

Calculation Report for 1AE408 - Diesel Gen. Intercooler Heat Exchanger

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 1,000.0
 Shell Flow (gpm) 880.0
 Tube Inlet Temp (°F) 100.0
 Constant Heat Load (BTU/hr) 3,118,000
 Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)

Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side h_o (BTU/hr·ft²·°F)
 Tube-Side h_i (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor
 Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 4.619E+5
 Tube Mass Flow (lbm/hr) 5.002E+5
 Heat Transferred (BTU/hr) 3.118E+6
 LMTD 15.1
 Effective Area (ft²) 737.0

Overall Fouling (hr·ft²·°F/BTU) 0.001580
 Shell-Side h_o (BTU/hr·ft²·°F) 1,182.5
 Tube-Side h_i (BTU/hr·ft²·°F) 1,187.4
 1/Wall Resis (BTU/hr·ft²·°F) 5,941.6
 LMTD Correction Factor 1.0000
 U Overall (BTU/hr·ft²·°F) 280.7

Property	Shell-Side	Tube-Side
Velocity (ft/s)	3.04	4.17
Reynold's Number	1.604E+04	3.172E+04
Prandtl Number	8.84	4.37
Bulk Visc (lbm/ft·hr)	2.75	1.59
Skin Visc (lbm/ft·hr)	2.87	1.53
Density (lbm/ft³)	64.56	61.95
Cp (BTU/lbm·°F)	0.89	1.00
K (BTU/hr·ft·°F)	0.28	0.36

Shell Temp In (°F) 122.0
 Shell Temp Out (°F) 114.4
 Tav Shell (°F) 118.2
 Shell Skin Temp (°F) 114.6
 Tube Temp In (°F) 100.0
 Tube Temp Out (°F) 106.2
 Tav Tube (°F) 103.1
 Tube Skin Temp (°F) 107.2

** Reynolds Number Outside Range of Equation Applicability
 !! With Zero Fouling The Test Heat Load Could Not Be Achieved

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PROTO-HX 3.01 by Proto-Power Corporation (SN#PHX-1009)
PSE&G - Hope Creek
Calculation Report for 1AE408 - Diesel Gen. Intercooler Heat Exchanger

06/04/98

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data	Extrapolation Data
Data Date	Tube Flow (gpm) 900.0
Shell Flow (gpm)	Shell Flow (gpm) 880.0
Shell Temp In (°F)	Tube Inlet Temp (°F) 100.0
Shell Temp Out (°F)	Constant Heat Load (BTU/hr) 3,118,000
Tube Flow (gpm)	
Tube Temp In (°F)	
Tube Temp Out (°F)	Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)
 Shell-Side ho (BTU/hr-ft²-°F)
 Tube-Side hi (BTU/hr-ft²-°F)
 1/Wall Resis (BTU/hr-ft²-°F)
 LMTD Correction Factor
 Overall Fouling (hr-ft²-°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results
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Shell Mass Flow (lbm/hr)	4.619E+5
Tube Mass Flow (lbm/hr)	4.502E+5
Heat Transferred (BTU/hr)	3.118E+6
LMTD	15.4
Effective Area (ft²)	737.0

Overall Fouling (hr-ft²-°F/BTU)	0.001580
Shell-Side ho (BTU/hr-ft²-°F)	1,185.7
Tube-Side hi (BTU/hr-ft²-°F)	1,094.1
1/Wall Resis (BTU/hr-ft²-°F)	5,941.6
LMTD Correction Factor	1.0000

U Overall (BTU/hr-ft²-°F)	274.5
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Property	Shell-Side	Tube-Side
Velocity (ft/s)	3.04	3.75
Reynold's Number	1.616E+04	2.866E+04
Prandtl Number	8.77	4.35
Bulk Visc (lbm/ft-hr)	2.73	1.59
Skin Visc (lbm/ft-hr)	2.84	1.52
Density (lbm/ft³)	64.54	61.95
Cp (BTU/lbm-°F)	0.89	1.00
K (BTU/hr-ft-°F)	0.28	0.36

Shell Temp In (°F)	122.7
Shell Temp Out (°F)	115.1
Tav Shell (°F)	118.9
Shell Skin Temp (°F)	115.3
Tube Temp In (°F)	100.0
Tube Temp Out (°F)	106.9
Tav Tube (°F)	103.5
Tube Skin Temp (°F)	107.9

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PROTO-HX 3.01 by Proto-Power Corporation (SN#FHX-1009)
PSE&G - Hope Creek
Calculation Report for 1AE408 - Diesel Gen. Intercooler Heat Exchanger

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data	Extrapolation Data
Data Date	Tube Flow (gpm) 800.0
Shell Flow (gpm)	Shell Flow (gpm) 880.0
Shell Temp In (°F)	Tube Inlet Temp (°F) 100.0
Shell Temp Out (°F)	Constant Heat Load (BTU/hr) 3,118,000
Tube Flow (gpm)	
Tube Temp In (°F)	
Tube Temp Out (°F)	Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr) Tube Mass Flow (lbm/hr) Heat Transferred (BTU/hr) LMTD Effective Area (ft²)	U Overall (BTU/hr-ft²-°F) Shell-Side ho (BTU/hr-ft²-°F) Tube-Side hi (BTU/hr-ft²-°F) 1/Wall Resis (BTU/hr-ft²-°F) LMTD Correction Factor Overall Fouling (hr-ft²-°F/BTU)
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Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Extrapolation Calculation Results
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Shell Mass Flow (lbm/hr) 4.619E+5 Tube Mass Flow (lbm/hr) 4.002E+5 Heat Transferred (BTU/hr) 3.118E+6 LMTD 15.8 Effective Area (ft²) 737.0	Overall Fouling (hr-ft²-°F/BTU) 0.001580 Shell-Side ho (BTU/hr-ft²-°F) 1,189.6 Tube-Side hi (BTU/hr-ft²-°F) 998.7 1/Wall Resis (BTU/hr-ft²-°F) 5,941.6 LMTD Correction Factor 1.0000 U Overall (BTU/hr-ft²-°F) 267.3
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Property	Shell-Side	Tube-Side
Velocity (ft/s)	3.04	3.34
Reynold's Number	1.632E+04	2.559E+04
Prandtl Number	8.69	4.33
Bulk Visc (lbm/ft-hr)	2.71	1.58
Skin Visc (lbm/ft-hr)	2.82	1.50
Density (lbm/ft³)	64.53	61.94
Cp (BTU/lbm-°F)	0.89	1.00
K (BTU/hr-ft-°F)	0.28	0.36

