

Mercury Electric Corporation

Honeywell Microturbine & Oilfield Experience

DOE/CETC/CANDRA Workshop

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Outline

- Mercury Electric Overview
- Mercury Flare Gas Installations
- Fleet Performance
- O & M Experience
- Technical Issues
- Installation Issues



Mercury Electric Overview

- Formed in 1995
- Focus: IPP, waste gas
- Early prototype testing
- Second Parallon 75 distributor in 1997
- Honeywell ceased production August/01
- Mercury is now an IPP only and will work with manufacturers on product testing & improvements



Some of Mercury's Commercial Installations

- WestJet Airlines
 - Standby power for reservation system
- Broxburn Vegetables
 - Greenhouse application
 - Supply power, heat & CO2

Mercury Oilfield Installations

- Nipisi 1 Parallon
- Evi 3 Parallons
- Mitsue 3 Parallons
- Morse River 6 Parallons
- Otter (2 sites) 15 Parallons
- Cynthia 3 Parallons
- Virginia Hills 3 Parallons
- Empress 8 Parallons
- Knopcik 4 Parallons
- Bear Lake 4 Parallons

Knopcik



- Knopcik Battery, Grande Prairie, AB

Bear Lake



Bear Lake Battery, Grande Prairie, AB



Fleet Performance

- Total run time for oilfield generation fleet:
146,000 hours
- Maximum continuous run time: 8,700 hours

Analysis of Downtime Causes

- Fuel quality and outages
- Turbine/generator
- Remote location of sites
- Fuel gas compression
- Grid outages

O & M Experience

- Developed expertise to diagnose problems remotely
- Stock common replacement parts on site
- Local operator, maintenance & repair network for remote sites
- Oilfield operators familiar with gas compression



O & M Costs and Performance

- Both O&M costs, availability cover wide range
- Early operation is R&D regardless of what you call it!
- Need to compress waste gas creates additional challenges compared to recip.

Technical Issues

- Microturbine
 - Most failures caused by cores or bearings
 - Some power electronics prototype failures, failures rare on production units
 - Recuperator failures rare on base load applications
 - Air filtration - high maintenance in dusty areas
 - Fuel filtration - high maintenance on waste gas

Technical Issues - continued

- Gas compressor
 - Critical to success of microturbines
 - Needed: reliable, long life compression
 - Fluctuating gas supply pressure
 - Lube oil contamination & change intervals

Technical Issues - continued

- Fuel treatment
 - Challenge: economical fuel conditioning
 - Developed solutions for both sweet, sour gas
 - Every site is different!
 - Challenging working environment

Installation Issues

- Skid or other modular approach
- Hazardous area classification
- Dusty environments
- Electric utility interconnect
- Electrical grounding