


raise
EER BOOST 
Energy Efficient Refrigerant

Big Data Perspective
Fortune 100 Data Center
09.22.16



Overview

- Summary
- Data Reviewed
- Analysis/Findings



Summary

- Energy savings of the test exceeded 22% due to the additional “halo” savings effect on CRAC 5 unit
- Halo effect resulted because CRAC 5 unit did not have to “work as hard” due to better efficiency/capacity of **EER Boost** in CRAC 4 unit
- RAISE **EER Boost** demonstrated a 30% energy savings over R-22

Data Reviewed

Baseline (6/30 - 7-7/17 ex 7/8)	OSAT	CRAC 4 (R-22)	CRAC 5 (R-22)	CRAC 4 + CRAC 5
Average kWh/Day	88	547	353	900
Standard Deviation	3	14	21	34
Samples	17	17	17	17
EER Boost (7/27 - 9/4 ex 8/5 - 8/11)	OSAT	CRAC 4 (EER Boost)	CRAC 5 (R-22)	CRAC 4 + CRAC 5
Average kWh/Day	85	426	288	715
Standard Deviation	2	20	26	26
Samples	33	33	33	33
Daily energy reduction, kWh		121	65	185
Daily energy reduction, %		22%	18%	21%
t statistic	3.6	25.1	9.7	19.9
P value	7.58E-04	1.29E-29	5.86E-13	4.07E-25

*Data sourced from Stetz Consulting report, page 12

Analysis/Findings

- 22% savings on CRAC 4 is underestimated because of “halo” savings on CRAC 5
- RAISE **EER Boost** results should receive benefit of CRAC 5 not having to “work as hard”
 comparing weighted average is ultra conservative and overlooks the halo effect
 excluding halo effect does not give credit to observed savings of test which may in fact have yielded a larger savings had both units been modified
- RAISE **EER Boost** demonstrated an energy savings of approx. 30%
 100% of CRAC 5’s savings was allocated to CRAC 4 because CRAC 5 continued R-22 usage during CRAC 4’s **EER Boost** test

Daily% energy reduction WITH Halo Effect	CRAC 4	CRAC 5	CRAC 4 + CRAC 5
Energy Reduction	121	65	186
Base Comparison	547	65	612
Daily energy reduction, %	22 %	100 %	30 %



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3338 Peachtree Road, Suite 3407, Atlanta, Georgia 30326 | USA 678.331.5548 | info@raiseenergysolutions.com