



Report No. 12137
Date: 9/2104

Electricity Reduction Pilot Program

CONDUCTED AT

CHELSEA PIERS

LOCATED AT

Pier 60, West Street, New York, NY

**TEST RESULTS
FOR
COMMERCIAL AIR-CONDITIONING**

A Confidential Report
Prepared by
Intellidyne LLC



SEPTEMBER 2004

CHELSEA PIERS PILOT REPORT SUMMARY

The attached technical report summarizes the Energy Saving Performance of the *IntelliCon*[®] “CAC” energy saving control which was installed on an electric powered, 10 Ton packaged unit manufactured by Trane Comfort Systems. The *IntelliCon*[®] unit was installed on the unit that provides space conditioning for the “electronics room” on Pier 60 at Chelsea Piers in Manhattan, New York and the validation data was collected from August 20, 2004 to September 8th, 2004. The test data was collected using “alternating day” methodology which is further describe later in this report.

The Air Conditioning system operates “24x7” for approximately 9 to 10 months per year. The test data in this report reflects a reduction in run time and consistent space temperatures in the area served by this packaged AC system. With the *IntelliCon*[®] control installed, the Compressor achieved a reduction in total run time of 11.03%.

The individual report contain the comparative “run time” hours for both the days when the IntelliCon control was in the circuit (On Days) and for those days when the IntelliCon control was out of the circuit (Off days).

This “pilot study” clearly shows the *IntelliCon*[®] control delivers above the minimum guaranteed savings of 10% and, by significantly reducing total compressor run time, should provide the additional benefit of extending the operational life of the compressor.



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 Glen Cove, NY 11542
 Phone: 516-676-0777
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Test Report

Report No. 12137

Date: 09/21/04

Customer:

Global Solutions
 Pier 60, West Street
 New York, NY

Test Site Location:

Chelsea Piers
 Pier 60, West Street
 New York, NY

Contact: Kevin Cosey or Hagit

Test Type: HEATING AIR CONDITIONING REFRIGERATION OTHER: _____
 Product Tested: HW LCH LCS CHW CHS AC CAC RU OTHER: _____

Type of Equipment:

Manufacturer: Trane
 Model: TTA120B300LA, S/N: 3145P73AD
 Cooling Capacity: 10 Ton (2.5 Ton Compressors)
 Application: AC for Electronics Room
 Volt, Amps, Ph: 206, 15.9 A_{avg}, 3Ø
 Equipment Location: Roof

Test Start Date: 08/20/04
 Test End Date: 09/08/04
 No. of Days in Test: 20

COMPRESSOR RUN-TIME: in HRS. in MIN.
 IntelliCon ON-DAYS: 391:15:28
 IntelliCon OFF-DAYS: 439:44:25
 RUN-TIME was reduced by: 11.03%

COMPRESSOR USAGE FACTOR:
 IntelliCon On-Days: 82%
 IntelliCon Off-Days: 92%

COOLING DEGREE-DAYS (FOR TEST PERIOD)
 IntelliCon ON-DAYS: 47 It was 3.42% Cooler on the ON-Days.
 IntelliCon OFF-DAYS: 49
 Total Degree-Days: 96

