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UTILITIES MANAGER©

This is what it's all about. How much energy must go into a pump to get the most out of it, and, what does a pump's inefficiency have to do with its reliability?

H ow many pumps in your plant operate at their best efficiency point (BEP)? The answer is very important. Back in the day, when energy costs were low and dollars for new equipment not so scarce, it might not have mattered to your operations. Today, though, with energy costs on the rise and so much riding on a site's reliability and ability to control unnecessary spending, it's quite a different story.

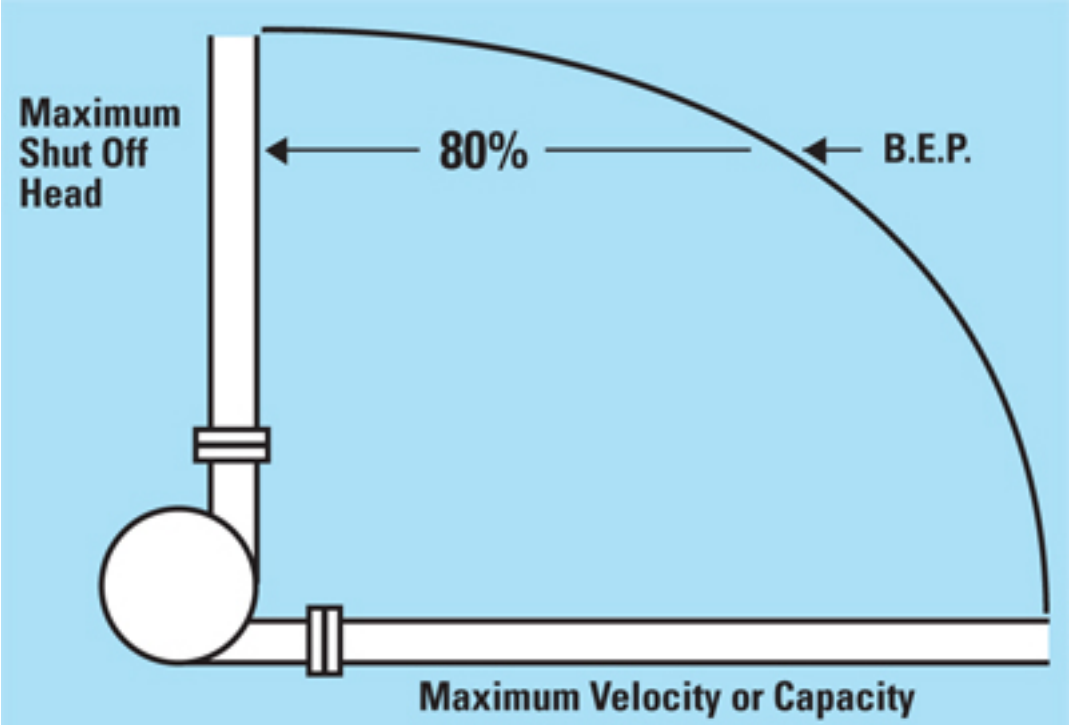

Fig. 1. The BEP for most single-stage centrifugal pumps is only somewhere between 80% and 85% of the shutoff head.

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Table 1. Pump Energy Cost-Analysis Report

Quantity of Pumps	HP	At .045 / kwhr Rate = $450.00 Per Year for 1 hp Motor	Total P/Yr Energy Costs	No. of Pumps Running	Actual Based on Pumps Running	Avg % Efficiency @ Design Point	Lost Energy @ Design Point	Lost Energy 10% Off Design Point	Lost Energy 20% Off Design Point
8	30-75	$450 x 50 hp x 8 pumps	$ 180,000.00	5	$ 112,500.00	82%	$ 20,250.00	$ 31,500.00	$ 42,750.00
2	125	$450 x 125 hp x 2 pumps	$ 112,500.00	1	$ 56,250.00	85%	$ 8,437.50	$ 14,062.50	$ 19,687.50
6	200	$450 x 200 hp x 6 pumps	$ 540,000.00	3	$ 270,000.00	84%	$ 43,200.00	$ 70,200.00	$ 97,200.00
4	225	$450 x 225 hp x 4 pumps	$ 405,000.00	4	$ 405,000.00	87%	$ 52,650.00	$ 93,150.00	$ 133,650.00
2	250	$450 X 250 hp X 2 pumps	$ 225,000.00	2	$ 225,000.00	87%	$ 29,250.00	$ 51,750.00	$ 74,250.00
27	350	$450 x 350 hp x 27 pumps	$ 4,252,500.00	20	$ 3,150,000.00	84%	$ 504,000.00	$ 819,000.00	$ 1,134,000.00
3	600	$450 x 600 hp x 3 pumps	$ 810,000.00	2	$ 540,000.00	68%	$ 183,600.00	$ 237,600.00	$ 291,600.00
6	1000	$450 x 1000 hp x 6 pumps	$ 2,700,000.00	4	$ 1,800,000.00	77%	$ 414,000.00	$ 594,000.00	$ 774,000.00
58			**$ 9,225,000.00**	**41**	**$ 6,558,750.00**		**$ 1,256,387.50**	**$ 1,911,262.50**	**$ 2,567,137.50**
			OPERATE PUMPS AT DESIGN POINT = SAVINGS					$ 655,875.00	$ 1,311,750.00

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