Shell Temp In (°F) 123.5 Shell Temp Out (°F) 115.9 Tav Shell (°F) 119.7 Shell Skin Temp (°F) 116.2 Tube Temp In (°F) 100.0 Tube Temp Out (°F) 107.8 Tav Tube (°F) 103.9 Tube Skin Temp (°F) 108.8
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Calculation Report for 1AE408 - Diesel Gen. Intercooler Heat Exchanger

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 775.0
 Shell Flow (gpm) 880.0
 Tube Inlet Temp (°F) 100.0
 Constant Heat Load (BTU/hr) 3,118,000
 Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side h_o (BTU/hr·ft²·°F)
 Tube-Side h_i (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor
 Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 4.619E+5
 Tube Mass Flow (lbm/hr) 3.877E+5
 Heat Transferred (BTU/hr) 3.118E+6
 LMTD 15.9
 Effective Area (ft²) 737.0

Overall Fouling (hr·ft²·°F/BTU) 0.001580
 Shell-Side h_o (BTU/hr·ft²·°F) 1,190.7
 Tube-Side h_i (BTU/hr·ft²·°F) 974.5
 1/Wall Resis (BTU/hr·ft²·°F) 5,941.6
 LMTD Correction Factor 1.0000

Property	Shell-Side	Tube-Side
Velocity (ft/s)	3.04	3.23
Reynold's Number	1.636E+04	2.482E+04
Prandtl Number	8.66	4.33
Bulk Visc (lbm/ft·hr)	2.70	1.58
Skin Visc (lbm/ft·hr)	2.81	1.50
Density (lbm/ft³)	64.52	61.94
Cp (BTU/lbm·°F)	0.89	1.00
K (BTU/hr·ft·°F)	0.28	0.36

U Overall (BTU/hr·ft²·°F) 265.4
 Shell Temp In (°F) 123.8
 Shell Temp Out (°F) 116.2
 Tav Shell (°F) 120.0
 Shell Skin Temp (°F) 116.4
 Tube Temp In (°F) 100.0
 Tube Temp Out (°F) 108.1
 Tav Tube (°F) 104.0
 Tube Skin Temp (°F) 109.0

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PROTO-HX 3.01 by Proto-Power Corporation (SN#PHX-1009)
PSE&G - Hope Creek
Calculation Report for 1AE408 - Diesel Gen. Intercooler Heat Exchanger

Calculation Specifications

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 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data	Extrapolation Data
Data Date	Tube Flow (gpm) 750.0
Shell Flow (gpm)	Shell Flow (gpm) 880.0
Shell Temp In (°F)	Tube Inlet Temp (°F) 100.0
Shell Temp Out (°F)	Constant Heat Load (BTU/hr) 3,118,000
Tube Flow (gpm)	
Tube Temp In (°F)	
Tube Temp Out (°F)	Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side ho (BTU/hr·ft²·°F)
 Tube-Side hi (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor
 Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results
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Shell Mass Flow (lbm/hr)	4.619E+5
Tube Mass Flow (lbm/hr)	3.752E+5
Heat Transferred (BTU/hr)	3.118E+6
LMTD	16.1
Effective Area (ft²)	737.0

Overall Fouling (hr·ft²·°F/BTU)	0.001580
Shell-Side ho (BTU/hr·ft²·°F)	1,191.9
Tube-Side hi (BTU/hr·ft²·°F)	950.2
1/Wall Resis (BTU/hr·ft²·°F)	5,941.6
LMTD Correction Factor	1.0000
U Overall (BTU/hr·ft²·°F)	263.3

Property	Shell-Side	Tube-Side
Velocity (ft/s)	3.04	3.13
Reynold's Number	1.641E+04	2.405E+04
Prandtl Number	8.64	4.32
Bulk Visc (lbm/ft·hr)	2.69	1.58
Skin Visc (lbm/ft·hr)	2.80	1.50
Density (lbm/ft³)	64.52	61.94
Cp (BTU/lbm·°F)	0.89	1.00
K (BTU/hr·ft·°F)	0.28	0.36

Shell Temp In (°F)	124.0
Shell Temp Out (°F)	116.4
Tav Shell (°F)	120.2
Shell Skin Temp (°F)	116.7
Tube Temp In (°F)	100.0
Tube Temp Out (°F)	108.3
Tav Tube (°F)	104.2
Tube Skin Temp (°F)	109.3

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 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm)	700.0
Shell Flow (gpm)	880.0
Tube Inlet Temp (°F)	100.0
Constant Heat Load (BTU/hr)	3,118,000

Input Fouling Factor	0.001580
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Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side ho (BTU/hr·ft²·°F)
 Tube-Side hi (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor
 Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results
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Shell Mass Flow (lbm/hr)	4.619E+5
Tube Mass Flow (lbm/hr)	3.502E+5
Heat Transferred (BTU/hr)	3.118E+6
LMTD	16.3
Effective Area (ft²)	737.0

Overall Fouling (hr·ft²·°F/BTU)	0.001580
Shell-Side ho (BTU/hr·ft²·°F)	1,194.5
Tube-Side hi (BTU/hr·ft²·°F)	901.0
1/Wall Resis (BTU/hr·ft²·°F)	5,941.6
LMTD Correction Factor	1.0000
U Overall (BTU/hr·ft²·°F)	258.9

