TECHNOLOGY DEMONSTRATION FOR

NYC DCAS

IDEA Program

PRESENTED TO:

Steven Lochner, Program Manager
Innovative Technologies

The City of New York
Dept. of Citywide Administrative Services
Division of Energy Management
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PRESENTED BY:

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A Confidential Report
Submit 011916 – Version 03

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TABLE OF CONTENTS

Submit 011916 – Version 03

❑ Intellidyne® Technology Demonstration

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Report No. 12175
Date: 12/11/15

Fuel & Electricity Reduction Program

CONDUCTED FOR

NYC – DCAS

as part of the IDEA energy reduction program

EXECUTIVE SUMMARY

A Confidential Report
Prepared by
Intellidyne LLC

Executive Summary

Intellidyne as part of the NYC DCAS IDEA program installed Energy Conservation Measures (ECM) at 4 NYC – DCAS properties, and collected data from June 2014 through July 2015.

The summary results are:

Location	Type of Unit	Application	Savings (%)
NYPD - 112th Precinct	Hot Water Boiler	Space Heating	12.04
NYPD - 112th Precinct	Domestic Hot Water Boiler	Domestic HW	N/A[1]
Brooklyn Recreation Ctr.	Boilers, 2	Heating, DHW, Pool	17.91 / 23.04
Brooklyn Recreation Ctr.	Roof Top Unit	Heating / Cooling	8.32 / 11.39
Brooklyn Recreation Ctr.	Roof Top Unit	Heating / Cooling	11.11 / 18.86
Brooklyn Recreation Ctr.	Roof Top Unit	Heating / Cooling	12.07 / 19.98
Brooklyn Recreation Ctr.	Roof Top Unit	Heating / Cooling	13.48 / 9.99
Brooklyn Recreation Ctr.	Roof Top Unit	Heating / Cooling	N/A[2] / 10.34
Brooklyn Recreation Ctr.	Boiler	Heating	16.92
Brooklyn Recreation Ctr.	Carrier Air Conditioner	Cooling	N/A[3]
FDNY - Red Hook	Boiler	Heating	N/A[4]
FDNY - Bronx	Roof Top Unit	Cooling	6.78
FDNY - Bronx	Boiler	Heating	14.89

[1] – Savings were indeterminate due to unexplained large volumes of DHW usage.

[2] - Savings were indeterminate because the heater barely ran during the test period.

[3] - Savings were indeterminate because the compressors did not run during the test period.

[4] - Savings could not be calculated due to constant interference by people at the test site.

These sites were chosen as being representative of the HVAC infrastructure currently in existence at a preponderance of similar properties throughout the metropolitan New York area.

Attached are documents that explain the M&V strategy employed at these locations along with the testing summary documents. Those documents are supported by the Microsoft Excel workbooks (also included with this submission) that contain the raw data downloaded from the data loggers utilized for the testing.

The supporting test summary documents contain temperature histogram and probability charts that further demonstrate that while saving energy, the temperature maintenance of these locations was not compromised by the ECMs implemented.

IntelliCon® Evaluation Procedures

- Specifics of the testing equipment used and how the data is obtained should be discussed, agreed upon, and documented by the facility and testing company.

- Duration and parameters of the test(s) need to be agreed upon before beginning any test(s). It is most important to note that the accuracy of short-term testing is dependent upon the reduction, and if possible, the elimination of as many variables as possible. Changes to thermostat settings, work-hours, etc. must be minimized and brought to the attention of the testing organization.

- Type and location of test equipment needs to be documented.

- For consistency, it has been decided that the first day of the first week should be indexed at the first “off” Monday of the Time Clock and set to the proper day and time from that point.

- Full documentation of the unit(s) being evaluated should include but not be limited to: Type of system, area(s) served, voltage, amperage, temperature, pressure, fuel consumption rate, location, etc., where applicable.

- Notification signs should be placed in the unit(s) to alert service companies that testing is in progress and to contact “Testing Company” before servicing or disconnecting the test equipment.

- Notification signs should be placed at the test unit(s) thermostat to alert service companies and site personnel that testing is in progress.

- Test equipment needs to be inspected weekly, or as agreed to by “Testing Organization” for the duration of the test(s).

- Facility owner/manager will designate two (2) personnel (in the event one is off site) with knowledge of the testing in progress as contacts to the facilities’ service company and/or “Testing Organization”.

- Upon completion of the test(s), “Testing Organization” will remove the test equipment, and retrieve the logged data to prepare a full report.

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** specifies are explained below.(depending on the application some or all of the equipment listed may be needed).

TIME CLOCK (PLC) - Model SG2-10HR-A

Manufacturer: TECO

The PLC is used as a time clock 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.

Pam 1 Relay or equivalent

Manufacturer: Air Products and Controls Inc.

The Pam 1 Relay is an interface device used to monitor when voltage is being applied to the cooling/refrigeration compressor or heating burner (Gas/Oil Valve). When voltage is sensed it is "On" when no-voltage is sensed it is off "OFF". The relay is used in conjunction with the "Change-of-State" data logger.

CURRENT SENSOR - Model RIBXGTF

1.

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

"CHANGE–OF–STATE" DATA LOGGER – Model UX120-017

Manufacturer: Onset Computer Corp.

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 or RELAY, above, and time and date-stamps

(logs) each change of status. By processing the logged data, the durations for each cycle can be determined.

“Temp” and “LIGHT INTENSITY” DATA LOGGER - Model UA- 002-64

Manufacturer: Onset Computer Corp.

This data logger is used to monitor and log outdoor temperature and Light Intensity and may be used to determine the solar influence on the facility.

“TEMPERATURE / R.H.” DATA LOGGER - Model UX100- 011

Manufacturer: Onset Computer Corp.
This data logger is used to monitor and log the temperature and Relative Humidity of the conditioned space.

EXTERNAL DATA LOGGER - Model UX120-006M

Manufacturer: Onset Computer Corp.
This data logger is used to monitor and log the temperature of the heating supply pipe and/or DHW Coil and requires the use of an external temperature sensor such as part number:
TMC50-HD

Ultrasonic Transit-Time Flow Meter

The flow meter is used to measure water flow in domestic hot water applications in order to normalize the usage. Since this is a “clear water” application it is necessary that a “Transit-time” technology meter be used. This also must be used with a Change of state/event data logger as a means of accumulating and allocating the usage to the “in” and “out” days.
(Other types of flow meters may be used, but those are more invasive since they must be cut in to the piping.

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.
- 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.*
- What the relative humidity in the conditioned space was during the test period.*
- What the temperature of the conditioned space was during the test period.
- What the outdoor air temperature was during the test period.
- What the Heating supply temperature was during the test period.*

** May not be evaluated during testing.*

Tools:
HOBOWARE Pro for Windows

(Includes 10' USB cable)

Special Software (Hoboware Pro) is used to off-load the data from the data loggers. This data is then filtered to render average daily temperature values and daily totalized run-time values. This data is then exported in a CSV delimited format for use with Microsoft Excel. This data is further analyzed by formula application within Excel.

Optic USB Base Station – Model BASE-U-1

Needed to offload and launch the pendant loggers.

Remote Monitoring Panel (RMP)

This Panel (used at some locations) is constructed by Intellidyne, on a site specific basis. It allows the data stored in the loggers to be downloaded to a remote location. This reduces the complications associated with performing M&V testing at multiple locations simultaneously, and the associated difficulties of scheduling and site access. The device sets up its own secure wifi network with the data loggers being directly connected to wifi enabled USB hubs. These hubs allow the transfer of data from the individual loggers to a remote location, which is accomplished via a GSM based wireless modem, or through an existing wifi infrastructure (if allowed).

How the Data Is Analyzed

This protocol was developed by Intellidyne over many years as a means to analyze the energy consumption of heating and/or cooling systems. It has been used on multiple projects in conjunction with Brookhaven National Laboratories and NYSERDA. These systems typically represent a portion of the connected load that are not typically sub-metered (as is the case here). As a result, there is no historical energy usage tied directly to those systems that can be used as a baseline for comparative analysis. This protocol allows that baseline consumption to be identified and will provide accurate results in as short a time period as is statistically possible. During any testing the elimination and/or reduction of as many variables as possible will yield the most accurate results and is especially true in the case of short-term testing. This protocol was developed with that in mind and being cognizant that the loading on the tested systems is influenced by a number of variables, most of which are changing on a day-to-day/ moment-to-moment basis. The alternating “in” circuit / “out” of circuit testing employed here has multiple advantages and is explained below.

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:

    a. Site specific ambient condition data is more accurate than weather-service data that may not be indicative of the test site.
    b. The alternating day methodology has a statistical tendency to minimize the effects of ambient temperature fluctuations and other consumption elements that are time-of-day or day-of-week sensitive.
    c. Generating the baseline over the entire testing period is more accurate than historical data or data gathered during a different or smaller point in time.

2. The Baseline data is necessary and is used to determine the effects or influences caused by ambient condition, and/or domestic hot water (DHW) usage fluctuations. These influences are analyzed and used as a basis to correct for varying ambient and/or DHW usages during the “in” circuit portion of the testing.

3. In order to determine the savings it is necessary to compare the two consumption cases (IntelliCon “in” and “out” of circuit). From that information one can deduce with a high degree of statistical confidence what the consumption for the “in” circuit portion of the testing should have been. When comparing the deduced consumption to the actual consumption the savings are calculated. The included documentation demonstrates the application of these mathematical calculations to the gathered data with the ensuing results.

Report No. 12175-1 & 2
Date: 10/1/15

Fuel Reduction Program

CONDUCTED AT

NYPD – 112TH PRECINCT

FOR

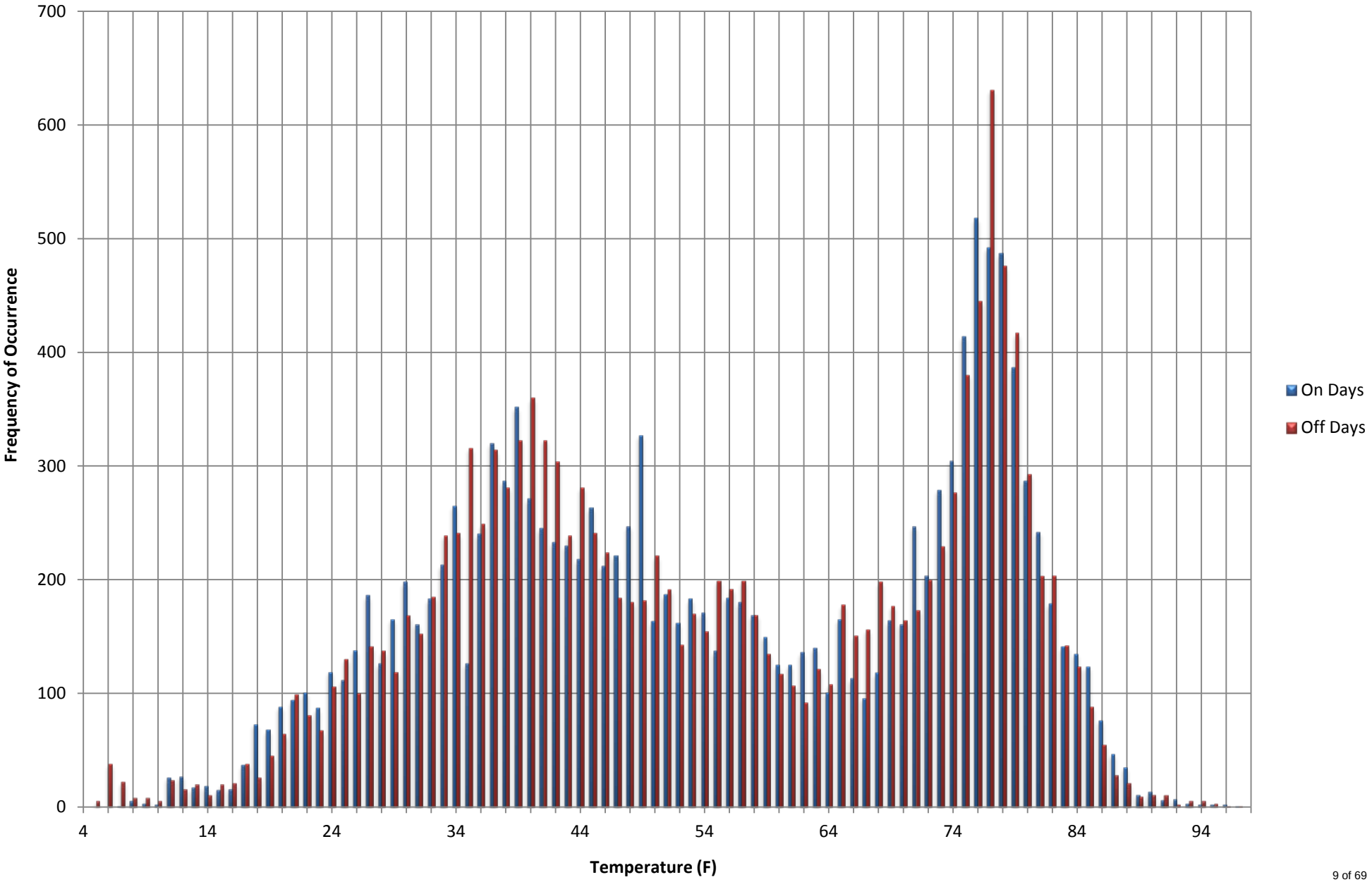
NYC - DCAS

TEST RESULTS FOR:

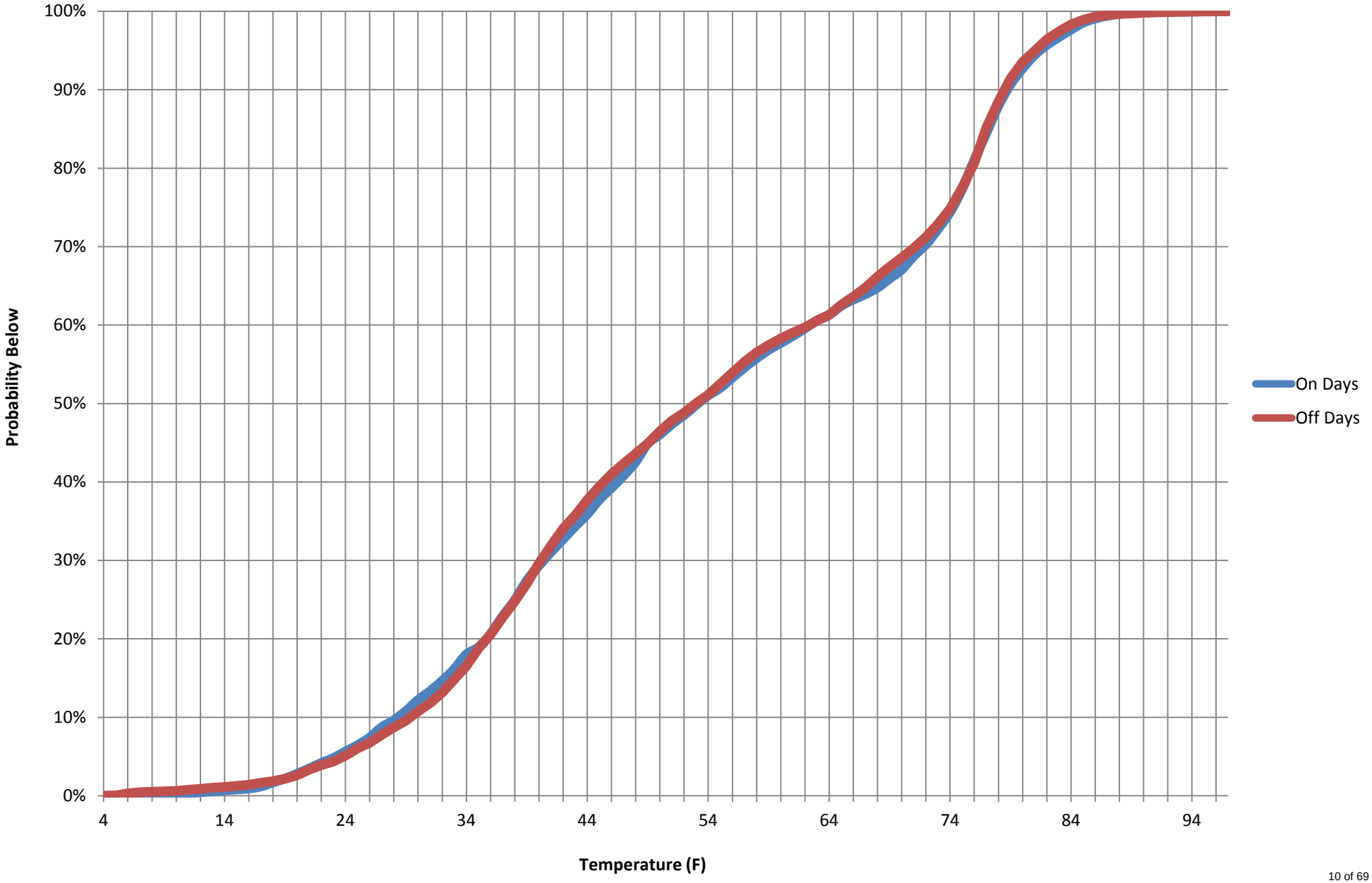
2 - HOT-WATER BOILERS
&
2 – DOMESTIC HOT-WATER HEATERS

A Confidential Report
Prepared by
Intellidyne LLC

112th Precinct
O.A.T Histogram (06/26/14 - 04/15/15)



112th Precinct
O.A.T Probabilities (06/26/14 - 04/15/15)



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Phone:516-676-0777
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Test Report

Report No. 12175-1

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
N.Y.P.D. 112th Precinct
68-04 Austin St.
Forest Hills, NY, 11375

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☑ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	H.B. Smith
Model:	28A-S/W--11
Capacity / SetPt:	3508 MBH
Fuel Type:	Nat Gas
Application:	Heating
Area Served:	All BLDG
Miscellaneous:	2 Boilers

Test Start Date: 11/04/14

Test End Date: 04/15/15

No. of Days in Test: 163

BURNER RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 755:40:08

***IntelliCon* OFF-DAYS:** 865:58:25

RUN-TIME was reduced by: 12.74%

BURNER USAGE FACTOR

***IntelliCon* On-Days:** 19.32%

***IntelliCon* Off-Days:** 22.14%

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 3285

It was 0.8% **Warmer on the On-Days.**

IntelliCon OFF-DAYS: 3311

Total Gallons: 6596

USAGE PER DEGREE DAY

ON-DAYS: 0:13:48.14

OFF-DAYS: 0:15:41.45

INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	753:31:15	853:37:40
CYCLES:	4645	7152
Burner #2		
RT:	2:08:53	12:20:45
CYCLES:	28	261

BURNER CYCLING REDUCTION:

IntelliCon ON-DAYS: 4673

IntelliCon OFF-DAYS: 7413

Cycling was reduced by: 37.0%

Notes:

Savings = 12.04%

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Test Report

Report No. 12175-2

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
N.Y.P.D. 112th Precinct
68-04 Austin St.
Forest Hills, NY, 11375

Test Type: ☑ HEATING ☐ AIR ☐ REFRIGERATION ☐ OTHER: _____

Product Tested: ☐ HW ☑ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	PVI
Model:	1000-N-250A-TP
Capacity / SetPt:	800 MBH
Fuel Type:	Nat Gas
Application:	DHW
Area Served:	All BLDG
Miscellaneous:	

Test Start Date: 06/26/14

Test End Date: 10/15/14

No. of Days in Test: 112

BURNER RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 43:02:56

***IntelliCon* OFF-DAYS:** 42:32:54

RUN-TIME was reduced by: -1.18%

BURNER USAGE FACTOR

***IntelliCon* On-Days:** 3.20%

***IntelliCon* Off-Days:** 3.17%

GALLONS USED DURING TEST PERIOD:

IntelliCon ON-DAYS: 17708

There was 43.2% **More Use on the On-Days**

IntelliCon OFF-DAYS: 12363

Total Gallons: 30071

USAGE PER GALLON

ON-DAYS: 0:00:08.752

OFF-DAYS: 0:00:12.390

INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	43:02:56	42:32:54
CYCLES:	742	825

BURNER CYCLING REDUCTION:

IntelliCon ON-DAYS: 742

IntelliCon OFF-DAYS: 825

Cycling was reduced by: 10.1%

Notes:

Actual Test duration was from 6/26/14 - 6/5/15. However, due to DHW system issues (large volume leaks) the only portion of the test that could be properly normalized was from 6/25/14 - 10/15/14. A chart depicting these flows is attached. It appears that around the 5th of June, 2015, the DHW Boiler was replaced. When the Boiler was replaced however, the Intellidyne control and some of the data logging equipment was also removed and/or disabled.

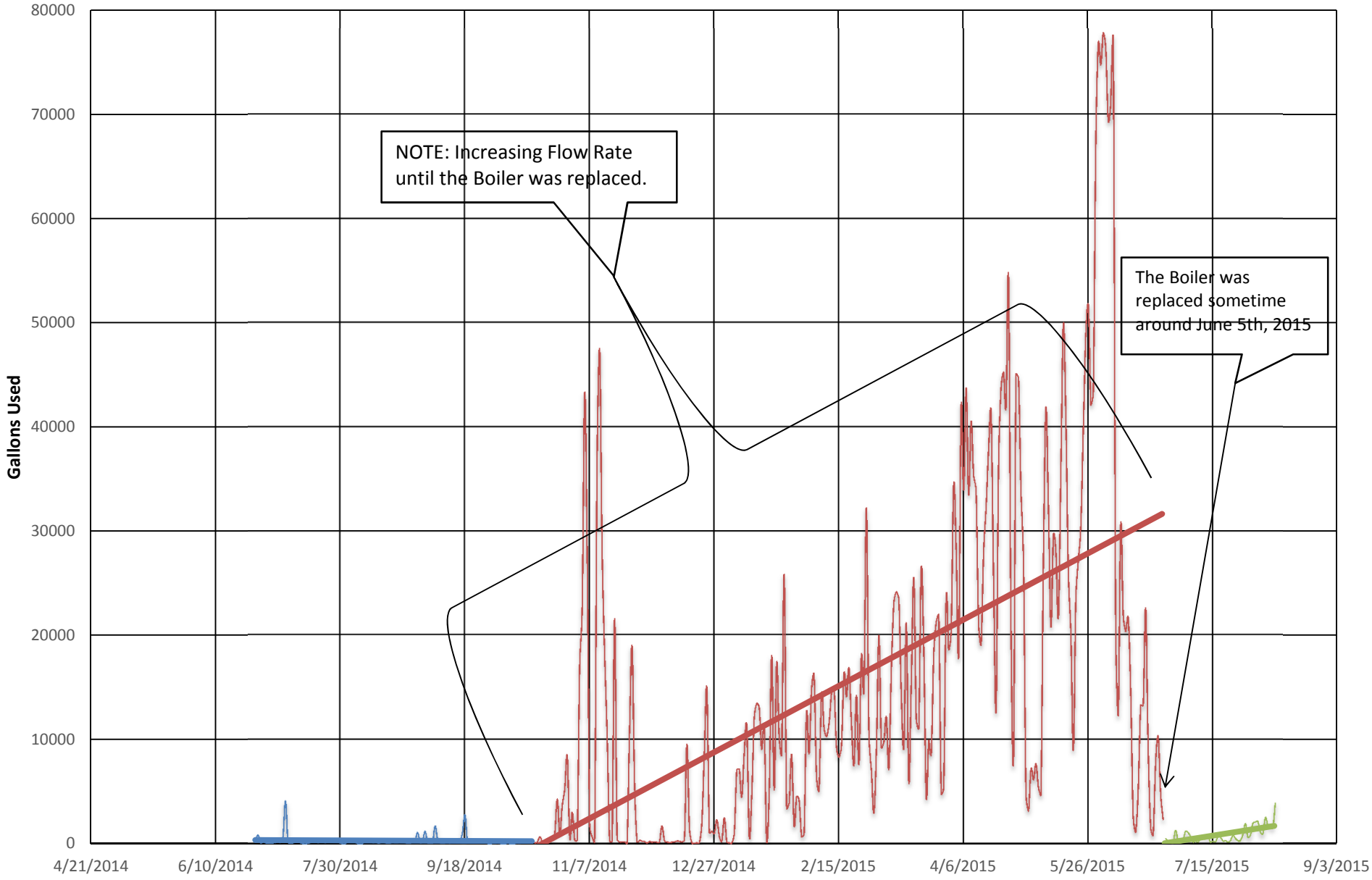
It was not possible to calculate the savings due to the the unexplainable large-volumns of DHW usage as shown on the attached chart.

