

طاقة للأجيال
Energy for generations

أرامكو السعودية
Saudi Aramco



Flaring Control

Khalid Nowaishi, Fahad A Al-Khaldi, & Mohammed S. Ba-Shammakh

Presented by: Fahad A Al-Khaldi

GPA-GCC SPECIALIZED SESSION

On Environmental Challenges in Gas Processing

Doha, Qatar - November 5, 2008

Outline

- Background
- Flaring Sources
- Worldwide Flaring Reduction Efforts
- Saudi Aramco Flaring Minimization Contribution
- Conclusion



Background

- For years associated gas used to be flared
- 1975, a major gas network was built to utilize the gas
- Flaring is reduced to only routine flaring which mainly includes purge gas + gas leakages
- Kingdom efforts to minimize air pollution, Includes:
 - Establishing Environmental regulations Specifying:
 - Maximum Pollutant release Limits
 - Requirement for smokeless flaring



Flaring Distribution



Background

Types of Flares :

- Pipe Flare Tip – Utility Flare
- Steam Assisted Flare System
- Air Assisted Flare Systems
- Totally Enclosed Ground Flare
- Sonic Flare



Outline

- Background
- **Flaring Sources**
- Worldwide Flaring Reduction Efforts
- Saudi Aramco Flaring Minimization Contribution
- Conclusion



Flaring Sources

- Unutilized Associated Gas
- Plants startups, shutdowns, Process upsets and equipment trips
- Off-spec products
- Flare system Purge gas and valves leakages
- Well drilling and work-over
- Pipelines Scraping



Outline

- Background
- Flaring Sources
- **Worldwide Flaring Reduction Efforts**
- Flaring Minimization Proposal
- Conclusion



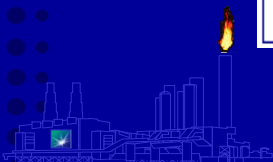
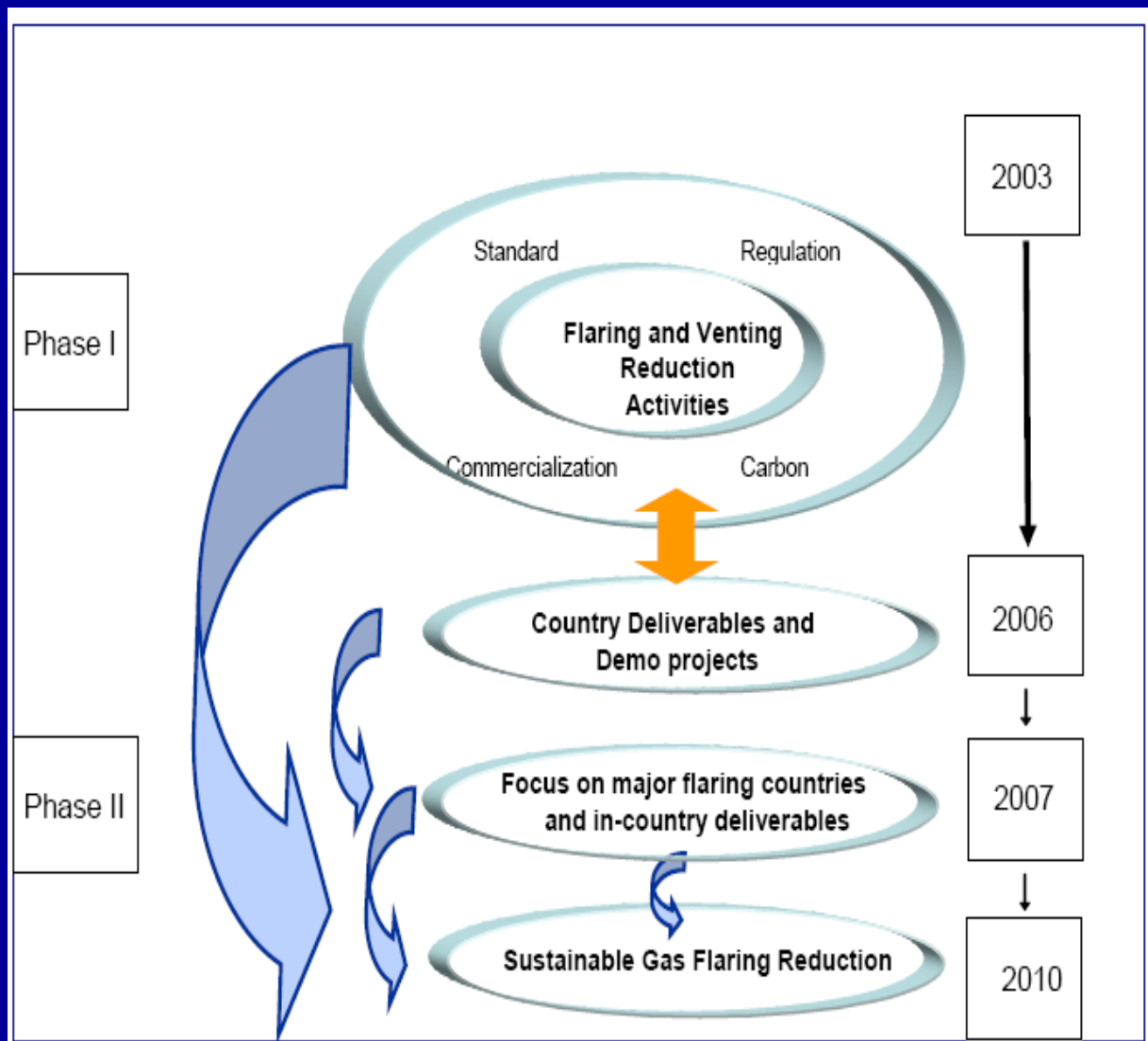
Worldwide Flaring Reduction Efforts

