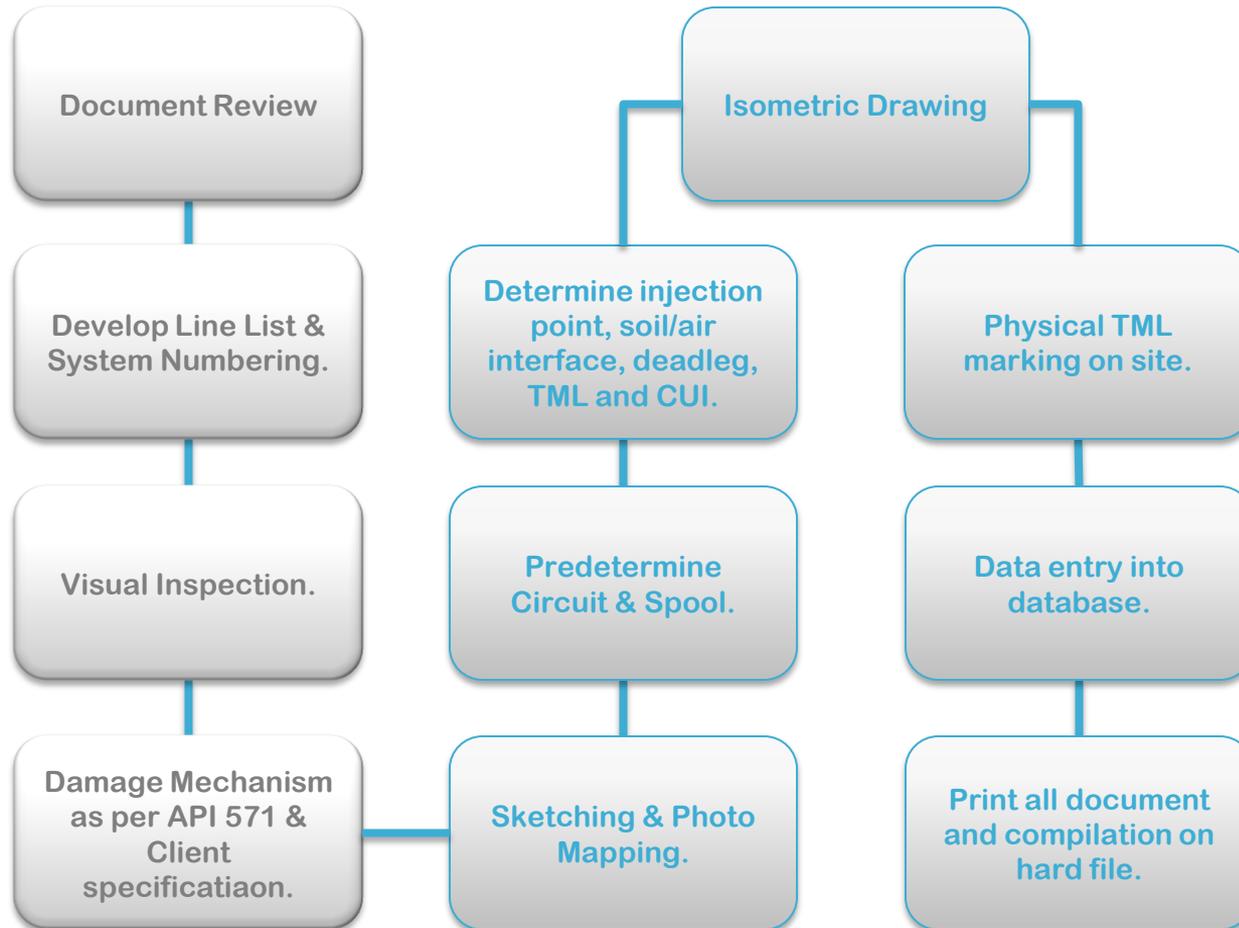
Client : SAHARA PETROCHEMICAL COMPANY
Project Name : SAHARA RELIABILITY PROJECT (SRP) - MERIDIUM SOFTWARE
Plant : AL WAHA

