

# 4<sup>th</sup> ICEPIM & OMIC GAS 2018



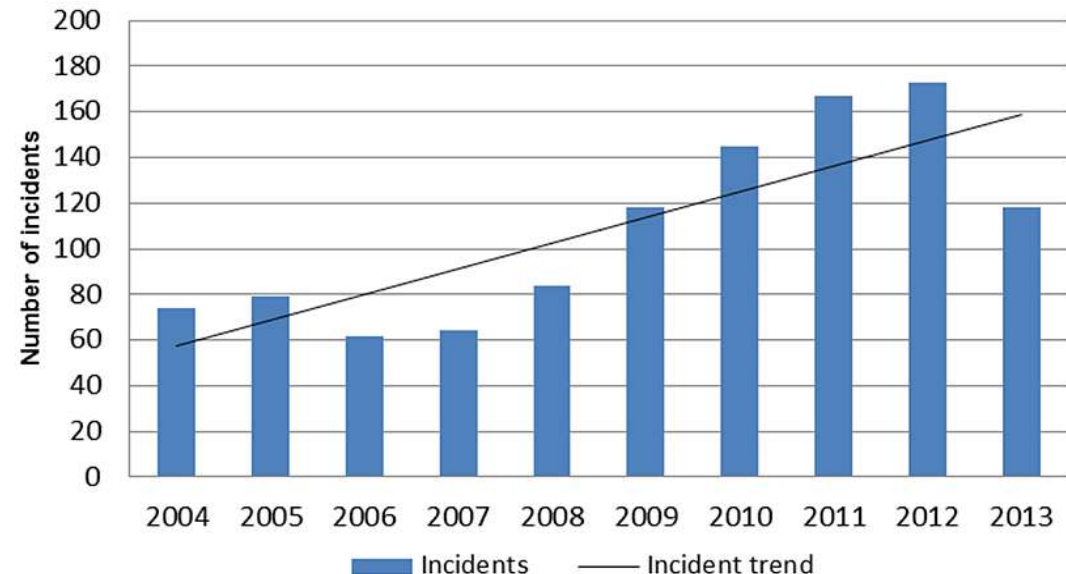
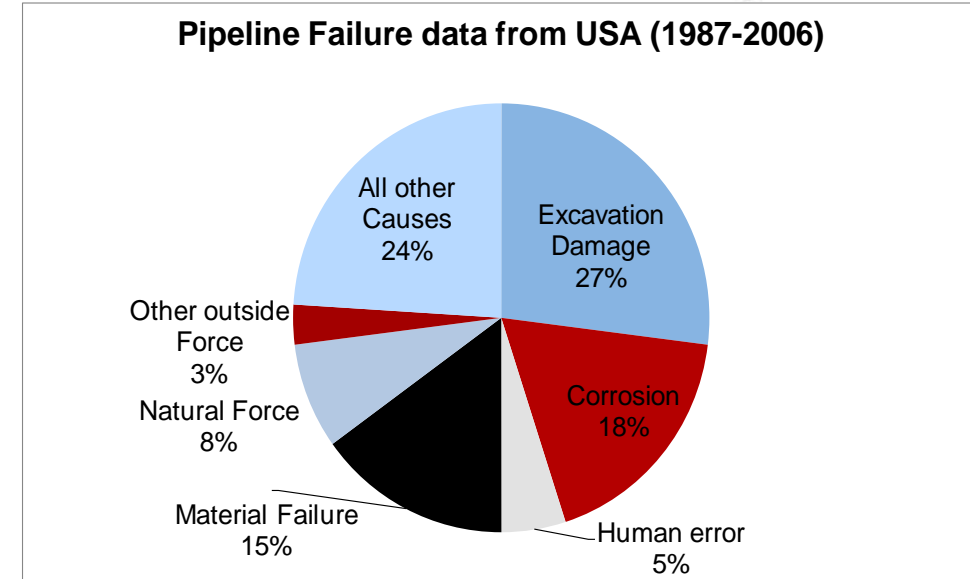
Reliance  
Gas Pipelines Limited

## Pipeline Personnel Training and Qualification - Key for Safe Pipeline Operations.

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  - Mumbai.
- 30<sup>th</sup> January 2018

# Important measure against failures caused by human error.

- Pipelines for the transmission and distribution of gas and hazardous liquids is one of the safest forms of Transportation.
- Pipeline represent huge capital investment and any untoward incident is catasrphic for human lives and assets.
- Investigations of pipeline accidents reveal that human error was a contributing factor to some failures.
- US-NTSB made explicit recommendations for the training, testing, and qualification of pipeline employees in 1987.
- The pipeline industry approached ASME .
- The ASME B31Q was formed.



