

Controlling and Monitoring

ACEEE – Portland Conference
Heat Pump Hot Water Systems
Large Applications - Hawaii

2/22/2016



Presenter Introduction

- **Robert Cooley, CEM**
 - Independent Consultant
 - Hawaii Energy Heat Pump Pilot
 - Contractor
- **Dennis Ensminger**
 - EDC Technologies, Inc.
 - Manufacturing and R&D Manager

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Who is EDC Technologies Inc.

- Efficiency, Diagnostic, Control = Energy Savings
- Established in 1984
- Primary market:
 - Multi family
 - lodging
 - commercial

Monitoring and Control

- Temp sensors on all aspects of the hot water system
 - Delivery, Returns, Hot water sources.. Etc..
- Monitor operational runtime for diagnosing hot water system
- Analysis of data as it comes in to apply logic to increase efficiency
 - System anomalies
 - System load analysis
- Optimizing system operation

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Hawaii Highrise

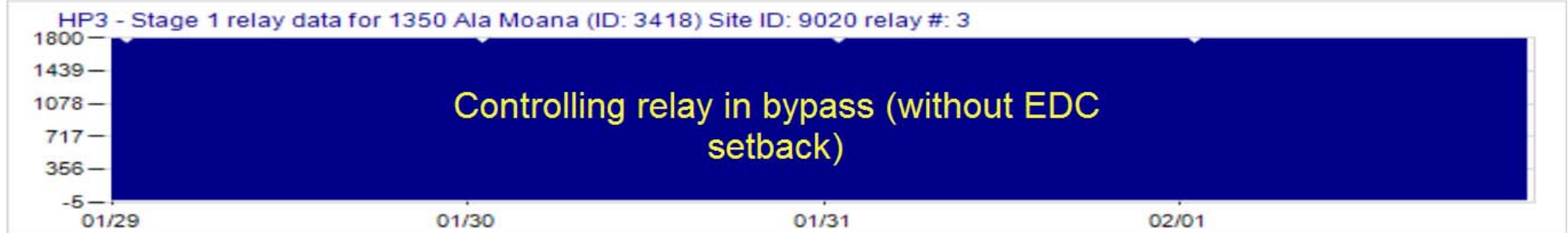
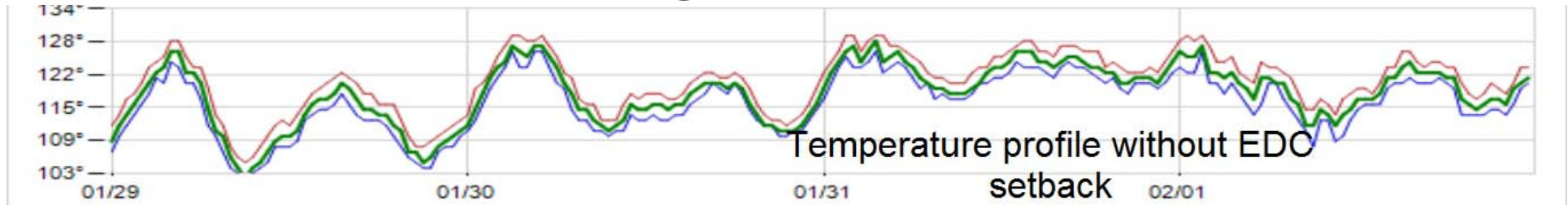
- 33 story high-rise
- Completed in 1968
- 374 units
- Gas to heat pump conversion in 2000
- 4 - E-Tech WH160HTCBP heat pumps
- ~ 157 kbtu each
- 1200g storage tank

Initial Configuration

- 4 heat pumps controlled by a Honeywell control set for 135 degrees F
- Delta control was non-operational
- Almost continuous heat pump operation.
- No redundancy. When 1 heat pump went off line, cold water resulted.
- 1375 kWh/day, \$385.61 daily electric cost