Property	Shell-Side	Tube-Side
Velocity (ft/s)	3.04	2.92
Reynold's Number	1.651E+04	2.252E+04
Prandtl Number	8.58	4.30
Bulk Visc (lbm/ft·hr)	2.67	1.57
Skin Visc (lbm/ft·hr)	2.78	1.49
Density (lbm/ft³)	64.51	61.94
Cp (BTU/lbm·°F)	0.89	1.00
K (BTU/hr·ft·°F)	0.28	0.36

Shell Temp In (°F)	124.6
Shell Temp Out (°F)	117.0
Tav Shell (°F)	120.8
Shell Skin Temp (°F)	117.3
Tube Temp In (°F)	100.0
Tube Temp Out (°F)	108.9
Tav Tube (°F)	104.5
Tube Skin Temp (°F)	109.9

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Calculation Specifications

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 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

<u>Test Data</u>	<u>Extrapolation Data</u>
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Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Tube Flow (gpm) 650.0
 Shell Flow (gpm) 880.0
 Tube Inlet Temp (°F) 100.0
 Constant Heat Load (BTU/hr) 3,118,000

Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)
 Shell-Side ho (BTU/hr-ft²-°F)
 Tube-Side hi (BTU/hr-ft²-°F)
 1/Wall Resis (BTU/hr-ft²-°F)
 LMTD Correction Factor

Overall Fouling (hr-ft²-°F/BTU)

<u>Property</u>	<u>Shell-Side</u>	<u>Tube-Side</u>
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results
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Shell Mass Flow (lbm/hr)	4.619E+5
Tube Mass Flow (lbm/hr)	3.252E+5
Heat Transferred (BTU/hr)	3.118E+6
LMTD	16.6
Effective Area (ft²)	737.0

Overall Fouling (hr-ft²-°F/BTU) 0.001580
 Shell-Side ho (BTU/hr-ft²-°F) 1,197.5
 Tube-Side hi (BTU/hr-ft²-°F) 851.1
 1/Wall Resis (BTU/hr-ft²-°F) 5,941.6
 LMTD Correction Factor 1.0000

U Overall (BTU/hr-ft²-°F) 254.1

<u>Property</u>	<u>Shell-Side</u>	<u>Tube-Side</u>
Velocity (ft/s)	3.04	2.71
Reynold's Number	1.664E+04	2.099E+04
Prandtl Number	8.51	4.29
Bulk Visc (lbm/ft-hr)	2.65	1.57
Skin Visc (lbm/ft-hr)	2.76	1.48
Density (lbm/ft³)	64.50	61.93
Cp (BTU/lbm-°F)	0.89	1.00
K (BTU/hr-ft-°F)	0.28	0.37

Shell Temp In (°F) 125.3
 Shell Temp Out (°F) 117.7
 Tav Shell (°F) 121.5
 Shell Skin Temp (°F) 117.9
 Tube Temp In (°F) 100.0
 Tube Temp Out (°F) 109.6
 Tav Tube (°F) 104.8
 Tube Skin Temp (°F) 110.5

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data	Extrapolation Data
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Data Date	Tube Flow (gpm)	1,000.0
Shell Flow (gpm)	Shell Flow (gpm)	880.0
Shell Temp In (°F)	Tube Inlet Temp (°F)	106.1
Shell Temp Out (°F)	Constant Heat Load (BTU/hr)	5,412,000
Tube Flow (gpm)		
Tube Temp In (°F)		
Tube Temp Out (°F)	Input Fouling Factor	0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)	U Overall (BTU/hr·ft ² ·°F)
Tube Mass Flow (lbm/hr)	Shell-Side ho (BTU/hr·ft ² ·°F)
Heat Transferred (BTU/hr)	Tube-Side hi (BTU/hr·ft ² ·°F)
LMTD	1/Wall Resis (BTU/hr·ft ² ·°F)
Effective Area (ft ²)	LMTD Correction Factor
	Overall Fouling (hr·ft ² ·°F/BTU)
Property	
Velocity (ft/s)	Shell Temp In (°F)
Reynold's Number	Shell Temp Out (°F)
Prandtl Number	Tav Shell (°F)
Bulk Visc (lbm/ft·hr)	Shell Skin Temp (°F)
Skin Visc (lbm/ft·hr)	Tube Temp In (°F)
Density (lbm/ft ³)	Tube Temp Out (°F)
Cp (BTU/lbm·°F)	Tav Tube (°F)
K (BTU/hr·ft·°F)	Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr)	4.619E+5	Overall Fouling (hr·ft ² ·°F/BTU)	0.001580
Tube Mass Flow (lbm/hr)	5.002E+5	Shell-Side ho (BTU/hr·ft ² ·°F)	977.2
Heat Transferred (BTU/hr)	5.412E+6	Tube-Side hi (BTU/hr·ft ² ·°F)	1,262.4
LMTD	65.6	1/Wall Resis (BTU/hr·ft ² ·°F)	5,941.6
Effective Area (ft ²)	304.0	LMTD Correction Factor	1.0000
		U Overall (BTU/hr·ft ² ·°F)	271.5
Property	Shell-Side	Tube-Side	
Velocity (ft/s)	2.37	4.18	Shell Temp In (°F)
Reynold's Number	2.178E+04	3.457E+04	Shell Temp Out (°F)
Prandtl Number	4.93	3.98	Tav Shell (°F)
Bulk Visc (lbm/ft·hr)	1.55	1.46	Shell Skin Temp (°F)
Skin Visc (lbm/ft·hr)	1.82	1.25	Tube Temp In (°F)
Density (lbm/ft ³)	63.35	61.84	Tube Temp Out (°F)
Cp (BTU/lbm·°F)	0.91	1.00	Tav Tube (°F)
K (BTU/hr·ft·°F)	0.29	0.37	Tube Skin Temp (°F)

