2010 Natural Gas STAR Annual Implementation Workshop
November 1-3, 2010
New Orleans, Louisiana
Assisting in Plant Design Utilizing GHG Management Software

By:
Brian Lockard - Manager, Corporate Climate Policy

November 1-3, 2010
New Orleans, Louisiana
About Noble Energy

- Independent energy company engaged in worldwide oil and gas exploration and production

- Domestic U.S. Operations
  - Rocky Mountains, Mid-Continent, and deepwater Gulf of Mexico

- Key International Operations
  - Offshore Israel and West Africa
Awareness Programs

Corporate Policy/Strategy Development

GHG Reduction Projects

- High bleed pneumatic replacements
- VRU pilot programs
- Heat trace/injection pump replacement
- IR camera directed maintenance

“All lagging strategies”
Noble Corporate GHG Strategy

- Goal is to have “a seat at the table” during early phases of a project
- Affect design, i.e. “Leading Strategies”
  - Project conceptual phase
  - Early stages of new field development
  - Engineering design input
  - Focus on minimizing GHG (CH4) footprint
Noble Energy Tamar Project
Noble Energy Tamar Project
Noble Energy Tamar Project

Project Background

- Field discovered in 1999, located 52 miles offshore Israel in the Eastern Mediterranean
- Estimated 8.4 TCF, gross reserves
- Initial development:
  - Five subsea wells flowing 200 to 250 MMCFD of natural gas each
  - 1.0 BCFD Receiving facility for liquids removal, dew point control
Noble Energy Tamar Project

Receiving Facility Equipment
- Compression
- Electric Generation
- Dehydration (MEG)
- Stabilization
- Centralized, hot oil heat
- Condensate storage
- Dew point control (Joule-Thomson valve)
- Vapor Recovery System
- Purge System
Noble Energy Tamar Project

- ESS Essential Suite version 7.3.3
- 2008 Criteria Pollutant and GHG inventories prepared in ESS
  - Only assets under operational control
  - Criteria pollutant inventory included only “regulated” domestic operations
  - GHG inventory included domestic and international operations
- Reported 2008 Inventory to Carbon Disclosure Project
Noble Energy Tamar Project

- Mid 2010 receiving facility design changed from onshore facility to offshore

- Successes
  - Maximized VRU capture
  - Minimized purge gas flow
  - Minimized fugitive emissions
    - Engineering design
    - Directed LDAR program using IR Technology
Noble Energy Tamar Project

Conclusions

- “Seat at the table” strategy had educational value with engineering and project team
- Emission reductions during design phase more effective than lagging controls
- GHG management software can be used as a design tool