MMS GOADS and Offshore Methane Emissions

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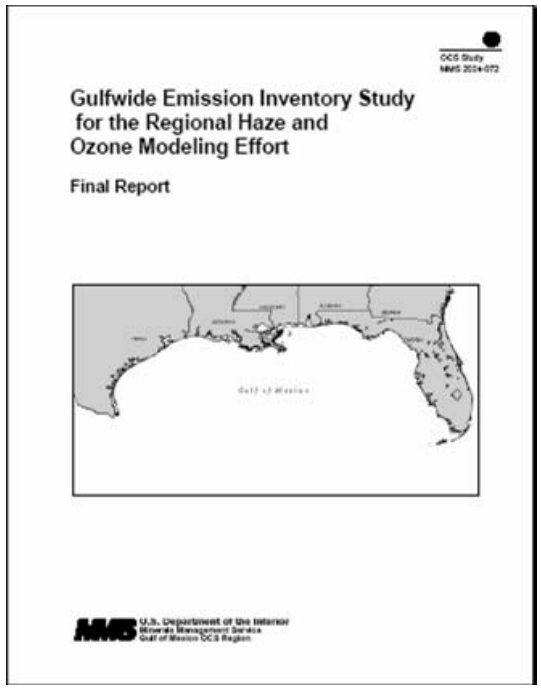
NEWFIELD

Agenda

- MMS GOADS 2000 Effort
- GOADS Offshore Emissions Sources
- EPA Analysis of Methane Emissions
- Opportunities for Methane Savings

MMS GOADS 2000 Inventory Summary

- Minerals Management Service **G**ulfwide **O**ffshore **A**ctivities **D**ata **S**ystem (MMS GOADS 2000)
  - Goal to develop base year 2000 air emissions inventory for the Gulf of Mexico Outer Continental Shelf
  - Collected monthly activity data from platform emissions sources
  - Used published Emission Factors (EFs) or calculations for estimating emissions
    - CO, NO_x, SO_2, PM_{1o}, $PM_{2.5}$, VOC, CO_2, N_2O, CH_4



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MMS GOADS 2000 Inventory Activity Data for Platform Sources

- Detailed activity data collected from each platform

GOADS Emissions Source	Activity Units
Amine Units	MMscf gas throughput
Boilers/Heaters/Burners	Gallons fuel, Mscf fuel gas
Diesel and Gasoline Engines	Gallons fuel
Drilling Rigs	Gallons fuel, Mscf fuel gas
Flares	Mscf flared, Mscf pilot fuel gas
Fugitives	Component count
Glycol Dehydrators	Mscf gas throughput
Loading Operations	Bbl transferred
Losses from Flashing	Bbl transferred
Mud Degassing	Drilling days
Natural Gas Engines	Mscf fuel gas
Natural Gas Turbines	Mscf fuel gas
Pneumatic Pumps	scf vented
Pressure/Level Controllers	scf vented
Storage Tanks	Bbl transferred
Vents	Mscf vented

MMS GOADS 2000 Effort Emission Factors

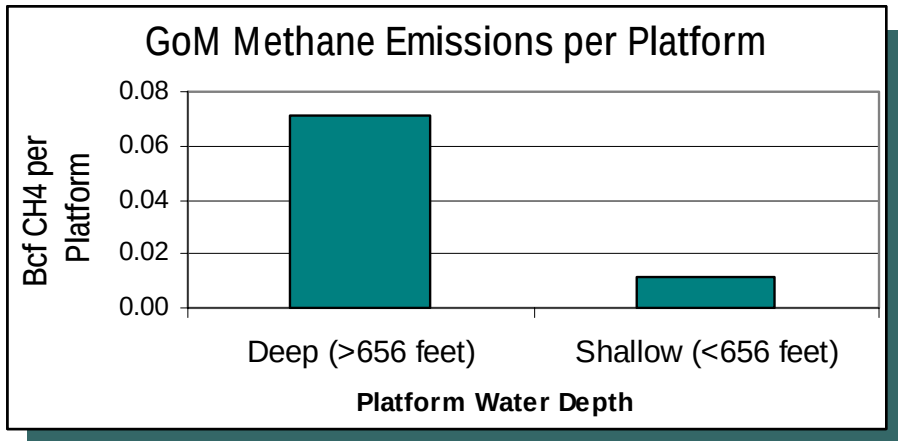
- GOADS 2000 was primarily a priority pollutant study
  - Some GOADS sources have EFs for THC or VOC rather than for methane
  - Some methane emissions were estimated using generic factors
- GOADS 2000 is a much more complete data set than used in the 1996 GRI/EPA study, *Methane Emissions from the Natural Gas Industry*
- EPA chose to analyze the GOADS 2000 data for improving their *Inventory of US Greenhouse Gas Emissions and Sinks*