Savings = N/A

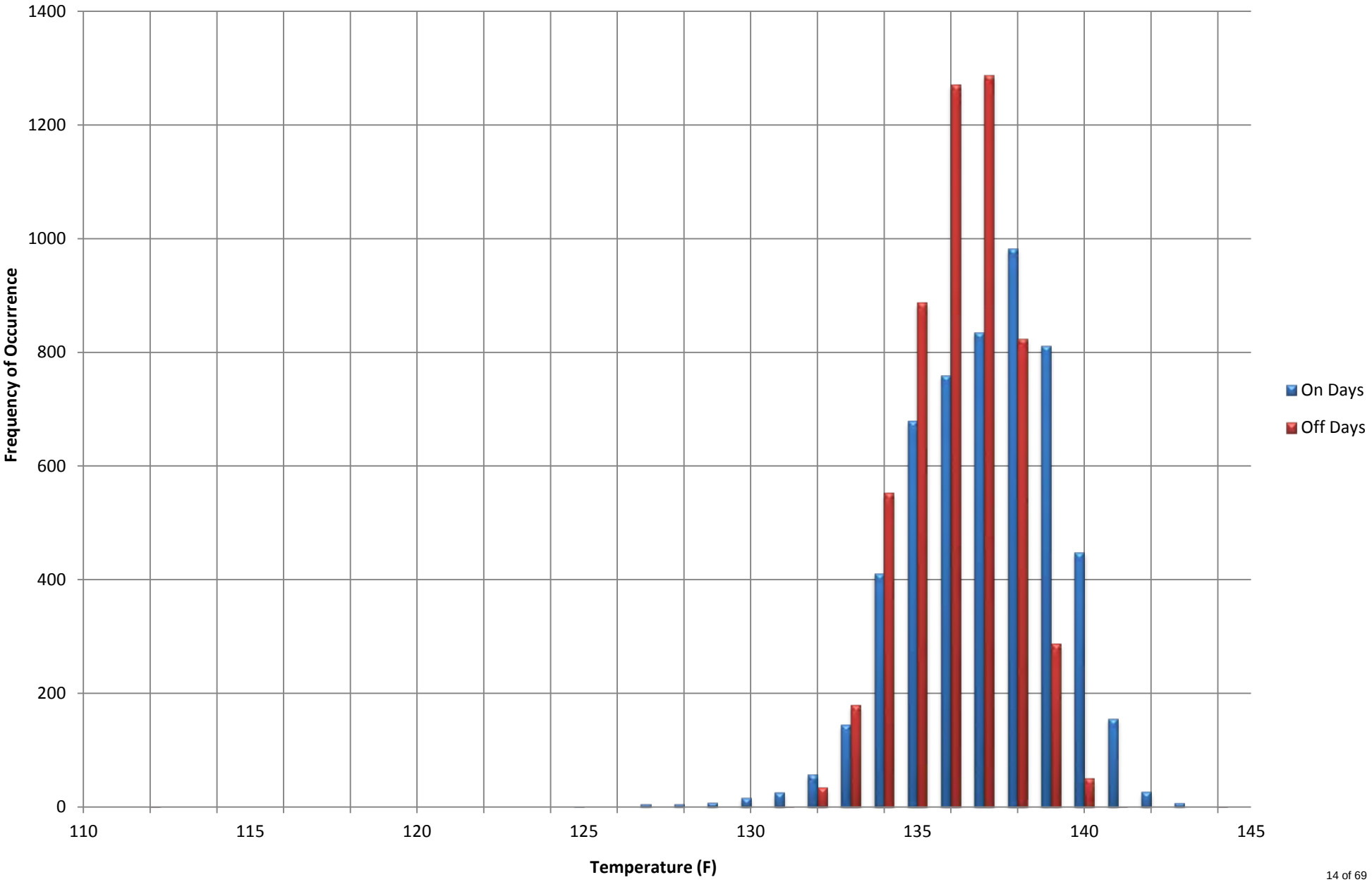
112 Precinct DHW Usage

with Trend Lines

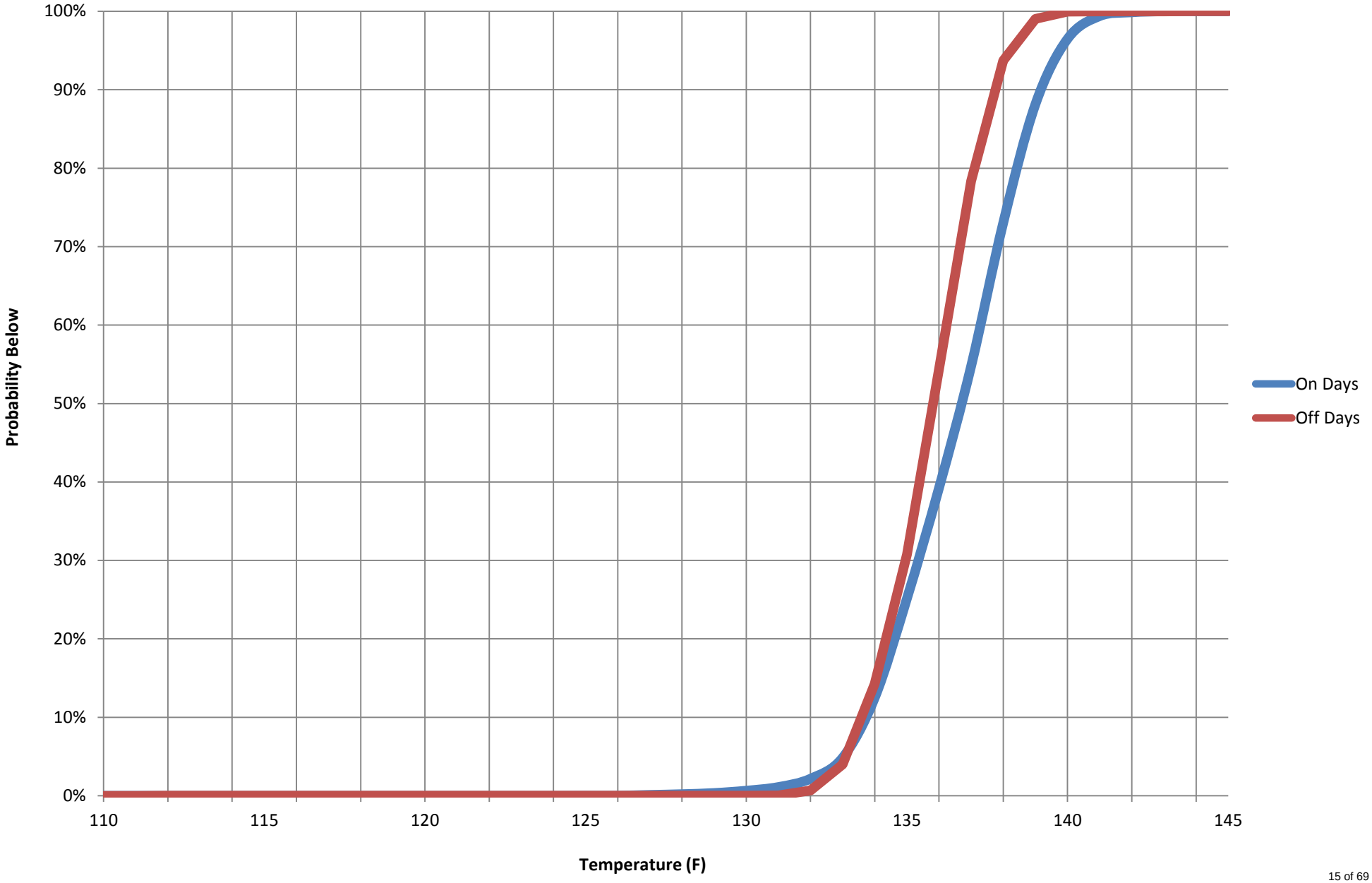
6/26/14 - 8/9/15



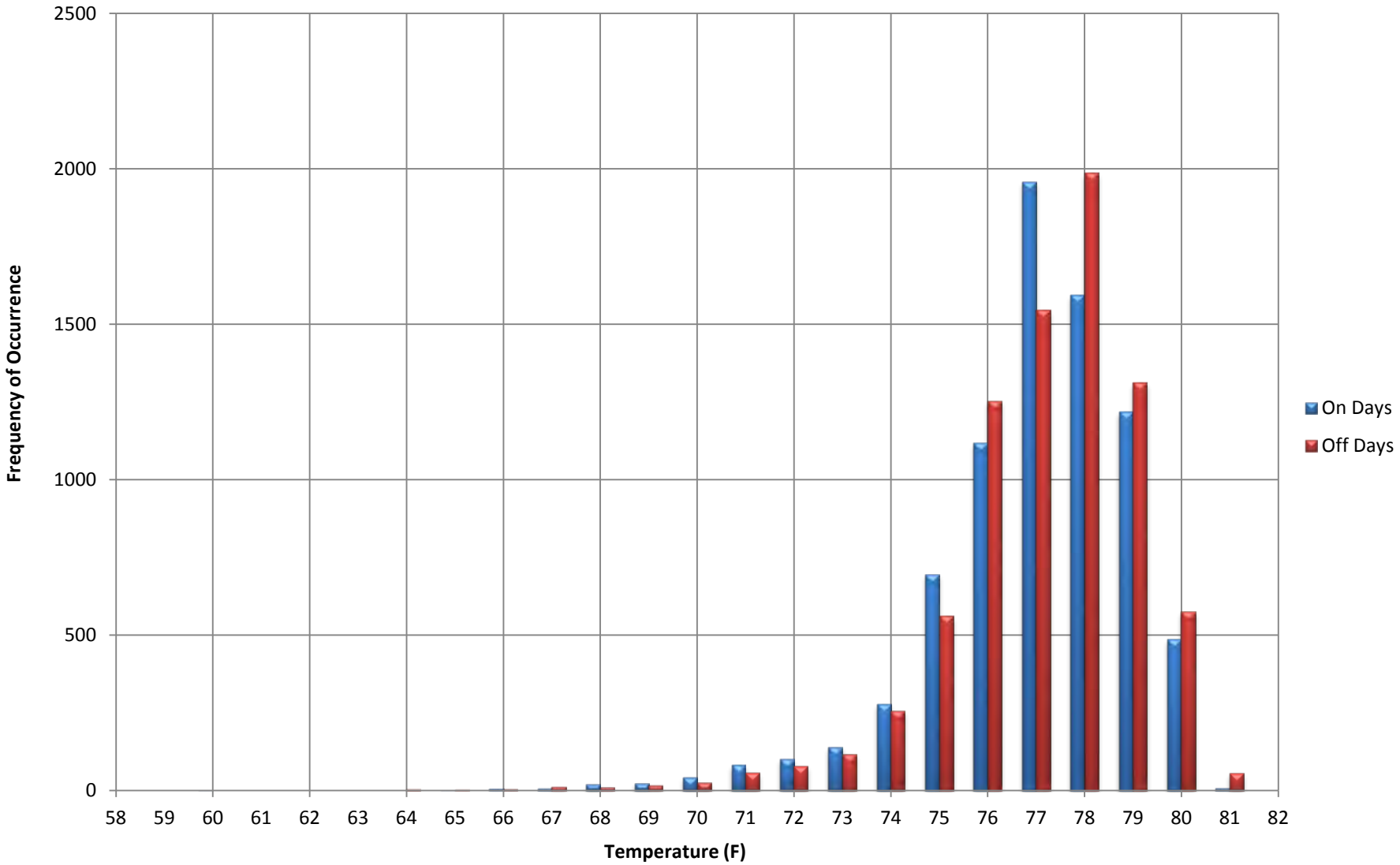
112th Precinct
D.H.W. Supply Temperature Histogram
(06/26/14 - 10/15/14)



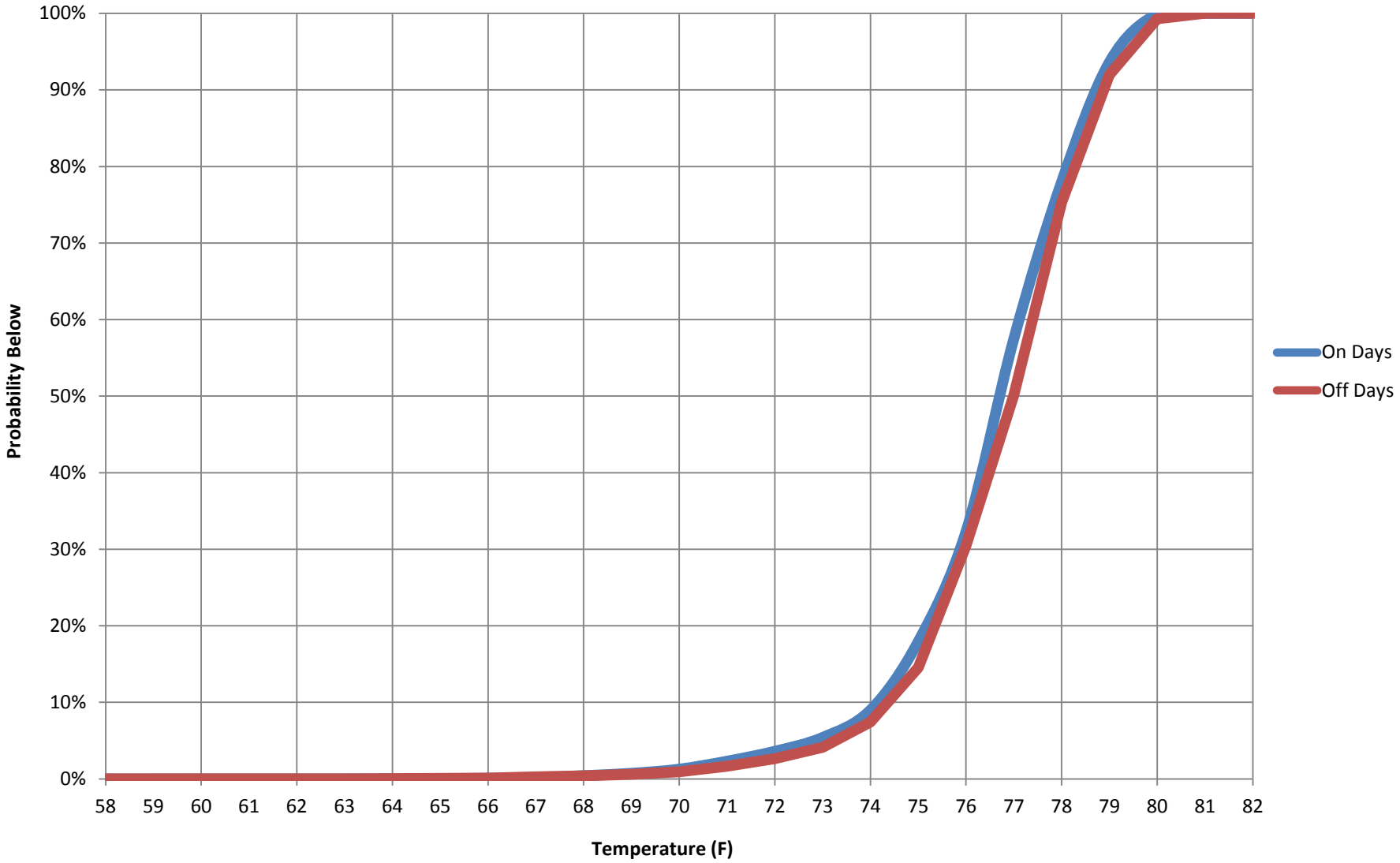
112th Precinct
D.H.W. Supply Temperature Histogram
(06/26/14 - 03/26/15)

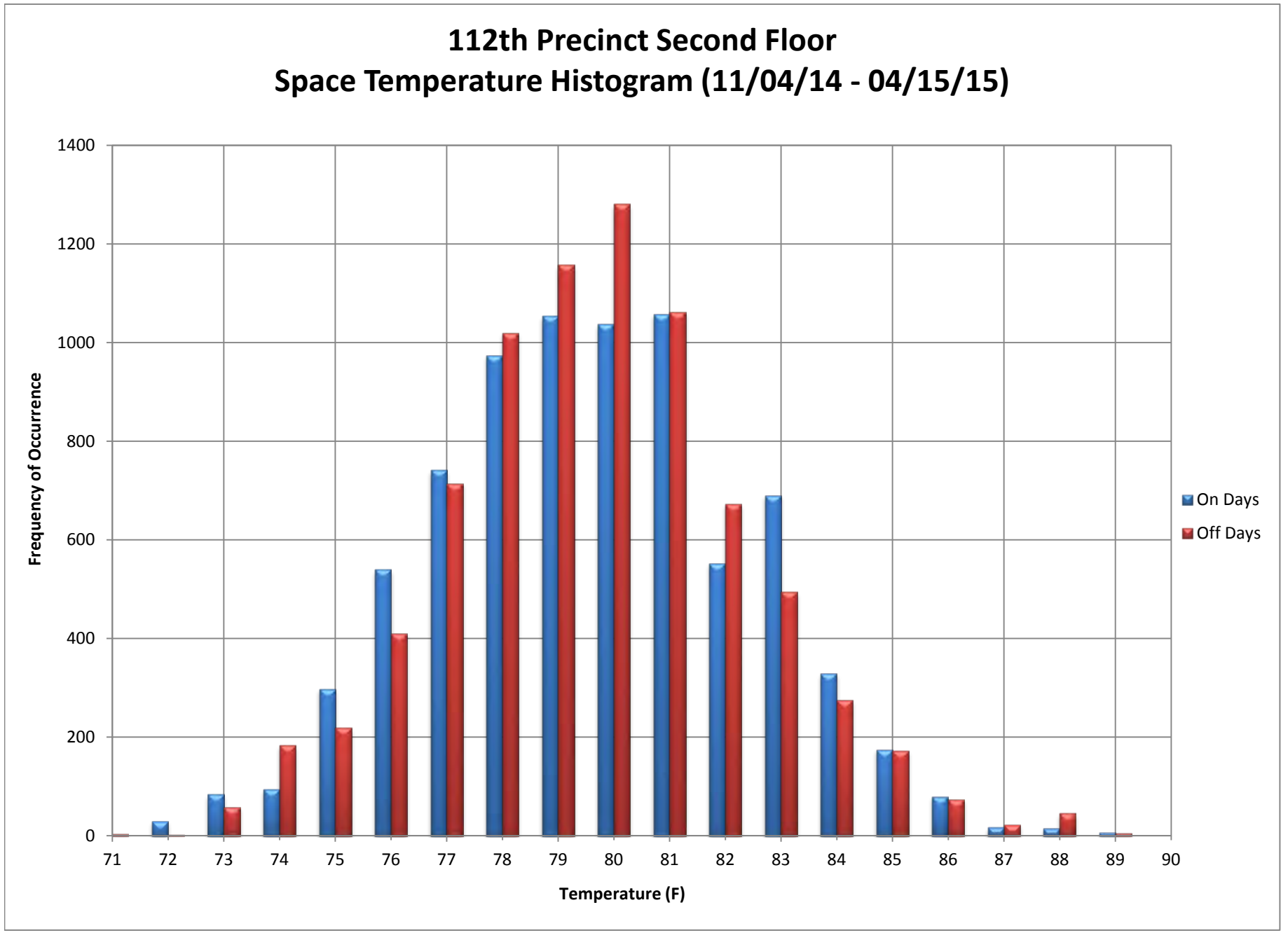


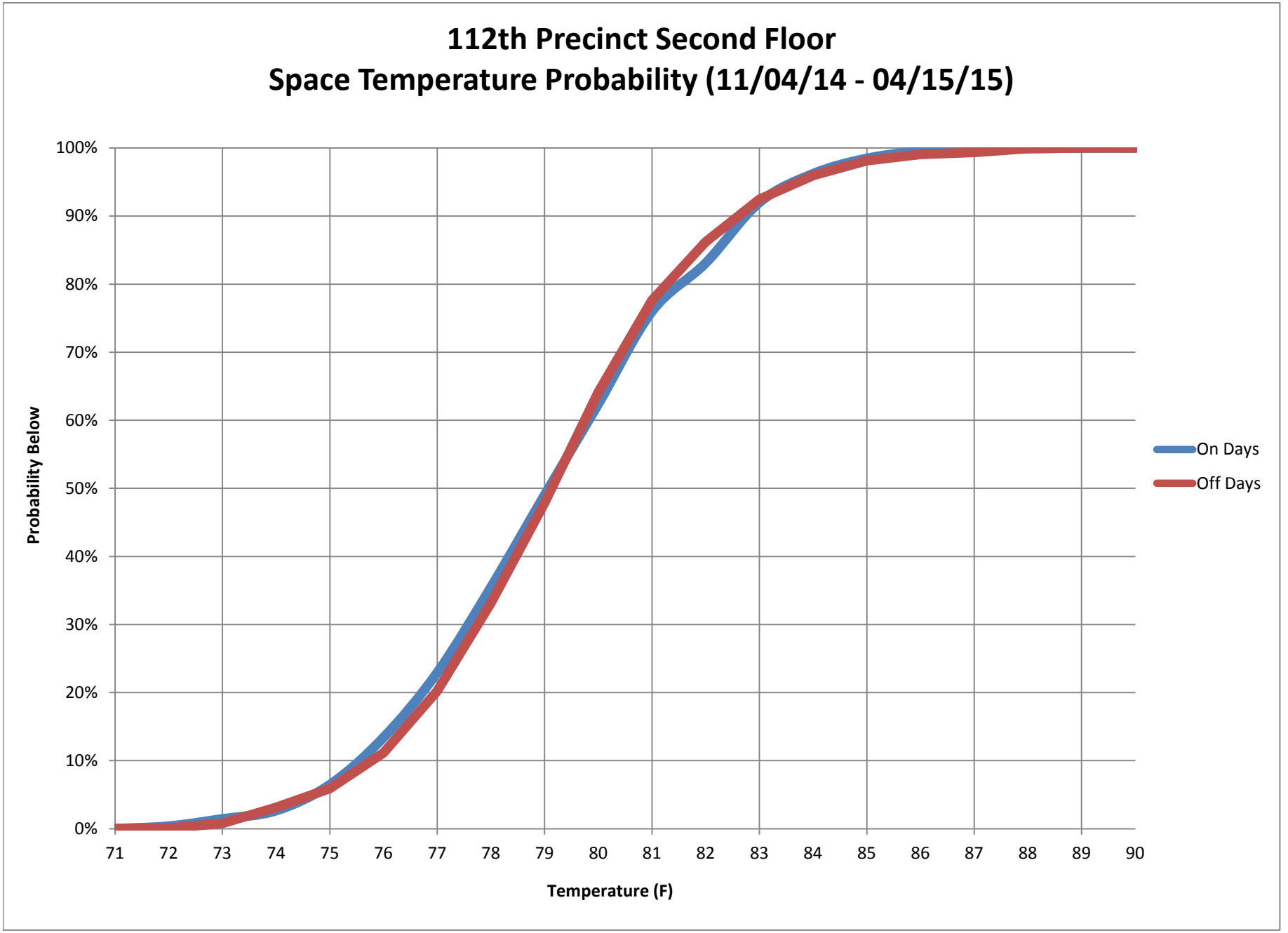
112th Precinct First Floor
Space Temperature Histogram (11/04/14 - 04/15/15)