At the World Summit on Sustainable Development held in Johannesburg, 2002 the following was achieved:

- Formation of a Global Standard for Gas Flaring Reduction (GGFR)
- Establishment of Carbon credit Claiming System from flaring reduction projects
- Major Oil and Gas Companies sharing global best practices and implementing country's specific flaring reduction programs



GGFR Initiatives




Outline

- Background
- Flaring Sources
- Worldwide Flaring Reduction Efforts
- **Saudi Aramco Flaring Minimization Contribution**
- Conclusion



Saudi Aramco Flaring Minimization Contribution

- Flaring Minimization Roadmap
 - ✓ Flaring Minimization Plan 
 - ✓ Install FGR in facilities with routine flaring rates > 1 MMSCFD 
 - ✓ Install smokeless flares in facilities with routine flaring < 1 MMSCFD
- Environmental Awareness



Environmental Awareness

- Sponsor Regional Promotional activities on Zero Flaring
 - ✓ GPA-GCC Zero Flaring seminar
 - ✓ Workshop Flaring minimization in **Petrochemical Industry**
- Promotion of Zero Flaring Roadmap through GPA-GCC Executive committee



Conclusion

In Summary, Saudi Aramco efforts include;

- Huge investment in Master Gas System
 - No associated gas flaring
- Implementation of Corporate Flaring Road map
 - Facility specific FMPs for continuous improvement
 - Implementation of FGRS
- Participation in GGFR initiatives through OPEC secretariat
- Sponsoring regional Zero Flaring initiatives



Thank you



Flaring Reduction Guidelines (4 M's)