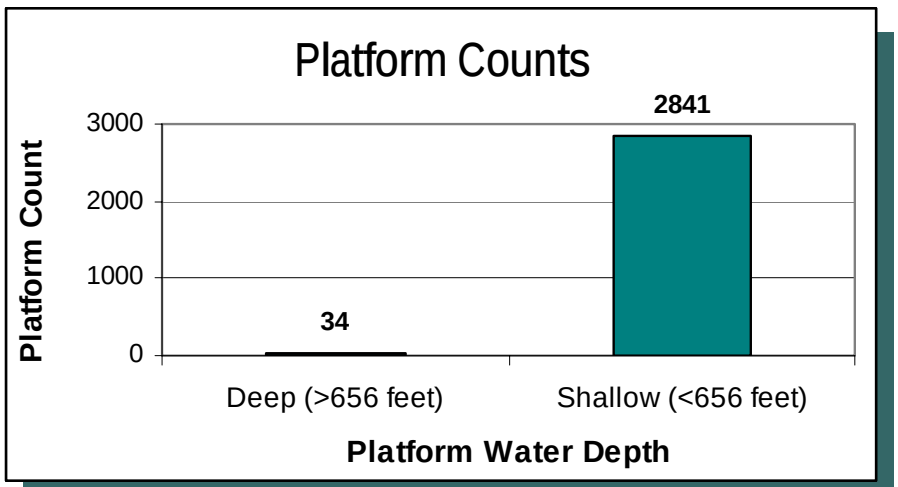
EPA Analysis

- EPA analysis relies on high level of detail in GOADS 2000 activity data
- EPA performed the following:
  - Evaluated GOADS 2000 methane EF for each source and replaced with an updated EF where available
  - Classified platforms as shallow (<656 ft) or deep water
  - Classified platforms as gas- or oil-producing (to split platform count between the gas and the oil EPA inventories)
  - Performed a statistical evaluation of methane emissions uncertainty
  - Results: Base year 2000 emissions per platform suitable for the EPA national inventory models

EPA Analysis: Methane Emissions by Platform Type

- On average, a deep water platform has more activity and higher methane emissions than a shallow water platform, but…

