Workshop on “ Maintenance Strategies “

Strategies for Pipeline Integrity on cross country pipeline carrying Petroleum Products

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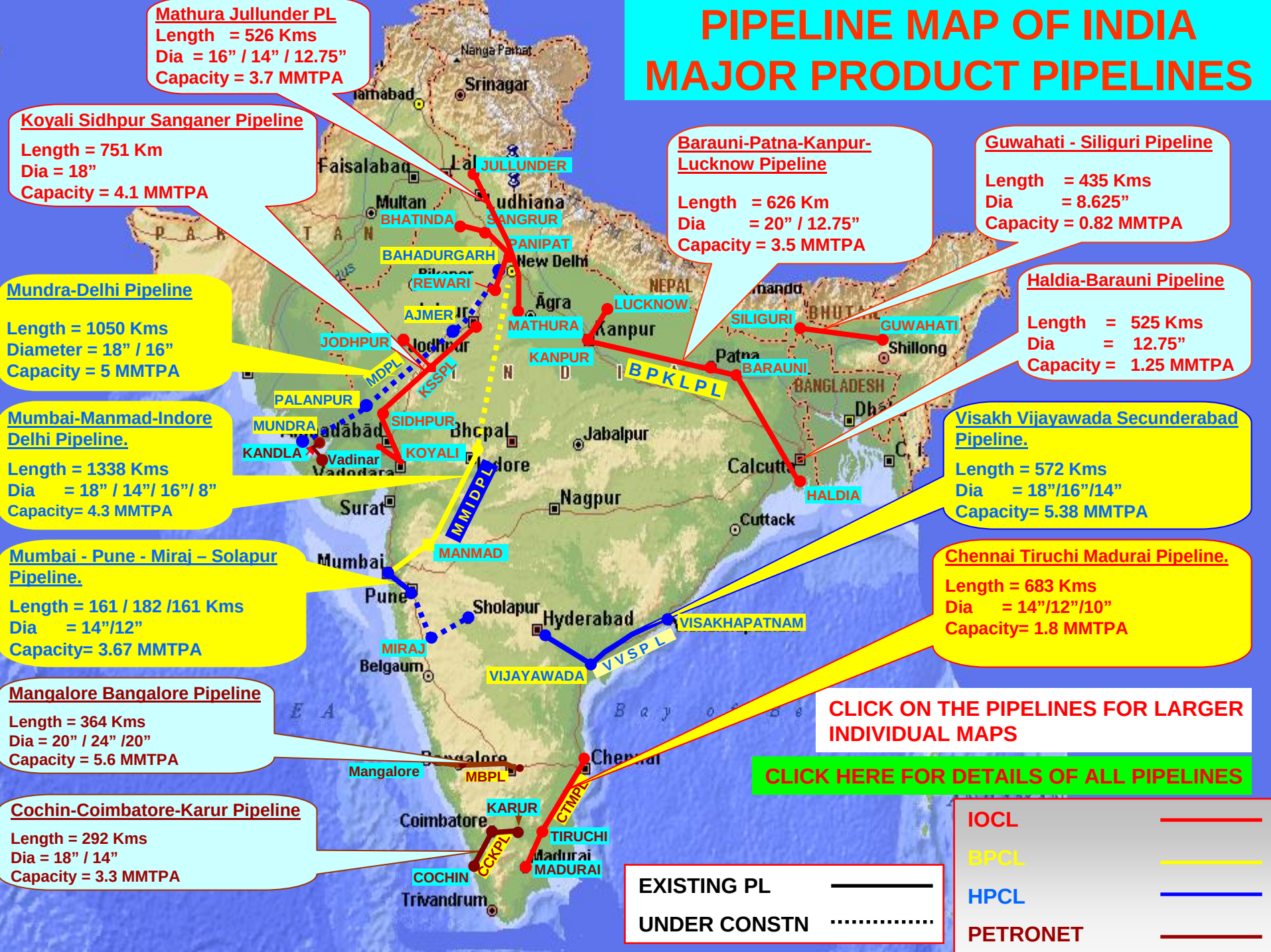
PIPELINE MAP OF INDIA
MAJOR PRODUCT PIPELINES