MEASURE

- Install flare header meters
- Recording procedures

MONITOR

- Reduce process upsets
- Manage flare header purge rates

MITIGATE

- Minimize leaks to flare
- Synchronize startups and shutdowns

MANAGE

- Develop KPIs to track and report flaring
- Compliance Audits

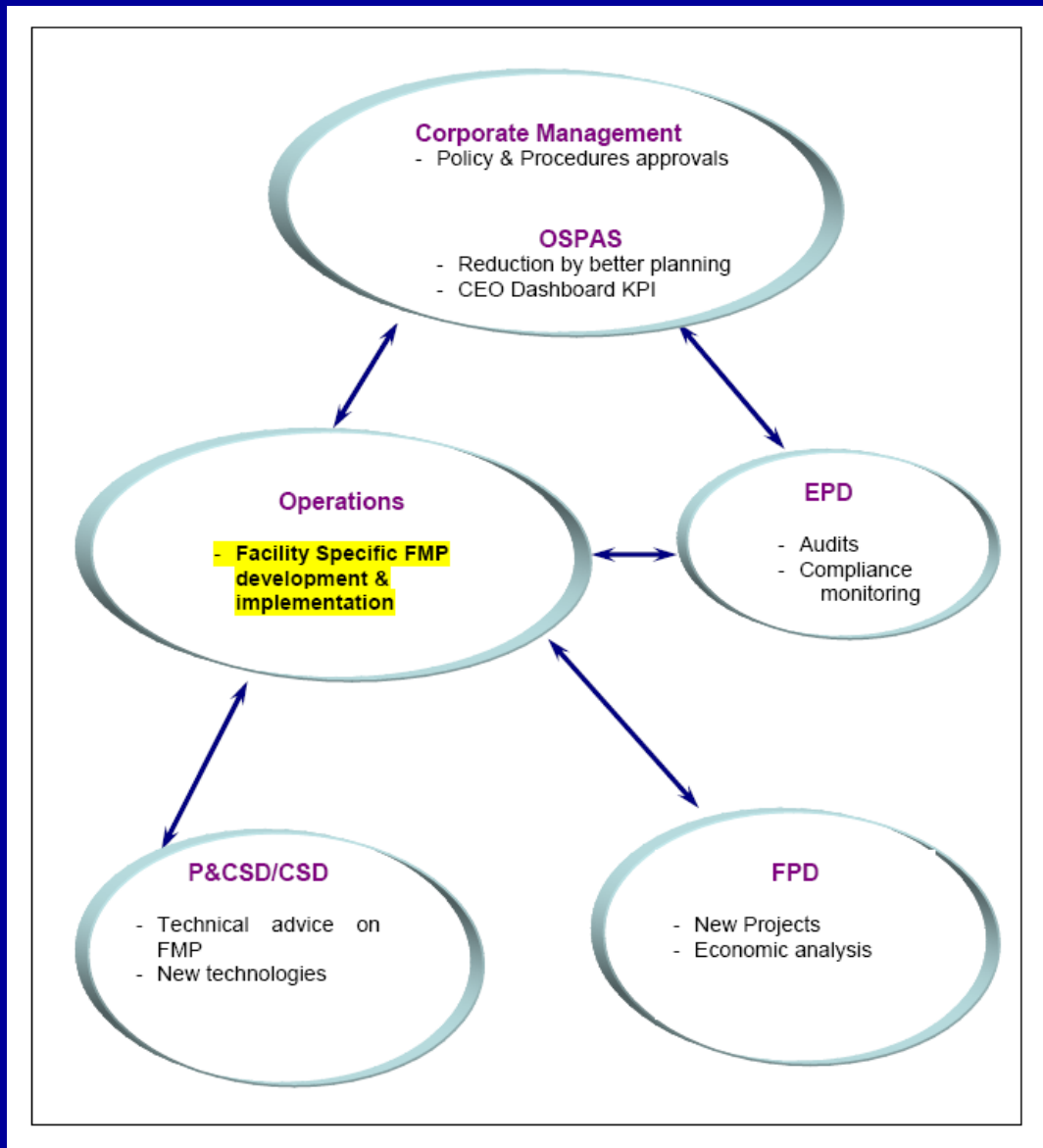


Facility Flaring Minimization Plan (FMP)

- Establishment of policies and procedures to minimize flaring
- Implementation of the measuring, monitoring and recording procedures of flared gas
- Implementation of common prevention measures - short term and long term



FMP – Frame work



Flare Gas Recovery

- Industry standard and proven technology
- Provides an economic incentive over smokeless staged flares
- Improves reliability of main flare tips
- Qualifies for CO₂ Tax credits
- Intangible benefits from reduced emissions
- Meets the flaring minimization objective



Staged Flaring