** Reynolds Number Outside Range of Equation Applicability
 !! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 900.0
 Shell Flow (gpm) 880.0
 Tube Inlet Temp (°F) 106.9
 Constant Heat Load (BTU/hr) 5,412,000
 Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side ho (BTU/hr·ft²·°F)
 Tube-Side hi (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor
 Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 4.619E+5
 Tube Mass Flow (lbm/hr) 4.502E+5
 Heat Transferred (BTU/hr) 5.412E+6
 LMTD 66.7
 Effective Area (ft²) 304.0

Overall Fouling (hr·ft²·°F/BTU) 0.001580
 Shell-Side ho (BTU/hr·ft²·°F) 984.4
 Tube-Side hi (BTU/hr·ft²·°F) 1,170.6
 1/Wall Resis (BTU/hr·ft²·°F) 5,941.6
 LMTD Correction Factor 1.0000

U Overall (BTU/hr·ft²·°F) 266.9

Property	Shell-Side	Tube-Side
Velocity (ft/s)	2.38	3.76
Reynold's Number	2.225E+04	3.155E+04
Prandtl Number	4.82	3.92
Bulk Visc (lbm/ft·hr)	1.52	1.44
Skin Visc (lbm/ft·hr)	1.78	1.22
Density (lbm/ft³)	63.29	61.82
Cp (BTU/lbm·°F)	0.91	1.00
K (BTU/hr·ft·°F)	0.29	0.37

Shell Temp In (°F) 186.0
 Shell Temp Out (°F) 173.2
 Tav Shell (°F) 179.6
 Shell Skin Temp (°F) 161.5
 Tube Temp In (°F) 106.9
 Tube Temp Out (°F) 118.9
 Tav Tube (°F) 112.9
 Tube Skin Temp (°F) 130.4

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 800.0
 Shell Flow (gpm) 880.0
 Tube Inlet Temp (°F) 107.8
 Constant Heat Load (BTU/hr) 5,412,000

Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)

Tube Mass Flow (lbm/hr)

Heat Transferred (BTU/hr)

LMTD

Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)

Shell-Side ho (BTU/hr-ft²-°F)

Tube-Side hi (BTU/hr-ft²-°F)

1/Wall Resis (BTU/hr-ft²-°F)

LMTD Correction Factor

Overall Fouling (hr-ft²-°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)

Shell Temp Out (°F)

Tav Shell (°F)

Shell Skin Temp (°F)

Tube Temp In (°F)

Tube Temp Out (°F)

Tav Tube (°F)

Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr)

4.619E+5

Tube Mass Flow (lbm/hr)

4.002E+5

Heat Transferred (BTU/hr)

5.412E+6

LMTD

68.1

Effective Area (ft²)

304.0

Overall Fouling (hr-ft²-°F/BTU)

0.001580

Shell-Side ho (BTU/hr-ft²-°F)

992.9

Tube-Side hi (BTU/hr-ft²-°F)

1,076.3

1/Wall Resis (BTU/hr-ft²-°F)

5,941.6

LMTD Correction Factor

1.0000

U Overall (BTU/hr-ft²-°F)

261.5

Property	Shell-Side	Tube-Side
Velocity (ft/s)	2.38	3.34
Reynold's Number	2.281E+04	2.850E+04
Prandtl Number	4.71	3.85
Bulk Visc (lbm/ft-hr)	1.48	1.42
Skin Visc (lbm/ft-hr)	1.73	1.19
Density (lbm/ft³)	63.22	61.79
Cp (BTU/lbm-°F)	0.92	1.00
K (BTU/hr-ft-°F)	0.29	0.37

Shell Temp In (°F)

189.1

Shell Temp Out (°F)

176.2

Tav Shell (°F)

182.7

Shell Skin Temp (°F)

164.7

Tube Temp In (°F)

107.8

Tube Temp Out (°F)

121.3

Tav Tube (°F)

114.6

Tube Skin Temp (°F)

133.6

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data	Extrapolation Data
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Data Date	Tube Flow (gpm)	775.0
Shell Flow (gpm)	Shell Flow (gpm)	880.0
Shell Temp In (°F)	Tube Inlet Temp (°F)	108.1
Shell Temp Out (°F)	Constant Heat Load (BTU/hr)	5,412,000
Tube Flow (gpm)		
Tube Temp In (°F)		
Tube Temp Out (°F)	Input Fouling Factor	0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)	U Overall (BTU/hr-ft ² -°F)
Tube Mass Flow (lbm/hr)	Shell-Side ho (BTU/hr-ft ² -°F)
Heat Transferred (BTU/hr)	Tube-Side hi (BTU/hr-ft ² -°F)
LMTD	1/Wall Resis (BTU/hr-ft ² -°F)
Effective Area (ft ²)	LMTD Correction Factor
	Overall Fouling (hr-ft ² -°F/BTU)
Property	
Velocity (ft/s)	Shell Temp In (°F)
Reynold's Number	Shell Temp Out (°F)
Prandtl Number	Tav Shell (°F)
Bulk Visc (lbm/ft-hr)	Shell Skin Temp (°F)
Skin Visc (lbm/ft-hr)	Tube Temp In (°F)
Density (lbm/ft ³)	Tube Temp Out (°F)
Cp (BTU/lbm-°F)	Tav Tube (°F)
K (BTU/hr-ft-°F)	Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr)	4.619E+5	Overall Fouling (hr-ft ² -°F/BTU)	0.001580
Tube Mass Flow (lbm/hr)	3.877E+5	Shell-Side ho (BTU/hr-ft ² -°F)	995.4
Heat Transferred (BTU/hr)	5.412E+6	Tube-Side hi (BTU/hr-ft ² -°F)	1,052.6
LMTD	68.5	1/Wall Resis (BTU/hr-ft ² -°F)	5,941.6
Effective Area (ft ²)	304.0	LMTD Correction Factor	1.0000
		U Overall (BTU/hr-ft ² -°F)	260.0
Property	Shell-Side	Tube-Side	
Velocity (ft/s)	2.38	3.24	Shell Temp In (°F)
Reynold's Number	2.298E+04	2.775E+04	Shell Temp Out (°F)
Prandtl Number	4.67	3.83	Tav Shell (°F)
Bulk Visc (lbm/ft-hr)	1.47	1.41	Shell Skin Temp (°F)
Skin Visc (lbm/ft-hr)	1.72	1.18	Tube Temp In (°F)
Density (lbm/ft ³)	63.20	61.79	Tube Temp Out (°F)
Cp (BTU/lbm-°F)	0.92	1.00	Tav Tube (°F)
K (BTU/hr-ft-°F)	0.29	0.37	Tube Skin Temp (°F)

