

IceCOLD®

CASE STUDY

FIELD RESULTS FOR ASPEN COURT APARTMENTS IN PLANO, TEXAS December 7, 2001

Attending:

1. Mike Farmer – Facilities with Aspen Court
2. Assistant to Mike
3. David Pickett

Equipment:

At Clubhouse

3 ton York heat pump
16 years old

BEFORE TREATMENT:

Outside temperature	= 72	
Inside temperature	= 74	
Temperature at inside air intake	= 74	
Temperature at inside air vent	= 64	
Temperature at outside condenser coil	= 84	
Outside condenser motor amperage	= 11 amps	
Sound level	= moderately noisy (valves and piston noises)	

AFTER TREATMENT:

Outside temperature	= 72	same
Inside temperature	= 74	same
Temperature at inside air intake	= 73	1 degree less
Temperature at inside air vent	= 49	15 degrees less
Temperature at outside condenser coil	= 96	13 degrees more
Outside condenser motor amperage	= 10 amps	1 ampere less
Sound level	= quiet and smooth (no valve or pistons noise)	

CONCLUSIONS:

- The 3 ton York heat pump system is well beyond its expected lifetime of 8 to 11 years.
- the system is now using 1 ampere less power = 9.1% less electricity cost
- the inside air is coming out 15 degrees cooler which is 22.3887% more efficient; (thermodynamics equations available upon request)
- Since the system is running 22% less time than it was; the system will last 22% longer than it would have. So its remaining life expectancy is increased 22% longer than it would have had. Fact; not an estimate.
- Since the system is running 22% less time than it was; you can assume that the system will need 22% less maintenance cost (filter changes, coil cleaning, etc.)
- Since the system is running at 9.1% less amperes, it is running approx. 9.1% cooler. Physics tells us that in a new system; for every 10 degrees centigrade cooler a unit runs it lasts twice as long (THEORETICALLY): THEREFORE WE ASSUME THE REMAINING USEFUL LIFE OF THE SYSTEM IS EXTENDED est. 50% due to the cooler operation.
- (Do not add the above 22% with the 50%!!) It will actually last 50% longer than the 22% extended life. So estimated extended life is 33% longer than it would have lasted without treatment.

- Efficiency and savings results usually increase by up to 33% better after 2 to 4 weeks of running after treatment. So actual efficiency would be up to 33%.
- Note that the (inside) evaporator coil is running at an estimated 15 degrees *f* cooler which will reduce humidity by 15% lower than it was due to the lower dew (condensing) point. Reduced humidity feels cooler and reduces the chance of mildew, mold and smells. Especially an advantage when a clubhouse is crowded or doors are opened a lot in hot sticky weather.

Equipment:

At Mike Farmer's apartment:

1 1/2 ton York AC only

16 years old

BEFORE TREATMENT:

Outside temperature	= 72	
Inside temperature	= 74	
Temperature at inside air intake	= 74	
Temperature at inside air vent	= 59	
Temperature at outside condenser coil	= 86	
Sound level		= average noise (valves and piston noises)

AFTER TREATMENT:

Outside temperature	= 72	same
Inside temperature	= 74	same
Temperature at inside air intake	= 73	1 degree less
Temperature at inside air vent	= 46	13 degrees less
Temperature at outside condenser coil	= 94	8 degrees more
Sound level		= quiet and smooth (no valve or pistons noise)

CONCLUSIONS:

- The 1 ½ ton York system is well beyond its expected lifetime of 8 to 11 years.
- the inside air is coming out 13 degrees cooler which is 18.781% more efficient
- Since the system is running 19% less time than it was; the system will last 19% longer than it would have. So its remaining life expectancy is increased 33% longer than it would have had. Fact; not an estimate.
- Since the system is running 19% less time than it was; you can assume that the system will need 19% less maintenance cost (filter changes, coil cleaning, etc.). Times 110 units will result in very large maintenance savings over even just 5 years.
- The unit will use 19% less electricity plus the estimated ½ amp (5%) drop in compressor amperage for total cost savings of 24%.
- Note that the (inside) evaporator coil is running at an estimated 15 degrees *f* cooler which will reduce humidity by 15% of what it was due to the lower dew point. Reduced humidity feels cooler and reduces the chance of mildew, mold and smells. In the summer, people feel more comfortable at lower humidity.
- Efficiency and savings results usually increase by up to 33% better after 2 to 4 weeks of running after treatment. So actual efficiency would be up to 25%.

A control test could be run by not treating 10% of the units to verify the above failure data. Such a control would be expected to be correct to within 15%.

The above testing was done with hand held digital instruments but was not in a controlled laboratory environment. Efficiency figures are observed static ratios that do not take into account the dynamics of the systems. The cool outside temperature may have understated the efficiency and savings results compared to a hot day.

David Pickett