DAMAGE MECHANISM REPORT

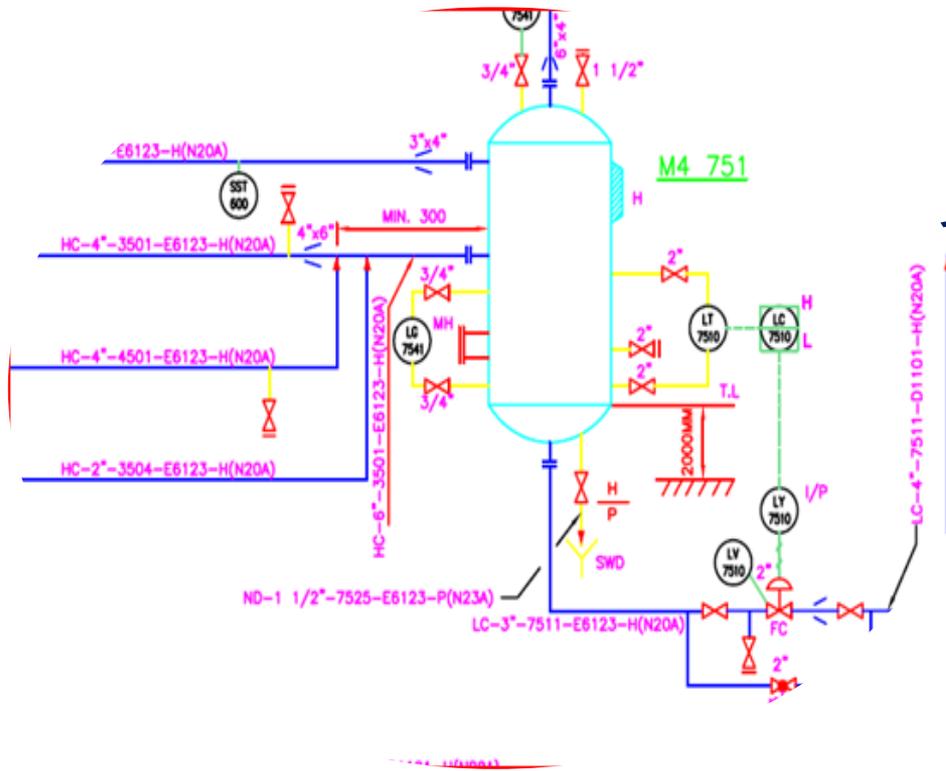
IDENTIFICATION	
1. System Number: 12 PL 035	6. Operating Temperature: 50°C / 100°C
2. Isometric Number: 12 PL 035	7. Operating Pressure: 40 BarG
3. Medium: ET / Gas	8. Line Routing From: E-2710
4. Piping Spec: 1FC4	9. Line Routing To: E-2711
5. Insulation Type: IB	10. Others (if any): N/A

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

Prepared by (Document Controller):  Name: Noorazzam Date: 29/05/10	Reviewed by (Inspector):  Name: M. RASHID Date: 30/5/10	Approved by (Inspector Supervisor):  Name: M. F. Osman Date: 29/05/2010	Reviewed and Approved by (Client):  Name: Date:
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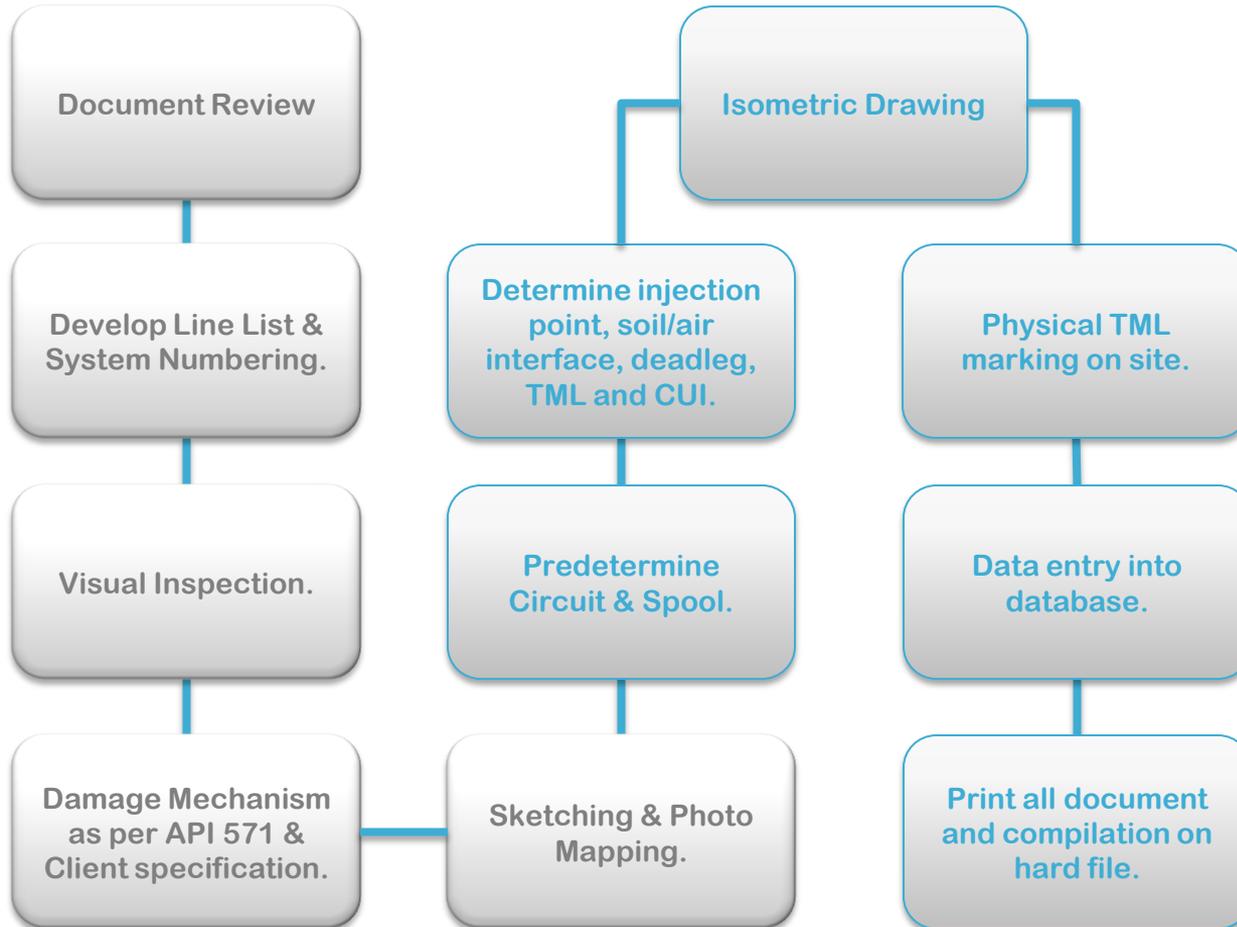