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 750.0
 Shell Flow (gpm) 880.0
 Tube Inlet Temp (°F) 108.3
 Constant Heat Load (BTU/hr) 5,412,000

Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)

Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)
 Shell-Side h_o (BTU/hr-ft²-°F)
 Tube-Side h_i (BTU/hr-ft²-°F)
 1/Wall Resis (BTU/hr-ft²-°F)
 LMTD Correction Factor

Overall Fouling (hr-ft²-°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 4.619E+5
 Tube Mass Flow (lbm/hr) 3.752E+5
 Heat Transferred (BTU/hr) 5.412E+6
 LMTD 68.9
 Effective Area (ft²) 304.0

Overall Fouling (hr-ft²-°F/BTU) 0.001580
 Shell-Side h_o (BTU/hr-ft²-°F) 997.8
 Tube-Side h_i (BTU/hr-ft²-°F) 1,028.1
 1/Wall Resis (BTU/hr-ft²-°F) 5,941.6
 LMTD Correction Factor 1.0000

U Overall (BTU/hr-ft²-°F) 258.4

Property	Shell-Side	Tube-Side
Velocity (ft/s)	2.38	3.14
Reynold's Number	2.314E+04	2.697E+04
Prandtl Number	4.64	3.81
Bulk Visc (lbm/ft-hr)	1.46	1.41
Skin Visc (lbm/ft-hr)	1.70	1.17
Density (lbm/ft³)	63.18	61.78
Cp (BTU/lbm-°F)	0.92	1.00
K (BTU/hr-ft-°F)	0.29	0.37

Shell Temp In (°F) 190.8
 Shell Temp Out (°F) 178.0
 Tav Shell (°F) 184.4
 Shell Skin Temp (°F) 166.6
 Tube Temp In (°F) 108.3
 Tube Temp Out (°F) 122.7
 Tav Tube (°F) 115.5
 Tube Skin Temp (°F) 135.4

** Reynolds Number Outside Range of Equation Applicability

†† With Zero Fouling The Test Heat Load Could Not Be Achieved

PROTO-HX 3.01 by Proto-Power Corporation (SN#PHX-1009)
PSE&G - Hope Creek
Calculation Report for 1AE405 - Diesel Gen. Jacket Heat Exchanger

06/04/98

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data	Extrapolation Data
Data Date	Tube Flow (gpm) 700.0
Shell Flow (gpm)	Shell Flow (gpm) 880.0
Shell Temp In (°F)	Tube Inlet Temp (°F) 108.9
Shell Temp Out (°F)	Constant Heat Load (BTU/hr) 5,412,000
Tube Flow (gpm)	
Tube Temp In (°F)	
Tube Temp Out (°F)	Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)
 Shell-Side ho (BTU/hr-ft²-°F)
 Tube-Side hi (BTU/hr-ft²-°F)
 1/Wall Resis (BTU/hr-ft²-°F)
 LMTD Correction Factor

Overall Fouling (hr-ft²-°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results
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Shell Mass Flow (lbm/hr)	4.619E+5
Tube Mass Flow (lbm/hr)	3.502E+5
Heat Transferred (BTU/hr)	5.412E+6
LMTD	69.8
Effective Area (ft²)	304.0

Overall Fouling (hr-ft²-°F/BTU)	0.001580
Shell-Side ho (BTU/hr-ft²-°F)	1,003.4
Tube-Side hi (BTU/hr-ft²-°F)	979.5
1/Wall Resis (BTU/hr-ft²-°F)	5,941.6
LMTD Correction Factor	1.0000

U Overall (BTU/hr-ft²-°F)	255.1
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Property	Shell-Side	Tube-Side
Velocity (ft/s)	2.38	2.93
Reynold's Number	2.352E+04	2.544E+04
Prandtl Number	4.56	3.76
Bulk Visc (lbm/ft-hr)	1.44	1.39
Skin Visc (lbm/ft-hr)	1.67	1.15
Density (lbm/ft³)	63.13	61.76
Cp (BTU/lbm-°F)	0.92	1.00
K (BTU/hr-ft-°F)	0.29	0.37

Shell Temp In (°F)	192.8
Shell Temp Out (°F)	180.0
Tav Shell (°F)	186.4
Shell Skin Temp (°F)	168.7
Tube Temp In (°F)	108.9
Tube Temp Out (°F)	124.4
Tav Tube (°F)	116.6
Tube Skin Temp (°F)	137.5

** Reynolds Number Outside Range of Equation Applicability
 !! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 650.0
 Shell Flow (gpm) 880.0
 Tube Inlet Temp (°F) 109.6
 Constant Heat Load (BTU/hr) 5,412,000

Input Fouling Factor 0.001580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side ho (BTU/hr·ft²·°F)
 Tube-Side hi (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor
 Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr)	4.619E+5
Tube Mass Flow (lbm/hr)	3.252E+5
Heat Transferred (BTU/hr)	5.412E+6
LMTD	70.8
Effective Area (ft²)	304.0