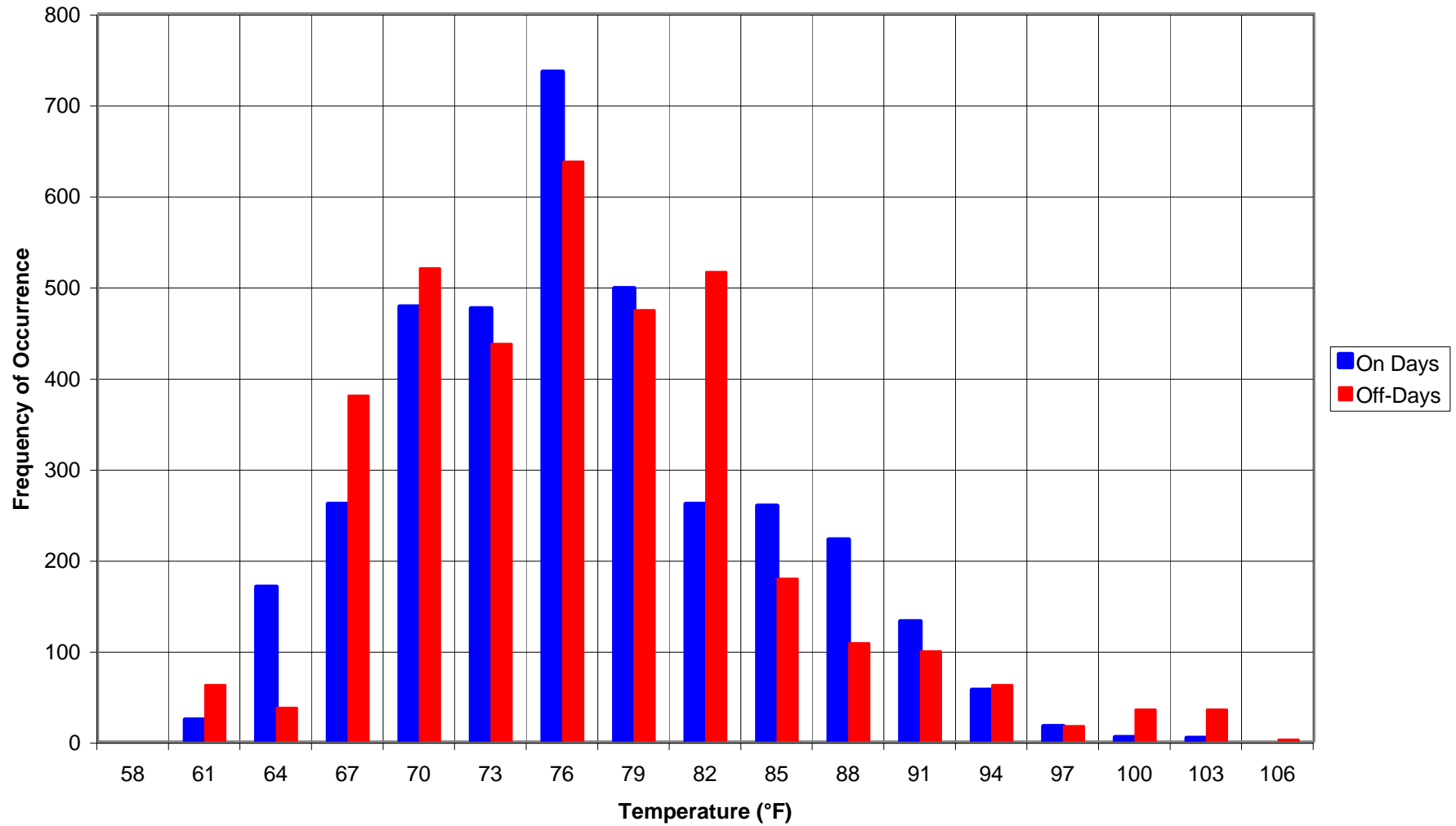
SOLAR LOAD COMPENSATION: (Lumens/Sq. Ft.)
 IntelliCon ON-DAYS: 99
 IntelliCon OFF-DAYS: 90 It was 9.51% Sunnier on the On-Days.

Savings = 11.03%

COMMENTS: Note: Effects of Solar Load and Outdoor Air Temperature fluctuations negated each other. As such, there was no need to compensate for their influence. The run-times for both compressors were combined and treated as one unit for analysis purposes. The usage factors for the compressors were above the normal levels of between 40% - 80%. Temperature maintenance within the space was well within normal limits of ±1°F.