## **1. Program Development**

- Determining Covered Tasks
- Abnormal Operating Conditions
- Processes and Procedures

### **1.1 Determining Covered Tasks**

- **Fault Tree Task Identification Process**
- **SME Covered Task Identification Process**

The nine threat grouped in ASME B31.8S are used to develop fault tress and task list identification

These threat groupings are as follows:

1. construction defects
2. equipment failure
3. external corrosion
4. Internal corrosion
5. incorrect operation
6. third-party damage
7. manufacturing defect
8. stress corrosion cracking
9. natural hazards

## 2. Training.

➤ Identification of the Need for Training an Individual

➤ Situations for Considering Training.

(a) requires qualification for a covered task not previously performed

(b) requires qualification for a covered task outside their knowledge and skills

(c) has had a qualification suspended or revoked

(d) fails an evaluation for qualification

(e) requires new or different knowledge or skills to perform a covered task

## 3. Proficiency level

Level1 –Awareness , Level2-Knowledge, Level3 -Skill, Level4 -Mastery

## **4 Evaluation**

- ✓ Evaluation Criteria.
- ✓ Evaluation Method Selection.
- ✓ Written Evaluations.
- ✓ Oral Interview Evaluations.
- ✓ Performance Evaluations.

## **5 Qualification**

- ✓ Initial Qualification.
- ✓ Subsequent Qualification.
- ✓ Suspension
- ✓ Revocation
- ✓ Reinstatement

## ❖ Purpose

To minimize the impact on safety and integrity of the pipeline due to human error that may result from an individual's lack of knowledge, skills, or abilities during the performance of certain activities.

Individuals who perform covered tasks and those individuals responsible for ensuring a qualified workforce; shall meet the requirements of applicable standard.

## ❖ Objective

- ✓ To develop a training & validation facility
- ✓ Provide the hands on training before actual work.
- ✓ Increase the onsite morale and confidence of workman.
- ✓ Identify & mitigate the risk associated with maintenance task.
- ✓ Validate the individual qualification required for task.
- ✓ Evaluate the effect of damage mechanism on
- ✓ Undertake R&D projects