Overall Fouling (hr·ft²·°F/BTU)	0.001580
Shell-Side ho (BTU/hr·ft²·°F)	1,009.7
Tube-Side hi (BTU/hr·ft²·°F)	930.2
1/Wall Resis (BTU/hr·ft²·°F)	5,941.6
LMTD Correction Factor	1.0000

Property	Shell-Side	Tube-Side
Velocity (ft/s)	2.39	2.72
Reynold's Number	2.396E+04	2.392E+04
Prandtl Number	4.48	3.71
Bulk Visc (lbm/ft·hr)	1.41	1.37
Skin Visc (lbm/ft·hr)	1.64	1.13
Density (lbm/ft³)	63.07	61.74
Cp (BTU/lbm·°F)	0.92	1.00
K (BTU/hr·ft·°F)	0.29	0.37

U Overall (BTU/hr·ft²·°F)	251.6
Shell Temp In (°F)	195.1
Shell Temp Out (°F)	182.3
Tav Shell (°F)	188.7
Shell Skin Temp (°F)	171.1
Tube Temp In (°F)	109.6
Tube Temp Out (°F)	126.3
Tav Tube (°F)	117.9
Tube Skin Temp (°F)	140.0

** Reynolds Number Outside Range of Equation Applicability
 !! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 1,000.0
 Shell Flow (gpm) 400.0
 Tube Inlet Temp (°F) 116.9
 Constant Heat Load (BTU/hr) 1,353,000
 Input Fouling Factor 0.003580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side h_o (BTU/hr·ft²·°F)
 Tube-Side h_i (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor
 Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 1.804E+5
 Tube Mass Flow (lbm/hr) 5.002E+5
 Heat Transferred (BTU/hr) 1.353E+6
 LMTD 33.7
 Effective Area (ft²) 738.0

Overall Fouling (hr·ft²·°F/BTU) 0.003580
 Shell-Side h_o (BTU/hr·ft²·°F) 73.1
 Tube-Side h_i (BTU/hr·ft²·°F) 1,178.0
 1/Wall Resis (BTU/hr·ft²·°F) 5,941.6
 LMTD Correction Factor 1.0000

Property	Shell-Side	Tube-Side
Velocity (ft/s)	1.92	3.76
Reynold's Number	2.721E+02	3.319E+04
Prandtl Number	569.67	3.70
Bulk Visc (lbm/ft·hr)	86.00	1.37
Skin Visc (lbm/ft·hr)	153.14	1.35
Density (lbm/ft³)	54.21	61.74
Cp (BTU/lbm·°F)	0.48	1.00
K (BTU/hr·ft·°F)	0.07	0.37

U Overall (BTU/hr·ft²·°F) 54.3
 Shell Temp In (°F) 160.2
 Shell Temp Out (°F) 144.6
 Tav Shell (°F) 152.4
 Shell Skin Temp (°F) 127.0
 Tube Temp In (°F) 116.9
 Tube Temp Out (°F) 119.6
 Tav Tube (°F) 118.3
 Tube Skin Temp (°F) 120.1

** Reynolds Number Outside Range of Equation Applicability
 !! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 900.0
 Shell Flow (gpm) 400.0
 Tube Inlet Temp (°F) 118.9
 Constant Heat Load (BTU/hr) 1,353,000

Input Fouling Factor 0.003580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)

Tube Mass Flow (lbm/hr)

Heat Transferred (BTU/hr)

LMTD

Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)

Shell-Side ho (BTU/hr·ft²·°F)

Tube-Side hi (BTU/hr·ft²·°F)

1/Wall Resis (BTU/hr·ft²·°F)

LMTD Correction Factor

Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)

Shell Temp Out (°F)

Tav Shell (°F)

Shell Skin Temp (°F)

Tube Temp In (°F)

Tube Temp Out (°F)

Tav Tube (°F)

Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr)

1.804E+5

Tube Mass Flow (lbm/hr)

4.502E+5

Heat Transferred (BTU/hr)

1.353E+6

LMTD

33.6

Effective Area (ft²)

738.0

Overall Fouling (hr·ft²·°F/BTU)

0.003580

Shell-Side ho (BTU/hr·ft²·°F)

73.8

Tube-Side hi (BTU/hr·ft²·°F)

1,094.7

1/Wall Resis (BTU/hr·ft²·°F)

5,941.6

LMTD Correction Factor

1.0000

U Overall (BTU/hr·ft²·°F)

54.5

Property	Shell-Side	Tube-Side
Velocity (ft/s)	1.92	3.39
Reynold's Number	2.836E+02	3.049E+04
Prandtl Number	547.92	3.62
Bulk Visc (lbm/ft·hr)	82.49	1.34
Skin Visc (lbm/ft·hr)	144.72	1.32
Density (lbm/ft³)	54.17	61.71
Cp (BTU/lbm·°F)	0.48	1.00
K (BTU/hr·ft·°F)	0.07	0.37

Shell Temp In (°F)

162.2

Shell Temp Out (°F)

146.6

Tav Shell (°F)

154.4

Shell Skin Temp (°F)

129.3

Tube Temp In (°F)

118.9

Tube Temp Out (°F)

121.9

Tav Tube (°F)

120.4

Tube Skin Temp (°F)

122.4

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

PSE&G - Hope Creek

Calculation Report for 1AE404 - Diesel Gen. Lube Oil Cooler

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 800.0
 Shell Flow (gpm) 400.0
 Tube Inlet Temp (°F) 121.3
 Constant Heat Load (BTU/hr) 1,353,000

Input Fouling Factor 0.003580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)

Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)
 Shell-Side ho (BTU/hr-ft²-°F)
 Tube-Side hi (BTU/hr-ft²-°F)
 1/Wall Resis (BTU/hr-ft²-°F)
 LMTD Correction Factor