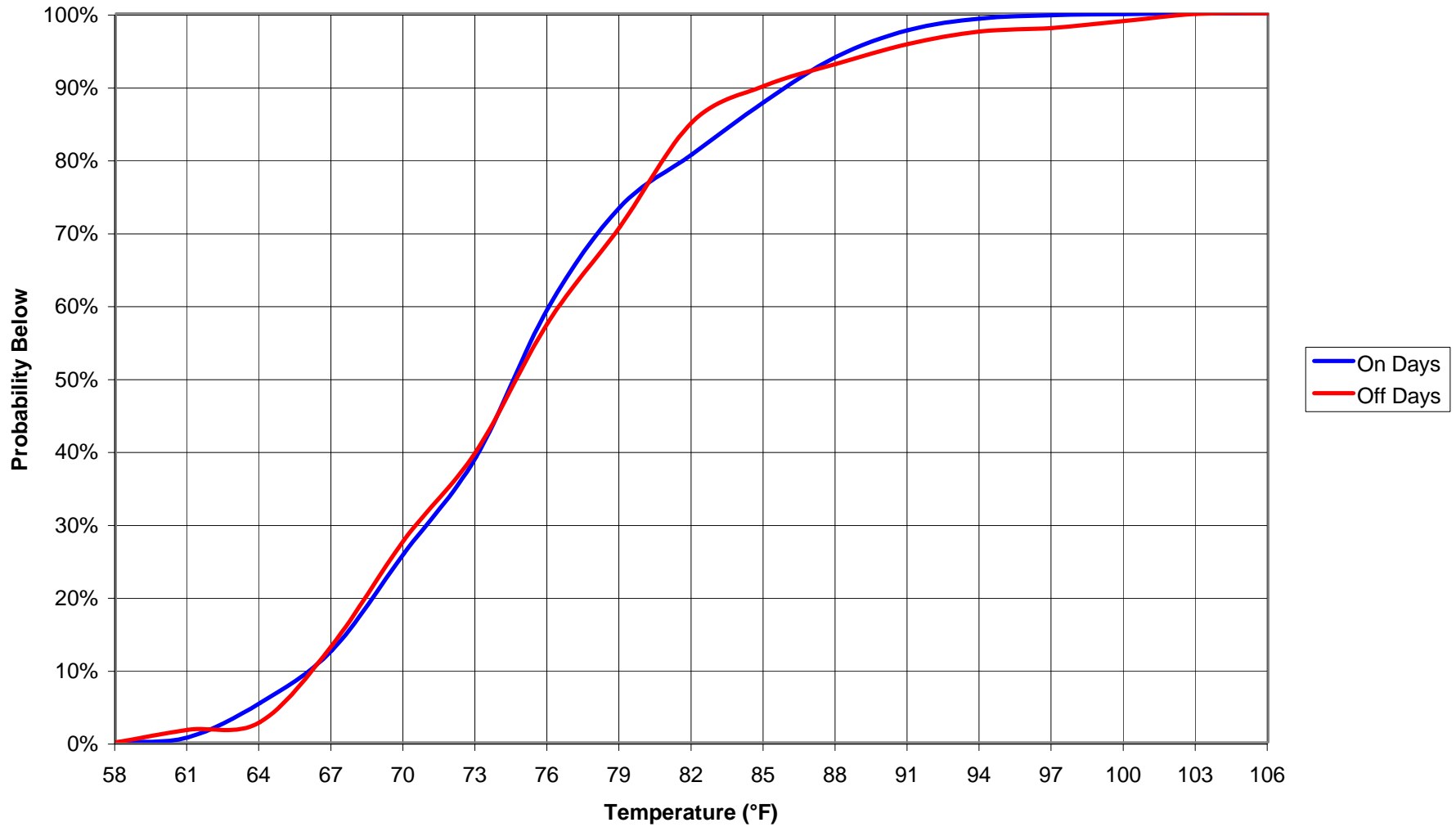
CHELSEA PIERS

Outside Air Temperature Histogram

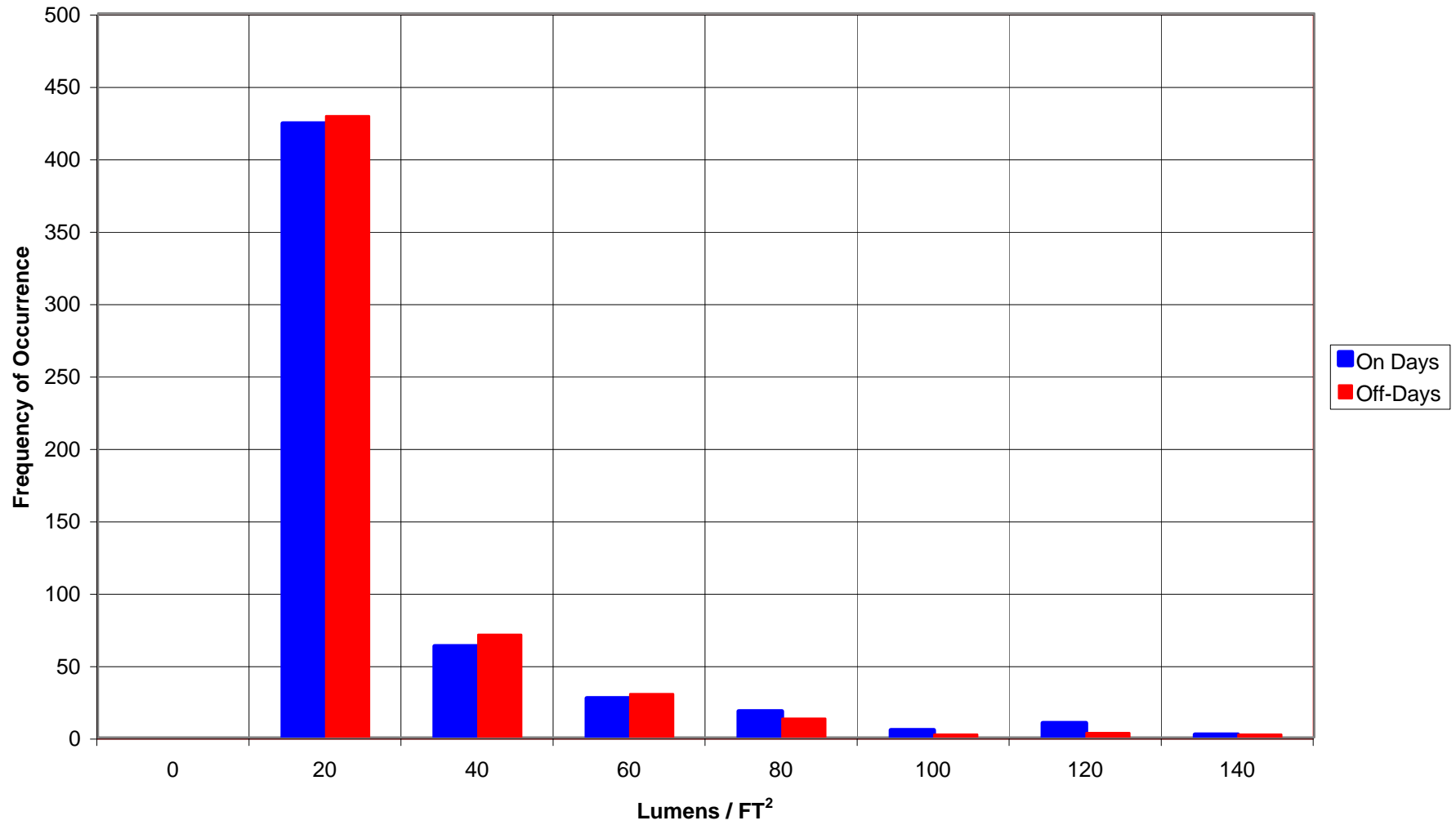


CHELSEA PIERS

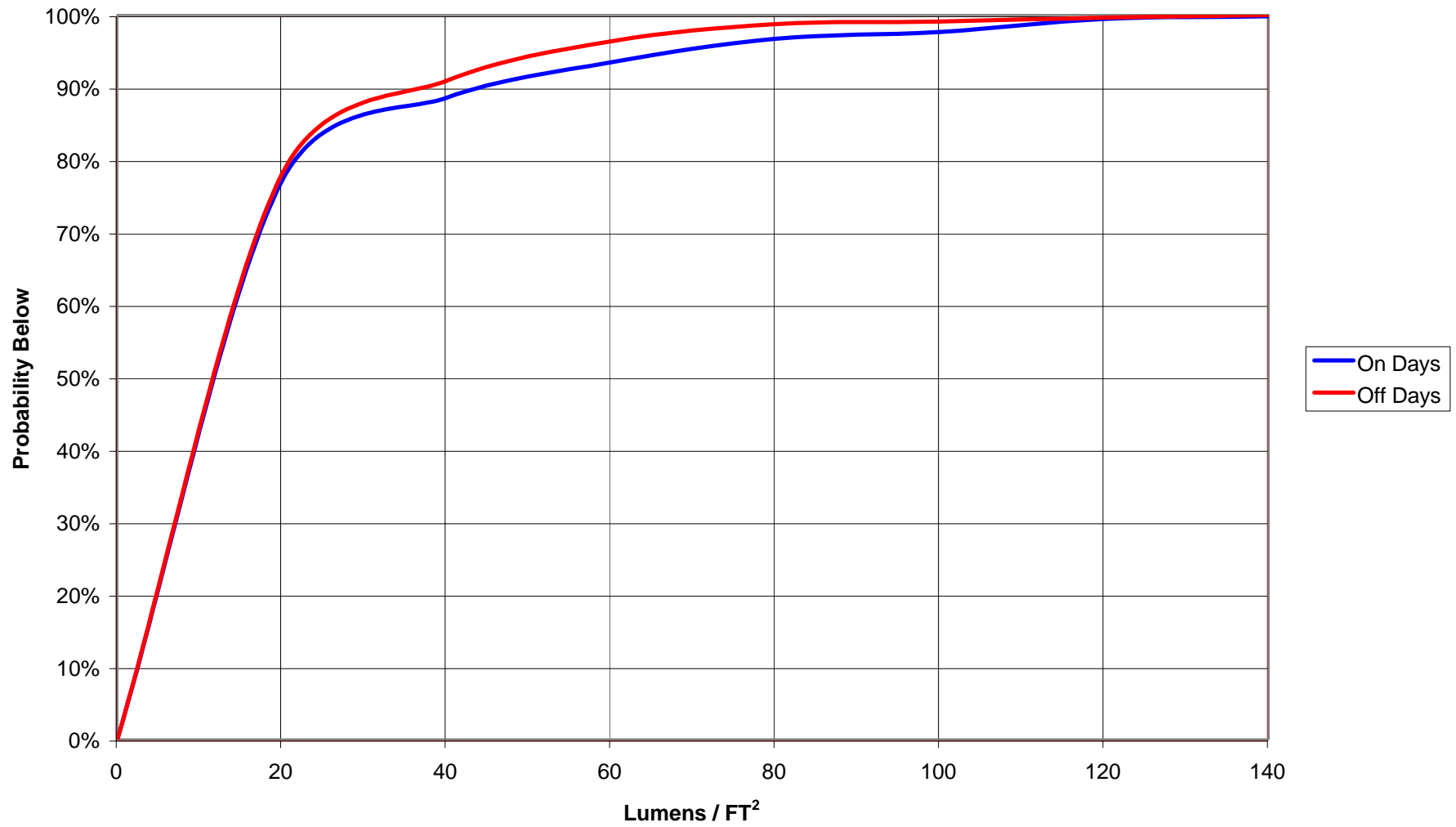