Sketching and Photo Mapping.



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.

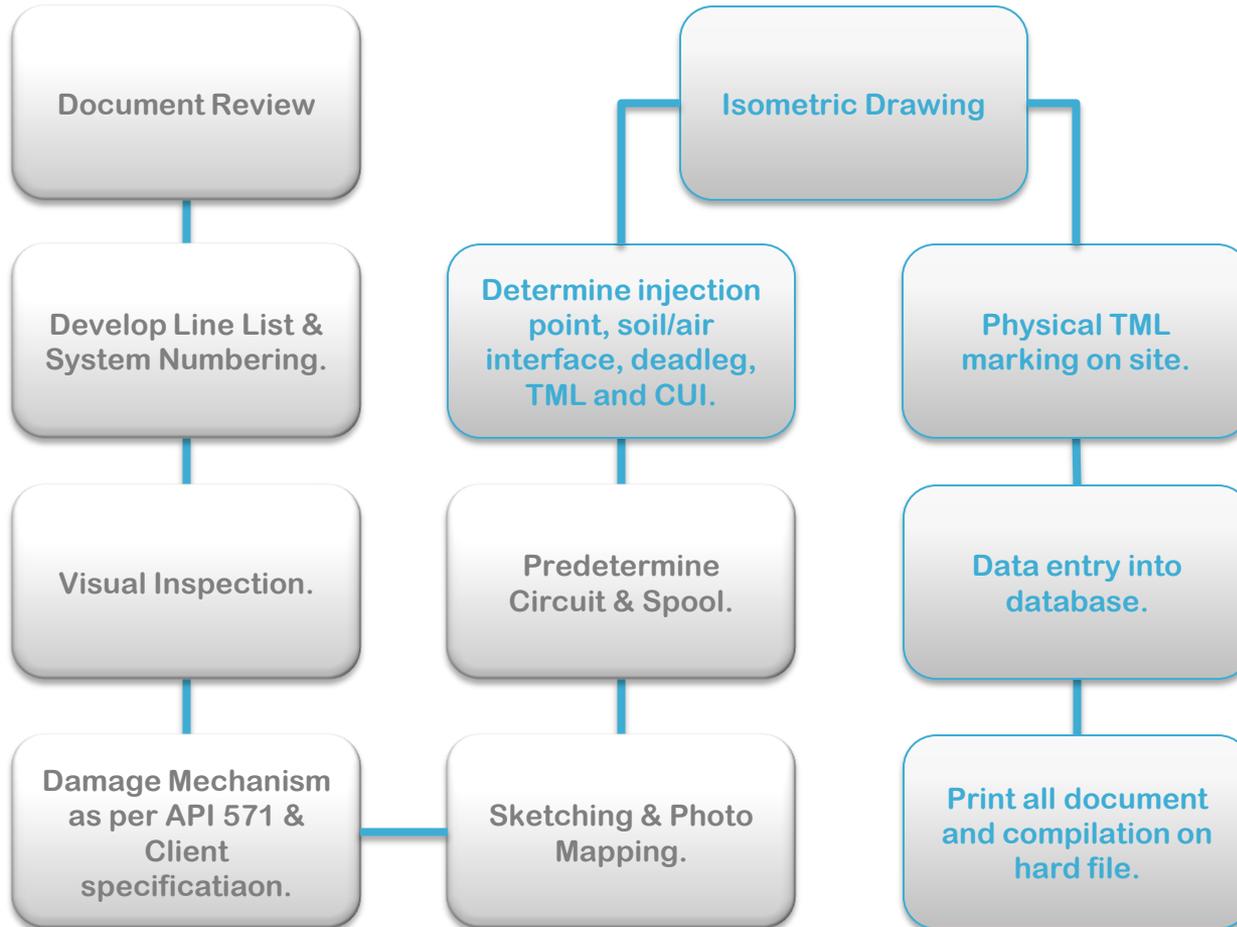




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PREDETERMINE CIRCUIT AND SPOOL