Overall Fouling (hr-ft²-°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 1.804E+5
 Tube Mass Flow (lbm/hr) 4.002E+5
 Heat Transferred (BTU/hr) 1.353E+6
 LMTD 33.5
 Effective Area (ft²) 738.0

Overall Fouling (hr-ft²-°F/BTU) 0.003580
 Shell-Side ho (BTU/hr-ft²-°F) 74.7
 Tube-Side hi (BTU/hr-ft²-°F) 1,009.3
 1/Wall Resis (BTU/hr-ft²-°F) 5,941.6
 LMTD Correction Factor 1.0000

U Overall (BTU/hr-ft²-°F) 54.7

Property	Shell-Side	Tube-Side
Velocity (ft/s)	1.92	3.01
Reynold's Number	2.980E+02	2.776E+04
Prandtl Number	523.16	3.53
Bulk Visc (lbm/ft-hr)	78.51	1.31
Skin Visc (lbm/ft-hr)	135.38	1.28
Density (lbm/ft³)	54.11	61.67
Cp (BTU/lbm-°F)	0.48	1.00
K (BTU/hr-ft-°F)	0.07	0.37

Shell Temp In (°F) 164.6
 Shell Temp Out (°F) 149.1
 Tav Shell (°F) 156.9
 Shell Skin Temp (°F) 132.1
 Tube Temp In (°F) 121.3
 Tube Temp Out (°F) 124.7
 Tav Tube (°F) 123.0
 Tube Skin Temp (°F) 125.1

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used

Extrapolation Was to User Specified Conditions

Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 775.0
 Shell Flow (gpm) 400.0
 Tube Inlet Temp (°F) 122.1
 Constant Heat Load (BTU/hr) 1,353,000

Input Fouling Factor 0.003580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)
 Shell-Side h_o (BTU/hr-ft²-°F)
 Tube-Side h_i (BTU/hr-ft²-°F)
 1/Wall Resis (BTU/hr-ft²-°F)
 LMTD Correction Factor

Overall Fouling (hr-ft²-°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 1.804E+5
 Tube Mass Flow (lbm/hr) 3.877E+5
 Heat Transferred (BTU/hr) 1.353E+6
 LMTD 33.5
 Effective Area (ft²) 738.0

Overall Fouling (hr-ft²-°F/BTU) 0.003580
 Shell-Side h_o (BTU/hr-ft²-°F) 75.0
 Tube-Side h_i (BTU/hr-ft²-°F) 988.2
 1/Wall Resis (BTU/hr-ft²-°F) 5,941.6
 LMTD Correction Factor 1.0000

U Overall (BTU/hr-ft²-°F) 54.8

Property	Shell-Side	Tube-Side
Velocity (ft/s)	1.92	2.92
Reynold's Number	3.028E+02	2.711E+04
Prandtl Number	515.37	3.50
Bulk Visc (lbm/ft-hr)	77.26	1.30
Skin Visc (lbm/ft-hr)	132.50	1.27
Density (lbm/ft³)	54.09	61.65
Cp (BTU/lbm-°F)	0.48	1.00
K (BTU/hr-ft-°F)	0.07	0.37

Shell Temp In (°F) 165.4
 Shell Temp Out (°F) 149.9
 Tav Shell (°F) 157.7
 Shell Skin Temp (°F) 132.9
 Tube Temp In (°F) 122.1
 Tube Temp Out (°F) 125.6
 Tav Tube (°F) 123.8
 Tube Skin Temp (°F) 126.0

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 750.0
 Shell Flow (gpm) 400.0
 Tube Inlet Temp (°F) 122.7
 Constant Heat Load (BTU/hr) 1,353,000

Input Fouling Factor 0.003580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)

Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side h_o (BTU/hr·ft²·°F)
 Tube-Side h_i (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor

Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 1.804E+5
 Tube Mass Flow (lbm/hr) 3.752E+5
 Heat Transferred (BTU/hr) 1.353E+6
 LMTD 33.4
 Effective Area (ft²) 738.0

Overall Fouling (hr·ft²·°F/BTU) 0.003580
 Shell-Side h_o (BTU/hr·ft²·°F) 75.2
 Tube-Side h_i (BTU/hr·ft²·°F) 965.7
 1/Wall Resis (BTU/hr·ft²·°F) 5,941.6
 LMTD Correction Factor 1.0000

U Overall (BTU/hr·ft²·°F) 54.8

Property	Shell-Side	Tube-Side
Velocity (ft/s)	1.92	2.83
Reynold's Number	3.066E+02	2.639E+04
Prandtl Number	509.37	3.47
Bulk Visc (lbm/ft·hr)	76.30	1.29
Skin Visc (lbm/ft·hr)	130.29	1.27
Density (lbm/ft³)	54.08	61.64
Cp (BTU/lbm·°F)	0.48	1.00
K (BTU/hr·ft·°F)	0.07	0.37

Shell Temp In (°F) 166.1
 Shell Temp Out (°F) 150.6
 Tav Shell (°F) 158.3
 Shell Skin Temp (°F) 133.7
 Tube Temp In (°F) 122.7
 Tube Temp Out (°F) 126.3
 Tav Tube (°F) 124.5
 Tube Skin Temp (°F) 126.7

** Reynolds Number Outside Range of Equation Applicability
 !! With Zero Fouling The Test Heat Load Could Not Be Achieved

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 700.0
 Shell Flow (gpm) 400.0
 Tube Inlet Temp (°F) 124.4
 Constant Heat Load (BTU/hr) 1,353,000
 Input Fouling Factor 0.003580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)
 Shell-Side ho (BTU/hr-ft²-°F)
 Tube-Side hi (BTU/hr-ft²-°F)
 1/Wall Resis (BTU/hr-ft²-°F)
 LMTD Correction Factor
 Overall Fouling (hr-ft²-°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 1.804E+5
 Tube Mass Flow (lbm/hr) 3.502E+5
 Heat Transferred (BTU/hr) 1.353E+6
 LMTD 33.4
 Effective Area (ft²) 738.0