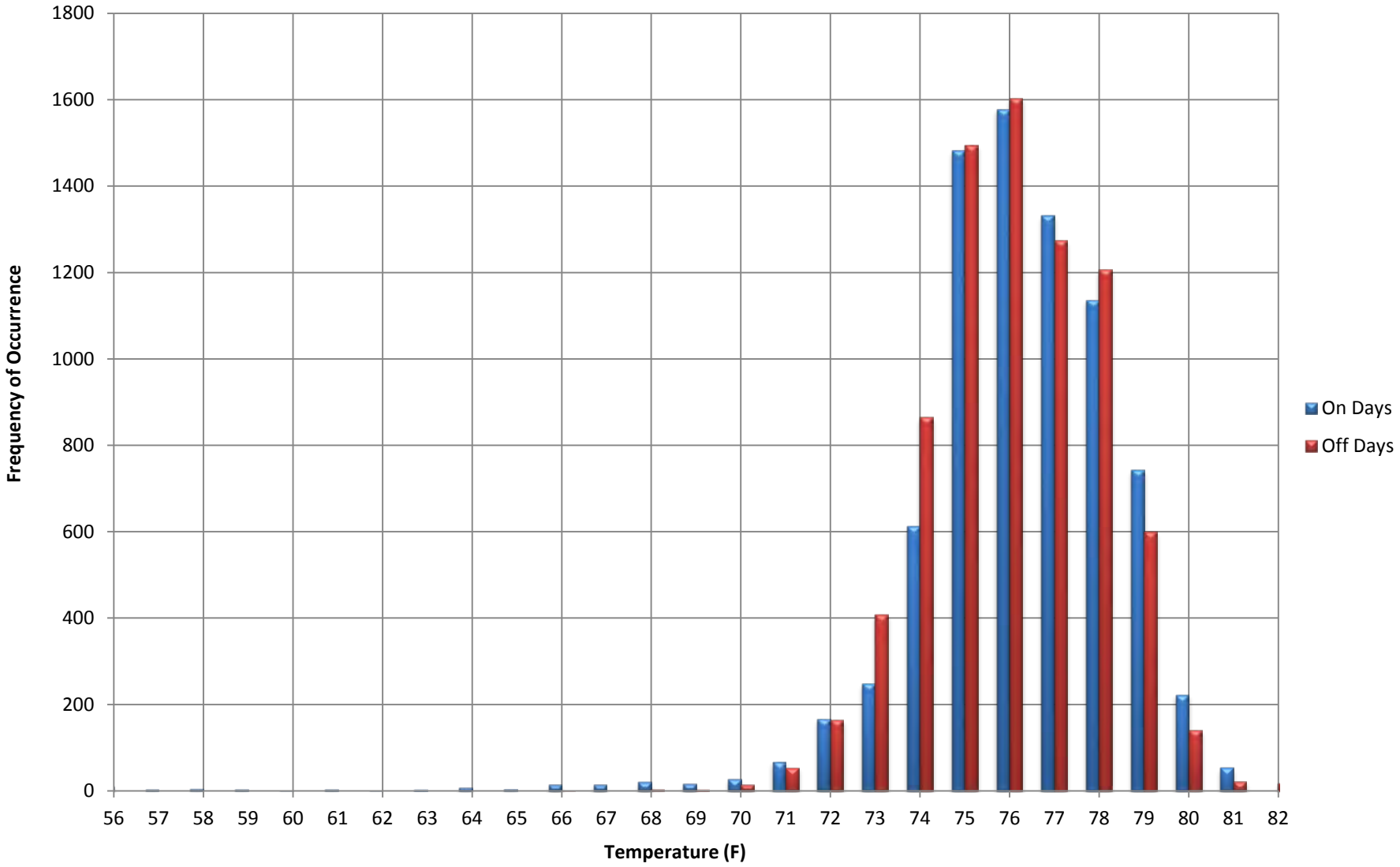
112th Precinct First Floor
Space Temperature Probability (11/04/14 - 04/15/15)



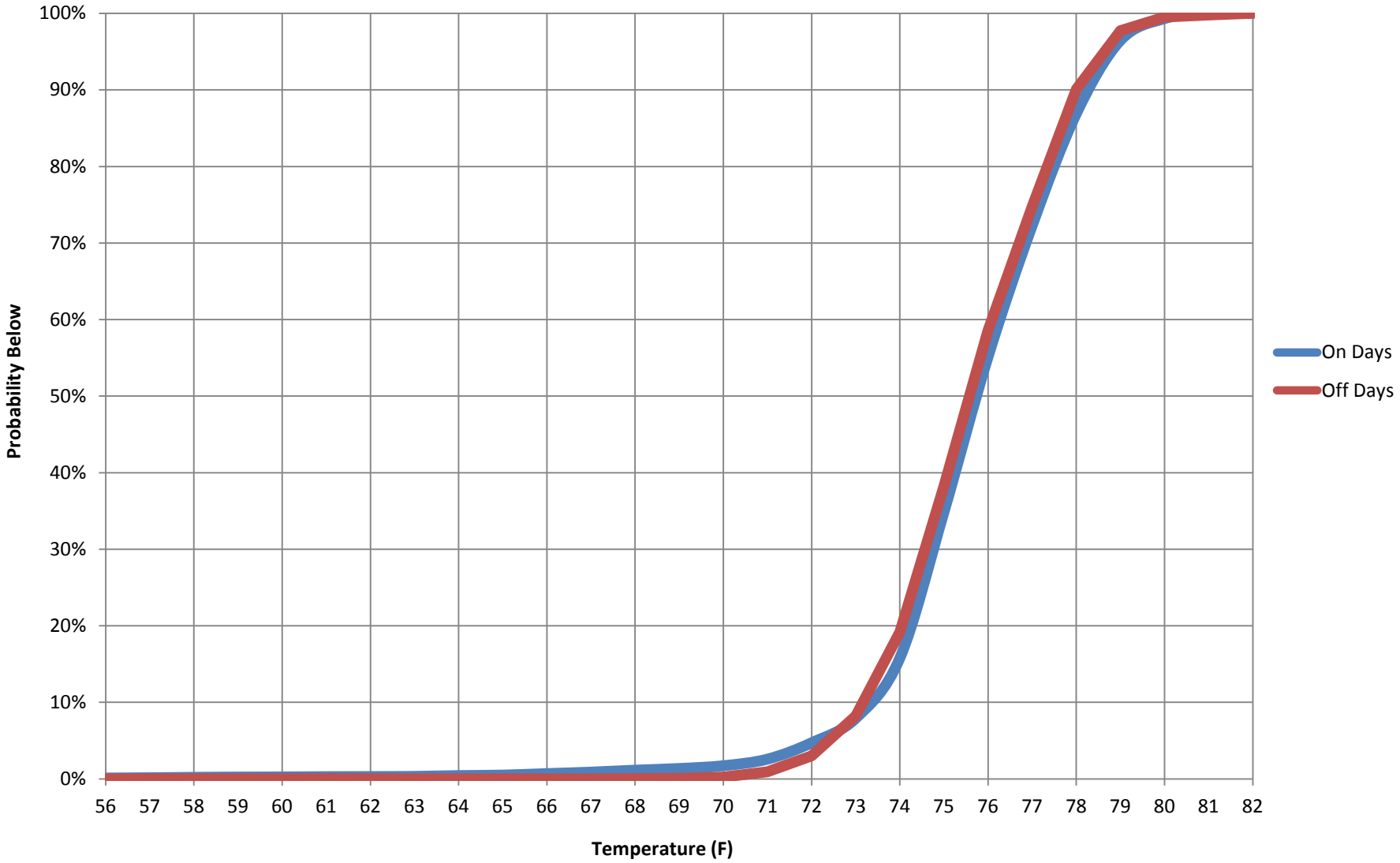

112th Precinct Second Floor
Space Temperature Histogram (11/04/14 - 04/15/15)
Frequency of Occurrence
1400
1200
1000
800
600
400
200
0
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
Temperature (F)
On Days
Off Days


112th Precinct Second Floor
Space Temperature Probability (11/04/14 - 04/15/15)
Probability Below
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
Temperature (F)
On Days
Off Days

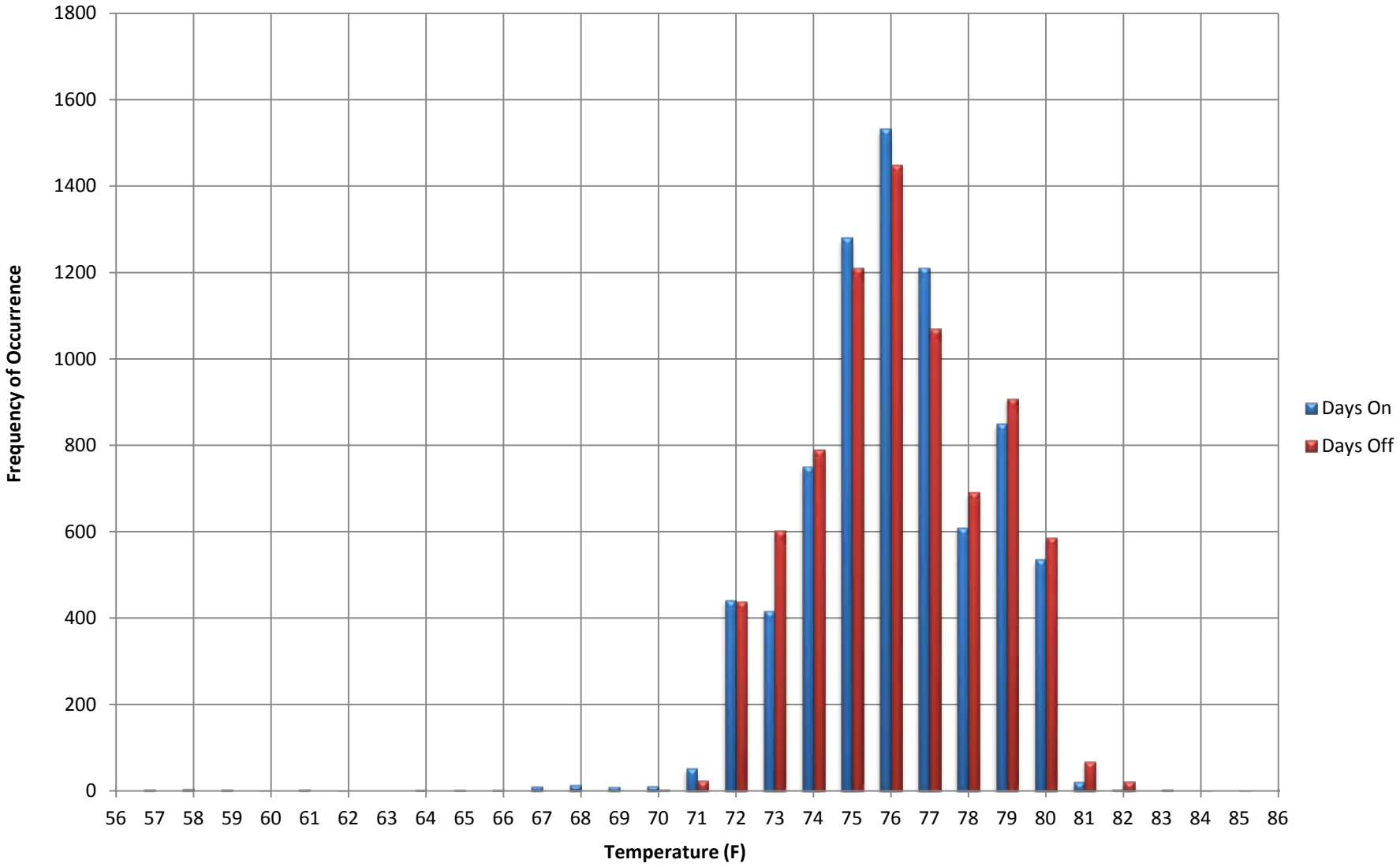
112th Precinct Third Floor
Space Temperature Histogram (11/04/14 - 04/15/15)

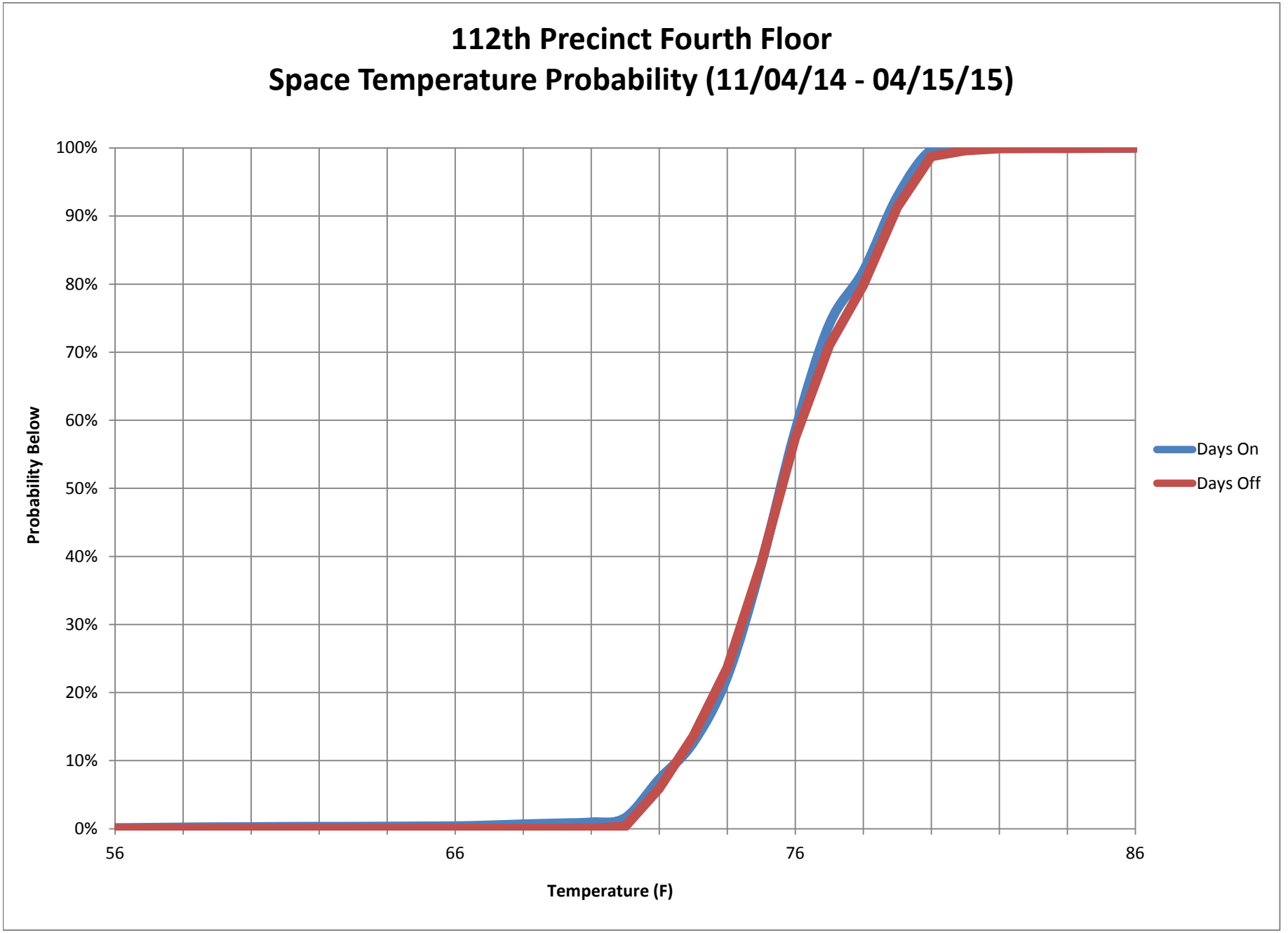


112th Precinct Third Floor
Space Temperature Probability (11/04/14 - 04/15/15)



112th Precinct Fourth Floor
Space Temperature Histogram (11/04/14 - 04/15/15)




112th Precinct Fourth Floor
Space Temperature Probability (11/04/14 - 04/15/15)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Probability Below
56
66
76
86
Temperature (F)
Days On
Days Off

Report No. 12175-3 thru 16
Date: 10/1/15

Fuel & Electricity Reduction Program

CONDUCTED AT

BROWNSVILLE RECREATION CENTER

FOR

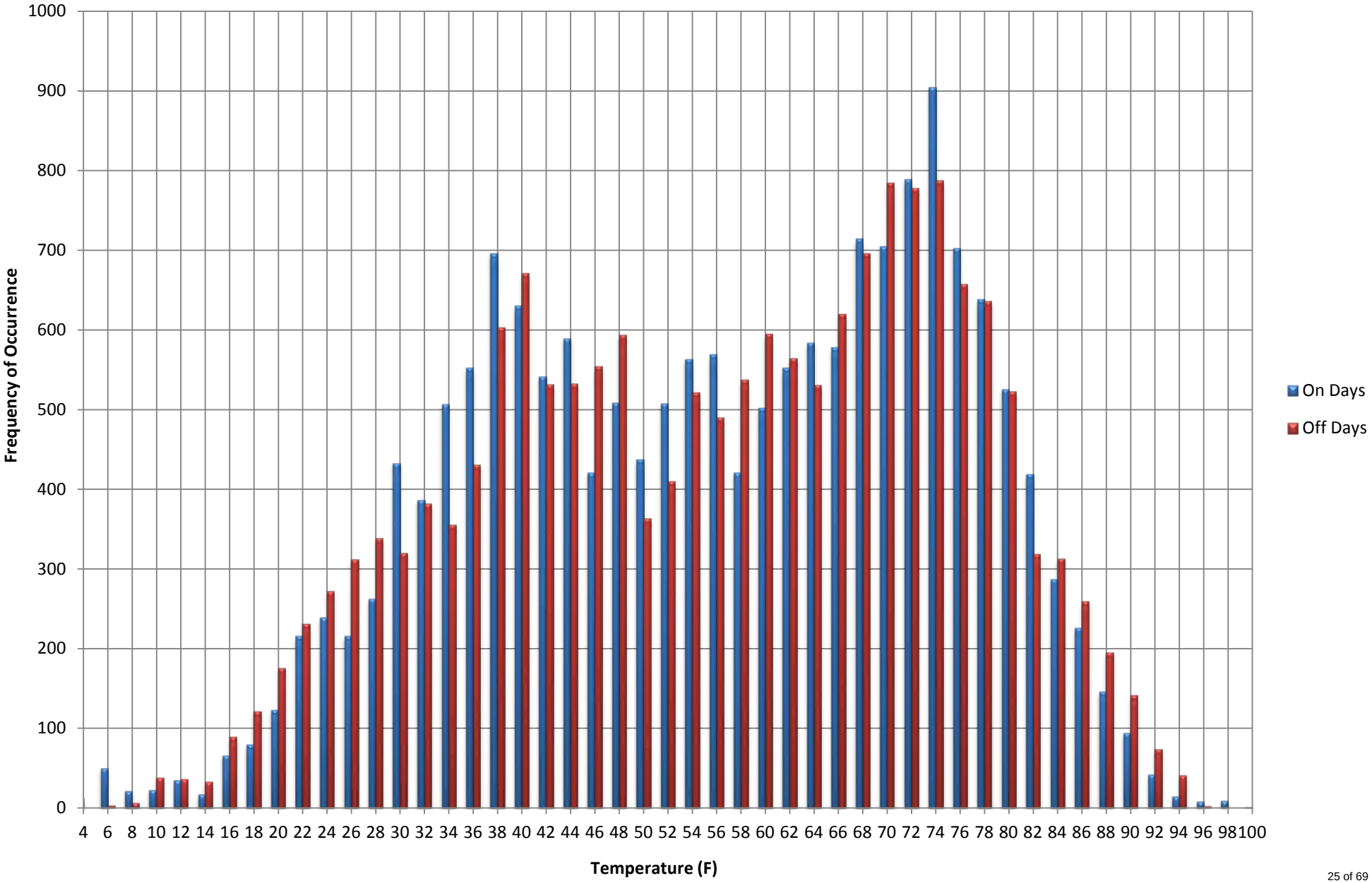
NYC - DCAS

TEST RESULTS FOR:

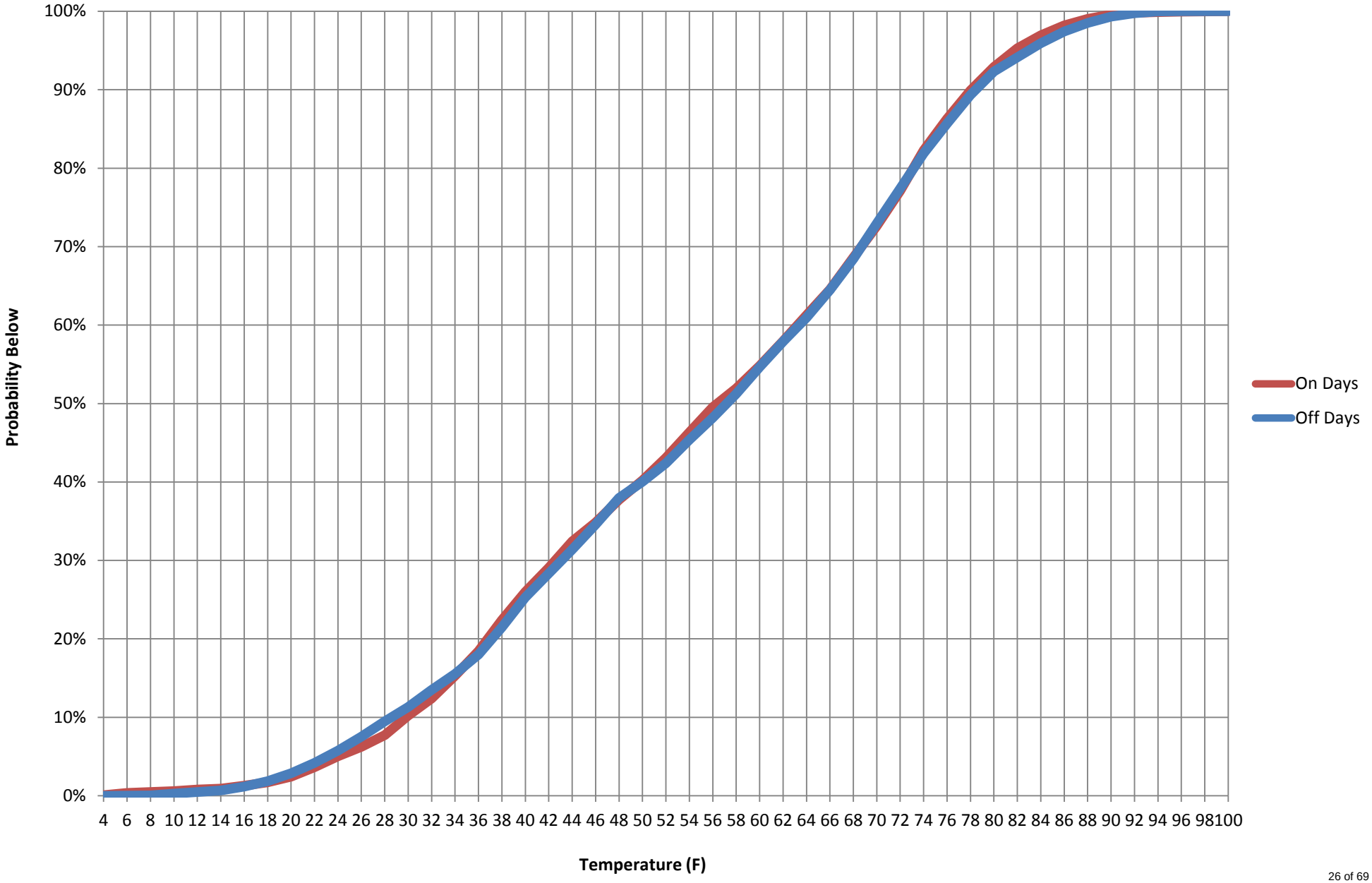
3 - HOT-WATER BOILERS
AND
5 – ROOF TOP UNITS WITH 2 COMPRESSORS & 1 HEATER, EACH

A Confidential Report
Prepared by
Intellidyne LLC

Brownsville Recreational Center
O.A.T Histogram (07/25/14 - 07/24/15)



Brownsville Recreational Center
O.A.T Probabilities (07/25/14 -- 07/24/15)



303 Sunnyside Blvd.
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Phone:516-676-0777
Fax: 516-676-2640

Test Report

Report No. 12175-3

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☑ CHW ☐ CHS ☐ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Weil-McLain / Power Flame
Model:	1888 / CR4-GO-25ATI
Capacity / SetPt:	1300-5485 MBH
Fuel Type:	Nat Gas
Application:	Heating, DHW, Pool Heating
Area Served:	Main BLDG.
Miscelaneous:	2 Boilers for the above applications

Test Start Date: 10/25/14

Test End Date: 05/11/15

No. of Days in Test: 199

BURNER RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 220:02:36

***IntelliCon* OFF-DAYS:** 268:18:56

RUN-TIME was reduced by: 17.99%

BURNER USAGE FACTOR

***IntelliCon* On-Days:** 4.61%

***IntelliCon* Off-Days:** 5.62%

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 2601

It was 0.1% **Warmer on the On-Days.**

IntelliCon OFF-DAYS: 2603

Total Degree-Days: 5204

USAGE PER DEGREE DAY

ON-DAYS: 0:05:04.61

OFF-DAYS: 0:06:11.06

INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	0:00:00	0:00:00
CYCLES:	0	0
Burner #2		
RT:	220:02:36	268:18:56
CYCLES:	3101	5082

BURNER CYCLING REDUCTION:

IntelliCon ON-DAYS: 3101

IntelliCon OFF-DAYS: 5082

Cycling was reduced by: 39.0%

Notes:
Boiler # 1 did not run for the duration of the test.