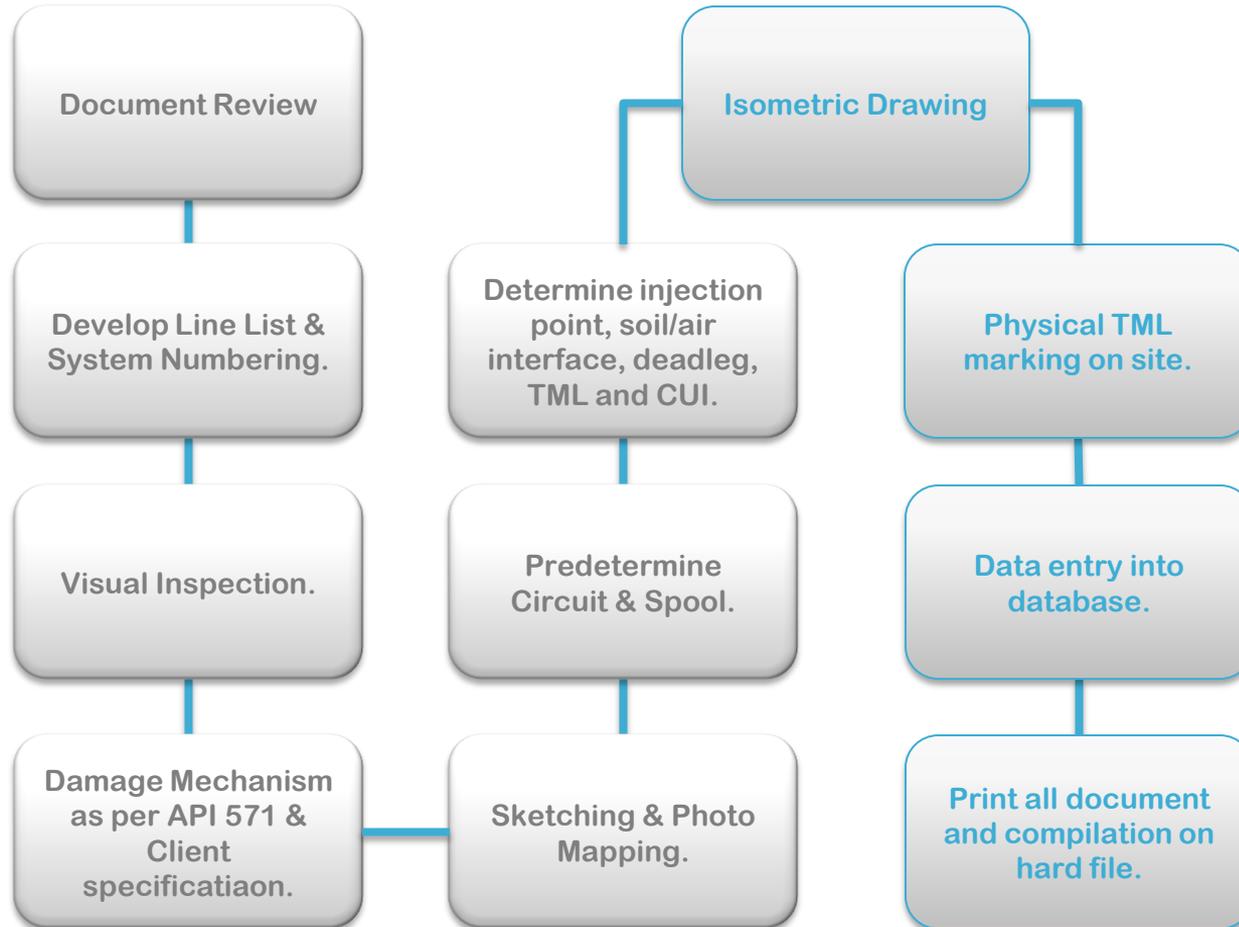


Determine injection point, soil/air interface, deadleg, TML and CUI

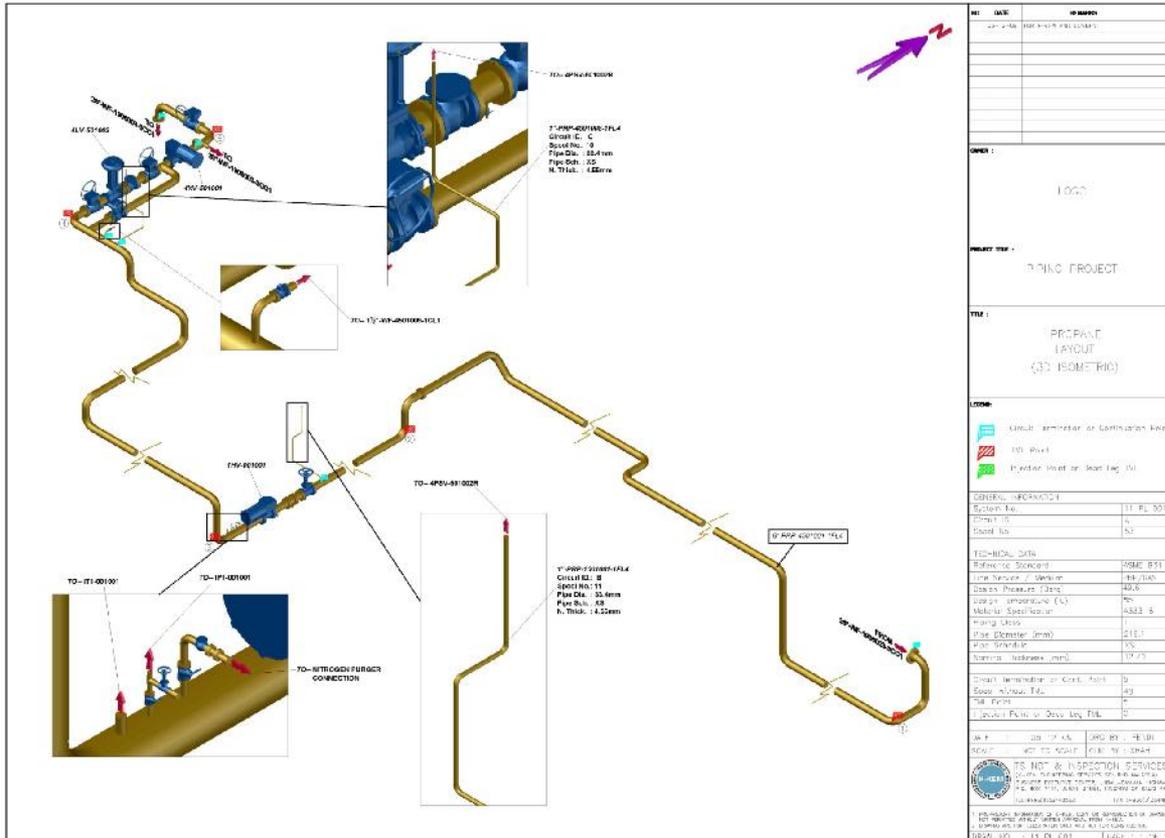
To indicate the existent of injection point, soil/air interface, dead leg as well as to mark up the MFD drawing for future references.