Outside Air Temperature Probabilities



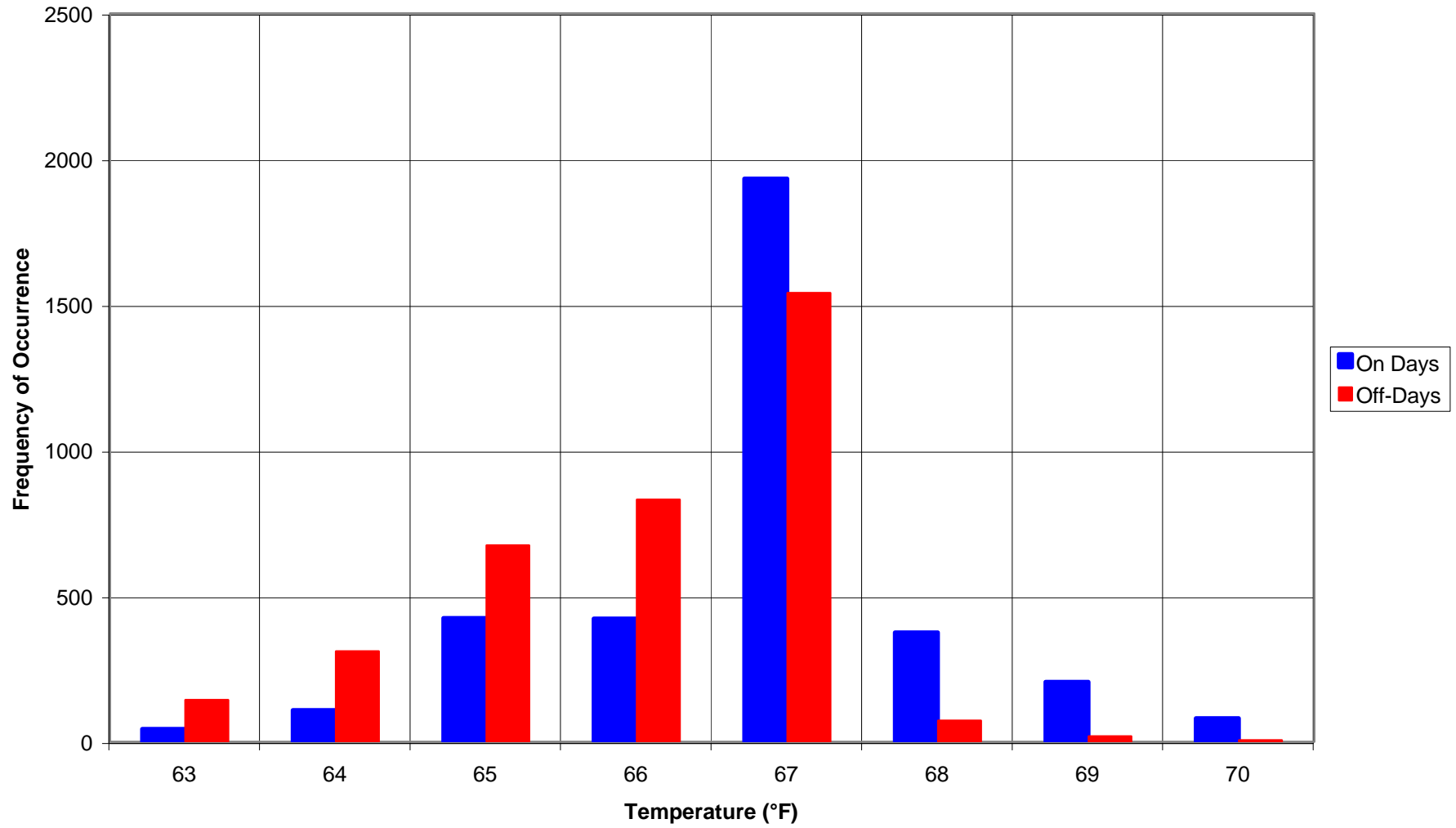
CHELSEA PIERS Solar Load Histogram



CHELSEA PIERS Solar Load Probabilities

