



# ICEPIM 2015

## International Conference on Pipeline Integrity management

# AN EFFECTIVE PIMS TO BE INTEGRAL PART OF HSE MANAGEMENT SYSTEM FOR INDIAN SCENERIO.

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# Pipeline Integrity -Introduction

- Pipeline Integrity is the state of pipeline w.r.t Public Safety, Environmental Protection And Operational Reliability. Its Error Free, Leak free, Incident Free operation of pipeline with no ill effects on health, safety, environment and economy.
- Effective PIMS is for uninterrupted supply of gas to consumer safeguarding public, environment, asset and reducing risk.



# Pipeline Integrity Methodology

- Developing a program / Plan.
- Assessing the threats.
- Carrying out mitigation, detection and prevention of all forms of pipeline defect.
- Monitoring and review.



# Elements of Pipeline Integrity Management

- Integrity Management Plan.
- Performance Management Plan.
- Communication Plan.
- Management of Change Plan.
- Quality Control Plan.



# Threat Classification of Integrity Management

There are 21 Threats identified and known and one threat is still unknown as per PRCI :-

- I. Time Dependent :- External Corrosion, Internal Corrosion , Stress Corrosion Cracking
- II. Stable :- Manufacturing defect, Welding defect & Equipment failure
- III. Time Independent :- Third party damage, Incorrect Operation , Weather related.
- IV. Unknown



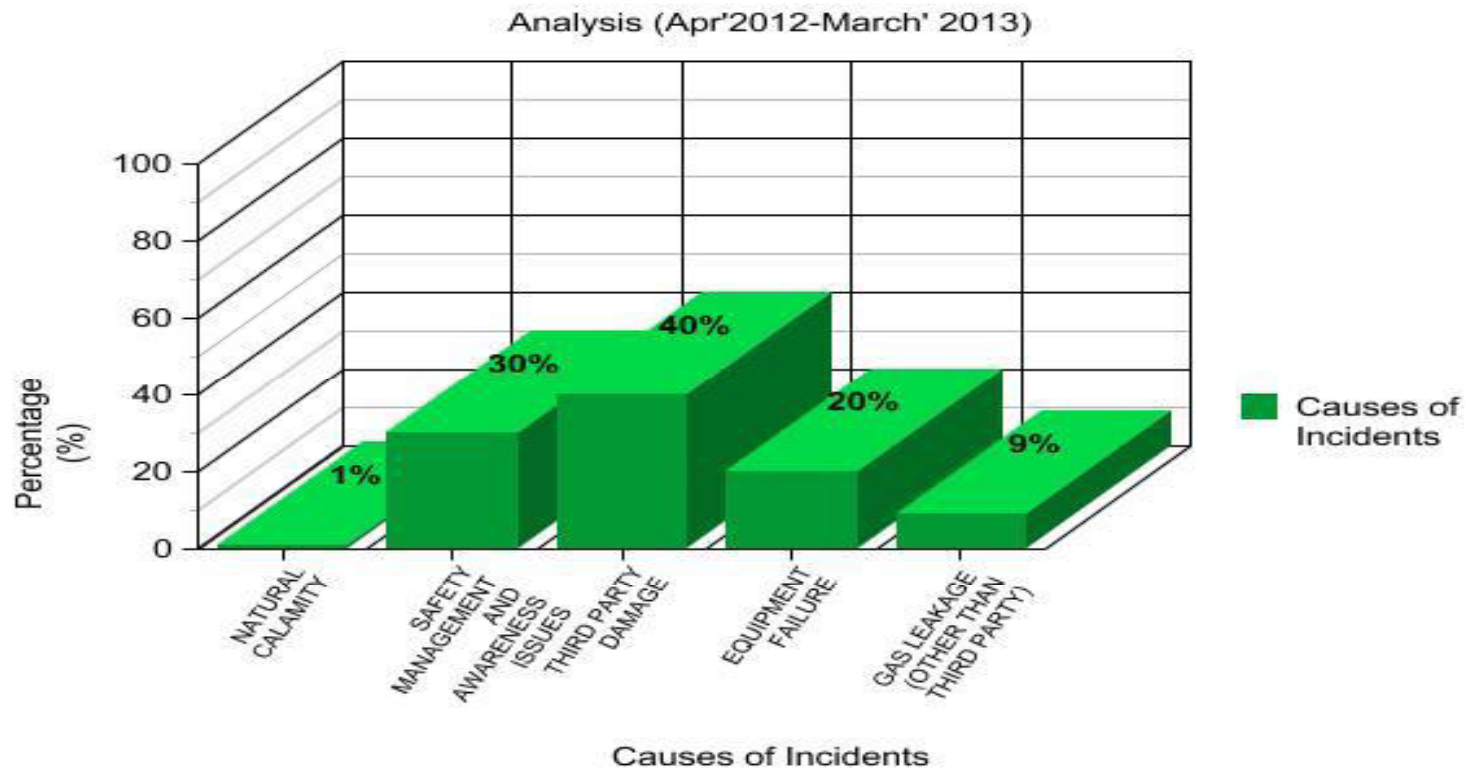
## Pipeline details and Corrosion Cost

- India has 15000 km of Cross Country Pipeline transmitting 401 MMSCMD Natural Gas excluding upstream pipeline in 15 States and UT.
- In US annual direct cost of corrosion is 276 Billion USD which is approx 3.2% of GDP for 30000 Miles of NG Cross Country and upstream pipeline



