

“Towards GHG Emission Reduction”

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Outlines

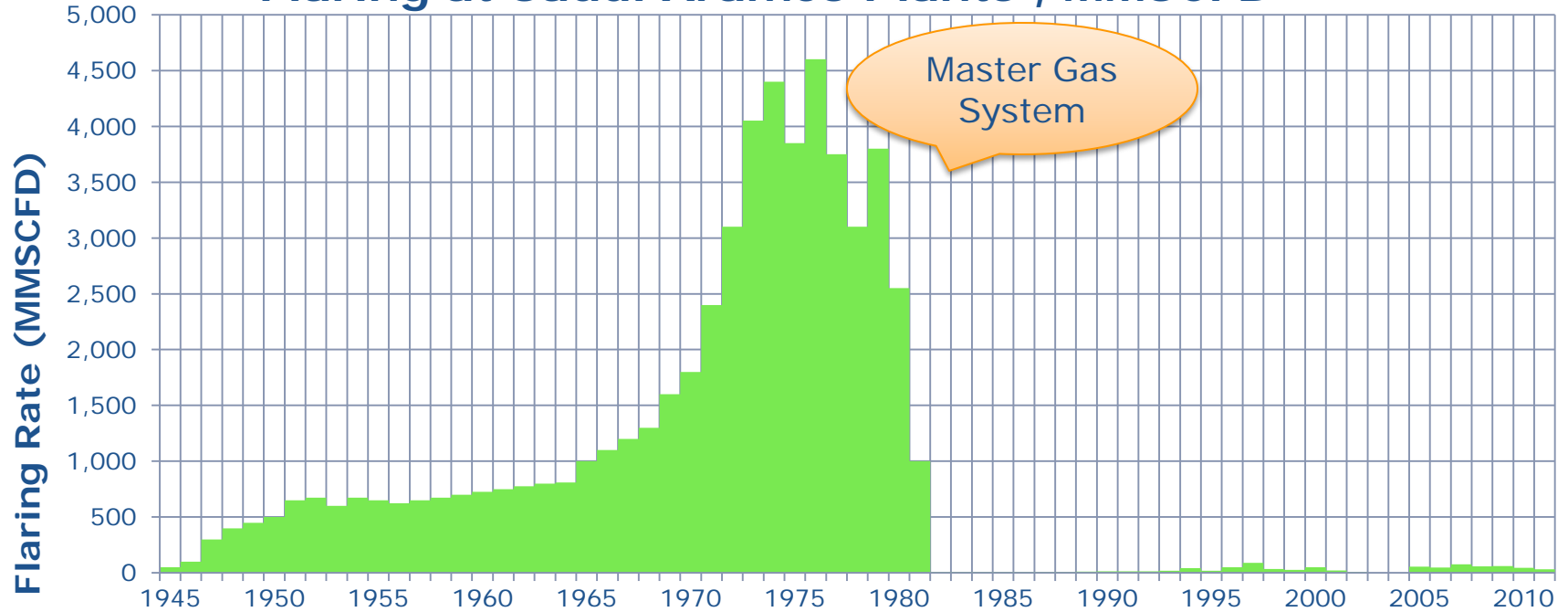
- ❖ **Facts about Methane (CH₄)**
- ❖ **Saudi Arabia Flaring Mitigation Program.**
- ❖ **Zero Discharge Technology**
- ❖ **Saudi Arabia Leak Detection and Repair (LDAR)**
- ❖ **Conclusion**

Facts About Methane (CH₄)

- CH₄ has molecular weight of around 16.
- CH₄ is the 2nd anthropogenic GHG after CO₂. 14 % of the global GHG emission
- CH₄ has shorter life time but has 21 times affect of CO₂ in global warming.
- The main Methane emission sources are :agricultures, coal mines, landfills, municipal wastewater, and Oil & Gas Sector.
- Oil & Gas sector contribute of around 20 % of the total worldwide methane emissions.

