BELIMO ENERGY VALVE SAVINGS ESTIMATOR Worksheet

Date: _____

Project Name: _____

Project Address: _____

_____

Contact Name: _____

Contact Phone: _____

CHILLED WATER PLANT DATA

CHILLERS: ❑ Water Cooled ❑ Air Cooled

PLANT DESIGN: ❑ Primary/Secondary ❑ Variable Pumping

ELECTRICITY COST (Average) _____ $/kWh

CHILLED WATER PLANT LOAD (Design Chiller Load) _____ tons

NUMBER OF CHILLERS _____ pcs.

OPERATING HOURS/DAY _____ hours

OPERATING DAYS/WEEK _____ days

OPERATING WEEKS/YEAR _____ weeks

CHILLER DESIGN INTEGRATED PART LOAD VALUE (IPLV)

- ❑ 0.3 = High Efficiency Variable Speed Chillers with Advanced Control Optimization
- ❑ 0.4 = High-Efficiency Variable Speed Chillers
- ❑ 0.6 = Typical Constant Speed Chillers
- ❑ 0.7 = Typical Constant Speed Old-style Chillers
- ❑ Actual Design = _____

ACTUAL PRIMARY PUMP HEAD (Design)
(if Variable Primary Design selected above) _____ ft. of head

-OR-

ACTUAL SECONDARY PUMP HEAD (Design)
(if Primary/Secondary Design selected above) _____ ft. of head

PUMP, VFD, MOTOR EFFICIENCY (Avg) _____ %
[Note: For conventional pumps based on static pressure sensor(s) use the lowest possible pump head at part load conditions. If pump(s) are controlled based on actual load, use the minimum pump head value.]

DESIGN DELTA OF DISTRIBUTION SYSTEM _____ °F

ACTUAL DELTA T (Prior to Energy Valve Installation) _____ °F

FUTURE DELTA T (Energy Valve Delta T Manager Setting) _____ °F

OTHER SAVINGS TO CONSIDER (if unknown leave blank)

COOLING TOWER WATER treatment chemicals savings _____ $/Year
(Enter the estimated water treatment savings if water cooled system. A rough estimate could be $300 per cooling tower per year. Enter $0 for air-cooled chiller systems.)

REDUCED NUMBER OF LAG CHILLERS, extending life of chillers, pumps _____ $/Year
(Increasing the Delta T allows the lag chillers to run less hours of operation. This can extend the useful life of the chillers and corresponding pumps, extending the date when an expensive chiller replacement is necessary. The net present value (NPV) depends upon the replacement cost, age, and remaining life of the existing chillers.)

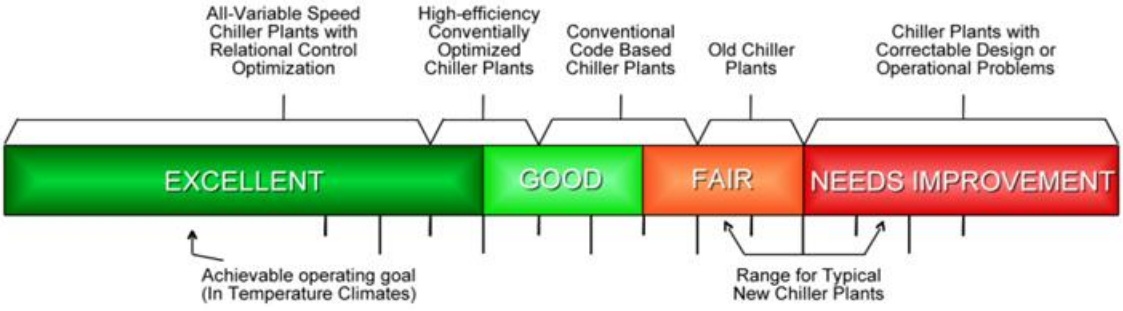
ALLOWING ADDITIONAL COOLING LOADS (GPM) to be added w/out upsizing distribution pumps _____ $/Year
(Increasing the Delta T allows less water flow in the distribution loop and full and part load conditions. This can allow additional loads to be added to the secondary loop without having to replace expensive distribution pumps. The value will depend upon the cost of replacing pumps.)

FINANCIALS

INCREMENTAL INVESTMENT FOR ENERGY VALVES _____ $
(Enter the incremental costs for Energy Valves over conventional control valves such as balancing valves, circuit setters, and labor to install and balance. If there are new valves installed in the plant that will be replaced by Energy Valves, the whole replacement costs have to be considered.)

DISCOUNT RATE (default 10) _____ %
(This depends on the finance instrument of the investment. If the project is financed by a mortgage with an interest rate of 4%, then enter 4. Alternatively, it could be financed by a bank loan or simply by cash that's on an organizations balance sheet. Some companies are using a so called internal Hurdle Rate.)

ANNUAL INFLATION RATE ON ENERGY COSTS (default 3) _____ %
(This is the inflation rate that is predicted for the cost of electricity. Some forecasts predict this to between 3 and 4% annually, over the next decade.)



kW/ton	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2
C.O.P	7.0	5.9	5.0	4.4	3.9	3.5	3.2	2.9

AVERAGE ANNUAL CHILLED WATER SYSTEM EFFICIENCY IN KW/TON (C.O.P.)
(Input energy included chillers, tower fans and all condenser & chilled water pumping)

1 ton = 3.5 kW

"While a recent study (Thorton et al. 2008) found that actual operating data on in-building cooling plants is scarce, the limited data the study uncovered indicates that in-building systems were operating at an average efficiency of 1.2 kW/ton (2.9 COP)."

CHILLER – VARIABLE PRIMARY SYSTEM

KW1 COMPRESSOR _____ kW/ton

KW5 CHILLER CONTROLS _____ kW/ton

KW6 TRANSMISSION OIL PUMP AND HEATERS _____ kW/ton

-OR-

CHILLER – PRIMARY/SECONDARY SYSTEM

KW1 COMPRESSOR _____ kW/ton

KW2 CONSTANT SPEED PRIMARY PUMPS (each) _____ ft. of head

KW5 CHILLER CONTROLS _____ kW/ton

KW6 TRANSMISSION OIL PUMP AND HEATERS _____ kW/ton

PUMP

PUMP DESIGN FACTOR _____ %

MINIMUM PUMP HEAD _____ ft. of head

MINIMUM GPM _____ GPM