# Incident Analysis India & US

As per PNGRB for FY 2012-13 incident analysis is as below



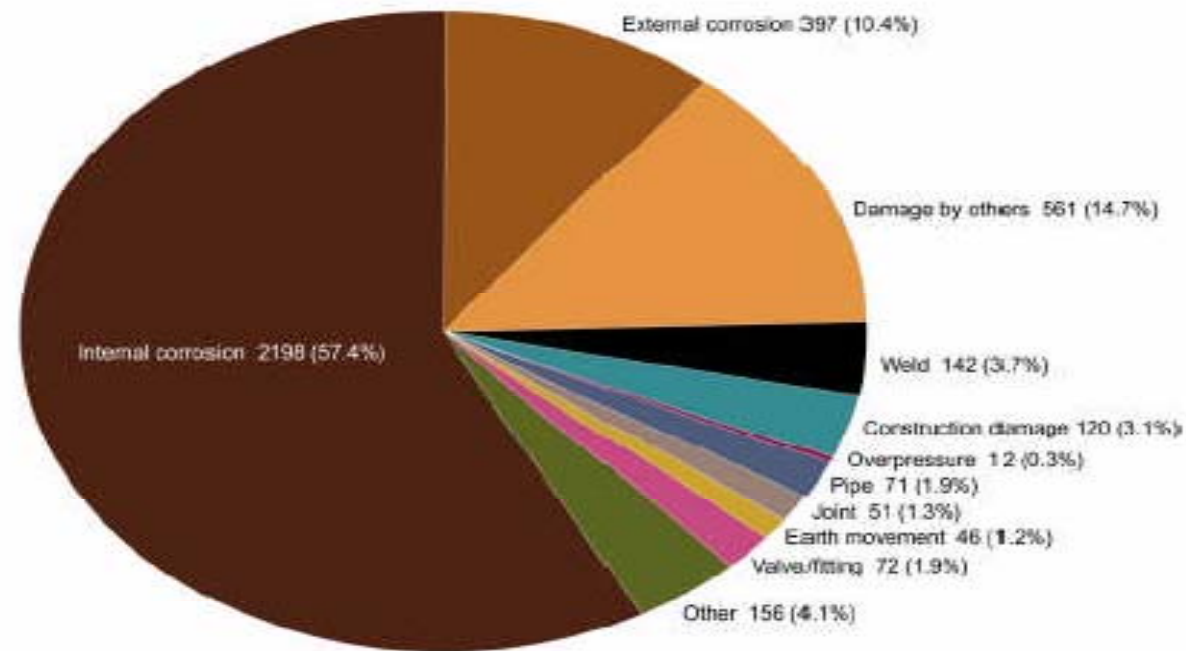
Total number of incidents = 5291



# Incident Analysis India & US

## NG Pipeline Incidents in U.S (data taken from Alberta Sweet Gas Pipeline Failures ERCB)

Figure 14a. Natural gas pipeline incidents, by cause for all years combined  
January 1, 1990, to December 31, 2005 (includes hits, leaks, and ruptures)



Total number of incidents: 3826 (100%)