Flaring Background

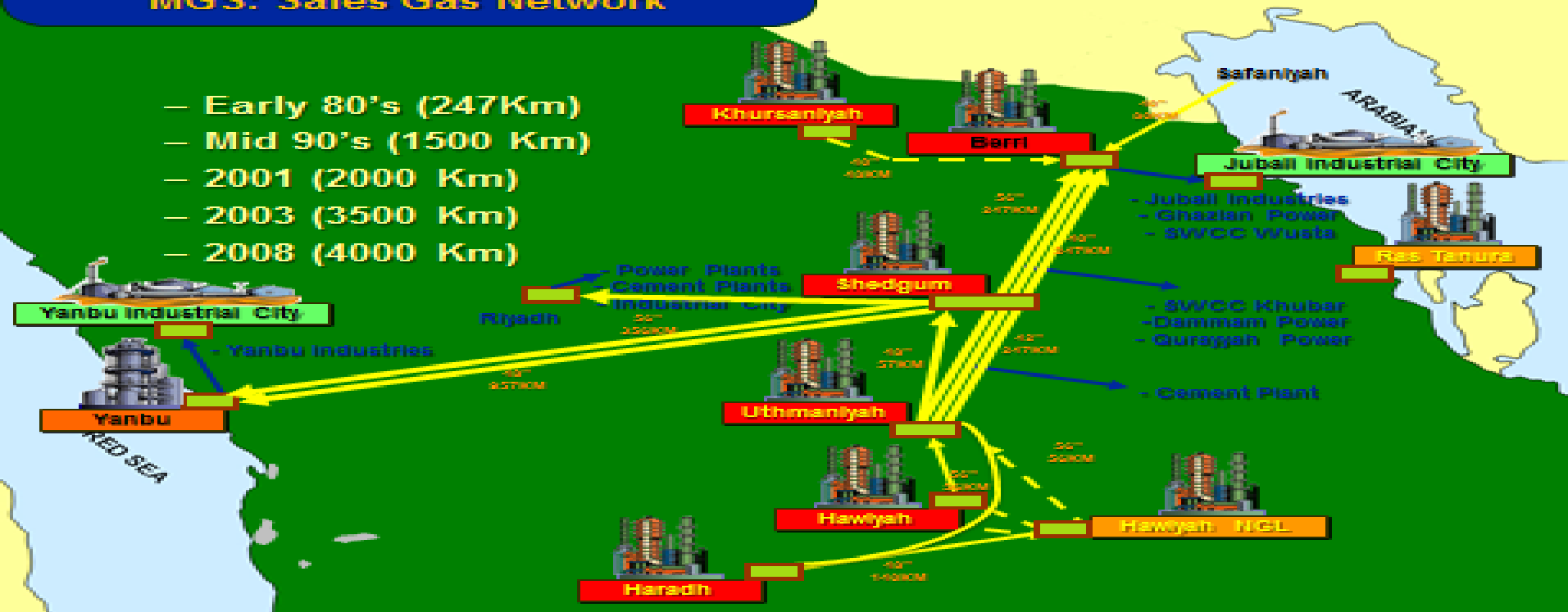
Flaring at Saudi Aramco Plants , MMSCFD



Flaring Background

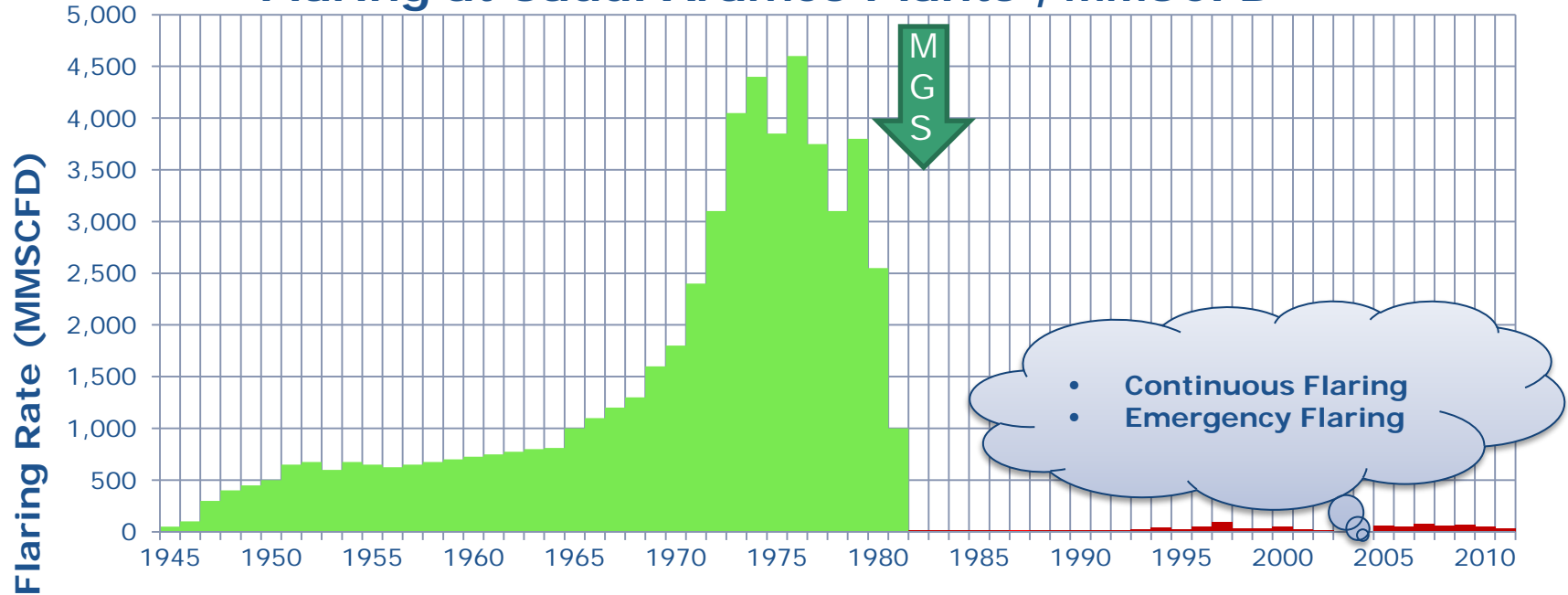
MGs: Sales Gas Network

- Early 80's (247Km)
- Mid 90's (1500 Km)
- 2001 (2000 Km)
- 2003 (3500 Km)
- 2008 (4000 Km)



Flaring Background

Flaring at Saudi Aramco Plants , MMSCFD



Flaring Mitigation Program

❖ Corporate Flaring Program

- Mitigate Flaring
- Enhance Quality of Environment
- Ensure Compliance