## ❖ Activities

- ✓ Classroom training
- ✓ Field hands on training.
- ✓ R&D Projects



## ❖ Program Modules.

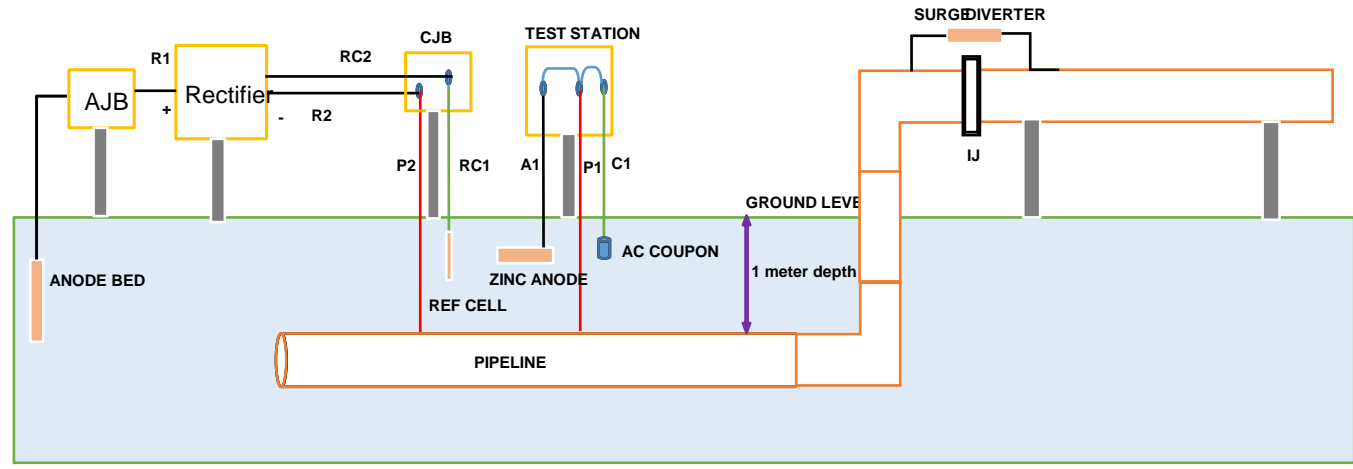
### ➤ 1 CP awareness training

- ✓ Measurement of Pipe to soil potential (PSP)
- ✓ Zinc anode healthiness checking and resistance measurement
- ✓ Pipeline Anode bed healthiness checking
- ✓ Insulation Joint & Surge diverter installation methodology & healthiness checking
- ✓ Coating survey – CIPL, ACVG/ DCVG
- ✓ Corrosion rate measurements in weight loss coupon and AC coupon
- ✓ CP Current requirement test
- ✓ Polarisation cell checking
- ✓ Soil resistivity testing
- ✓ Effect of high PSP on pipeline – testing
- ✓ Pipeline ON/OFF survey
- ✓ Peel off strength checking for coating
- ✓ Coating application
- ✓ Rail/road casing and carrier pipe measurements
- ✓ Effect on carrier pipe due to shorting of casing and carrier pipe
- ✓ Foreign line measurements such as - PSP field measurements and external power / stray current AC/DC (interference) measurements.

# LND Center –CS08 – Phase-1



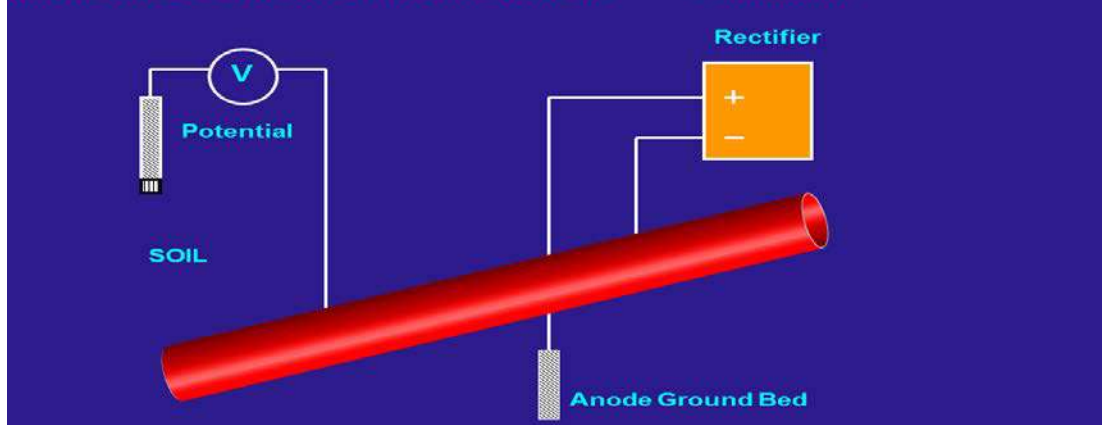
## CP Awareness Module



- Cable Size**
- R1,R2 - 1C 35sqmm Armoured,Black clour
  - P1,P2 - 1C 35sqmm Armoured,Red clour
  - RC1, C1- 1C 4sqmm Green colour unarmoured
  - A1 - 1C 25sqmm unarmoured, black

- Assets**
- Test Staion - 1 no
  - CJB - 1 no
  - AJB - 1 no
  - AC coupon - 1 no
  - 1C 35sqmm cable - 100m
  - 1C 25sqmm cable - 20m
  - Zinc Anode - 1 no
  - Permanent Reference cell - 1 no
  - MMO Tubular Anode - 2 no
  - Surge Diverter EXFSL300 - 1 no
  - Rectifier - 1 no