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



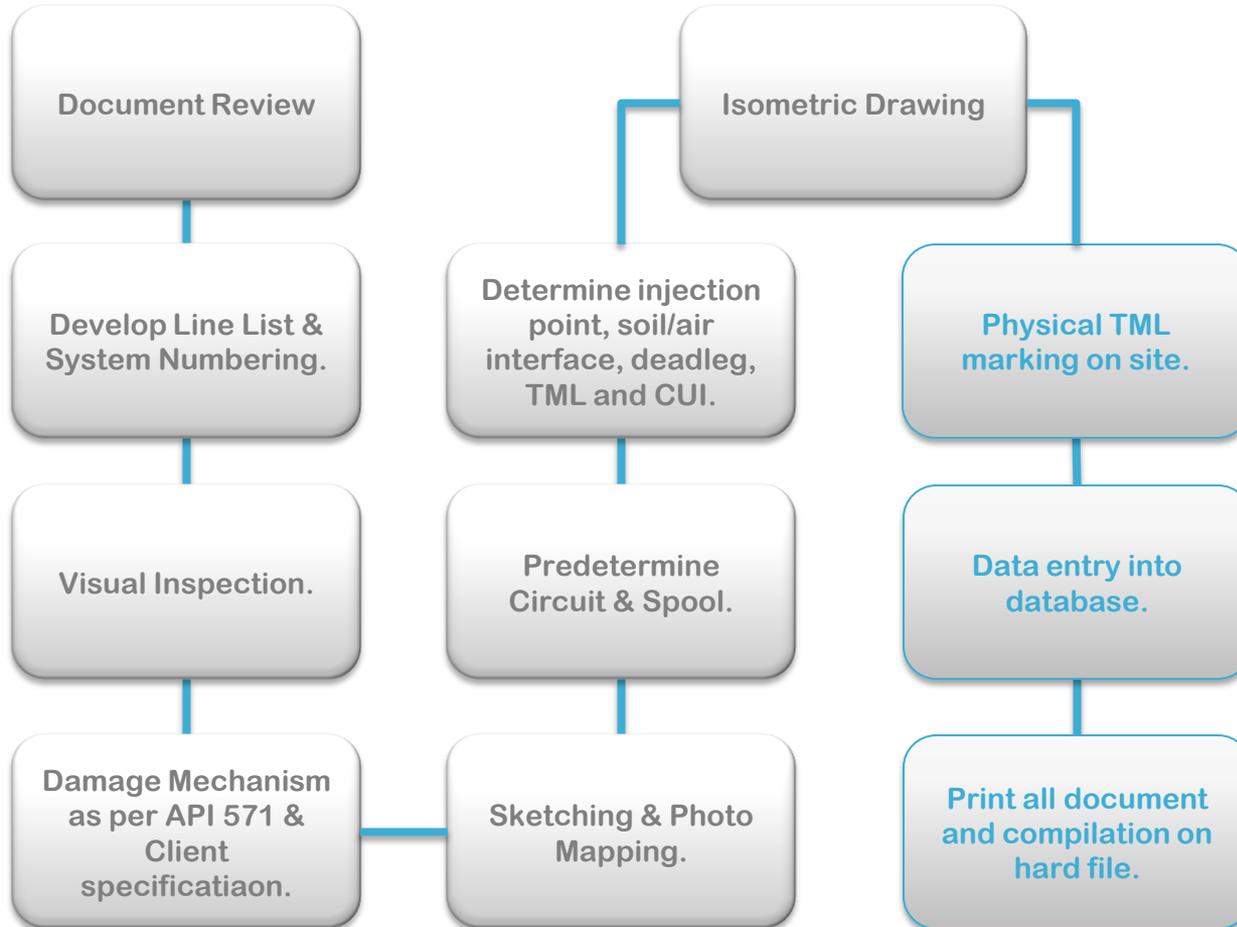
3D Isometric Drawings.