❖ Preserve Hydrocarbon Resources

- Power Generation and Petrochemical

Key Challenges

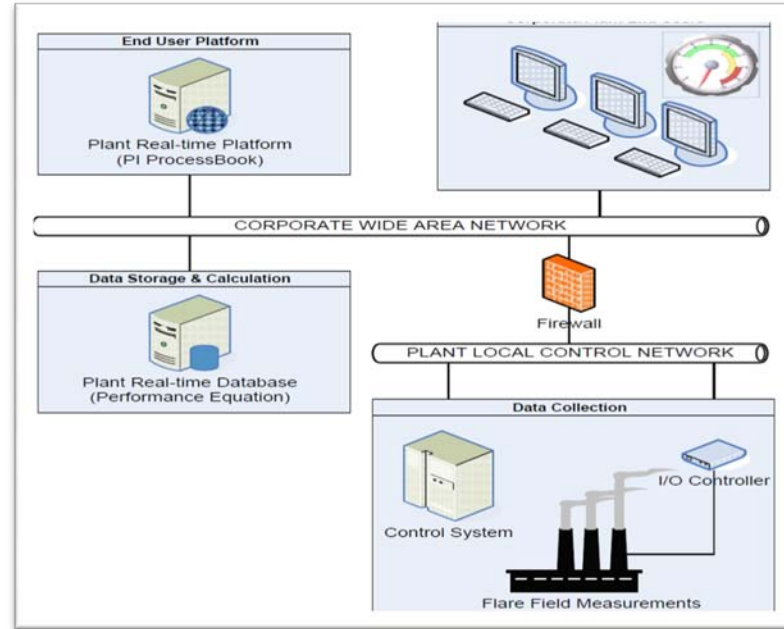
- Inaccurate Measurement of Flaring Losses
 - Unavailability or Deficiency in Flow-meters
 - Manual Estimation
 - Inconsistent Methodology of Reporting
- Lack of Governance and Flaring Policy
- Accountability
- Difficulty in Planning Mitigation Measures

Flaring Mitigation Program

❖ Develop Real-Time Flare Monitoring System (FMS)