Need for Managing Pipeline Integrity

- To ensure 99.9 % availability of pipeline for timely, un-interrupted & safe delivery to valued customer.
- Eliminate / prevent the probable elements which can lead to loss/ damage to national property, Human & environment.
- To extend the life of the pipeline system

Approach for Pipeline Integrity

- Conform to various codes & standards like ASME B 31.4, OISD 141,138,188, API 1160 etc.
- To put in place Quality control & HSE Management System.
- Data collection, analysis and review for fine tuning of system components.
- Address the issues / close interaction with stakeholders

Pipeline Integrity Management

- Integrity Management plan
- Performance plan
- Communication plan
- Management of change
- Quality control plan

Threats to the Pipeline Integrity

- Stable
  - Manufacturing Rel. Defects :
    - Defective pipe /pipe seam
  - Welding/Fabrication Related
    - Defective pipe girth weld
    - Defective fabrication weld etc.
  - Equipment
    - Gasket / O-ring failure
    - Control / Relief
    - Seal/ packing failure
    - Miscellaneous

Threats to the Pipeline Integrity

- Time Dependent
  - Corrosion
    - External
    - Internal
    - SCC
- Time Independent
  - Third party / Mechanical Damage
    - Damage inflicted by 1st , 2nd, 3rd Parties
    - Previously damaged pipe
    - Vandalism
    - Operation error

Threats to the Pipeline Integrity

- Weather related and outside forces
  - Cold weather
  - Lightning
  - Heavy rains or flood
  - Earth Movement /Erosion

Maintenance strategies

- Causes of Failure:

  (decreasing frequency of occurrence)

  - Damage from outside forces (i.e. mechanical damage)
  - Corrosion (internal and external)
  - Defective weld and pipe
  - Construction/material

Maintenance strategies

- Focus on certain key aspects of maintenance strategies
  - Right of user (ROU)
  - Corrosion

Maintenance strategies

- Right of user (ROU) :
  - Patrolling
    - Physical – Day & Night
    - Vehicle – armed security covering vulnerable spots
  - Village meet
  - Off site DMP
  - Interaction / joint patrolling with police dept.
  - Interaction with external agencies
  - Third party damage (pilferage / construction)
  - Security Tracking System

Case study

- Road / drain by PWD department :
  - Unauthorized work during night
  - Damage to pipeline
  - Matter with DC & transport secretary
  - Organized meet with works agencies under chairmanship of DC
  - Process replicated in all dist. along pipeline
- Recommendation
  - Continual sensitization & information exchange with interested parties to minimize the threat.

Maintenance strategies

- Corrosion
  - Monitoring of Cathodic protection
  - Timely conduct of health surveys
    - CAT/DCVG/CPL
    - Pigging (IP)
    - UT (above ground)
  - Dosage of corrosion inhibitor
  - Analysis of pigging residue
  - Monitoring of internal corrosion
    - Corrosion coupon
    - ER probe

Case Study

- Pipeline crossing NH :
  - PSP same for Casing / carrier line
  - Polarization decay

- Recommendation :
  - Proper monitoring of workmanship during construction can avoid such incidents