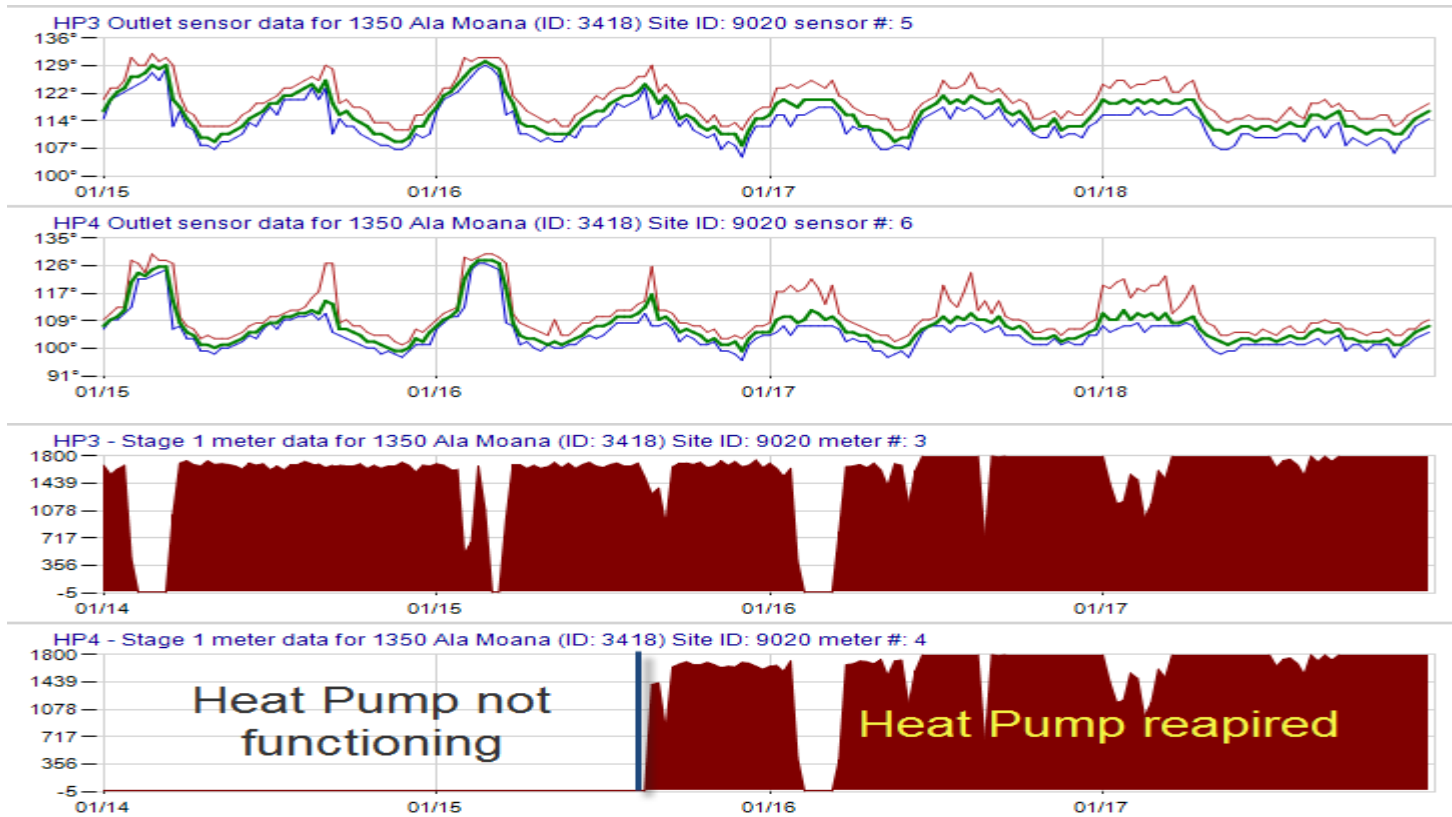
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Monitoring Data - Before



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HP Repair - Before vs After



Changes Made

- Temperature set points changed (lower)
- All heat pumps heat exchangers cleaned
- One heat pump recirculation pump replaced
- Storage tank connections modified

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Storage Tank Repipe