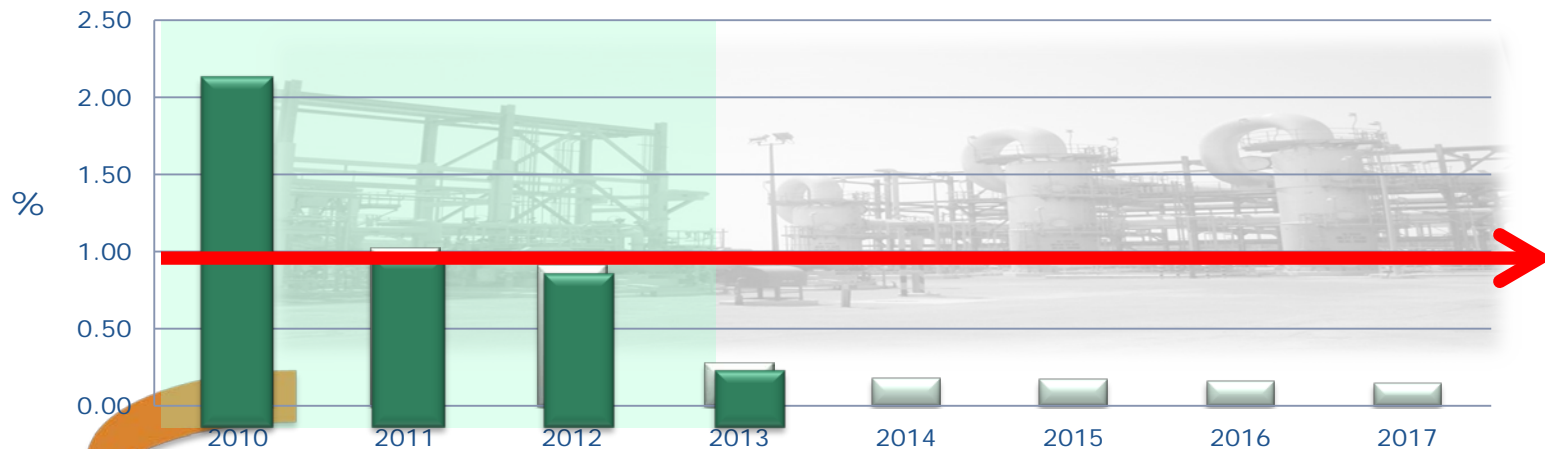
- In-house Smart Solution
- ESC Capability
- Site-specific FMS
- Rolled-out to the Field



Flaring Mitigation Program

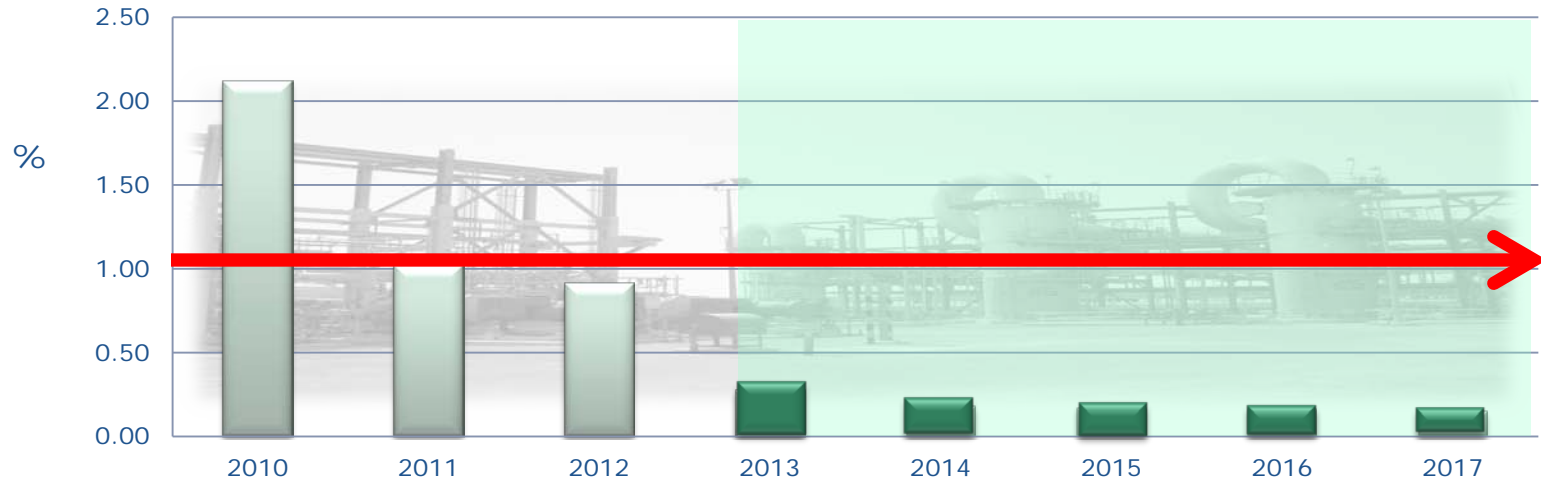
- Accurate and Consistent Corporate-wide Reporting
- Establish Flaring Loss KPIs (Corporate Dashboard)
- Implement Site-specific Flare Mitigation Measures
- Mandate Standards and Procedures for Consistency and Compliance