## IMPRESSED CURRENT CP (ICCP) SYSTEM - Permanent





# LND Center –CS08 – Phase-1

TRU/CPPSM Unit



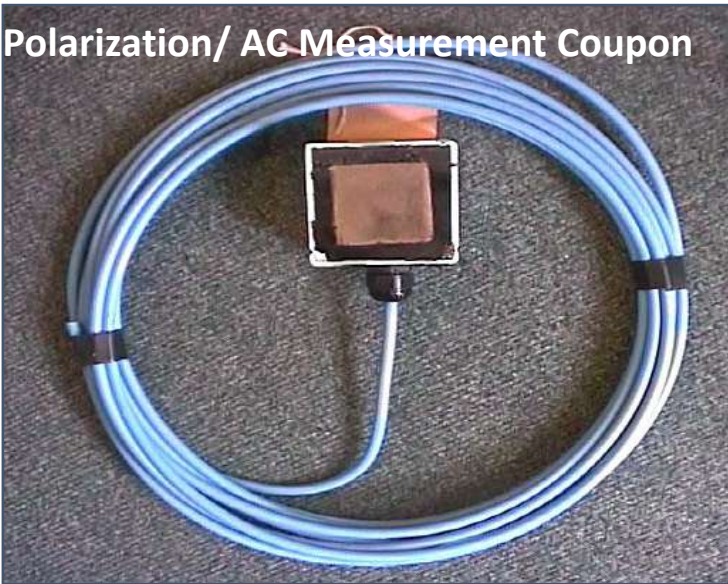
Portable Reference Cell



ER Probe and Reader



Polarization/ AG Measurement Coupon





# LND Center –CS08 – Phase-1



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Weighted Corrosion Coupon/Weight loss coupon



Handheld CP monitoring system



GPS / GPRS based tracking and monitoring solution



Polarization cell/SSD



## ❖ Program Modules.

### ➤ 2. Pipeline Maintenance

#### ▪ Pipeline

- ✓ Visual inspection of installed pipe and component for mechanical damage.
- ✓ Measure and characterize mechanical damage on installed pipe
- ✓ Locate underground pipelines with pipeline locator and depth measurement.
- ✓ Pipeline locator accuracy verification
- ✓ Installation of mechanical clamps and sleeves.
- ✓ Install and Maintain Pipeline Markers

#### • Valves

- ✓ Manually opening & closing valve operations
- ✓ Valve visual inspection and preventive /corrective maintenance
- ✓ Actuator /operator inspection and testing, preventive and corrective maintenance
- ✓ Valve construction

#### • QOEC –Operation & maintenance

## ❖ **Proposed Tasks to be covered in Ph-2.**

### ➤ **Inspect, Test, and Maintain Sensing Devices**

Repair, replace, adjust and verification of sensing device (e.g., pressure switches; pressure, temperature, and differential transmitters)

### ➤ **Inspection and Testing, Preventive and Corrective Maintenance Pressure-Regulating Device**

### ➤ **Inspection and Testing, Preventive and Corrective Maintenance Pressure-Relieving Device**

### ➤ **Launching or Receiving Internal Devices**

Isolating pipeline, barrels, relieving pressure, inertisation, inserting or removing, internal devices, pressurizing barrel, and launching/receiving internal devices.

These devices may include cleaning and inspection pigs.

## ❖ **Proposed Tasks to be covered in Ph-2.**

### ➤ **Operation, Testing, Preventive and Corrective Maintenance of Valve Actuators**

1. Electric Actuator
2. Hydraulic Actuator
3. Gas/Pneumatic Actuator

### ➤ **Coating Application and Repair**

1. Surface preparation
2. Compound preparing.
3. Coating repair
4. Holiday check.

### ➤ **Gas Leakage Survey**

1. Conduction survey ( In plant, Patrolling)
2. Survey equipment
3. Reporting.

❖ **Proposed Tasks to be covered in Ph-2.**

➤ **Damage Prevention During Excavation Activities by or on Behalf of the Operaor**

1. Verifying underground pipeline.
2. Marking.
3. Providing required notifications.
4. Use of spotter/swamper to guide equipment operator.
5. Hand digging,
6. Trail Pits
7. Restoration.





**Trained**  
employee works efficiently

**Untrained**  
employee works inefficiently

**Vs**

**Cost of Training Vs Cost of Not Training**

The illustration is split into two vertical panels. The left panel has a light blue background and shows a woman in a business suit sitting at a desk, working on a computer. A circular inset next to her shows a small stack of three money boxes. The right panel has a light purple background and shows a man in a business suit sitting at a desk, looking stressed with his hand to his forehead. A circular inset next to him shows a large stack of ten money boxes. A central circle with 'Vs' in it separates the two panels. At the bottom, a blue banner contains the text 'Cost of Training Vs Cost of Not Training' and a logo for 'SWIFT' on the left.

*Thank You!*