Savings = 17.91%

303 Sunnyside Blvd.
Suite # 75
Plainview, NY 11803
Phone:516-676-0777
Fax: 516-676-2640

Test Report

Report No. 12175-4

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☑ CHW ☐ CHS ☐ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Weil-McLain / Power Flame
Model:	1888 / CR4-GO-25ATI
Capacity / SetPt:	1300-5485 MBH
Fuel Type:	Nat Gas
Application:	Heating, DHW, Pool Heating
Area Served:	Main BLDG.
Miscelaneous:	2 Boilers for the above applications

Test Start Date: 07/25/14

Test End Date: 10/24/14

No. of Days in Test: 92

BURNER RUN-TIME: ☑ in HRS. ☐ in MIN.

IntelliCon **ON-DAYS:** 101:44:26

IntelliCon **OFF-DAYS:** 115:52:39

RUN-TIME was reduced by: 12.20%

BURNER USAGE FACTOR

IntelliCon **On-Days:** 4.61%

IntelliCon **Off-Days:** 5.25%

Gallon Usage (for Test period)

IntelliCon ON-DAYS: 8554660

Used 14.1% **More on the ON-Days**

IntelliCon OFF-DAYS: 7498420

Total Degree-Days: 16053080

USAGE PER DEGREE DAY

ON-DAYS: 0:00:00.04

OFF-DAYS: 0:00:00.06

INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	0:00:00	0:00:00
CYCLES:	0	0
Burner #2		
RT:	101:44:26	115:52:39
CYCLES:	1803	2333

BURNER CYCLING REDUCTION:

IntelliCon ON-DAYS: 1803

IntelliCon OFF-DAYS: 2333

Cycling was reduced by: 22.7%

Notes:
Boiler # 1 did not run for the duration of the test.

Savings = 23.04%

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Phone:516-676-0777

Test Report

Report No. 12175-5

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☐ HEATING ☑ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER: _____

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☑ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	48HCTD17F3A5A1H2C0
Capacity / SetPt:	15 Ton / 248-310 MBH
Fuel Type:	
Application:	HVAC
Area Served:	Workout Gym
Miscelaneous:	(RTU 1) 2 Compressors

Test Start Date: 07/25/14

Test End Date: 07/24/15

No. of Days in Test: 174

COMPRESSOR RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 462:50:17

***IntelliCon* OFF-DAYS:** 491:18:16

RUN-TIME was reduced by: 5.79%

COMPRESSOR USAGE FACTOR

***IntelliCon* On-Days:** 11%

***IntelliCon* Off-Days:** 12%

COOLING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 326

It was 6.3% **Warmer on the On-Days.**

IntelliCon OFF-DAYS: 307

Total Degree-Days: 632

USAGE PER DEGREE-DAY

ON-DAYS: 1:25:13

OFF-DAYS: 1:36:10

INDIVIDUAL COMPRESSOR USAGE

	ON-DAY	OFF-DAY
Comp #1		
RT:	216:56:59	233:49:28
CYCLES:	2165	2189
Comp #2		
RT:	245:53:18	257:28:48
CYCLES:	2879	3266

Notes:
Usage factor is low due to window a/c units being used.

Savings = 11.39%

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Test Report

Report No. 12175-6

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER: _____

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☑ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	48HCTD17F3A5A1H2C0
Capacity / SetPt:	15 Ton / 248-310 MBH
Fuel Type:	
Application:	HVAC
Area Served:	Workout Gym
Miscelaneous:	(RTU 1) 2 Compressors

Test Start Date: 11/01/14

Test End Date: 05/10/15

No. of Days in Test: 191

BURNER RUN-TIME:

***IntelliCon* ON-DAYS:** 256:25:43 ☑ in HRS. ☐ in MIN.

***IntelliCon* OFF-DAYS:** 282:03:42 **RUN-TIME was reduced by:** **9.09%**

BURNER USAGE FACTOR

***IntelliCon* On-Days:** **11%**

***IntelliCon* Off-Days:** **12%**

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 2574 **It was** **0.8%** **Warmer on the On-Days.**

IntelliCon OFF-DAYS: 2596

Total Degree-Days: 5170

USAGE PER DEGREE-DAY

ON-DAYS: 0:05:59

OFF-DAYS: 0:06:31

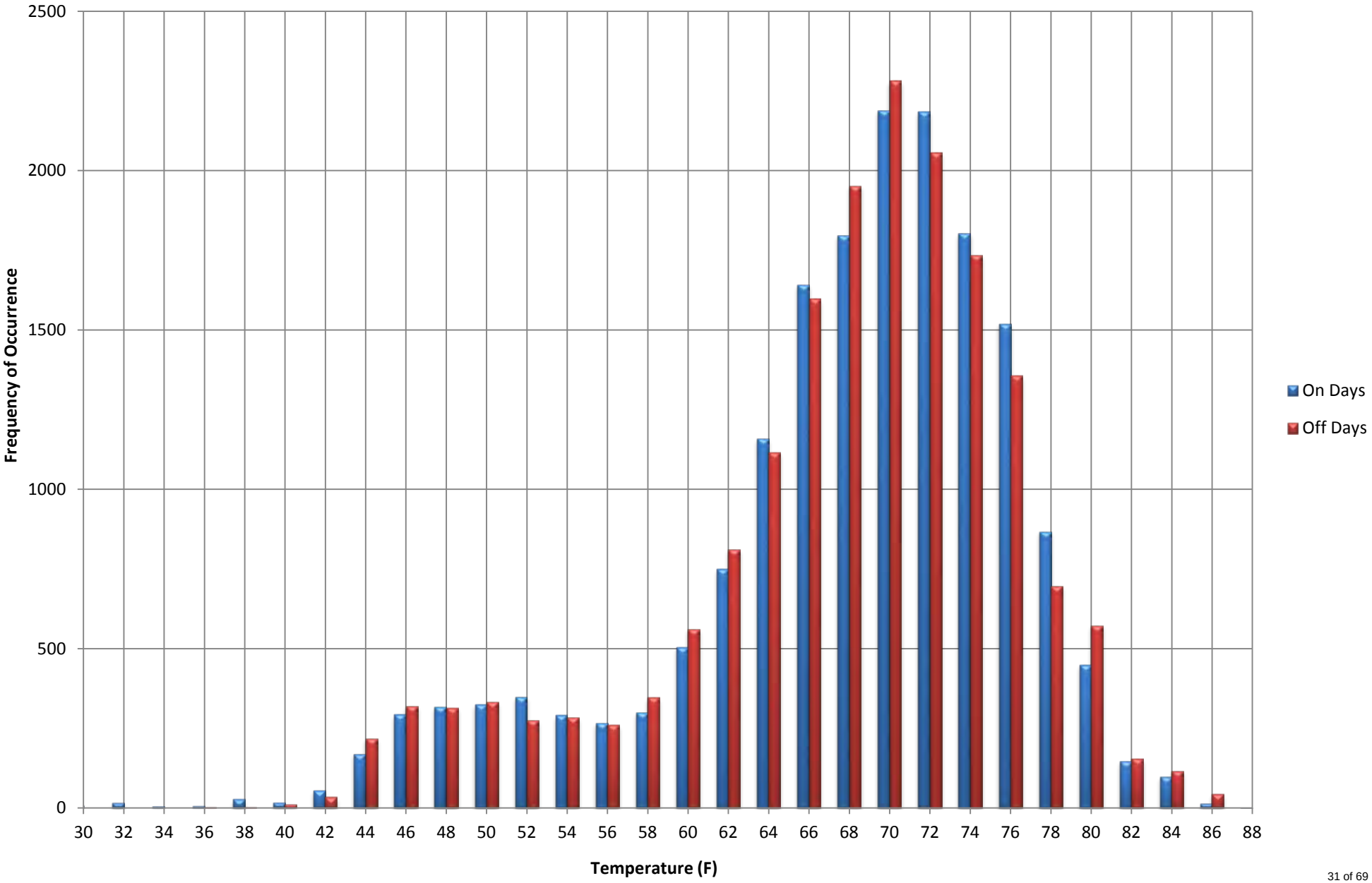
INDIVIDUAL BURNER USAGE

Burner #1	ON-DAY	OFF-DAY
RT:	256:25:43	282:03:42
CYCLES:	7332	2384

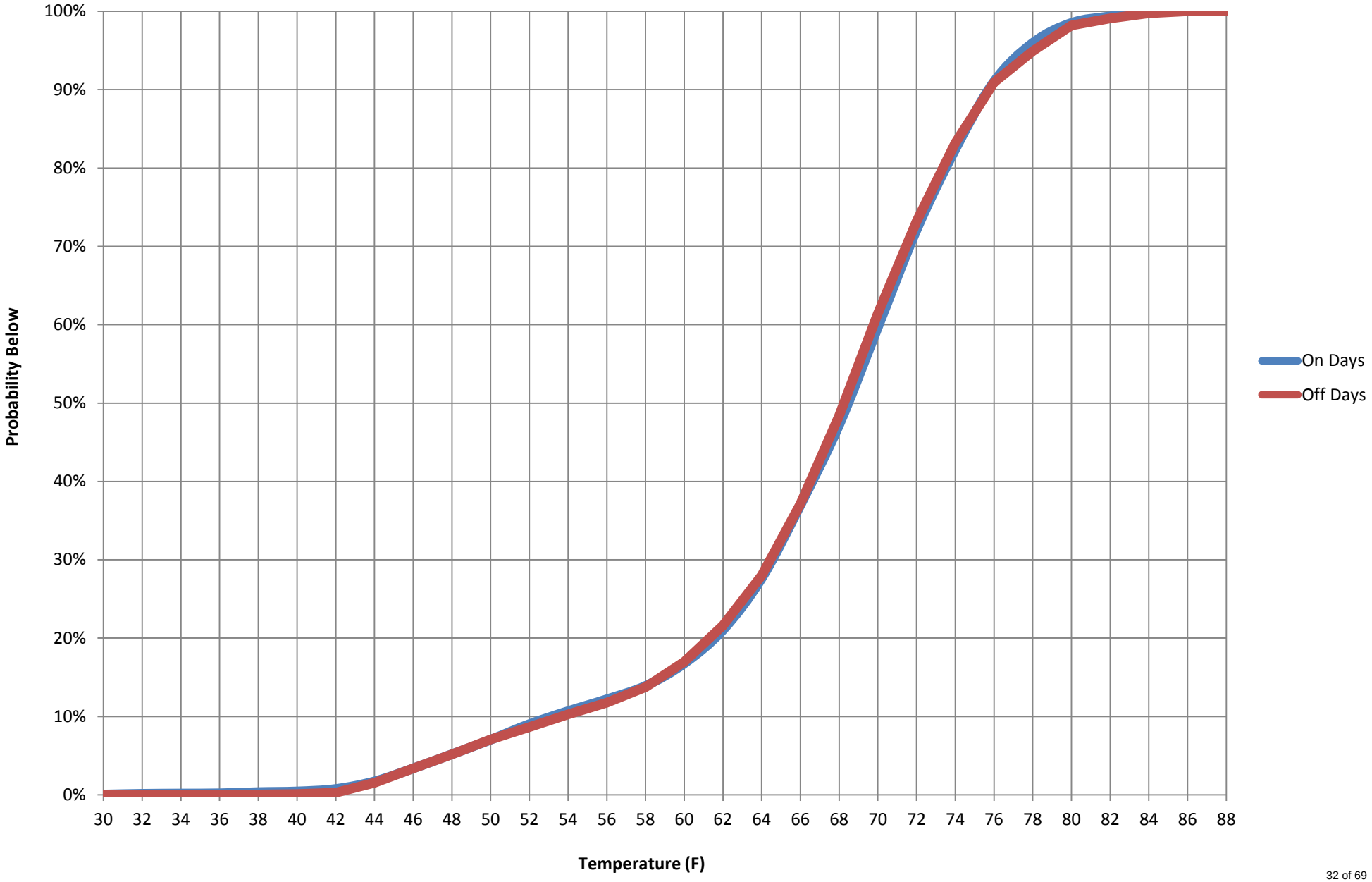
Notes:

Savings = 8.32%

B.R.C. RTU-1
Return Temperature Histogram
(07/025/14 - 07/24/15)



B.R.C. RTU-1
Return Temperature Probabilities
(07/025/14 - 07/24/15)



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Phone:516-676-0777

Test Report

Report No. 12175-7

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☐ HEATING ☑ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER: _____

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☑ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	48HCTD17F3A5A1H2C0
Capacity / SetPt:	15 Ton / 248-310 MBH
Fuel Type:	
Application:	HVAC
Area Served:	Second floor Kitchen
Miscelaneous:	(RTU 2) 2 Compressors

Test Start Date: 07/25/14

Test End Date: 07/23/15

No. of Days in Test: 165

COMPRESSOR RUN-TIME: ☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 835:25:00

***IntelliCon* OFF-DAYS:** 939:03:48

RUN-TIME was reduced by: 11.04%

COMPRESSOR USAGE FACTOR

***IntelliCon* On-Days:** 21%

***IntelliCon* Off-Days:** 24%

COOLING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 326

It was 9.6% **Warmer on the On-Days.**

IntelliCon OFF-DAYS: 297

Total Degree-Days: 623

USAGE PER DEGREE-DAY

ON-DAYS: 2:33:48

OFF-DAYS: 3:09:34

INDIVIDUAL COMPRESSOR USAGE

	ON-DAY	OFF-DAY
Comp #1		
RT:	656:13:07	735:43:40
CYCLES:	1194	985
Comp #2		
RT:	179:11:53	203:20:08
CYCLES:	512	494

Notes:
Test Period is From 7/25/2014-10/23/2014, 5/11/2015-7/23/2015

Savings = 18.86%

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Test Report

Report No. 12175-8

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☑ HEATING ☐ AIR ☐ REFRIGERATION ☐ OTHER: _____

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☑ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	48HCTD17F3A5A1H2C0
Capacity / SetPt:	15 Ton / 248-310 MBH
Fuel Type:	
Application:	HVAC
Area Served:	Second floor Kitchen
Miscelaneous:	(RTU 2) 2 Compressors

Test Start Date: 10/24/14

Test End Date: 05/10/15

No. of Days in Test: 199

BURNER RUN-TIME:

***IntelliCon* ON-DAYS:** 788:33:37 ☑ in HRS. ☐ in MIN.

***IntelliCon* OFF-DAYS:** 894:12:35 **RUN-TIME was reduced by:** **11.81%**

BURNER USAGE FACTOR

***IntelliCon* On-Days:** **33.0%**

***IntelliCon* Off-Days:** **37.4%**

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 2614 **It was** **0.8%** **Warmer on the On-Days.**

IntelliCon OFF-DAYS: 2635

Total Degree-Days: 5249

USAGE PER DEGREE-DAY

ON-DAYS: 0:18:06

OFF-DAYS: 0:20:22

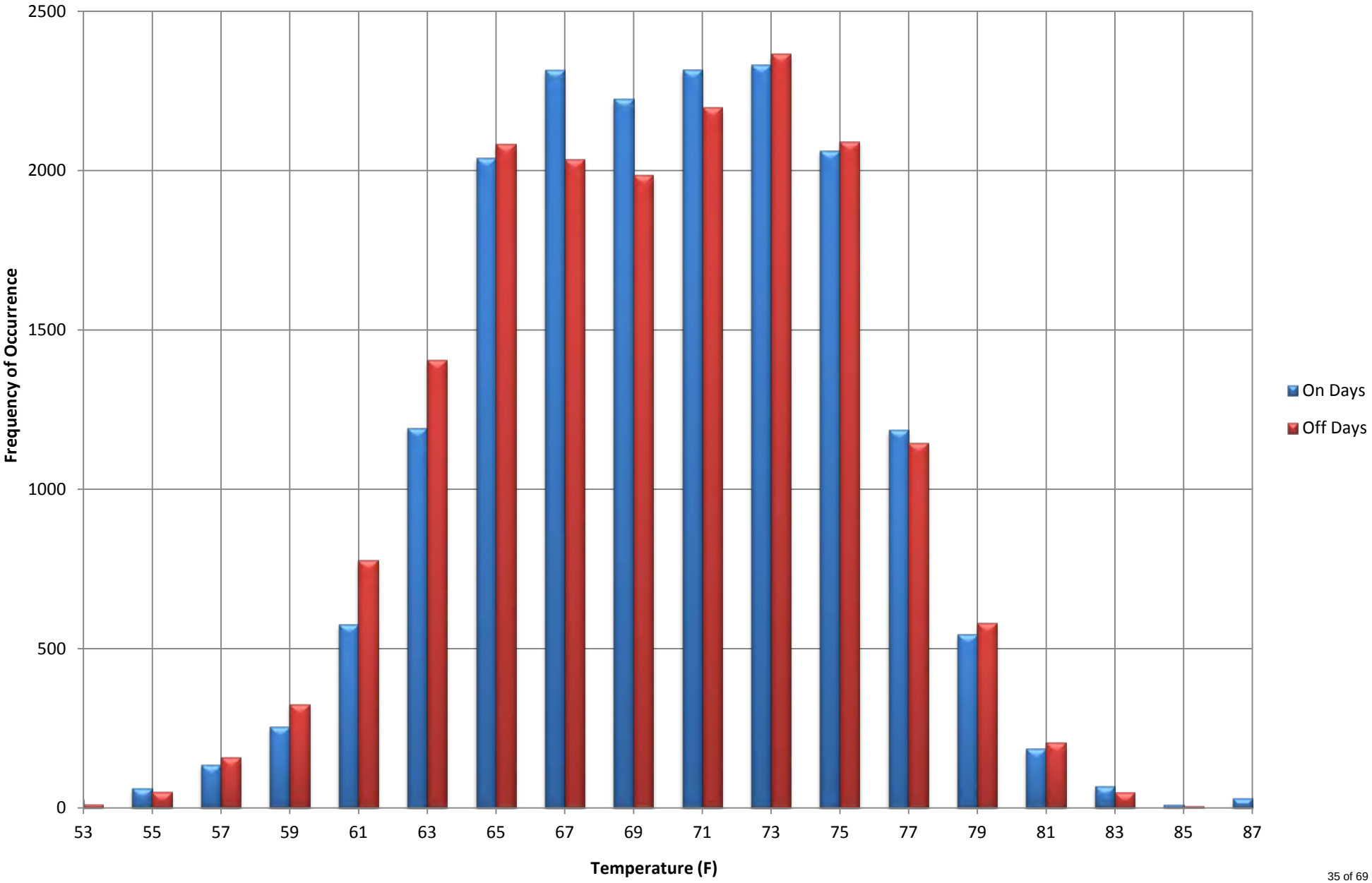
INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	788:33:37	894:12:35
CYCLES:	13597	20235

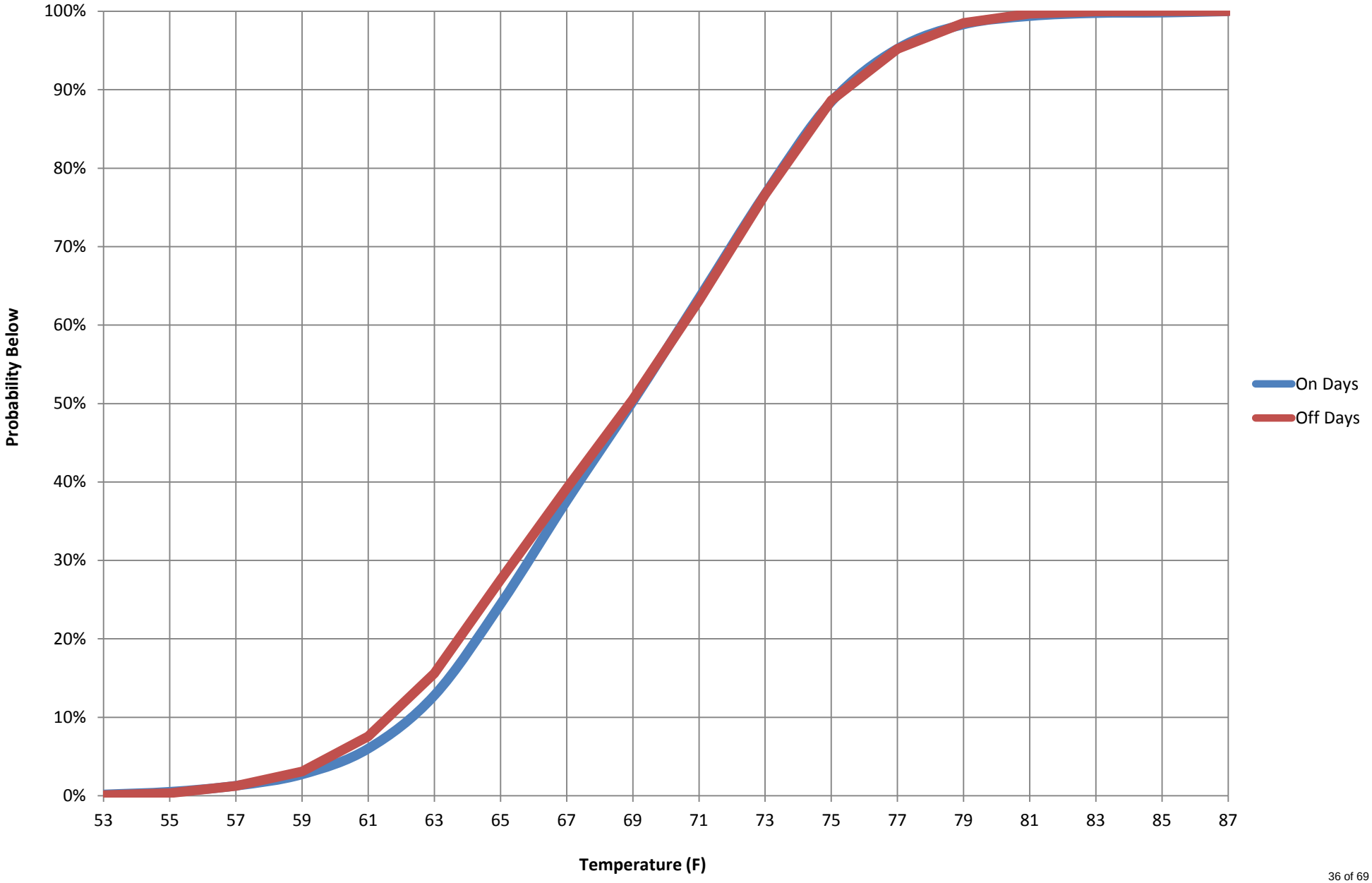
Notes:

Savings = 11.11%

B.R.C. RTU-2
Return Temperature Histogram
(07/025/14 - 07/24/15)



B.R.C. RTU-2
Return Temperature Probabilities
(07/025/14 - 07/24/15)



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Test Report

Report No. 12175-9

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☐ HEATING ☑ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☑ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	48TJF028
Capacity / SetPt:	25 Ton / 242-485 MBH
Fuel Type:	
Application:	HVAC
Area Served:	Unknown
Miscelaneous:	(RTU 2-2) 2 Compressors

Test Start Date: 08/06/14

Test End Date: 07/24/15

No. of Days in Test: 164

COMPRESSOR RUN-TIME: ☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 467:32:38

***IntelliCon* OFF-DAYS:** 538:45:41

RUN-TIME was reduced by:

COMPRESSOR USAGE FACTOR

***IntelliCon* On-Days:** 12%

***IntelliCon* Off-Days:** 14%

COOLING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 296

IntelliCon OFF-DAYS: 273

Total Degree-Days: 569

It was 8.4% **Warmer on the On-Days.**

USAGE PER DEGREE-DAY

ON-DAYS: 1:34:50

OFF-DAYS: 1:58:30

INDIVIDUAL COMPRESSOR USAGE

	ON-DAY	OFF-DAY
Comp #1		
RT:	23:11:55	1:12:40
CYCLES:	1421	58
Comp #2		
RT:	444:20:43	537:33:01
CYCLES:	500	47

Notes:

Savings = 19.98%

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Test Report

Report No. 12175-10

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☑ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	48TJF028
Capacity / SetPt:	25 Ton / 242-485 MBH
Fuel Type:	
Application:	HVAC
Area Served:	Unknown
Miscelaneous:	(RTU 2-2) 2 Compressors

Test Start Date: 12/16/14

Test End Date: 04/01/15

No. of Days in Test: 107

BURNER RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 247:06:35

***IntelliCon* OFF-DAYS:** 285:05:20

RUN-TIME was reduced by: **13.32%**

BURNER USAGE FACTOR

***IntelliCon* On-Days:** **19%**

***IntelliCon* Off-Days:** **22%**

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 1807

IntelliCon OFF-DAYS: 1833

Total Degree-Days: 3640

It was **1.4%** **Warmer on the On-Days.**

USAGE PER DEGREE-DAY

ON-DAYS: 0:08:12

OFF-DAYS: 0:09:20

INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	247:06:35	285:05:20
CYCLES:	8150	4369

BURNER CYCLING REDUCTION:

IntelliCon ON-DAYS: 8150

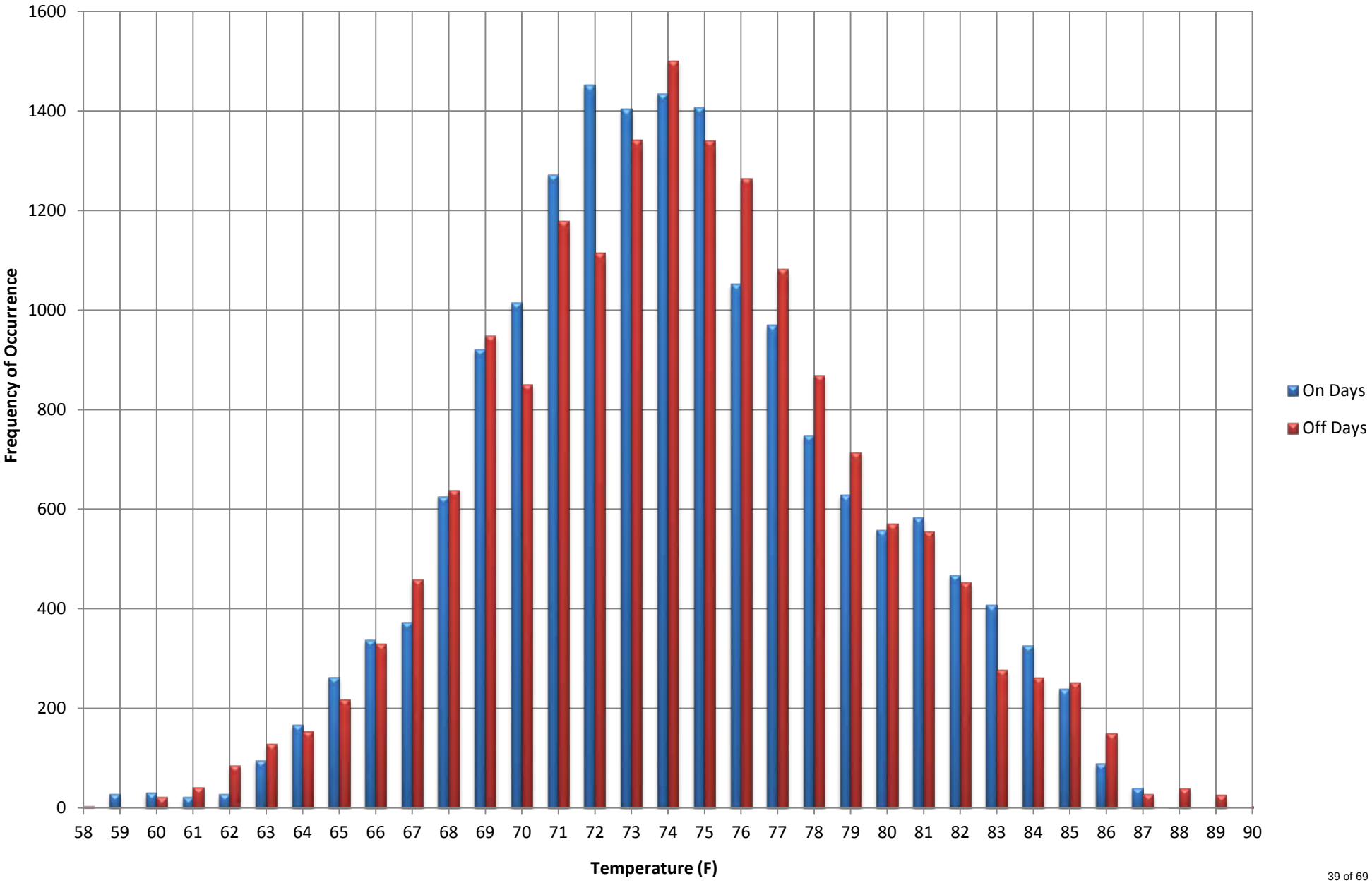
IntelliCon OFF-DAYS: 4369

Cycling was reduced by: **46.4%**

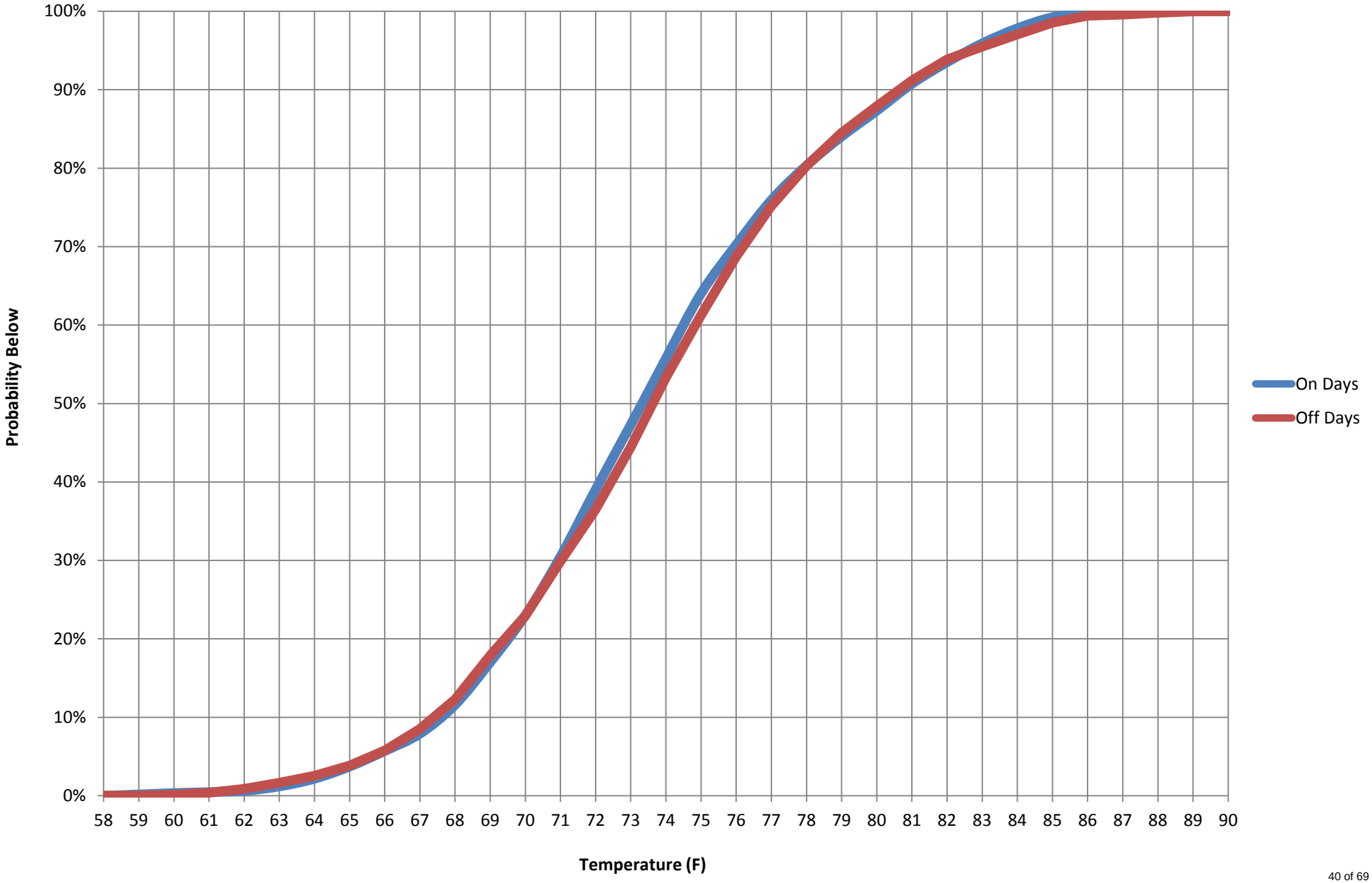
Notes:

Savings = 12.07%

B.R.C. RTU-2
Return Temperature Histogram
(08/06/14 - 07/24/15)



B.R.C. RTU-2
Return Temperature Probabilities
(08/06/14 - 07/24/15)



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Test Report

Report No. 12175-11

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☐ HEATING ☑ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☑ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	48TJF028
Capacity / SetPt:	25 Ton / 242-485 MBH
Fuel Type:	
Application:	HVAC
Area Served:	Main Gym
Miscelaneous:	(Gym RTU) 2 Compressors

Test Start Date: 08/03/14

Test End Date: 08/16/15

No. of Days in Test: 111

COMPRESSOR RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 970:43:45

***IntelliCon* OFF-DAYS:** 1191:37:17

RUN-TIME was reduced by: 18.54%

COMPRESSOR USAGE FACTOR

***IntelliCon* On-Days:** 36%

***IntelliCon* Off-Days:** 45%

COOLING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 1355.34

IntelliCon OFF-DAYS: 1497.52

Total Degree-Days: 2852.86

It was 9.5% **Cooler on the ON-Days.**

USAGE PER DEGREE-DAY

ON-DAYS: 0:42:58

OFF-DAYS: 0:47:45

INDIVIDUAL COMPRESSOR USAGE

	ON-DAY	OFF-DAY
Comp #1		
RT:	359:14:31	393:51:59
CYCLES:	346	93
Comp #2		
RT:	611:29:14	797:45:18
CYCLES:	747	37

Notes:

Savings = 9.99%

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Test Report

Report No. 12175-12

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☑ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	48TJF028
Capacity / SetPt:	25 Ton / 242-485 MBH
Fuel Type:	Nat Gas
Application:	HVAC
Area Served:	Main Gym
Miscelaneous:	(Gym RTU) 2 Compressors

Test Start Date: 11/03/14

Test End Date: 05/05/15

No. of Days in Test: 184

BURNER RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 1214:09:59

***IntelliCon* OFF-DAYS:** 1387:17:58

RUN-TIME was reduced by: **12.48%**

BURNER USAGE FACTOR

***IntelliCon* On-Days:** **55%**

***IntelliCon* Off-Days:** **63%**

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 2794

IntelliCon OFF-DAYS: 2762

Total Degree-Days: 5557

It was **1.2%** **Colder on the On-Days.**

USAGE PER DEGREE-DAY

ON-DAYS: 0:26:04

OFF-DAYS: 0:30:08

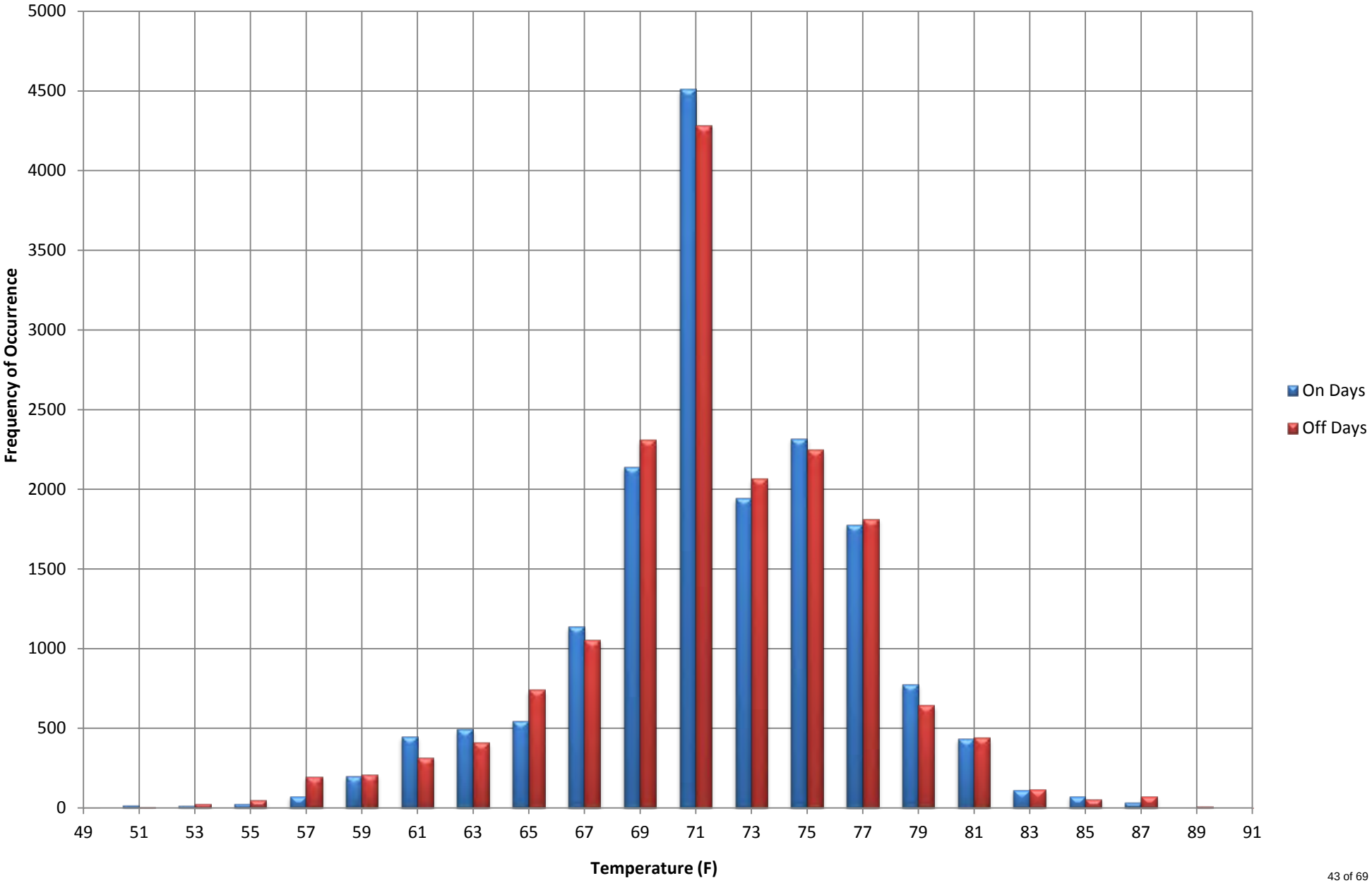
INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	1214:09:59	1387:17:58
CYCLES:	4405	4472

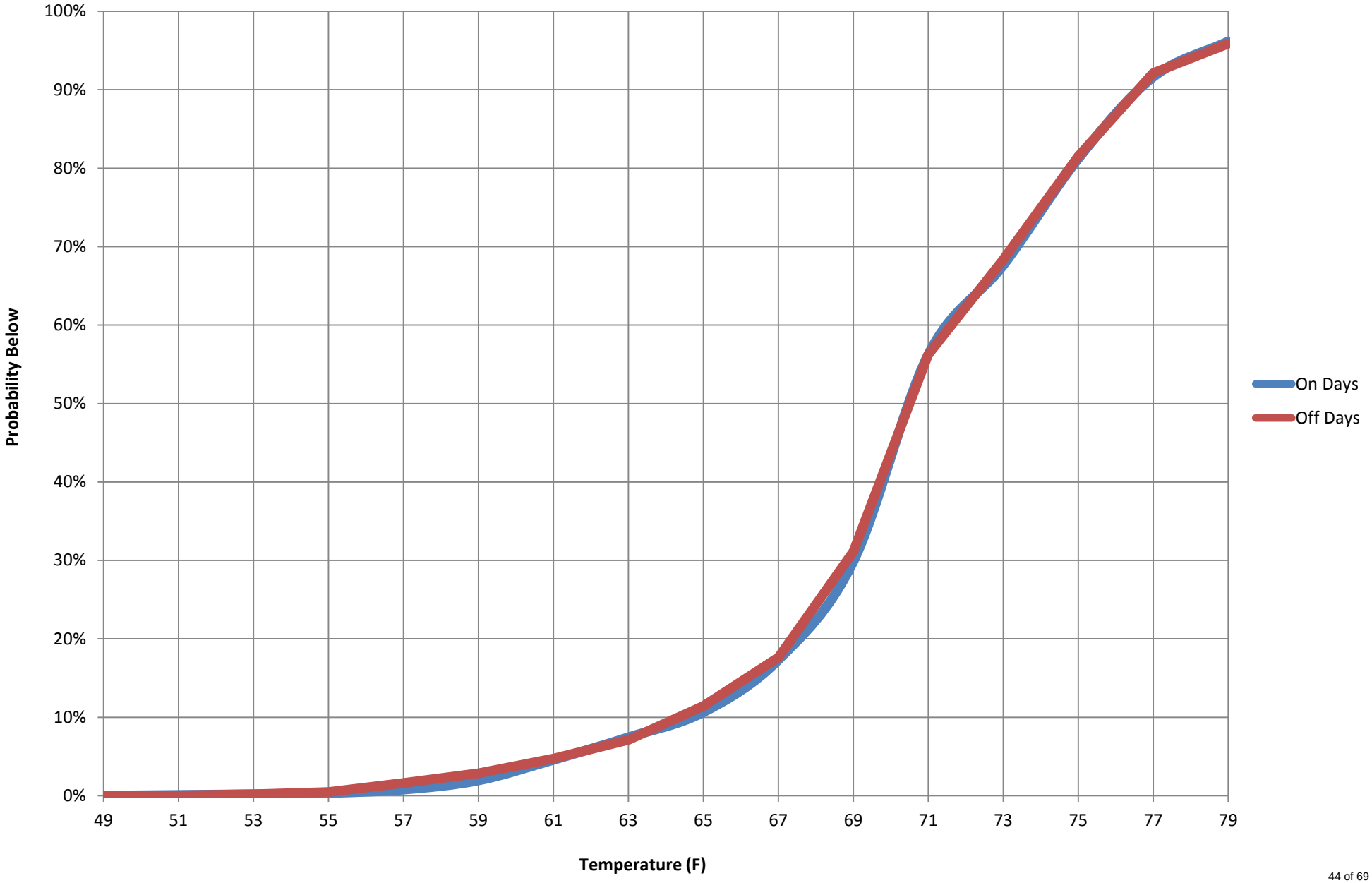
Notes:

Savings = 13.48%

B.R.C. Gym RTU
Return Temperature Histogram
(08/03/14 -- 07/24/15)



B.R.C. Gym RTU
Return Temperature Probabilities
(08/03/14 -- 08/30/14)



Intellidyne
The Power To Save
303 Sunnyside Blvd.
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Plainview, NY 11803
Phone:516-676-0777

Test Report

Report No. 12175-13

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☐ HEATING ☑ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☑ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	York
Model:	ZF300N32B2AA1
Capacity / SetPt:	25 Ton / 160-320 MBH
Fuel Type:	Nat Gas
Application:	HVAC
Area Served:	Unknown area on second floor
Miscelaneous:	2 Compressors

Test Start Date: 08/06/14

Test End Date: 08/05/15

No. of Days in Test: 174

COMPRESSOR RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 744:47:48

***IntelliCon* OFF-DAYS:** 795:11:05

RUN-TIME was reduced by: 6.34%

COMPRESSOR USAGE FACTOR

***IntelliCon* On-Days:** 18%

***IntelliCon* Off-Days:** 19%

COOLING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 474

IntelliCon OFF-DAYS: 454

Total Degree-Days: 928

It was 4.5% **Warmer on the On-Days.**

USAGE PER DEGREE-DAY

ON-DAYS: 1:34:15

OFF-DAYS: 1:45:07

INDIVIDUAL COMPRESSOR USAGE

	ON-DAY	OFF-DAY
Comp #1		
RT:	563:51:58	589:49:58
CYCLES:	708	504
Comp #2		
RT:	180:55:50	205:21:07
CYCLES:	103	75

Notes:

RTU not functioning properly very low usage factor
Longer test has shown improved usage factor

Savings = 10.34%

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Suite # 75
Plainview, NY 11803
Phone:516-676-0777

Test Report

Report No. 12175-14

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☑ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	York
Model:	ZF300N32B2AA1
Capacity / SetPt:	25 Ton / 160-320 MBH
Fuel Type:	Nat Gas
Application:	HVAC
Area Served:	Unknown area on second floor
Miscelaneous:	2 Compressors