Short-Term Measures – Benefits



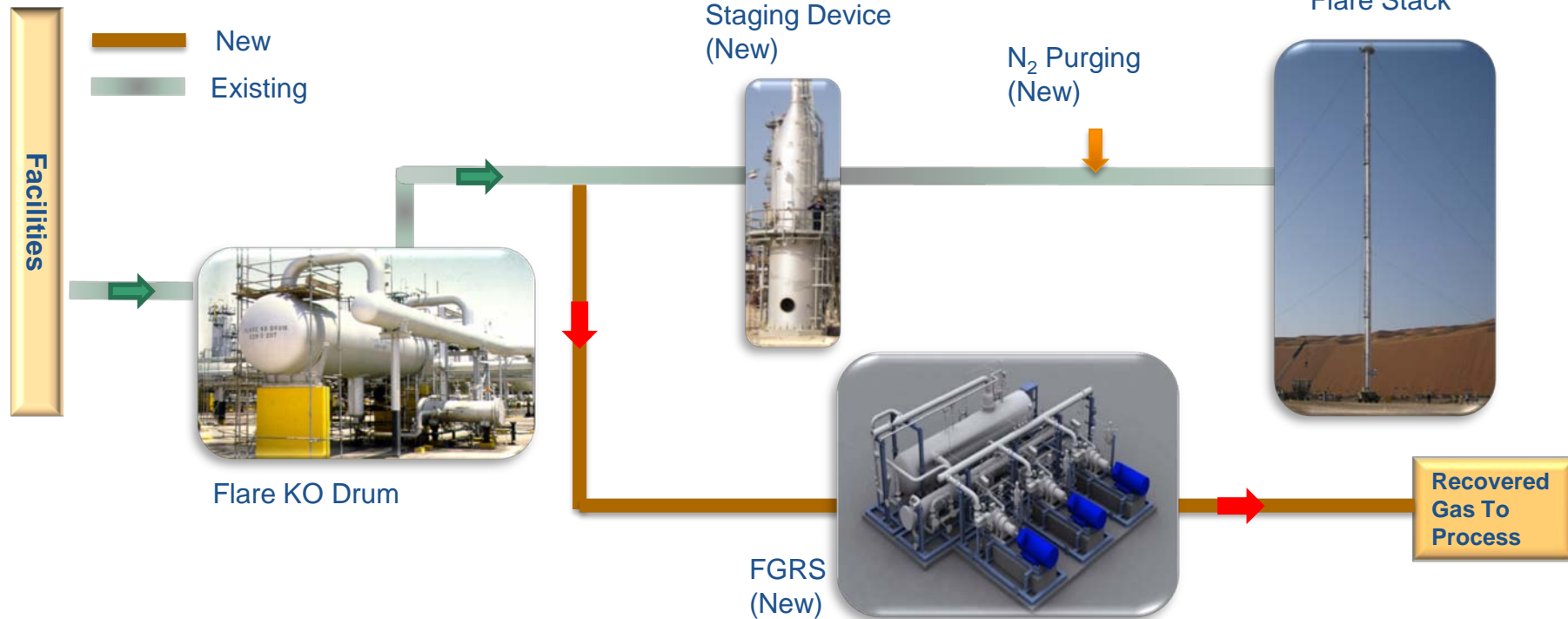
- ✓ Real-time Monitoring
- ✓ Implementation of Mitigation Measures
- ✓ Leak Surveys and Upgrade for Control Valves
- ✓ Purge Gas Optimization

