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Energy vs Performance Evaluation

Scenario:

A medium size manufacturing facility is evaluating the effectiveness, efficiency and reliability of its aging compressed air system. Production is normally 8 hours/day, 5 days/week with occasional 12 hour shifts and weekends. Two thirds of the compressed air used is indoors and 1/3 at their outdoor yard. Four years ago, the company began its own light sandblasting and added a dust collector. Plant personnel are noticing increasing amounts of water (both inside and out) in the compressed air supply. Filters and moisture traps continue to be installed to remove this water at the point of use. System pressure continues to drop at the furthest ends of the piping network.

System facts:

- Compressor capacity 1000 cfm
- Compressor delivery pressure 110 psi
- Lowest pressure point 95 psi.
- Power cost $0.12/kwh (day) $0.08 (night)
- Current air dryer: 8 year old non cycling refrige
- Current dewpoint performance 50-60 degrees F
- Approx. operating hours/year: 3,200
- Approx average compressor load: 85%

- **DRYER TYPE (Proposal #)**

Dryer Type	Cycling Refrige	Heatless Regen	Heated Regen	Blower Purge Regen	Single Tower Regen
Proprosal	#1	#2	#3	#4	#5
Initial Cost	$28,000	$37,858	$54,041	$73,900	$36,875
Annual Power Cost	$2,904	$8,092	$6,767	$5,118	$2,427
% Compressed Air Lost To Purge	0%	15%	7.5%	0 to 1%	0%
Design Cycle	24hr/day	24hr/day	24hr/day	24hr/day	16hr/day
Dewpoint Dryness	+ 40 to 45F	-40	-40	-40	-40
Potential Water Remaining/8 hr	3.12 gal.	0.046 gal.	0.046 gal.	0.046 gal.	0.046 gal.
Vapor Content Remaining	700 ppm/w	12.5 ppm/w	12.5 ppm/w	12.5 ppm/w	12.5 ppm/w
RH After Dryer	12.82%	0.29%	0.29%	0.29%	0.29%