THANK YOU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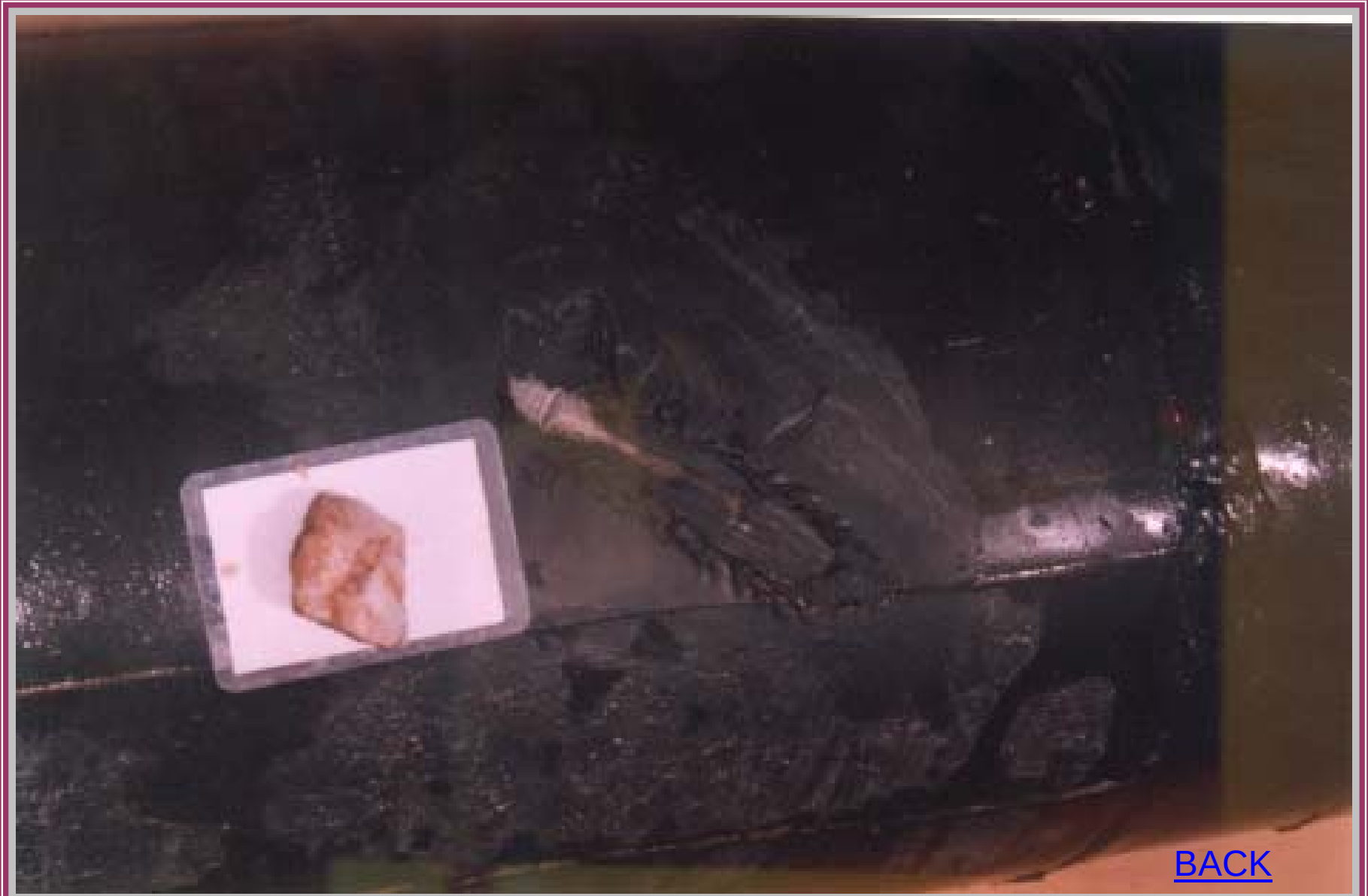