# Incident Analysis India & US

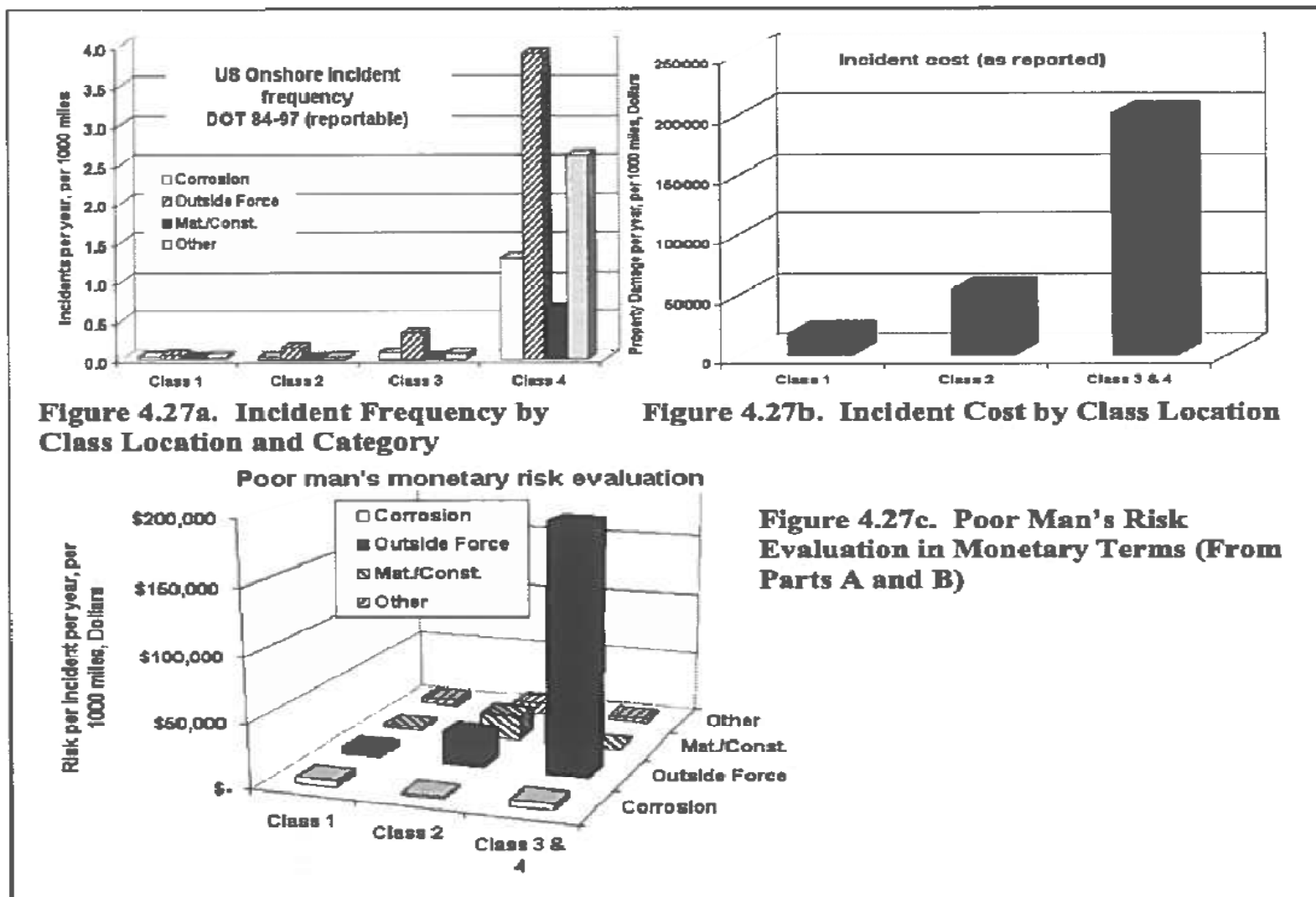


Fig.4.27. Incident trends from 1984 through 1997: US DOT database.

## Regulatory & Standard Scenerio in India

- ❑ In India Pipeline are designed and constructed as per best prevailing standard national and internationally.
- ❑ When Pipeline integrity compromised leads to affect the HSE Parameter.
- ❑ PNGRB and OISD is regulatory body and Safety implementing body in India for Cross Country Pipeline in Mid Stream & Downstream and Upstream Offshore.



## Regulatory & Standard Scenerio in India

- I. PNGRB in year 2012 and 2013 did gazzete notification for NG Pipeline network and CGD Network respectively.
  
- II. OISD in 2014 has issued Standard Operating Procedure for Integrity Assessment of Piggable and Non Piggable pipeline along with standard specific for NG (226) ,LPG (214) and also GDN 233 especially for Non Piggable Pipeline.



## Constraints faced for NG pipelines in India

- Location class reclassification due to urbanization
- Old Pipeline design / Unpiggable NG pipelines.
- Non availability of As Built Data
- No **One Point Call System** in India
- Unavailability failure database and learning at public domain
- No Pipeline Integrity department /Corrosion Engineer and MIS on PIMS presented to management.
- Inadequate usage of technique Fitness for Service and Residual Life Assessment.
- Non availability of **indigenous international reputed vendors for ILI**

## Strategy adopted by Indian pipeline operator

- PIDS and Leakage detection system
- Aerial and Ground Pipeline Survey
- Pipeline patrolling – GPS, Intelligent / Smart Helmet and Information Sharing between each group of pipeline operators
- Online CP Monitoring through SCADA and CP Field monitoring through data logger.
- Increasing frequency of Intelligent pigging
- ECDA, ICDA and Pressure Testing

## Areas for Improvement and development

Some of the new methods and R&D across happening are :-

- I. UAV Unmanned aerial vehicle for pipeline surveillance
- II. Effective Pipeline Intrusion Detection System
- III. Efficient leakage detection system



## Conclusion

It is evident now that Pipeline Integrity Management System & Safety are interlinked and compliment each other especially in Indian scenario. Effective and Efficient PIMS will help in reducing the occurrence of incidents thereby meeting its objective of uninterrupted supply of Natural Gas to consumer by safeguarding Public ,Environment Asset and reducing the risk .





# Assuring India a safer and healthier pipelines.....

