

أرامكو السعودية  
Saudi Aramco



# Flaring Minimization Roadmap

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GPA-GCC Zero Flaring Seminar

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# Outline

- Environmental Regulations
- Corporate Flaring Task Team
- Background
- Flaring Practices & Trends
- Flare Gas Recovery
- Flaring Minimization Roadmap
- Future Outlook
- Summary

# Environmental Regulations

- PME environmental standards require controls for visible emissions (smoke)
- This requirement only applies to routine emissions
- Uncontrolled sources
  - Flares
  - Burn Pits

# Corporate Flaring Task Team

Task Team commissioned October 2005

- Multi-disciplined team from Engineering, Loss Prevention

Team Charter: Develop a corporate roadmap on flaring, to incorporate

- Environmental Regulations
- Flare design for new facilities
- Flare upgrades for existing facilities
- FGR applications, cost and economics
- Flare minimization guidelines
- Future Outlook

# Background

- A huge gas network created to utilize our gas
- Daily flaring limited to purge gas + gas leakage + operational requirements
- Have begun to minimize flaring, but still room for improvement
- Meeting smokeless flaring regulations except at a few facilities, being addressed
- Is “smokeless flaring” best way forward?
- What are others doing?

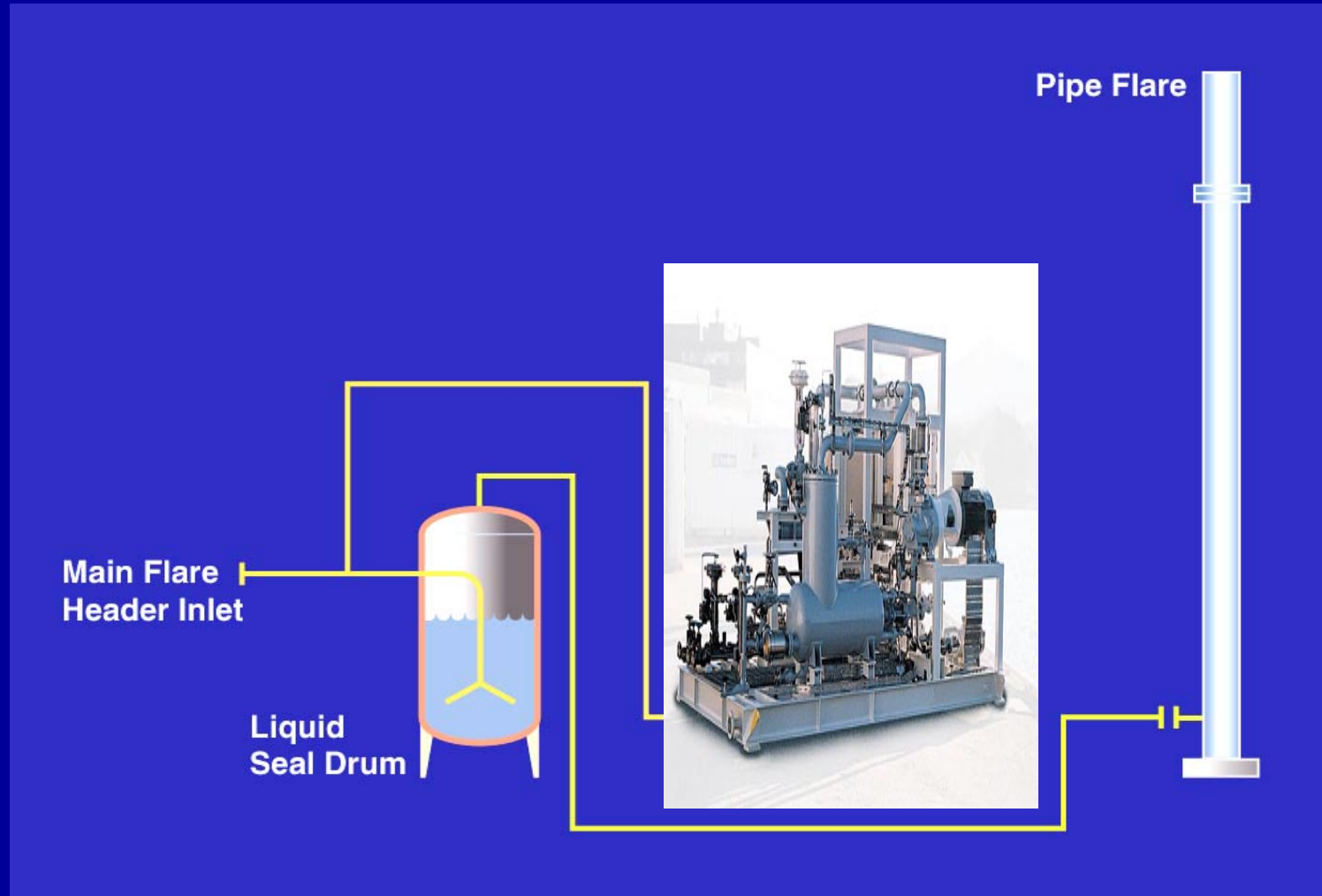
# Flaring Practices & Trends

- Our Current Practices
  - Maintain a visible flame
  - Flare metering and record keeping not enforced
  - Guidelines to minimize flaring not standardized
- Compliance with PME Regulations
  - Pursuing “smokeless” to meet target and compliance date
  - Current flare standard recommends staged flaring with 1<sup>st</sup> stage being a smokeless utility flare
- Worldwide Practices & Trends
  - Wide implementation of FGR / Zero flaring to minimize emissions, recover valuable gas and claim CO<sub>2</sub> tax credit

# Flare Gas Recovery

- Industry standard and proven technology
- Provides an economic incentive
- Intangible benefits from reduced emissions of SOX, NOX, VOC
- Improves reliability of main flare tip
- Meets corporate strategies & objectives, reinforces image

# Staged Flaring





# Flaring Minimization Roadmap

- Develop Guidelines to Minimize Flaring
  - Install Meters on all Flare Headers
  - Develop KPIs, Utilize Best Practices
- Install FGR in facilities with routine flaring rates  $> 1$  MMSCFD
- Convert flares with routine flaring rates  $< 1$  MMSCFD to smokeless

# Future Outlook

- FGR and Flaring Minimization meet several of our corporate strategic imperatives:

*Manage & Protect Resources / Optimize Processes / Improve Health & Safety / Protect the Environment*

- Install FGR for new “mega” projects
- Retrofit existing gas plants & refineries with FGR, as well as the larger production facilities
- Claim CO<sub>2</sub> tax credit
- Eventually zero flaring

# Summary

## Flaring Minimization Roadmap;

- Develop guidelines to minimize flaring
- Incorporate FGR into future Projects
- Install FGR in existing facilities with routine flaring rates  $> 1$  MMSCFD