Long-Term Measures – Benefits



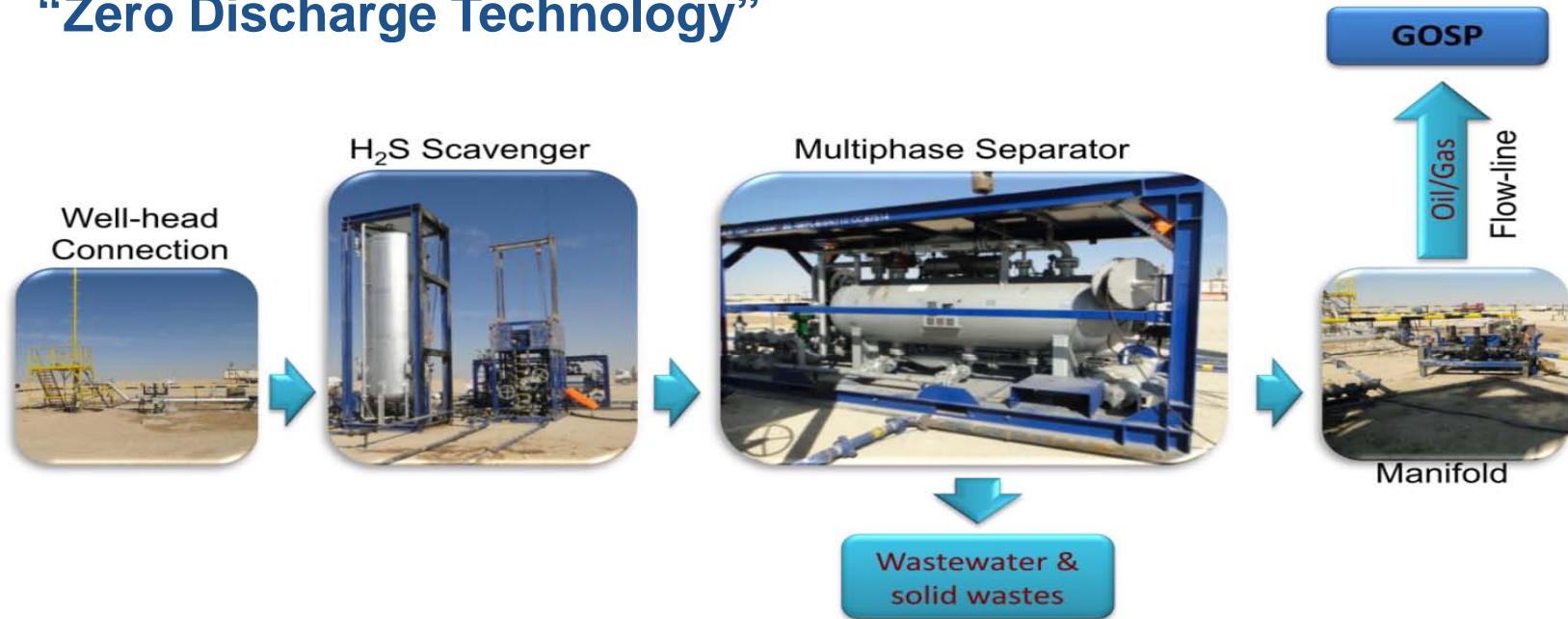
✓ Flare Gas Recovery Projects

Flare Gas Recovery System



Drilling & Work Over

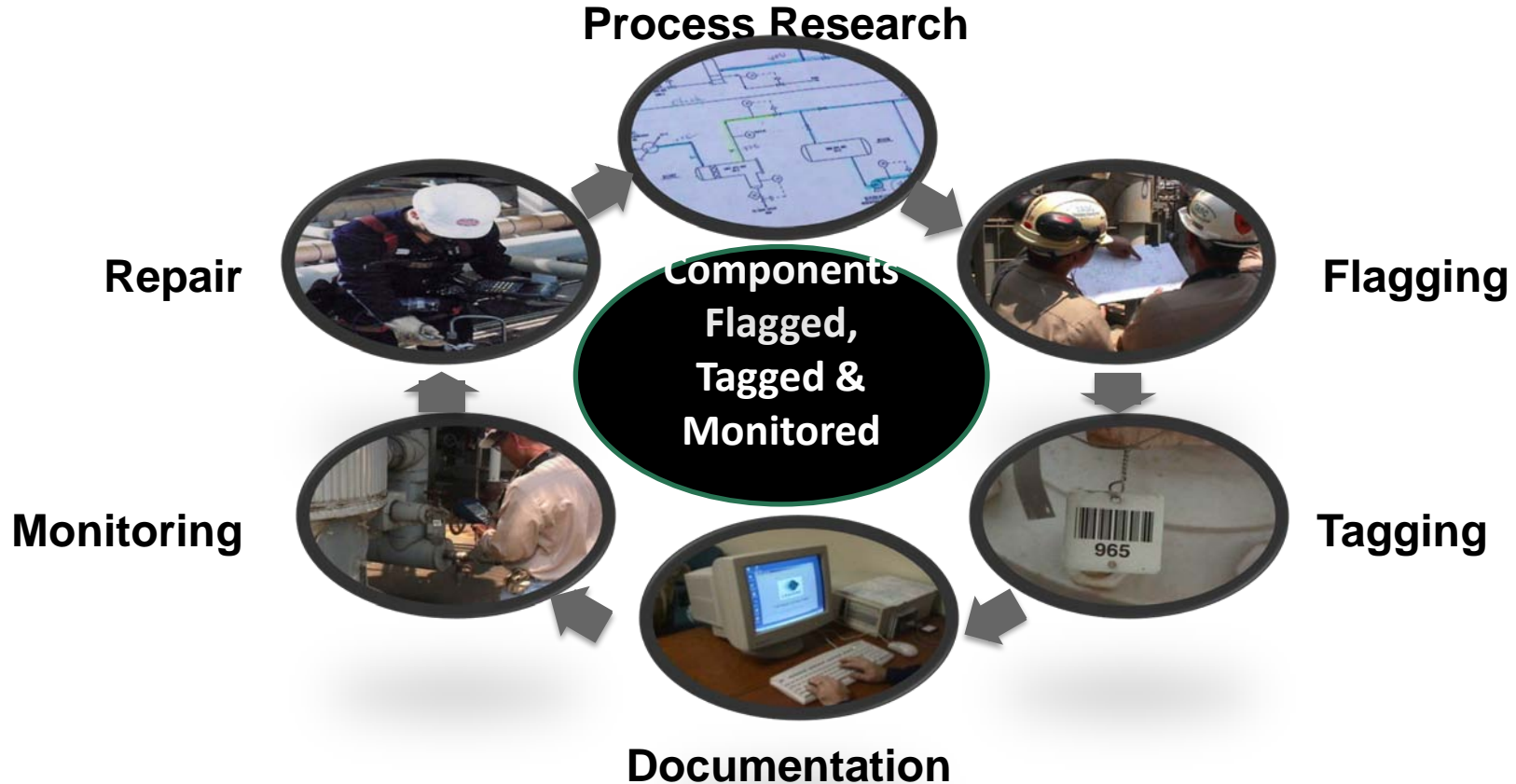
“Zero Discharge Technology”



Saudi Arabia Leak Detection and Repair (LDAR)

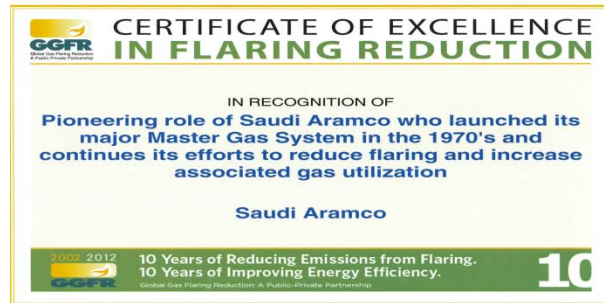
- Detection and reduction of fugitive emissions from pumps, connectors, valves, agitators, and open-end line at Oil & Gas facilities.
- LDAR programs defined under PME & RC government regulations.
- Saudi Arabian Oil & Gas companies has developed LDAR protocol to guide and standardizes the LDAR program implementation
- Smart LDAR such as utilizing infrared camera (FLAIR) is being adopted and under research

Implementation Methodology



Conclusion

- **Protect Environment and Conserve Natural Resources**
- **Realize 50% Reduction by minimalizing flaring**
- **Roll out of Corporate Flaring and LDAR Program**
- **Recognized Leader in Flare Mitigation at Regional and Global Level**





Thank You



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