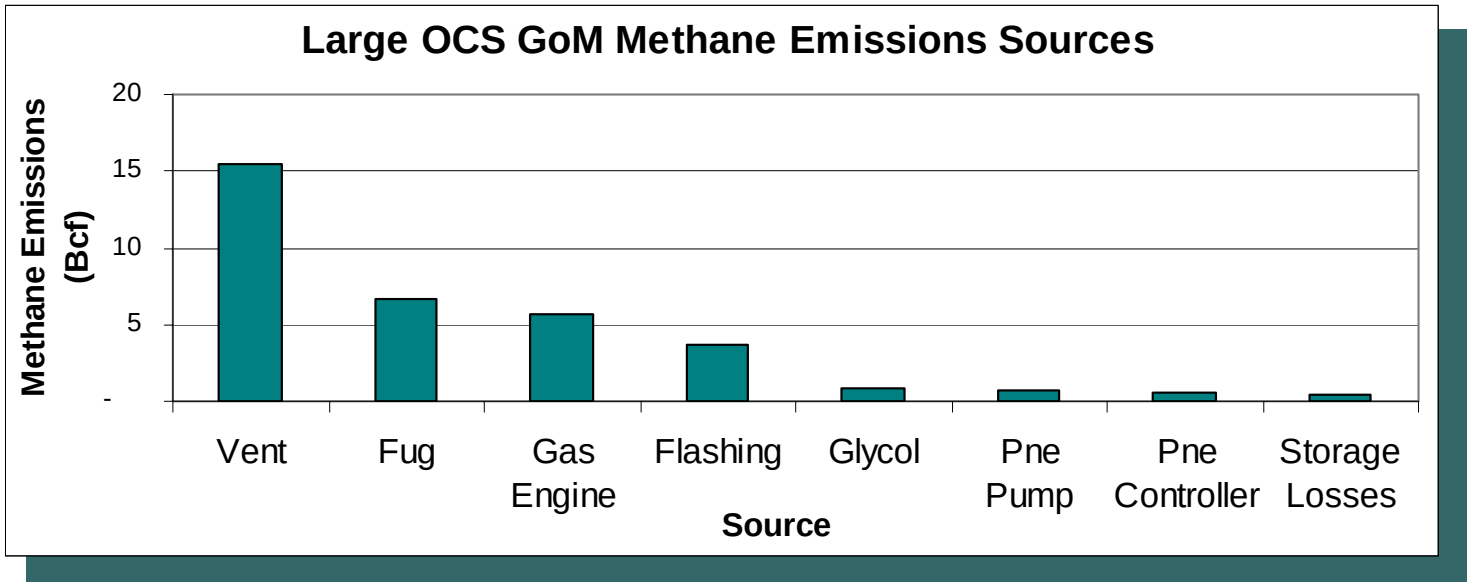




…most OCS emissions are from shallow water platforms, which are much more numerous

EPA Analysis: Largest Methane Emissions Sources, All OCS GoM

- Large sources can be targeted for reduction



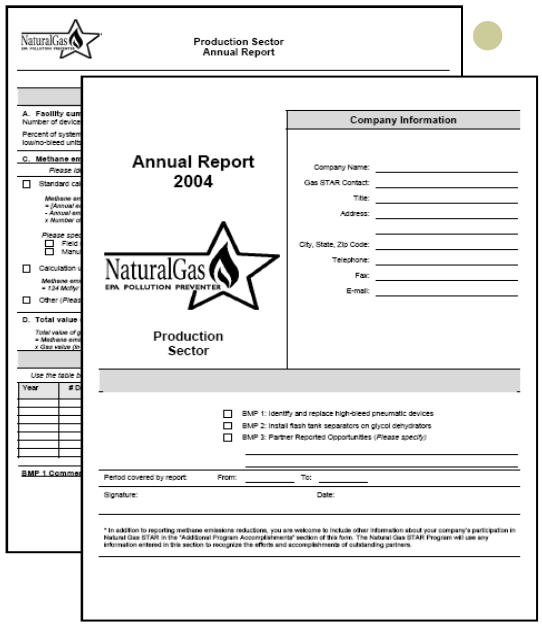
  - Vent: routine or emergency releases from misc. equipment that does not have its own GOADS source

Methane Savings: GOADS and Natural Gas STAR

- Data already collected for GOADS can be used to examine potential methane savings
- Get credit for what you already accomplished: Report to Gas STAR all voluntary methane reductions already achieved
  - Low-bleed pneumatic devices (<6scf/hr)
  - Vapor recovery installations
  - Routing process vents and blowdowns to flares / vapor recovery / compressor suction
  - Glycol dehydrator optimizations
  - Number of components for which leak inspection occurs
  - Centrifugal compressor dry seals

Methane Savings Opportunities

- Examine your platform activities for large methane emission sources



Gas STAR Annual Report

- Consider new projects to save methane
  - Install vapor recovery units
  - Route more sources to vapor recovery / flare / compressor suction
  - Conduct / continue leak inspections
  - Replace centrifugal compressor wet seals
  - Optimize glycol dehydrator units
  - Install automated air/fuel controllers

Conclusions

- Use GOADS studies to identify your existing voluntary methane savings and report to Gas STAR
- Use GOADS studies to identify and reduce large methane emissions sources

GOADS Emissions Source	Methane Savings Activity
Fugitives	• Conduct/continue leak inspection • Centrifugal compressor wet seals • Reciprocating compressor rod packing replacement
Glycol Dehydrators	• Routing process vents and blowdowns to flares / vapor recovery / compressor suction • Optimize glycol dehydrators
Natural Gas Engines	• Install automated air/fuel controllers
Pressure/Level Controllers	• Low-bleed pneumatic devices (<6scf/hr)
Storage Tanks	• Vapor recovery installations
Vents	• Routing process vents and blowdowns to flares / vapor recovery / compressor suction