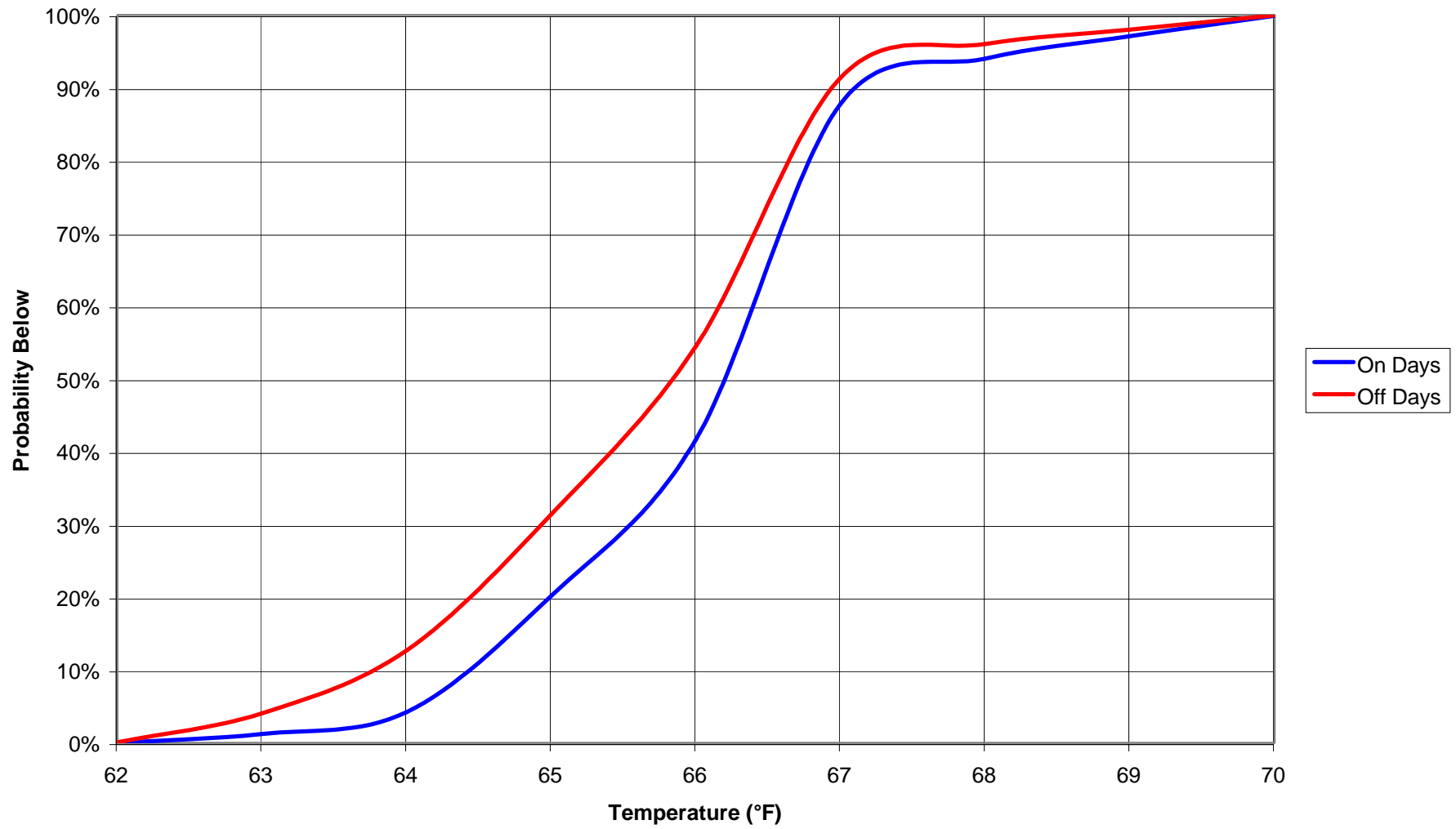


CHELSEA PIERS Space Temperature Histogram



CHELSEA PIERS

Space Temperature Probabilities





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Testing Methodology

EQUIPMENT USED FOR TESTING PURPOSES

Specific timing and data logging devices are used to gather detailed information about the unit(s) being evaluated. Each device has been carefully selected for its reliability, capability and function. The individual devices INTELLIDYNE uses are explained below.

