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From Experience

Aligning Vendor Utilities

Most facility projects have multiple vendors supplying numerous pieces of equipment. Because of this, it is usual to see a wide range of temperatures and pressures specified for various utilities. This variation can create additional costs for a project by increasing the number of piping systems, piping accessories, and main plant equipment required.

ORIGINAL SUPPLY AND RETURN TEMPS						
System	Equipment	Design Basis	Unit	Supply Temp°F	Return Temp (Design Basis)°F	Heat Duty (btu/hr)
PROCESS HOT WATER	Tempered Water Heat Exchanger	85	gpm	180.0	150.0	1,239,300
PROCESS HOT WATER	Oil Heater	150	gpm	180.0	160.0	1,458,000
PROCESS HOT WATER	Ingredient Water Heat Exchanger	435	gpm	180.0	160.0	4,228,200
PROCESS HOT WATER	Recirculation Unit	250	gpm	190.0	170.0	2,430,000
PROCESS HOT WATER	Aux Heater	375	gpm	190.0	170.0	3,645,000
PROCESS HOT WATER	CIP Acid Heater	187	gpm	180.0	160.0	1,817,640
PROCESS HOT WATER	CIP Caustic Heater	187	gpm	190.0	170.0	1,817,640
		1,669	gpm			16,635,780
OPTIMIZED SUPPLY AND RETURN TEMPS						
System	Equipment	Design Basis	Unit	Supply Temp°F	Return Temp (Design Basis)°F	Heat Duty (btu/hr)
PROCESS HOT WATER	Tempered Water Heat Exchanger	85	gpm	180.0	150.0	1,239,300
PROCESS HOT WATER	Oil Heater	100	gpm	180.0	150.0	1,458,000
PROCESS HOT WATER	Ingredient Water Heat Exchanger	290	gpm	180.0	150.0	4,228,200
PROCESS HOT WATER	Recirculation Unit	167	gpm	180.0	150.0	2,434,860
PROCESS HOT WATER	Aux Heater	250	gpm	180.0	150.0	3,645,000
PROCESS HOT WATER	CIP Acid Heater	125	gpm	180.0	150.0	1,822,500
PROCESS HOT WATER	CIP Caustic Heater	125	gpm	180.0	150.0	1,822,500
		1,142	gpm			16,650,360

Hixson's Process Utilities Department works with vendors to reduce the variation without jeopardizing the process. As illustrated in the tables above, supply and return temperatures in a process hot water loop were aligned, thus eliminating the need for thermal mixing valves and reduced pump capacity.

While this example dealt with process hot water, the same approach can be applied to compressed air operating pressures, steam pressures, refrigeration suction pressures, and other tempering systems. Check with your process engineer prior to a project start to determine whether streamlining vendor operating points is possible with your design.



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