SAUDI ARAMCO LEAK DETECTION AND REPAIR (LDAR) PROGRAM

Environmental Protection Department

Homood Al-Hilal
OUTLINE

- Background
- Saudi Aramco’s LDAR Protocol
- LDAR implementation (SOW)
- Benefits of this program
- Best Practice case scenario
- Piloting smart LDAR technology
BACKGROUND

- Emitted gas compounds impacts health and environment.
- LDAR is a work practice designed to identify leaking equipment so that emissions can be reduced through repairs at specified location, regular intervals and within a specified time frame.
• Requirements as specified under Saudi Arabia and Saudi Aramco Environmental regulations.

• Provide Saudi Aramco Operating Facilities with a consistent process to conduct LDAR.

**Engineering Standard**

SANDA 482
Aircraft & Space Environment Standards

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**ROYAL COMMISSION FOR JIZAN AND YANBU**

Royalty Commission Environmental Regulations

*Volume I*

Environmental Control Department
SAUDI ARAMCO’S LDAR PROTOCOL

Components

- Valves
- Pumps
- Compressors
- Pressure relief valves
- Fittings
- Pipes
SAUDI ARAMCO’S LDAR PROTOCOL


- Using of Flame Ionization Detectors (FID) or Photo Ionization Detectors (PID) to detect leaking components.
An optical gas imaging camera is capable to detect gas leaks and to assist the LDAR program during the surveying process.
LDAR IMPLEMENTATION (SOW)

- Prepare master list
- Conduct field survey
- Tag all potential leaking equipment
- Identify the repairs required
- Identify all leaks to the facility that can be minimized
- Install/develop in-house software and database
- Develop a training program
- Calibrate the gas analyzer
BENEFITS

- Protect the environment and reduce fugitive air emission
- Reduce product losses
- Increase facility workers and operators safety
- Decrease exposure for the surrounding community
BEST PRACTICE CASE SCENARIO

Implementation Methodology

- Process Research
- Repair
- Monitoring
- Documentation
- Components
  - Flagged, Tagged & Monitored
- Flagging
- Tagging
Process Research
Identify the stream if it’s liquid or vapor
# Identify the stream if it is HAPS or VOC

## HAPS examples
- Hexane
- Naphthalene
- Nitrobenzene

## VOC examples
- Propane
- Phosgene
- Benzene
## Material Balance & Calculation

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Flagging on the P&ID
Flagging on the Field
Tagging
## Sample of documentation

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MONITORING
Toxic Vapor Analyzer
MONITORING
Toxic Vapor Analyzer

- No Leakeage: Tens of thousands
- Leakage: 2 – 3%
- Immediate repair: 95%
- Shut-down items: 5%
Building in House Capacity

- Permanently Assigned Two Employees
- Trained and Certified
- Established a Complete LDAR Lab
- Purchased Two Toxic Vapor Analyzers
SMART LDAR TECHNOLOGY

- Piloting the Autonomous Gas Leaks Detection System (IntelliRed) Smart LDAR Camera.

- Uses thermal imaging and visible camera that can remotely and autonomously detect hydrocarbon gas leaks.
Thank you!