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.

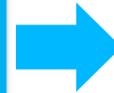


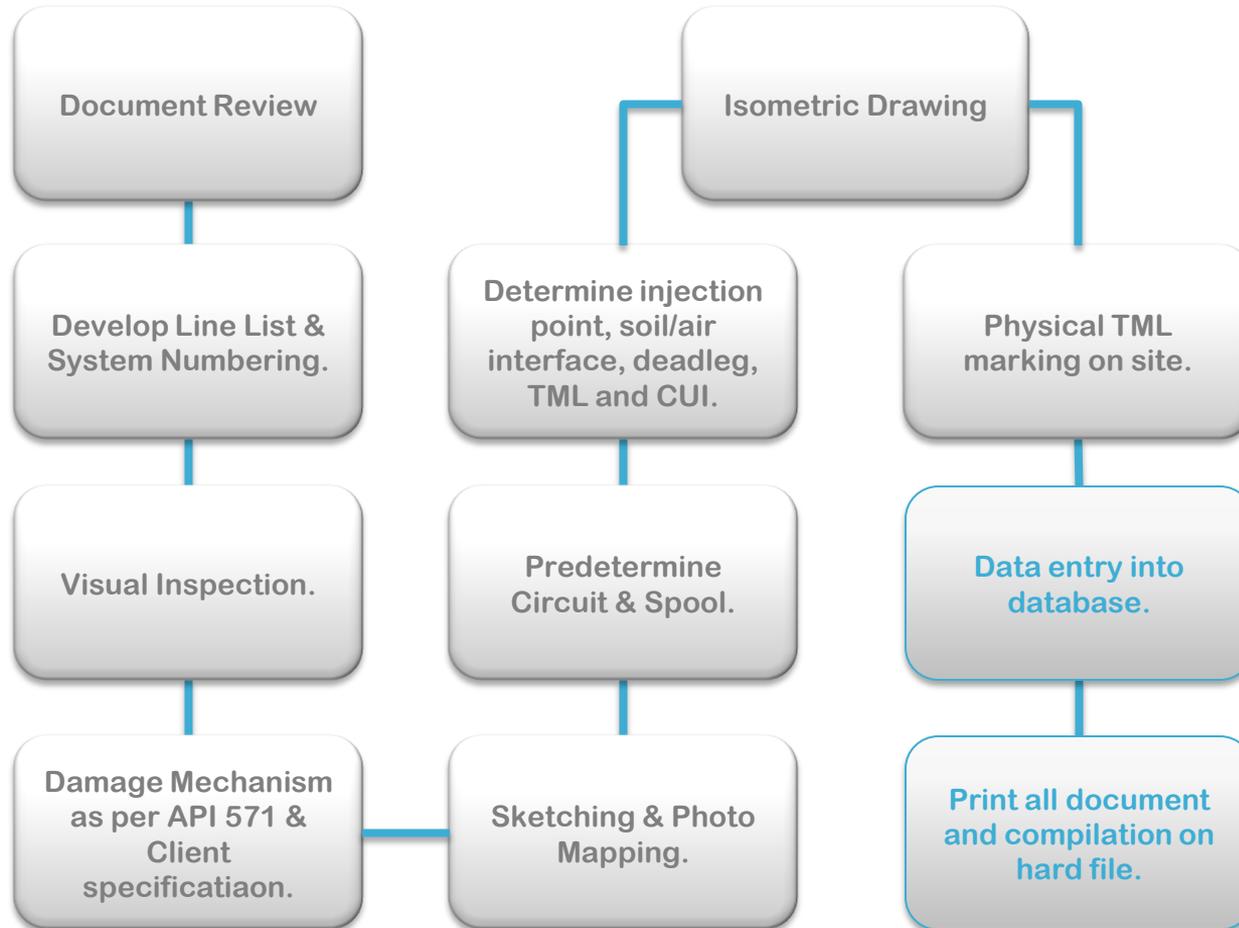
Physical TML marking on site.