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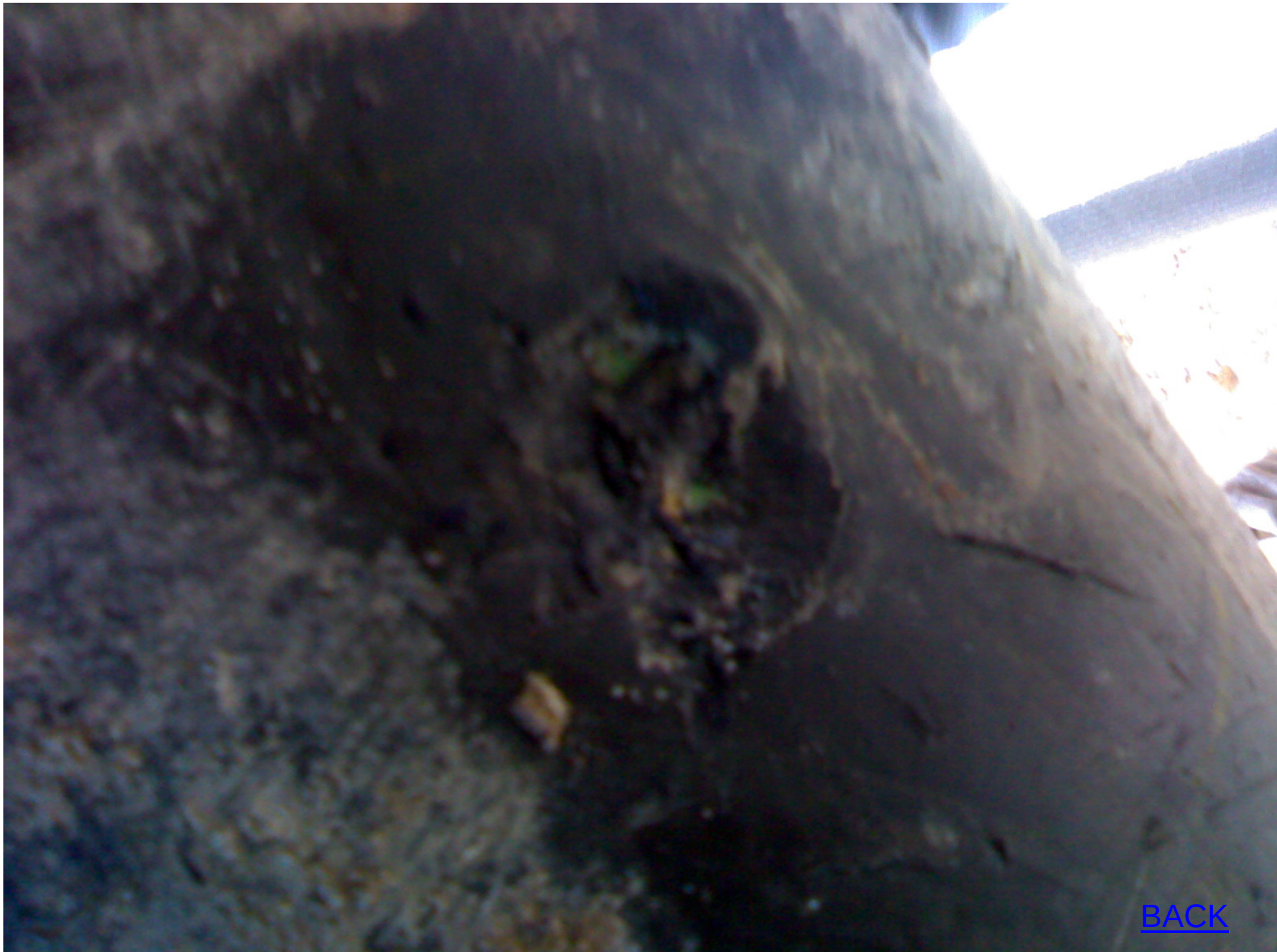