1. TIME CLOCK:

Manufacturer: Tork Model: 8007V-0

Is used to switch the IntelliCon® product in and out of the circuit. This is done on a 24 hour basis. The result is that the IntelliCon® product is in control ("in" the circuit) one day and not in control ("out" of circuit) the next day. A 14 day time clock was selected so that a complete alternation of days that IntelliCon® is in control would result.

2. CURRENT SWITCH:

Manufacturer: Veris Industries Model: Hawkeye 608/908

The current switch is used to monitor when current is being drawn by the cooling/refrigeration compressor or heating burner. When current is sensed it is "On" when no-current is sensed it is off "OFF". The current switch is used in conjunction with the "Change-of-State" data logger.

3. "CHANGE-OF-STATE" DATA LOGGER:

Manufacturer: Onset Computer Corp. Model: H06-001-02

This device monitors and logs the "change-of-states" (the on / off status) of the unit being tested. It is used in conjunction with the CURRENT SWITCH, above, and time and date-stamps (logs) each change of status. By processing the logged data, the durations for each cycle can be determined.

4. "LIGHT INTENSITY" DATA LOGGER

Manufacturer: Onset Computer Corp. Model: HLI

This data logger is used to monitor and log Light Intensity and is used to determine the solar-load influence on the facility.

5. "T/Rh" DATA LOGGER

Manufacturer: Onset Computer Corp. Model: H08-004-02

This data logger is used to monitor and log the temperature and relative humidity in the conditioned space.

6. "TEMPERATURE" DATA LOGGER

Manufacturer: Onset Computer Corp. Model: H08-001-02

This data logger is used to monitor and log the outdoor air temperature, and is used to determine the degree-day influence on the facility

WHAT DATA IS COLLECTED

Linking all of the above together with the IntelliCon® product being “in” and “out” of the circuit, on alternating days, yields the following data:

- ? How many on/off cycles per day (if applicable).
- ? Total “on time” per cycle, per day.
- ? Total “off time” per cycle, per day.
- ? What the solar load of the facility was during the test period (if applicable).
- ? What the relative humidity in the conditioned space was during the test period (if applicable).
- ? What the temperature of the conditioned space was during the test period (if applicable).
- ? What the outdoor air temperature was during the test period (if applicable).

How The Data Is Analyzed

Upon completion of the test, all the data is evaluated to calculate the reduction of consumption (savings).

Short-term testing analysis can only be performed properly by the elimination and reduction of as many variables as possible and through the analysis of the data on a statistical basis. The alternating “in” circuit / “out” of circuit testing has the advantage of minimizing the variations due to time-sensitivity, day-of-week sensitivity, degree-day effects, etc.

In order to properly evaluate the data, the following must be determined:

1. A baseline must be established. Baseline consumption data is the “use” or consumption information that is unaffected by the IntelliCon economizer (“out” of circuit). This may be derived during the test (which is what is done here) or from historical records. The advantage of deriving the base-line during the test is that site specific degree-day and solar data may be determined as opposed to weather-service data that may or may not be indicative of the test site.
2. It is necessary to determine what effects or influences are caused by solar- load and degree-day variations. This is done by performing a statistical analysis on the solar and degree-day data collected during the base-line phase.
3. In order to properly compare the two consumption cases (IntelliCon “in” and “out” of circuit), and determine the savings, it is necessary to adjust (or “normalize”) the data collected during the “in-circuit” phase. The consumption data collected when the IntelliCon economizer was “in-circuit”, is “normalized” by compensating for the effects of the solar and degree-day influences that occurred during the same phase of the test. This is accomplished by applying the statistical analysis results of the solar and degree-day influences (collected during the base-line phase) as a means to compensate for the solar and degree-day variations that occurred during the “in” circuit phase of the test.
4. The normalized consumption data acquired during the “in” circuit phase is compared to the base-line data and the savings determined.