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



To
physically
identify and
marking on
site for the
TML.







Data entry into database.

Data entry to be filled up by documents controller.

The data consisting of Piping Class, CUI, Inspection System Number, Corrosion Isometric Number, Reason For Exclusion, Line's System Description, Injection Points, Soil/Air Interfaces, Design Data (e.g. Pressure, Temperature, Material of Construction, Service, Diameter, Pipe Schedule, Nominal Thickness, Required Thickness, etc), External Inspection Interval, and Corrosion Monitoring Inspection Interval.

Filling up the necessary technical information for review by inspection supervisor.

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



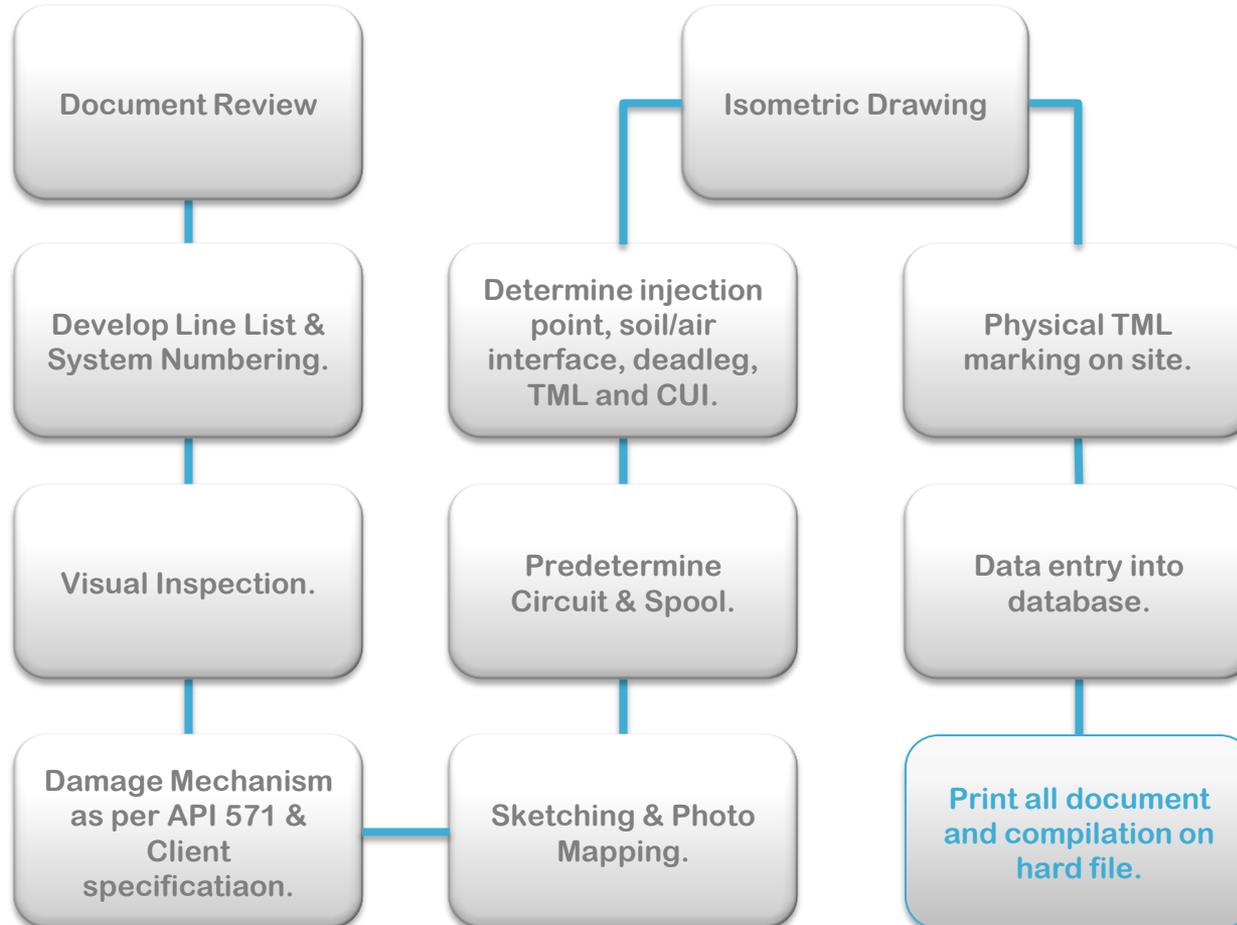


TYPICAL EXAMPLE – PIPING/EQUIPMENT MERIDIUM TEMPLATE.

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.

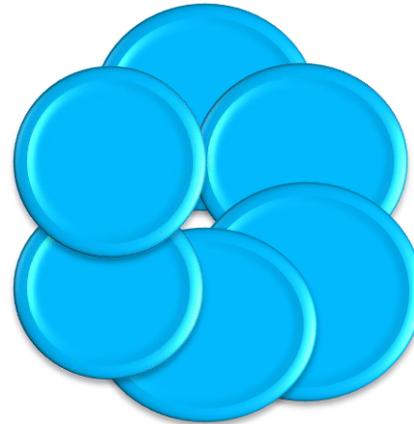
The piping thickness base reading had been carried out using a data logger UT machine which is in complying to the MERIDIUM software. The machine used was OLYMPUS Panametric DL37 plus as recommended by MERIDIUM.





Printing all document and compilation on hard file.

To provide the hard file
for finalizing all
document prepared.

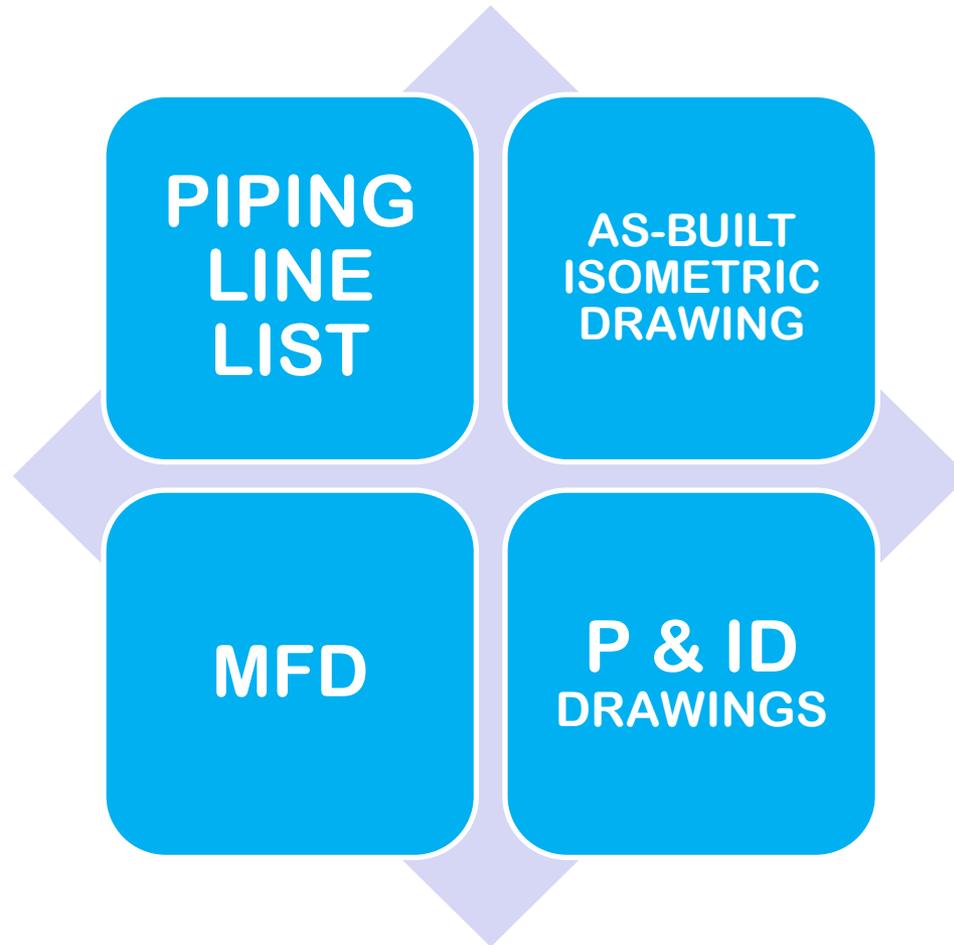


Also to provide soft
copy of all required
document.

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



OUR REQUIREMENTS.





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**Q & A
SESSION.**