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- Identifying potential pipeline impact by threat
- Gathering , reviewing and integrating data
- Risk assessment
- Evaluate all threats
- Integrity assessment
- Response to integrity assessment and mitigation

- Plan evaluation is performed at least annually to provide a continuing measure of integrity management program effectiveness

Plan Evaluation helps to answer

- Were all integrity management program objectives accomplished?
- Were pipeline integrity and safety effectively improved through the integrity management program ?

Performance measure characteristics- the measures provide an indication of effectiveness

Performance or activity measure- to evaluate prevention or mitigation activities

Operational measures- e.g. change in corrosion rate due to the implementation of more effective CP program

Direct integrity measures- include leaks, ruptures, injuries and fatalities

Performance measurement methodology- evaluate system integrity management program performance within in house or compare with industry-wide basis

Keeps appropriate company personnel, jurisdictional authorities and public informed

External Communication

- Landowner sand tenants along the ROU
- Public officials other than Emergency Responders
- Local and regional Emergency responders
- General public

Internal Communication

Formal procedure for management of Change

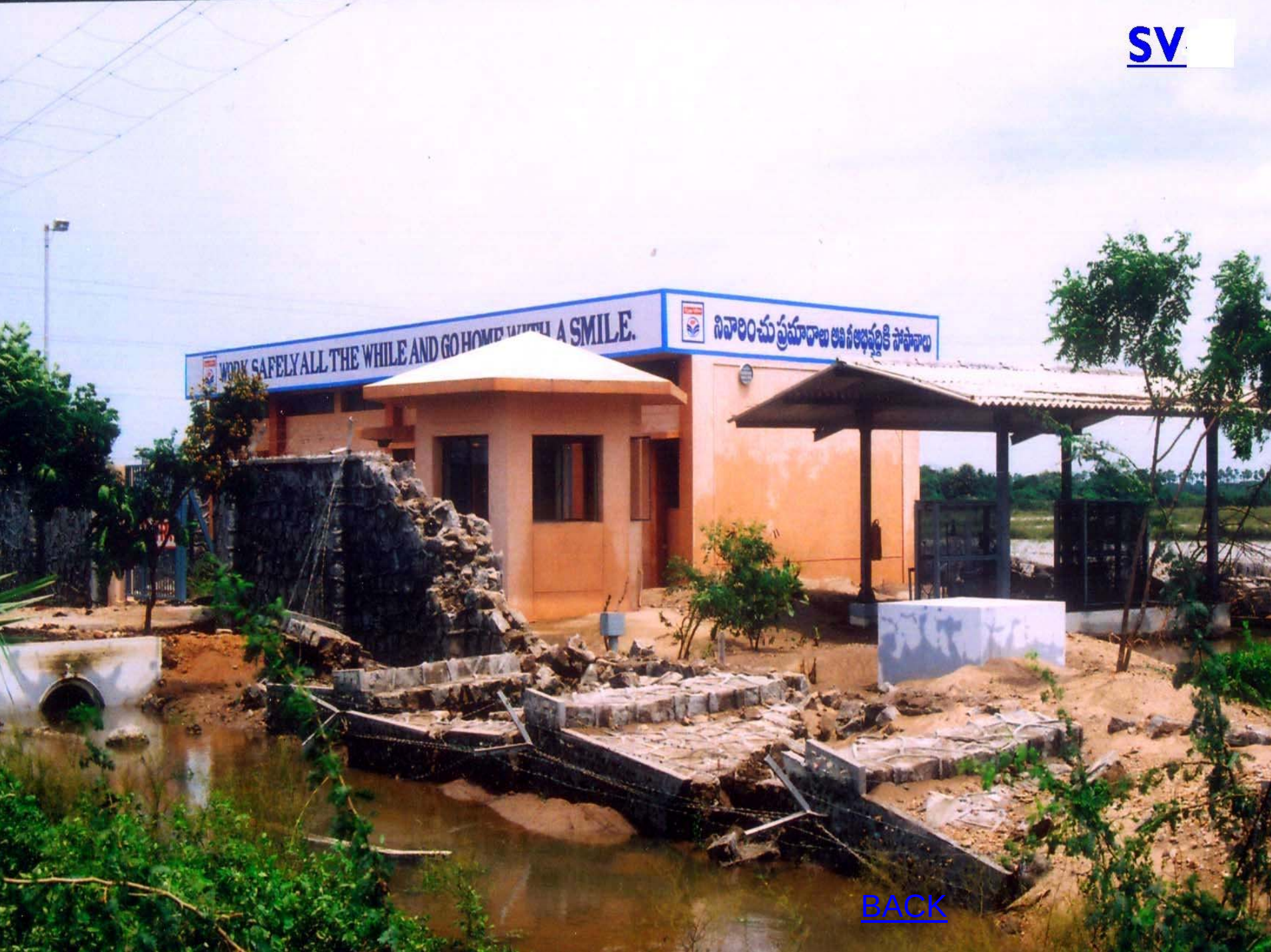
Management of Change shall address technical, physical, procedural and organizational changes to the system

Management of Change process includes

- Reasons for change
- Authority for approving changes
- Analysis of implications
- Acquisition of required work permits
- Documentation
- Communication of change to effective parties
- Time limitation
- Qualification of staff

Management of Change ensures that the integrity management process remains viable and effective as change to the system occurs

The application of new technologies in the integrity management program and the results of such application should be documented and communicated to all concerned


WORK SAFELY ALL THE WHILE AND GO HOME WITH A SMILE.
నివారించు ప్రమాదాలు లేని ఆరోగ్యానికి సోపానాలు

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