Test Start Date: 08/06/14

Test End Date: 08/05/15

No. of Days in Test: 365

BURNER RUN-TIME: ☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 0:23:37

***IntelliCon* OFF-DAYS:** 0:10:14

RUN-TIME was reduced by: -130.78%

BURNER USAGE FACTOR

***IntelliCon* On-Days:** 0%

***IntelliCon* Off-Days:** 0%

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 2787

It was 0.6% **Colder on the On-Days.**

IntelliCon OFF-DAYS: 2770

Total Degree-Days: 5557

USAGE PER DEGREE-DAY

ON-DAYS: 0:00:01

OFF-DAYS: 0:00:00

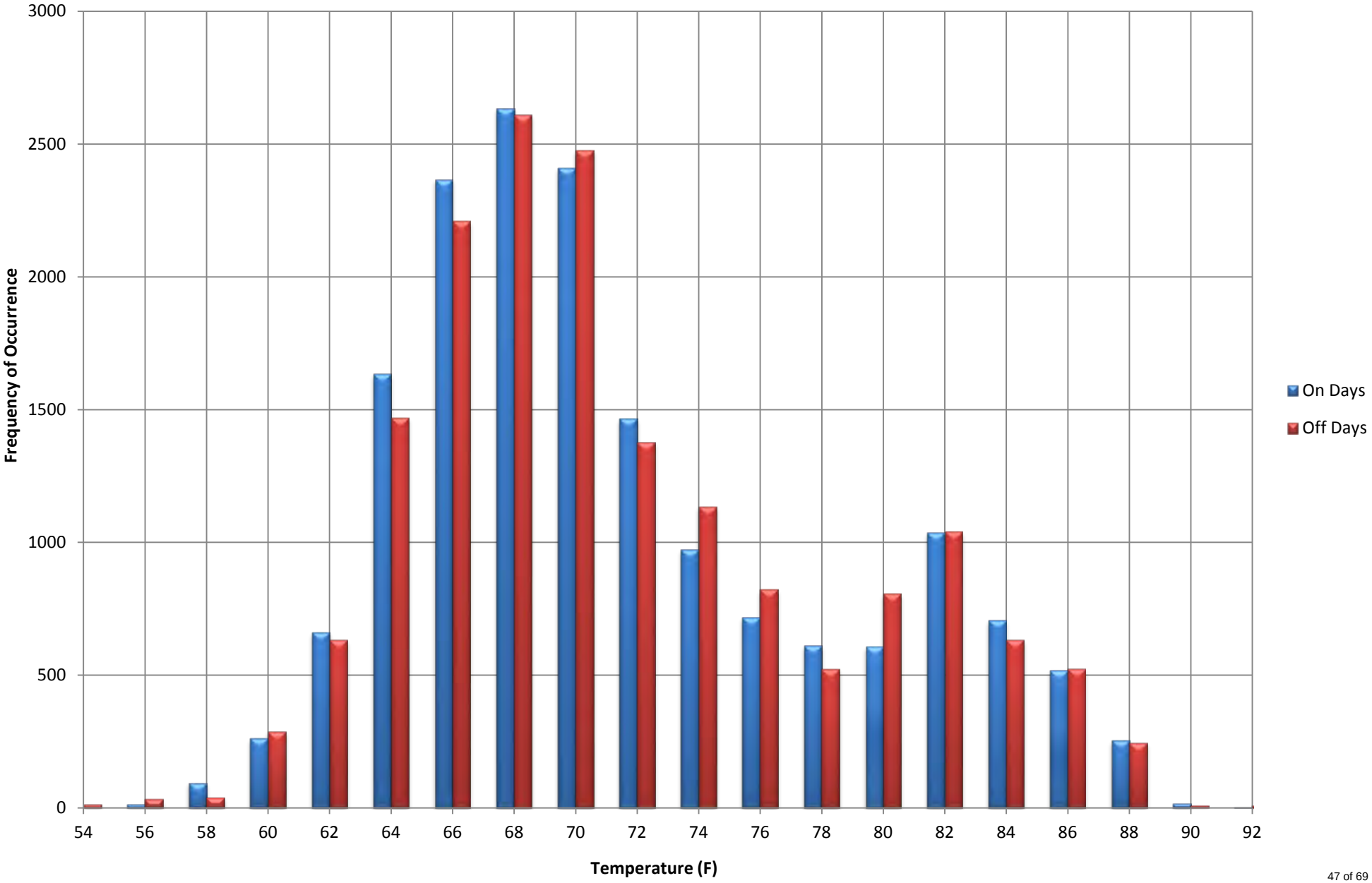
INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	0:23:37	0:10:14
CYCLES:	14	3

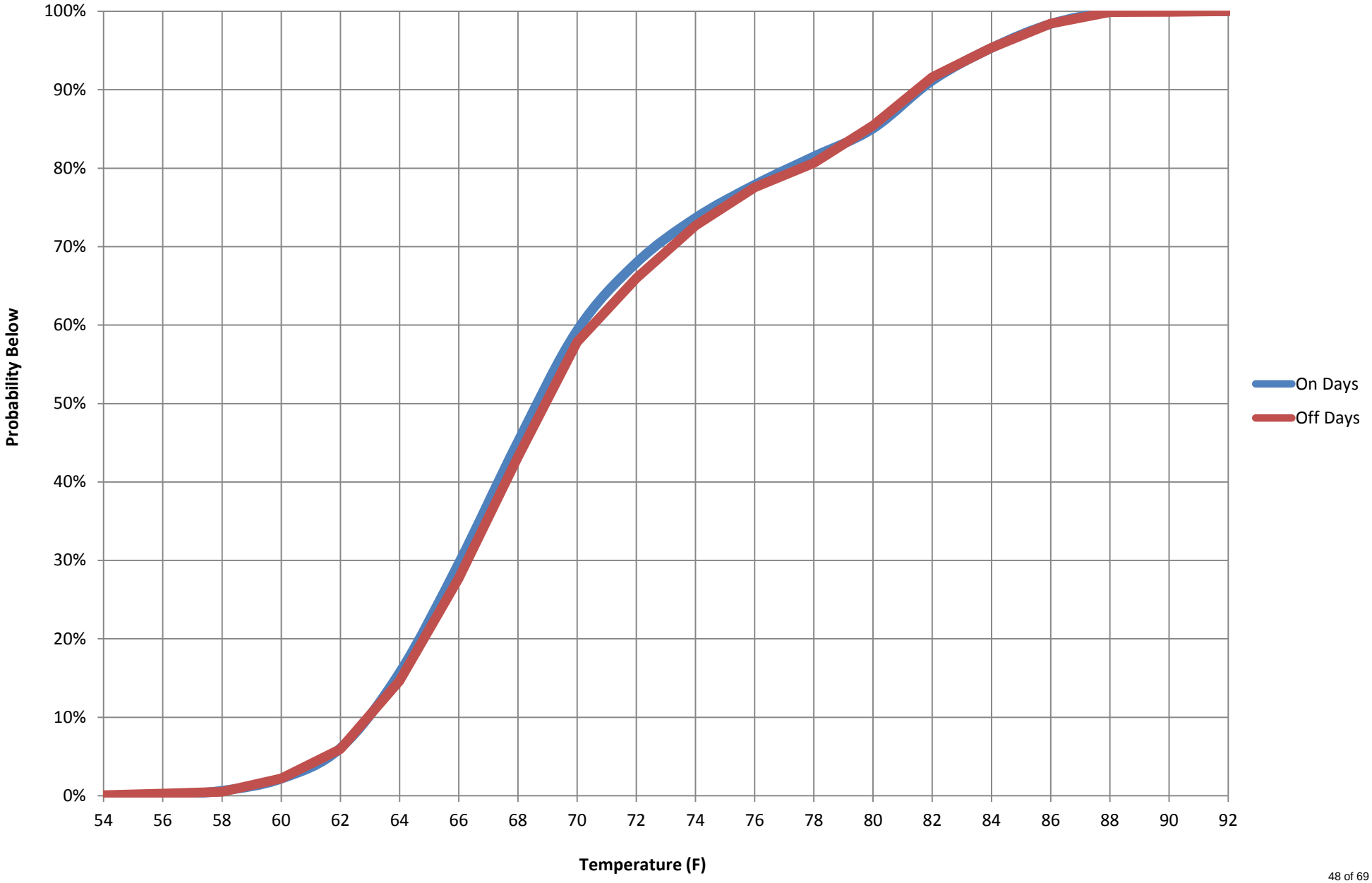
Notes:
Unit barely ran for heating (see run-times)

Savings = N/A

B.R.C. York RTU
Return Temperature Histogram
(08/06/14 - 07/24/15)



B.R.C. York RTU
Return Temperature Probabilities
(08/06/14 - 07/24/15)



303 Sunnyside Blvd.
Suite # 75
Plainview, NY 11803
Phone:516-676-0777
Fax: 516-676-2640

Test Report

Report No. 12175-15

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER: _____

Product Tested: ☐ HW ☑ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Weil-McLain / Power Flame
Model:	588 / WCR4-GO-12
Capacity / SetPt:	300-1357 MBH
Fuel Type:	Nat Gas
Application:	Heating
Area Served:	Golden Age Center
Miscelaneous:	

Test Start Date: 10/30/14

Test End Date: 05/18/15

No. of Days in Test: 201

BURNER RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 352:55:32

***IntelliCon* OFF-DAYS:** 426:00:17

RUN-TIME was reduced by: **17.15%**

BURNER USAGE FACTOR

***IntelliCon* On-Days:** **14.63%**

***IntelliCon* Off-Days:** **17.66%**

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 2611

It was **0.3%** **Warmer on the On-Days.**

IntelliCon OFF-DAYS: 2618

Total Degree-Days: 5229

USAGE PER GALLON

ON-DAYS: 0:08:06.68

OFF-DAYS: 0:09:45.81

INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	352:55:32	426:00:17
CYCLES:	3161	4589

BURNER CYCLING REDUCTION:

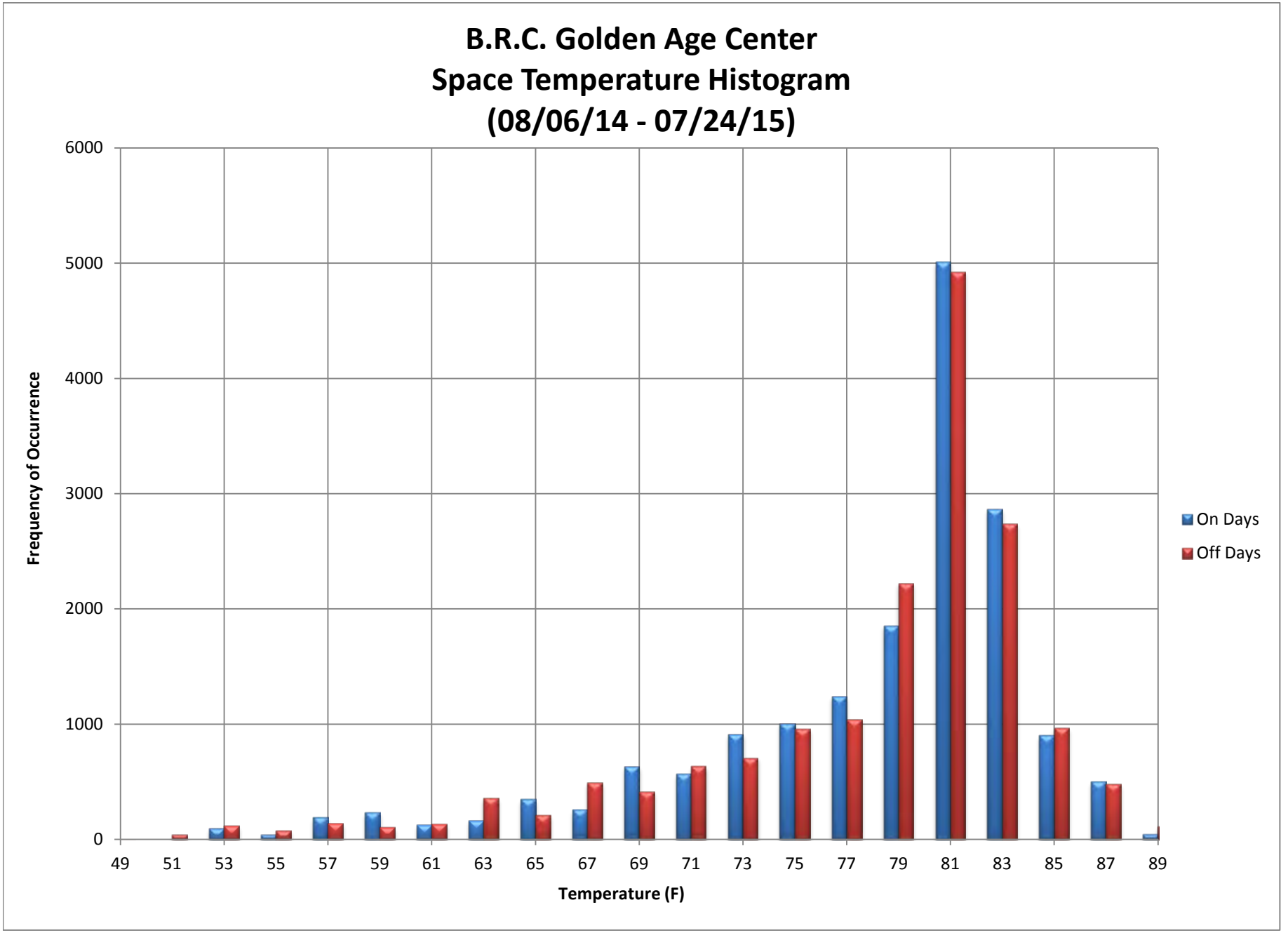
IntelliCon ON-DAYS: 3161

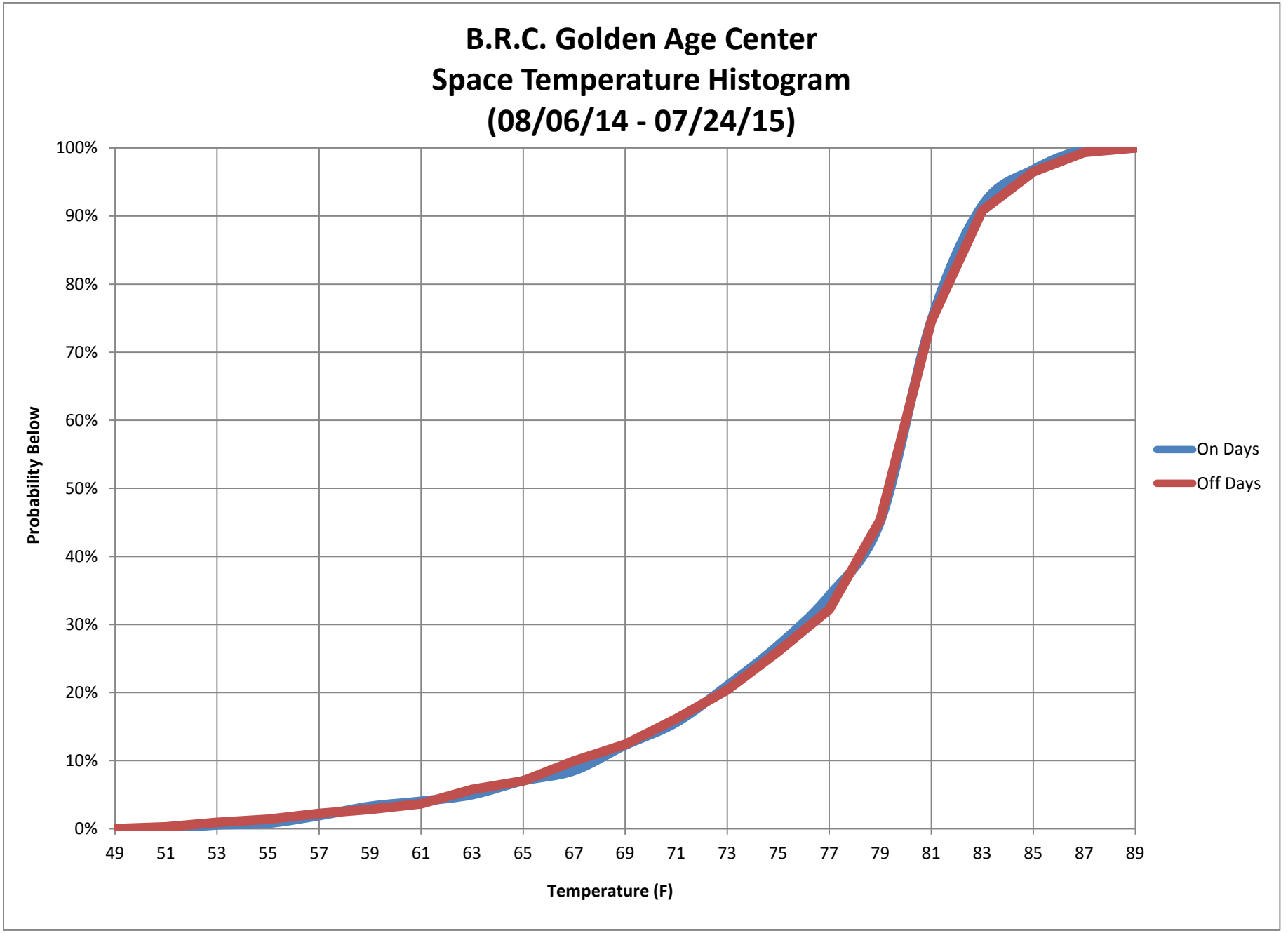
IntelliCon OFF-DAYS: 4589

Cycling was reduced by: **31.1%**

Notes:

Savings = 16.92%


B.R.C. Golden Age Center
Space Temperature Histogram
(08/06/14 - 07/24/15)
Frequency of Occurrence
6000
5000
4000
3000
2000
1000
0
49
51
53
55
57
59
61
63
65
67
69
71
73
75
77
79
81
83
85
87
89
Temperature (F)
On Days
Off Days


B.R.C. Golden Age Center
Space Temperature Histogram
(08/06/14 - 07/24/15)
Probability Below
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
49
51
53
55
57
59
61
63
65
67
69
71
73
75
77
79
81
83
85
87
89
Temperature (F)
On Days
Off Days

Intellidyne
The Power To Save
303 Sunnyside Blvd.
Suite # 75
Plainview, NY 11803
Phone:516-676-0777
Fax: 516-676-2640

Test Report

Report No. 12175-16

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
Brownsville Recreation Center
1555 Linden Blvd.
Brooklyn, NY 11212

Test Type: ☐ HEATING ☑ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER: _____

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☑ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	50BU044501
Capacity / SetPt:	44 Ton
Fuel Type:	Nat Gas
Application:	Cooling
Area Served:	Golden Age Center
Miscelaneous:	2 Compressors

Test Start Date: 10/30/14

Test End Date: 05/18/15

No. of Days in Test: 201

COMPRESSOR RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 0:00:00

***IntelliCon* OFF-DAYS:** 0:00:00

RUN-TIME was reduced by: 0.00%

COMPRESSOR USAGE FACTOR

***IntelliCon* On-Days:** 0.00%

***IntelliCon* Off-Days:** 0.00%

COOLING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 2611

IntelliCon OFF-DAYS: 2618

Total Degree-Days: 5229

It was 0.3% **Cooler on the ON-Days.**

USAGE PER GALLON

ON-DAYS: 0:00:00.00

OFF-DAYS: 0:00:00.00

INDIVIDUAL COMPRESSOR USAGE

	ON-DAY	OFF-DAY
Comp #1 RT:		
Comp #1 CYCLES:		
Comp #2 RT:		
Comp #2 CYCLES:		

Notes:
Air Conditioner did not run for the duration of the entire test.

Savings = N/A

Report No. 12175-17
Date: 10/1/15

Fuel Reduction Program

CONDUCTED AT

FDNY – RED HOOK

FOR

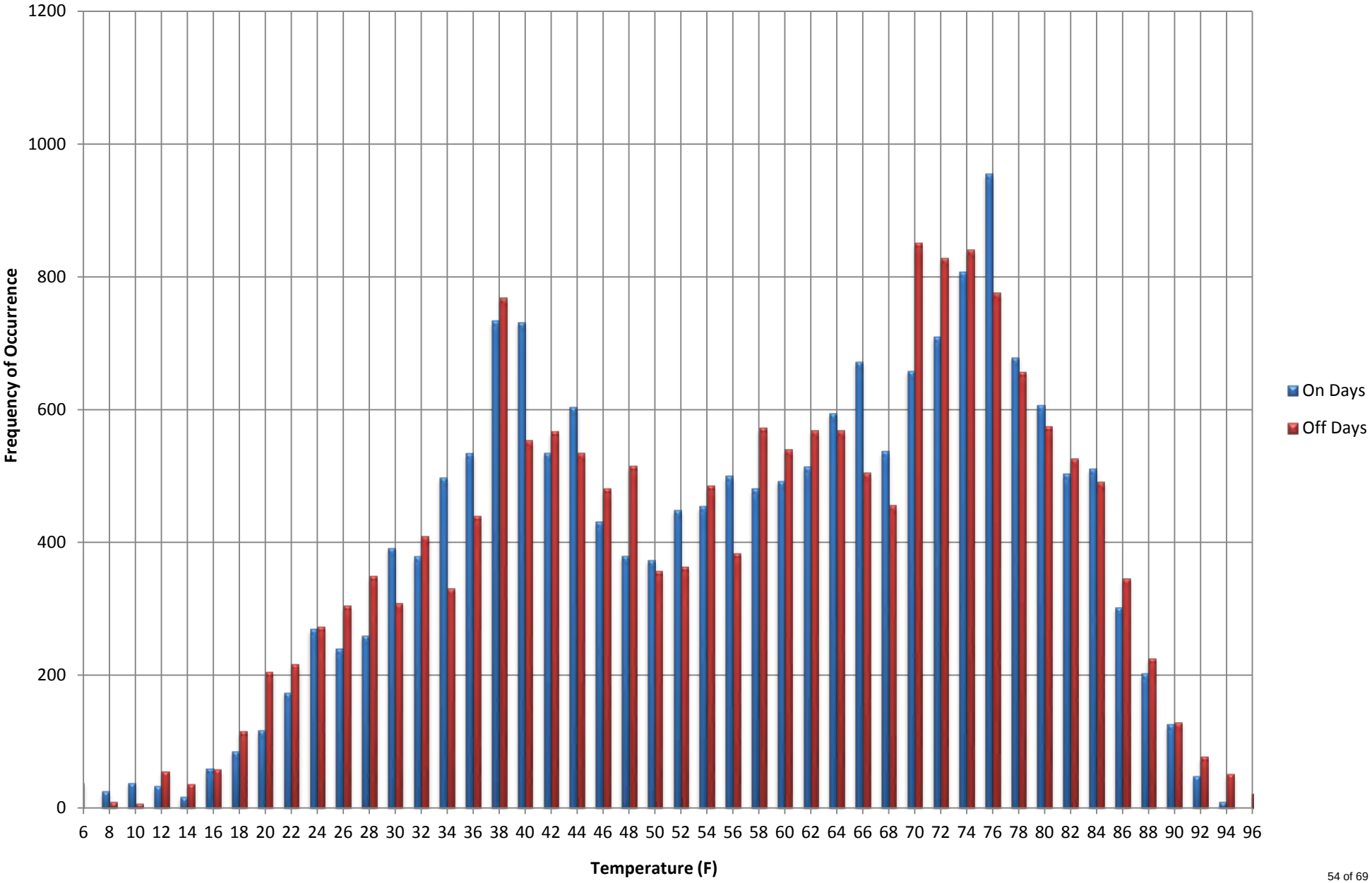
NYC - DCAS

TEST RESULTS FOR:

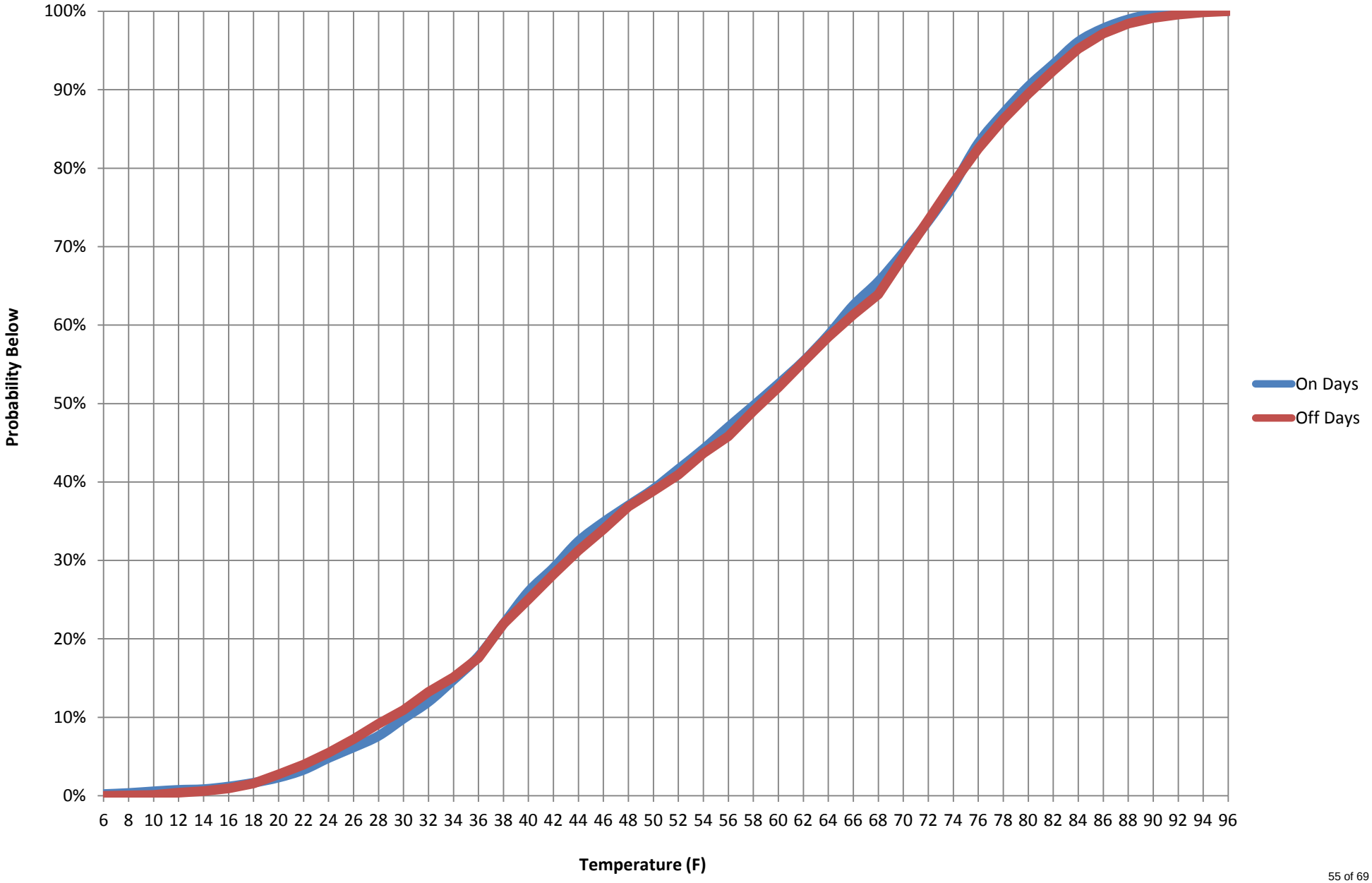
1 - HOT-WATER BOILER

A Confidential Report
Prepared by
Intellidyne LLC

FDNY-Red Hook
O.A.T Histogram (07/03/14 - 07/07/15)



FDNY-Red Hook
OAT Probabilities (07/03/14 -- 07/07/15)



Intellidyne
The Power To Save

303 Sunnyside Blvd.
Suite # 75
Plainview, NY 11803
Phone:516-676-0777
Fax: 516-676-2640

Test Report

Report No. 12175-17

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
F.D.N.Y. Station House E. 202 / L. 104
31 Richards Street
Brooklyn, NY 11211

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☑ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Burnham
Model:	V906A
Capacity / SetPt:	1010 MBH
Fuel Type:	Nat Gas
Application:	Heating
Area Served:	All BLDG
Miscellaneous:	

Test Start Date: 07/03/14

Test End Date: 09/02/14

No. of Days in Test: 62

BURNER RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 208:30:25

***IntelliCon* OFF-DAYS:** 213:15:45

RUN-TIME was reduced by: 2.23%

BURNER USAGE FACTOR

***IntelliCon* On-Days:** 28%

***IntelliCon* Off-Days:** 29%

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 1306

It was 3.5% **Warmer on the On-Days.**

IntelliCon OFF-DAYS: 1354

Total Degree-Days: 2660

USAGE PER DEGREE-DAY

ON-DAYS: 0:09:34.73

OFF-DAYS: 0:09:27.06

INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	208:30:25	213:15:45
CYCLES:	3321	4322

BURNER CYCLING REDUCTION:

IntelliCon ON-DAYS: 3321

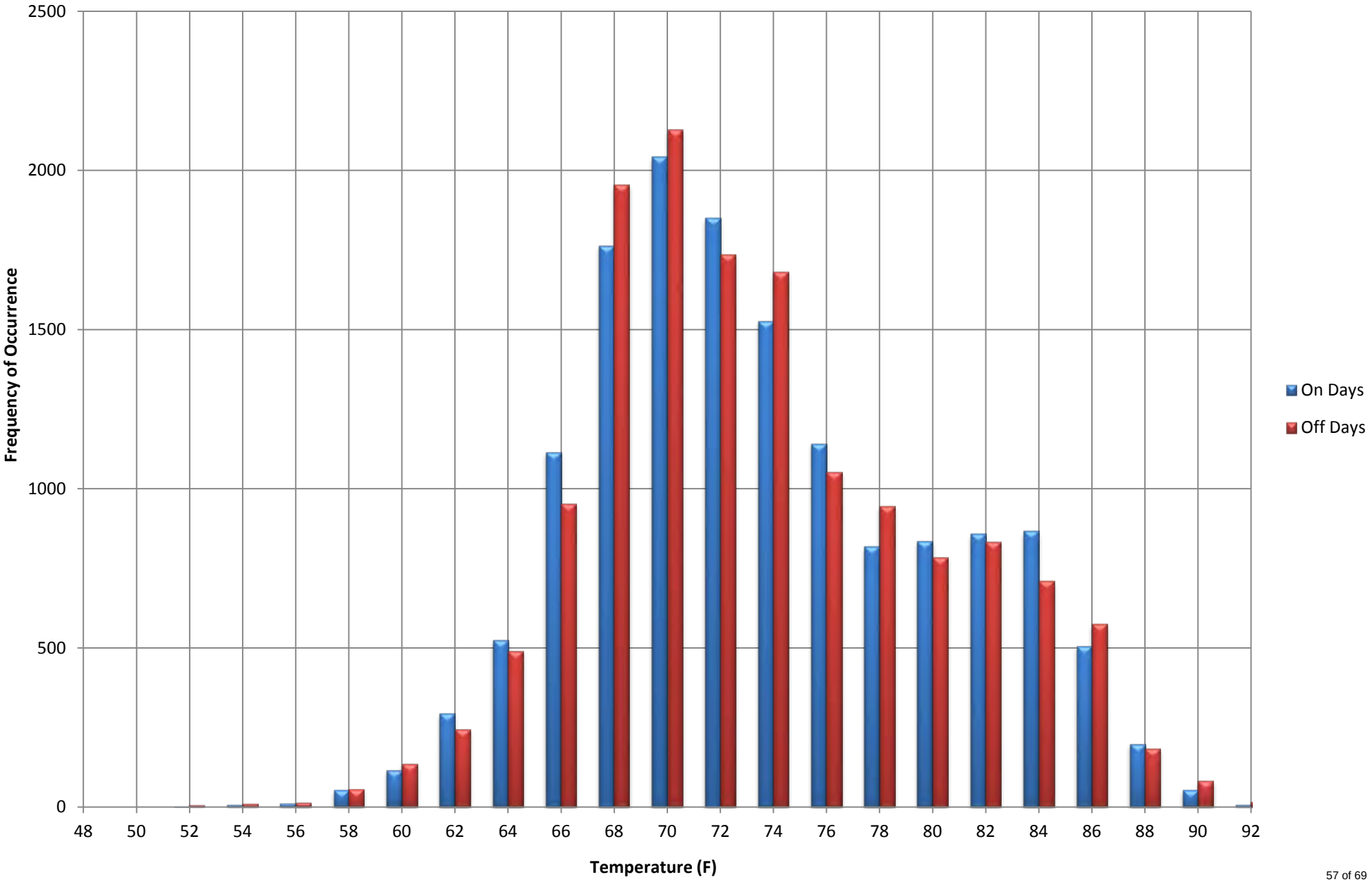
IntelliCon OFF-DAYS: 4322

Cycling was reduced by: 23.2%

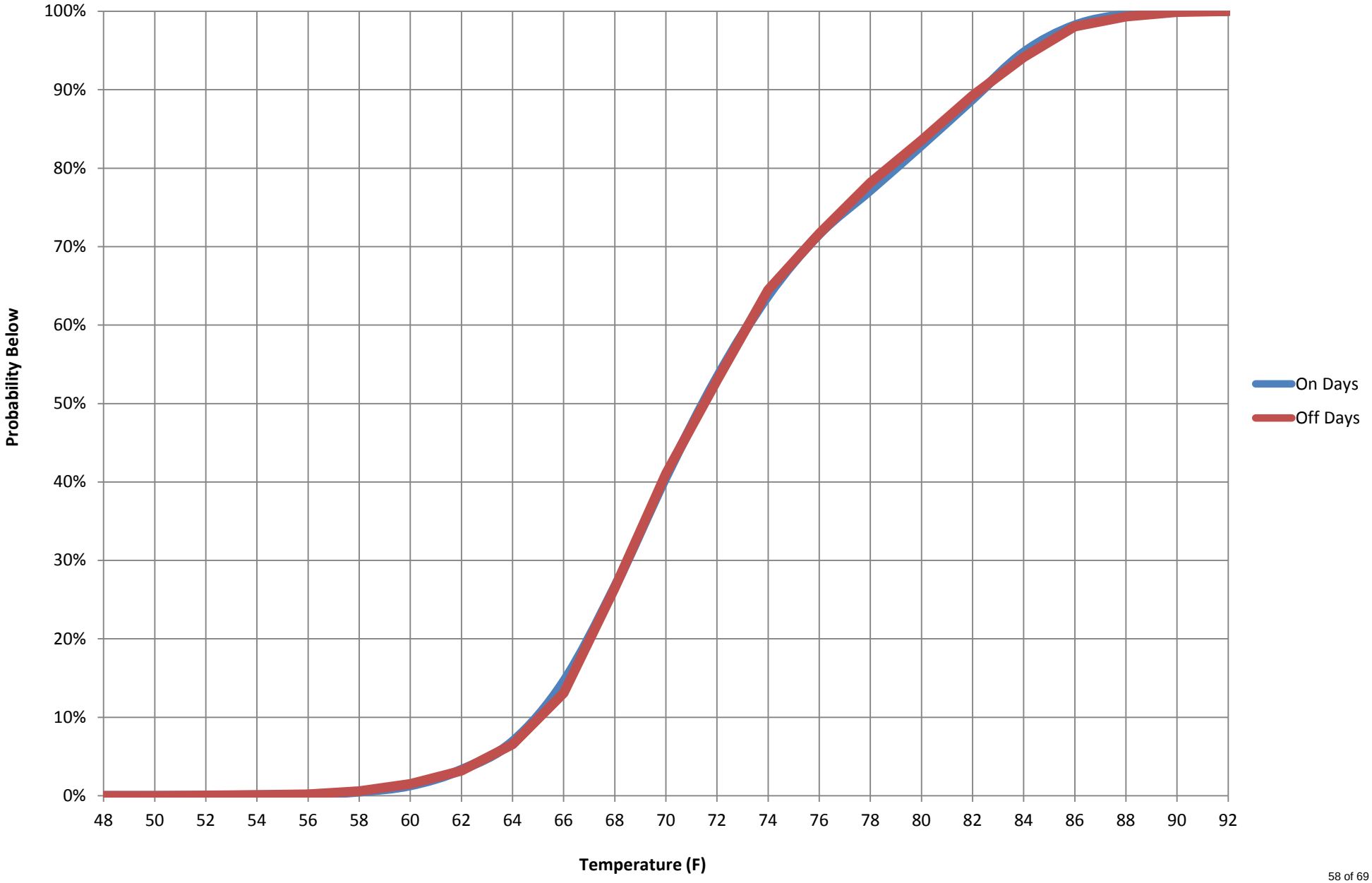
Notes:
Due to interference with the testing at this facility, it was not possible to analyze the data to determine the savings.

Savings = N/A

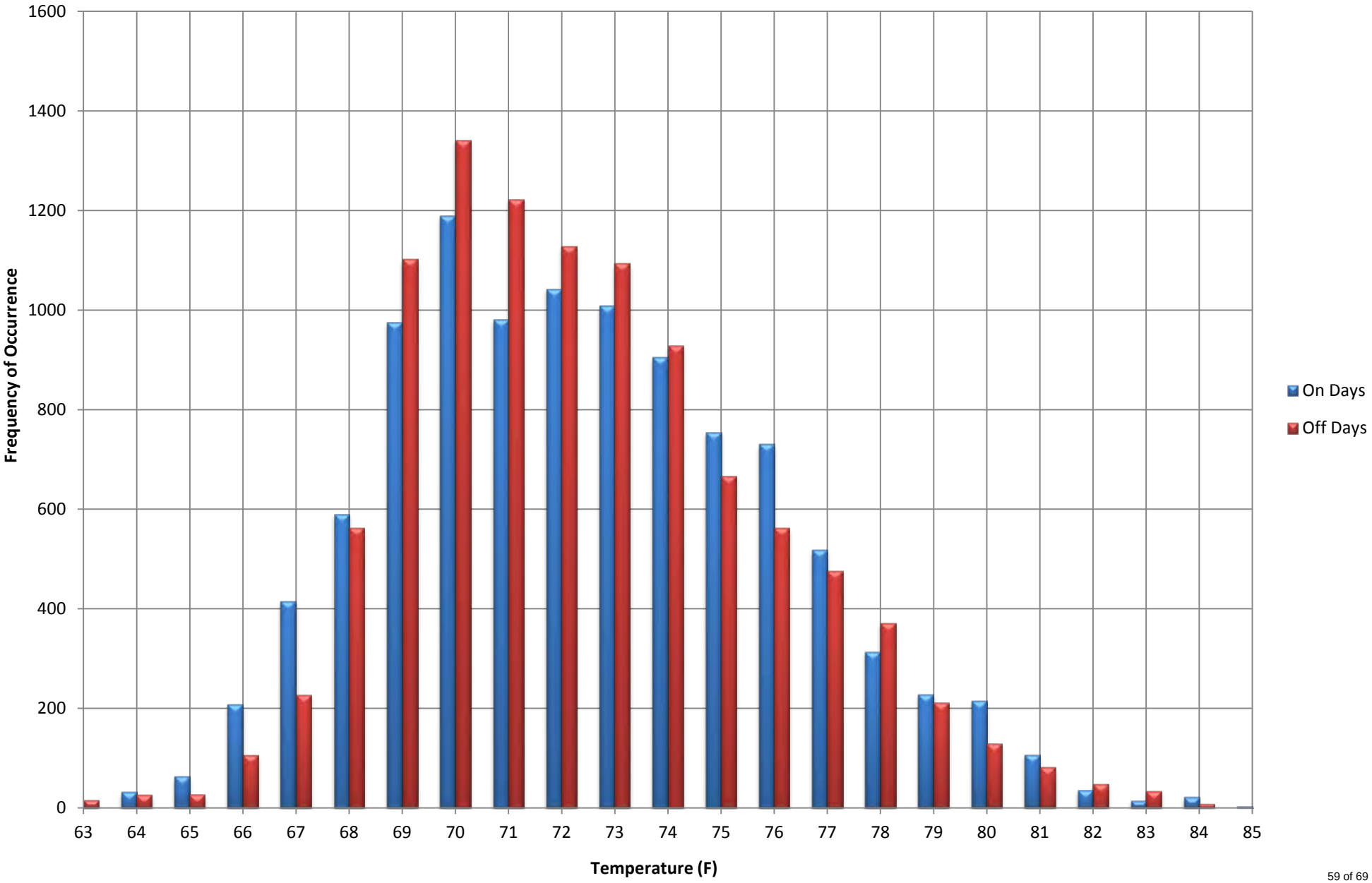
FDNY-Red Hook
Lower Space Temperature Histogram
(07/03/14 - 05/02/15)



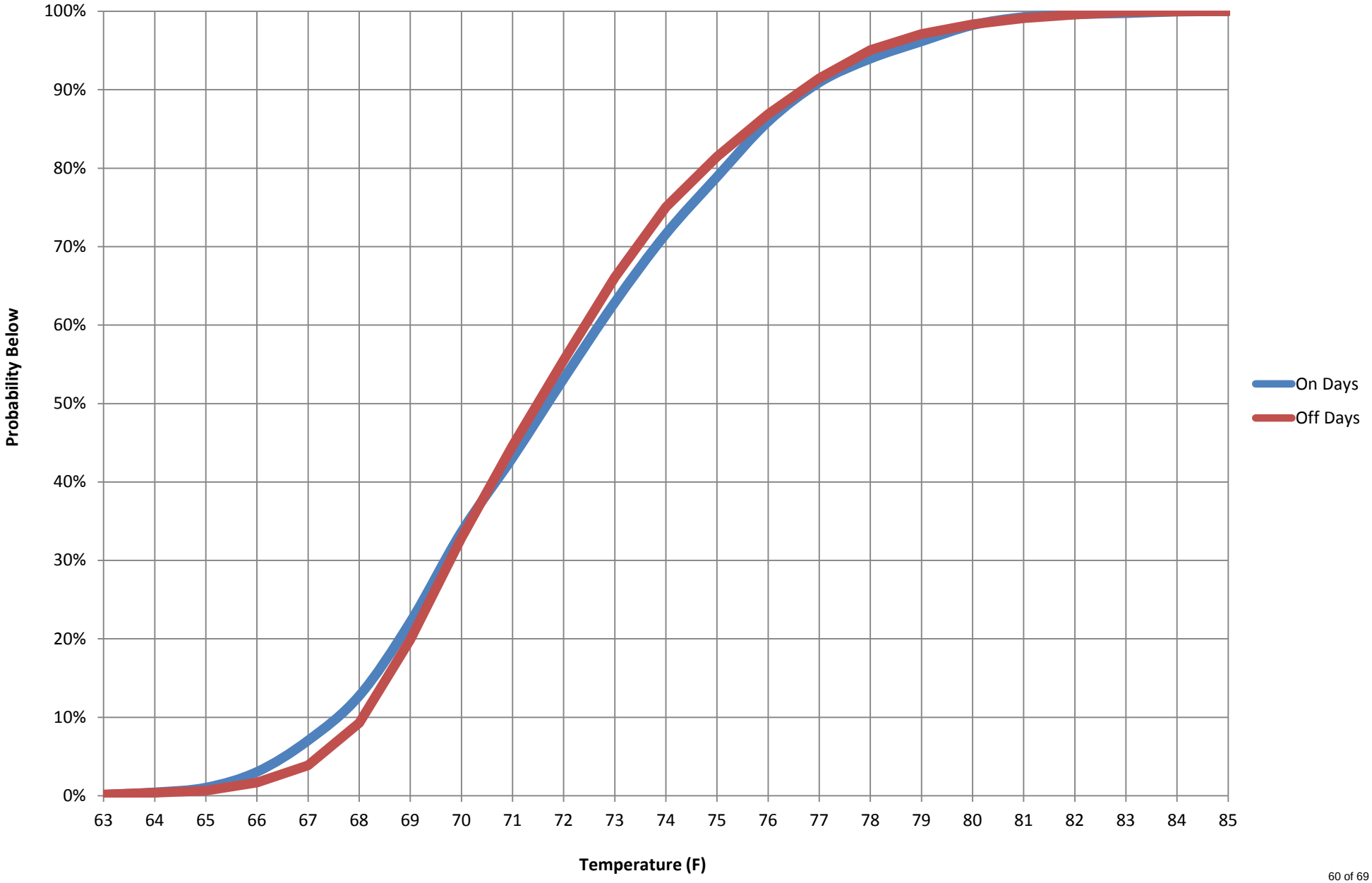
FDNY-Red Hook
Lower Space Temperature Probabilities
(07/03/14 - 05/02/15)



FDNY-Red Hook
Upper Space Temperature Histogram
(07/03/14 - 02/03/15)



FDNY-Red Hook
Upper Space Temperature Probabilities
(07/03/14 - 02/03/15)



Report No. 12175-18 &19
Date: 10/1/15

Fuel & Electricity Reduction Program

CONDUCTED AT

FDNY - BRONX

FOR

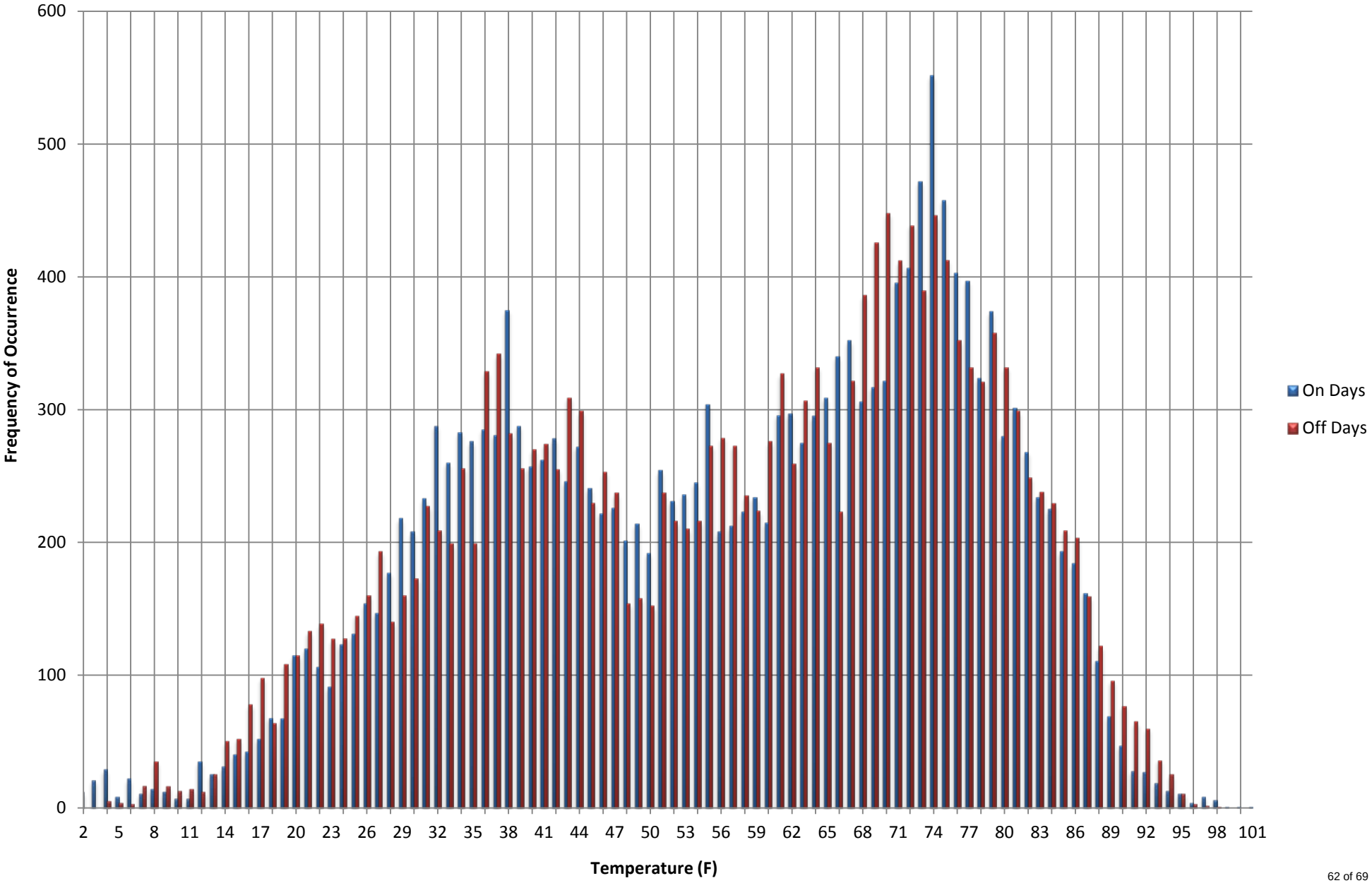
NYC - DCAS

TEST RESULTS FOR:

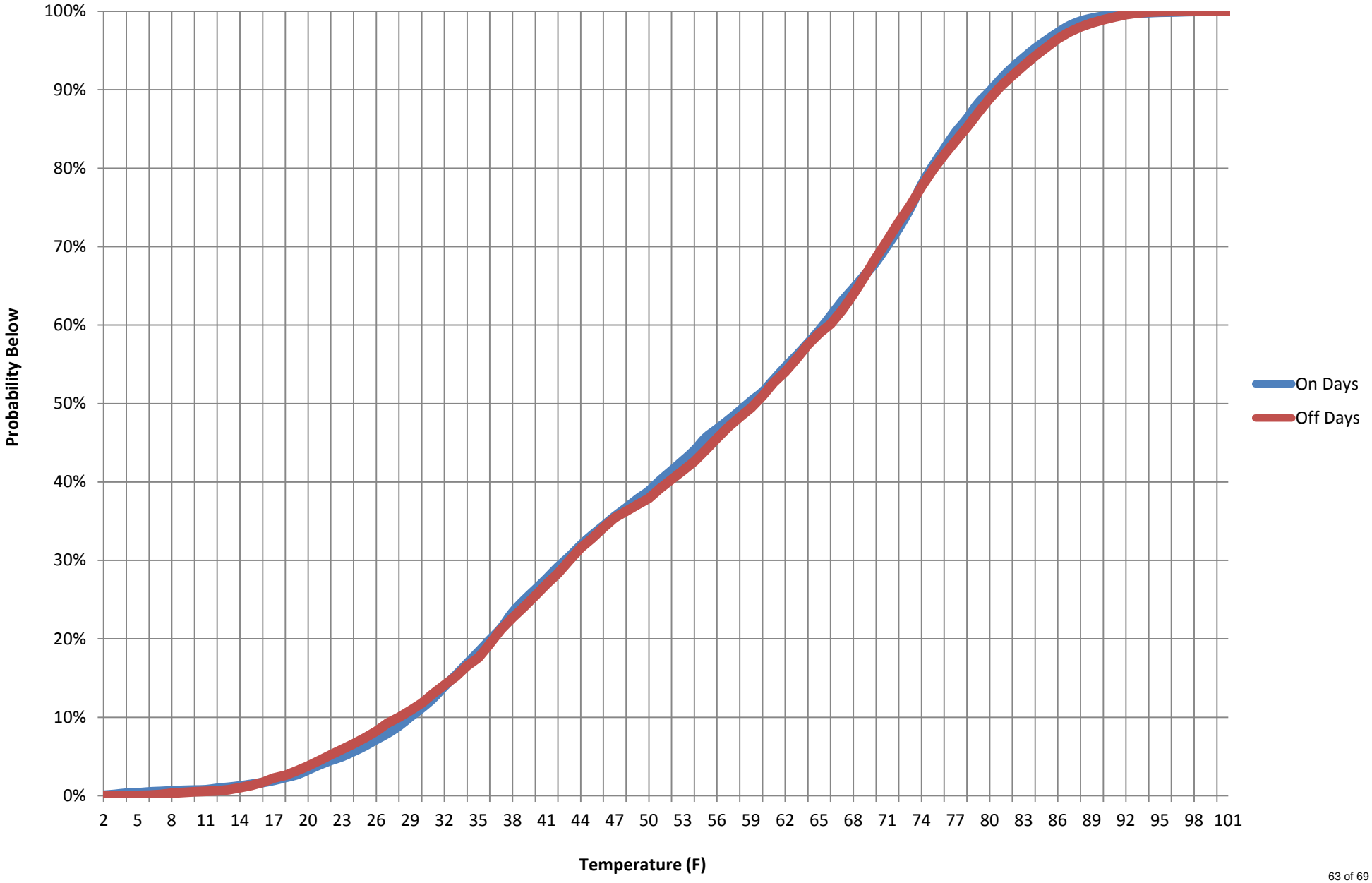
1 - HOT-WATER BOILER
AND
1 - ROOFTOP UNIT WITH 2 COMPRESSORS

A Confidential Report
Prepared by
Intellidyne LLC

FDNY-Bronx
O.A.T Histogram (07/03/14 - 07/27/15)



FDNY-Bronx
OAT Probabilities (07/03/14 - 07/27/15)



303 Sunnyside Blvd.
Suite # 75
Plainview, NY 11803
Phone:516-676-0777

Test Report

Report No. 12175-18

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
F.D.N.Y. Station House E.50 / L.19 / BAT.26
1155 Washington Avenue
Bronx, NY 10456

Test Type: ☐ HEATING ☑ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☑ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Carrier
Model:	50TC-D17A7A5A0F2A0
Capacity / SetPt:	15 Ton 2 Stage
Fuel Type:	
Application:	HVAC
Area Served:	All BLDG
Miscellaneous:	2 Compressors and Electric Heat

Test Start Date: 07/03/14

Test End Date: 07/27/15

No. of Days in Test: 390

COMPRESSOR RUN-TIME:

☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 2826:25:14

***IntelliCon* OFF-DAYS:** 3104:18:35

RUN-TIME was reduced by: 8.95%

COMPRESSOR USAGE FACTOR

***IntelliCon* On-Days:** 30%

***IntelliCon* Off-Days:** 33%

COOLING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 830

IntelliCon OFF-DAYS: 839

Total Degree-Days: 1670

It was 1.1% **Cooler on the ON-Days.**

USAGE PER DEGREE-DAY

ON-DAYS: 3:24:13

OFF-DAYS: 3:41:56

INDIVIDUAL COMPRESSOR USAGE

	ON-DAY	OFF-DAY
Comp #1		
RT:	1813:12:01	2108:31:59
CYCLES:	2930	1318
Comp #2		
RT:	1013:13:13	995:46:36
CYCLES:	3019	2411

Notes:

Due to the occupants desire to maintain low room setpoints , the normal balance point determination was not used. The Balance point was determined by the temperature of the outside air at which there was not a facility need for cooling. This caused the air conditioning to run outside of the normal cooling season and also imposed an artificial load on the heating system, which caused the heating system to run in response to the artificial space temperature needs as opposed to normal heat loss needs.

Savings = 6.78%

303 Sunnyside Blvd.
Suite # 75
Plainview, NY 11803
Phone:516-676-0777

Test Report

Report No. 12175-19

Date: 10/01/15

Customer:
NYC-DCAS

Test Site Location:
F.D.N.Y. Station House E.50 / L.19 / BAT.26
1155 Washington Avenue
Bronx, NY 10456

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER:

Product Tested: ☐ HW ☑ LCH ☐ LCS ☐ CHW ☐ CHS ☐ FA ☐ CAC ☐ AC ☐ RU

Type of Equipment:

Manufacturer:	Burnhan
Model:	V906A
Capacity / SetPt:	1010 MBH
Fuel Type:	Nat Gas
Application:	Heating
Area Served:	All BLDG
Miscelaneous:	

Test Start Date: 07/26/14
Test End Date: 07/27/15
No. of Days in Test: 367

BURNER RUN-TIME: ☑ in HRS. ☐ in MIN.

***IntelliCon* ON-DAYS:** 336:16:45
***IntelliCon* OFF-DAYS:** 392:11:54
RUN-TIME was reduced by: 14.26%

BURNER USAGE FACTOR

***IntelliCon* On-Days:** 7.64%
***IntelliCon* Off-Days:** 8.91%

HEATING DEGREE-DAYS (FOR TEST PERIOD)

IntelliCon ON-DAYS: 601
IntelliCon OFF-DAYS: 535
Total Degree-Days: 1136

It was 12.3% **Colder on the On-Days.**

USAGE PER DEGREE-DAY

ON-DAYS: 0:33:34.16
OFF-DAYS: 0:43:57.32

INDIVIDUAL BURNER USAGE

	ON-DAY	OFF-DAY
Burner #1		
RT:	336:16:45	392:11:54
CYCLES:	6562	8412

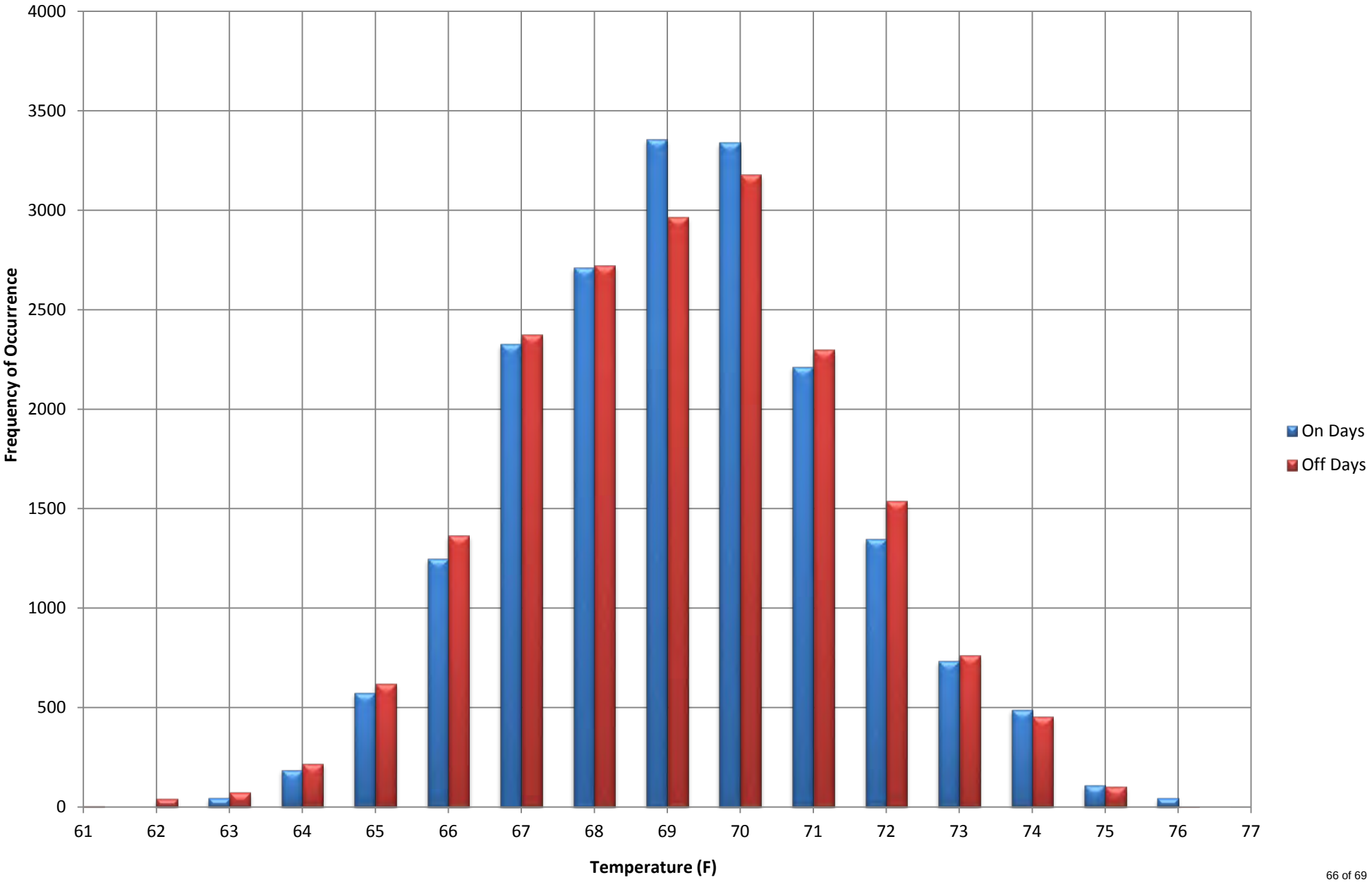
BURNER CYCLING REDUCTION:

IntelliCon ON-DAYS: 6562
IntelliCon OFF-DAYS: 8412
Cycling was reduced by: 22.0%

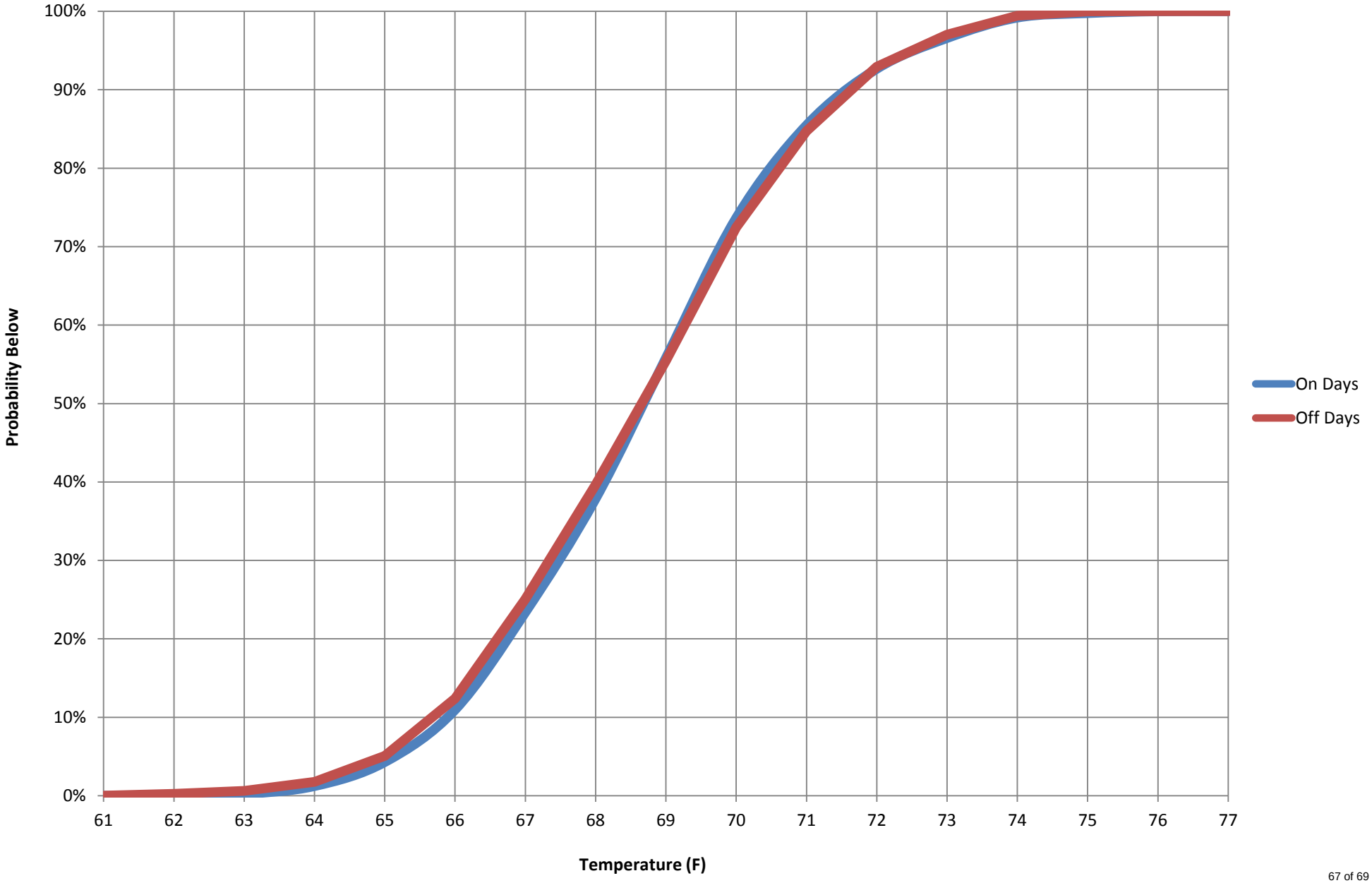
Notes:
Boiler runs to maintain temperature (standby loss) during summer
Usage Factor is 17.8% during heating season so far

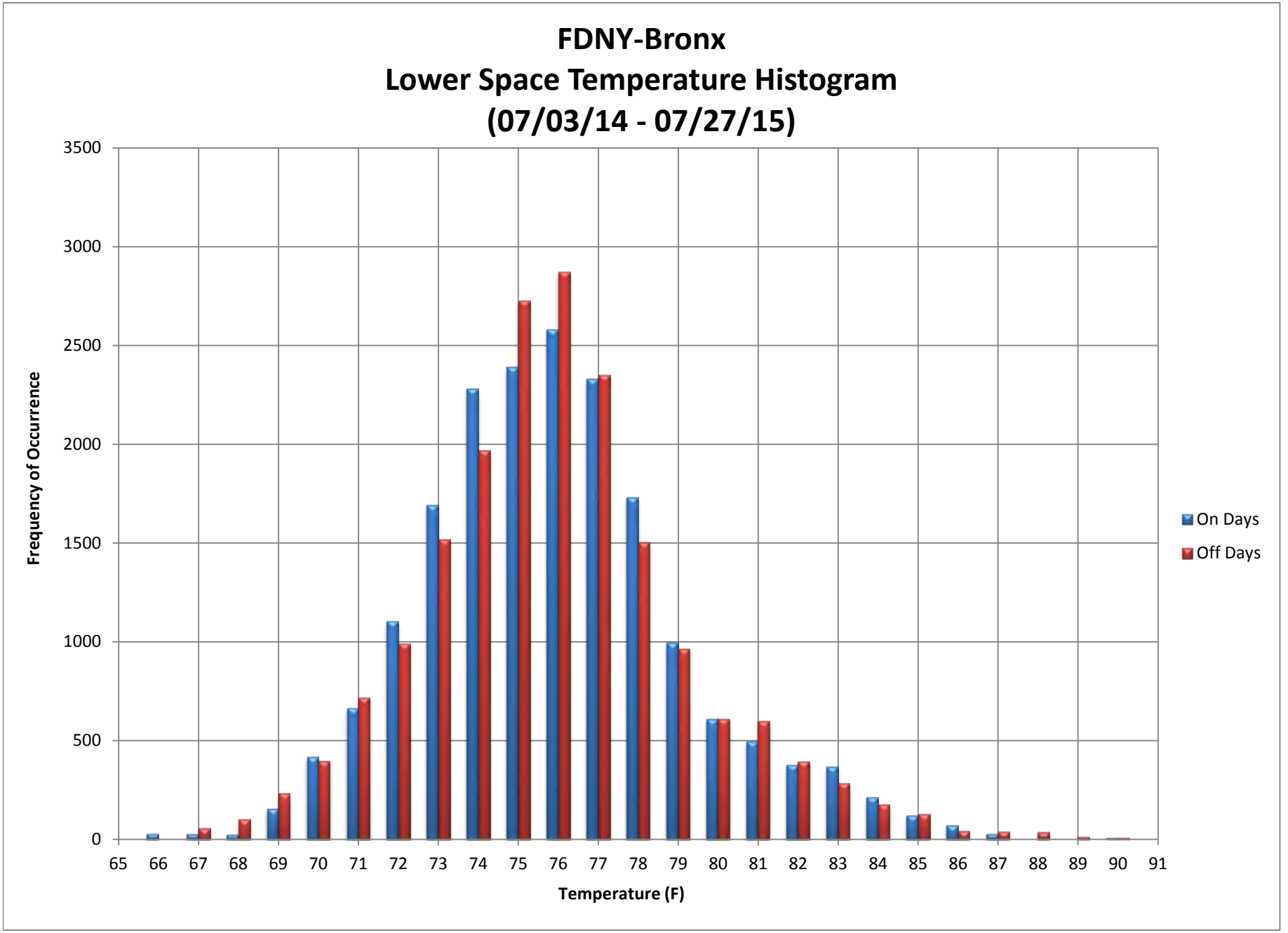
Savings = 14.89%

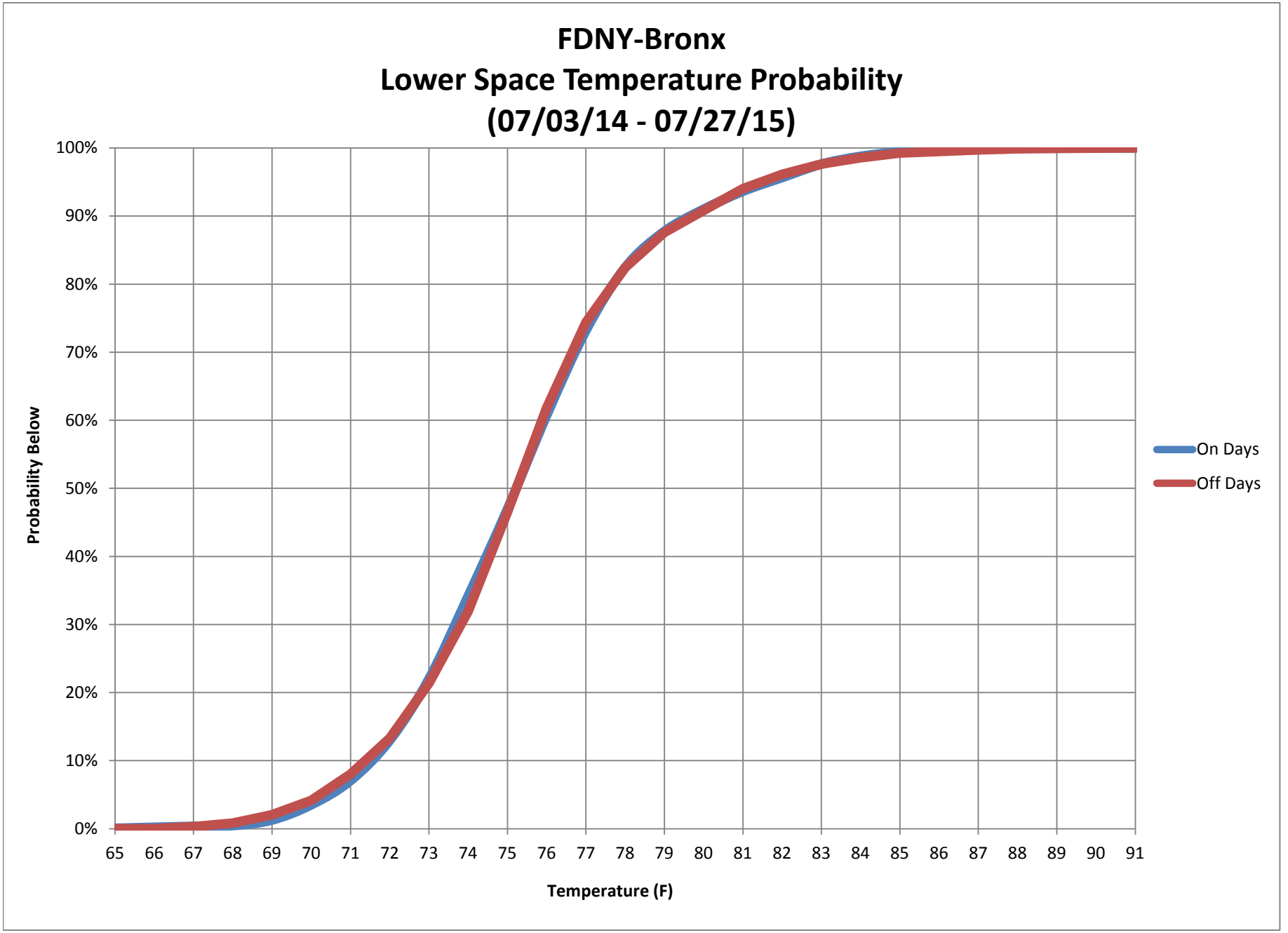
FDNY-Bronx
Gym Space Temperature Histogram
(07/03/14 - 07/27/15)



FDNY-Bronx
Gym Space Temperature Probabilities
(07/03/14 - 07/27/15)




FDNY-Bronx
Lower Space Temperature Histogram
(07/03/14 - 07/27/15)
Frequency of Occurrence
3500
3000
2500
2000
1500
1000
500
0
65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91
Temperature (F)
On Days
Off Days


FDNY-Bronx
Lower Space Temperature Probability
(07/03/14 - 07/27/15)
Probability Below
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91
Temperature (F)
On Days
Off Days