

Acme Fill Corporation
Martinez, Ca

**Microturbine
Landfill Gas to Energy Project**

**Chris Charrette
CD Charrette Consulting, Inc
CDCharrette@aol.com**

Site Overview

- Active & Inactive Landfill
- Landfill Methane content: 500 - 520 BTUs
- Daily LFG Processed: 700 – 800 cfm
- Electrical Demand
 - Gas Compression & Conditioning skid
 - Leachate Treatment Plant
 - Misc. Buildings and Offices

Energy Generation Overview

- 4 – 70 kw IR Induction Units
- Operating Since – August 2003
- 3 Units Operating 24/7
- 1 Unit Operated as Needed for Peak Load Shaving
- 52,000 Total Operating Hours or 13,000 Hours/Unit
- All Power Used Onsite – “No-Export” Agreement

Economic Overview

- Utilized PG&E Rebate Incentive Program
- Capital Payback Period – 1.5 years
- Peak PG&E Monthly Bill Prior to August 2003 - \$33,000/Month
- Current PG&E Bill \$7500/Month
- Departing Load Charges - \$800/Month
- Future Load Bank Installation

Project Problems

- PG&E Interconnection Agreement
- Electrical Protection Equipment
- Electrical Protection Scheme
- Electrical Protection Settings

PG&E Interconnection Agreement

- Submitted Protection Equipment Settings
 - No Export Agreement
 - Underpower Agreement
- Submitted Protection Equipment
- Submitted Electrical Single Line

During this Process there is no detailed protection scheme review

However.....

Know Where to Look

- Rule 21 - Umbrella Basics
- PG&E Interconnection Handbook – Details
 - Section G2 Protection Control Requirements
 - Section G5 Energization And Synchronization Requirements (pre-parallel Information)

Protection Equipment & Settings

- Know Existing Equipment – Transformer
- Understand Protection Relay Specifications
 - Sensing Capability & Reliability
 - Read Product Manual
- Understand and Calculate Protection Settings
 - Current Transformer Ratios
 - Underpower = 5% kw gross name plate rating
 - No Export = .1% transformer rating.

Bottom Line

- Understand Equipment Limitations
- Understand How to Calculate all Settings based on Existing and Specified Equipment
- If You Don't know or Understand - **Ask the Question!!!**

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Union Mine, El Dorado County



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