Overall Fouling (hr-ft²-°F/BTU) 0.003580
 Shell-Side ho (BTU/hr-ft²-°F) 75.8
 Tube-Side hi (BTU/hr-ft²-°F) 922.1
 1/Wall Resis (BTU/hr-ft²-°F) 5,941.6
 LMTD Correction Factor 1.0000

Property	Shell-Side	Tube-Side
Velocity (ft/s)	1.92	2.64
Reynold's Number	3.173E+02	2.505E+04
Prandtl Number	493.39	3.41
Bulk Visc (lbm/ft-hr)	73.74	1.27
Skin Visc (lbm/ft-hr)	124.50	1.24
Density (lbm/ft³)	54.04	61.61
Cp (BTU/lbm-°F)	0.49	1.00
K (BTU/hr-ft-°F)	0.07	0.37

U Overall (BTU/hr-ft²-°F) 55.0
 Shell Temp In (°F) 167.8
 Shell Temp Out (°F) 152.3
 Tav Shell (°F) 160.0
 Shell Skin Temp (°F) 135.6
 Tube Temp In (°F) 124.4
 Tube Temp Out (°F) 128.3
 Tav Tube (°F) 126.3
 Tube Skin Temp (°F) 128.6

** Reynolds Number Outside Range of Equation Applicability
 !! With Zero Fouling The Test Heat Load Could Not Be Achieved

PSE&G - Hope Creek

Calculation Report for 1AE404 - Diesel Gen. Lube Oil Cooler

Calculation Specifications

Constant Heat Load/Cold Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Fouling Was Input by User

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 650.0
 Shell Flow (gpm) 400.0
 Tube Inlet Temp (°F) 126.3
 Constant Heat Load (BTU/hr) 1,353,000

Input Fouling Factor 0.003580

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)

Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr-ft²-°F)
 Shell-Side ho (BTU/hr-ft²-°F)
 Tube-Side hi (BTU/hr-ft²-°F)
 1/Wall Resis (BTU/hr-ft²-°F)
 LMTD Correction Factor

Overall Fouling (hr-ft²-°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft-hr)		
Skin Visc (lbm/ft-hr)		
Density (lbm/ft³)		
Cp (BTU/lbm-°F)		
K (BTU/hr-ft-°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr)	1.804E+5
Tube Mass Flow (lbm/hr)	3.252E+5
Heat Transferred (BTU/hr)	1.353E+6
LMTD	33.3
Effective Area (ft²)	738.0

Overall Fouling (hr-ft²-°F/BTU)	0.003580
Shell-Side ho (BTU/hr-ft²-°F)	76.4
Tube-Side hi (BTU/hr-ft²-°F)	877.6
1/Wall Resis (BTU/hr-ft²-°F)	5,941.6
LMTD Correction Factor	1.0000

U Overall (BTU/hr-ft²-°F) 55.1

Property	Shell-Side	Tube-Side
Velocity (ft/s)	1.93	2.45
Reynold's Number	3.296E+02	2.369E+04
Prandtl Number	476.27	3.34
Bulk Visc (lbm/ft-hr)	71.00	1.25
Skin Visc (lbm/ft-hr)	118.42	1.22
Density (lbm/ft³)	53.99	61.58
Cp (BTU/lbm-°F)	0.49	1.00
K (BTU/hr-ft-°F)	0.07	0.37

Shell Temp In (°F)	169.7
Shell Temp Out (°F)	154.2
Tav Shell (°F)	162.0
Shell Skin Temp (°F)	137.7
Tube Temp In (°F)	126.3
Tube Temp Out (°F)	130.5
Tav Tube (°F)	128.4
Tube Skin Temp (°F)	130.8

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

Attachment (2)

**RHR Heat Exchanger
Minimum SACS Flow Rate**

Calculation Specifications

Constant Inlet Temperature Method Was Used
 Extrapolation Was to User Specified Conditions
 Design Fouling Factors Were Used

Test Data

Data Date
 Shell Flow (gpm)
 Shell Temp In (°F)
 Shell Temp Out (°F)
 Tube Flow (gpm)
 Tube Temp In (°F)
 Tube Temp Out (°F)

Extrapolation Data

Tube Flow (gpm) 8,650.0
 Shell Flow (gpm) 10,000.0
 Tube Inlet Temp (°F) 100.0
 Shell Inlet Temp (°F) 212.0

Fouling Calculation Results

Shell Mass Flow (lbm/hr)
 Tube Mass Flow (lbm/hr)
 Heat Transferred (BTU/hr)
 LMTD
 Effective Area (ft²)

U Overall (BTU/hr·ft²·°F)
 Shell-Side ho (BTU/hr·ft²·°F)
 Tube-Side hi (BTU/hr·ft²·°F)
 1/Wall Resis (BTU/hr·ft²·°F)
 LMTD Correction Factor

Overall Fouling (hr·ft²·°F/BTU)

Property	Shell-Side	Tube-Side
Velocity (ft/s)		
Reynold's Number		
Prandtl Number		
Bulk Visc (lbm/ft·hr)		
Skin Visc (lbm/ft·hr)		
Density (lbm/ft³)		
Cp (BTU/lbm·°F)		
K (BTU/hr·ft·°F)		

Shell Temp In (°F)
 Shell Temp Out (°F)
 Tav Shell (°F)
 Shell Skin Temp (°F)
 Tube Temp In (°F)
 Tube Temp Out (°F)
 Tav Tube (°F)
 Tube Skin Temp (°F)

Extrapolation Calculation Results

Shell Mass Flow (lbm/hr) 5.002E+6
 Tube Mass Flow (lbm/hr) 4.327E+6
 Heat Transferred (BTU/hr) 1.238E+8
 LMTD 85.4
 Effective Area (ft²) 3,740.0

Overall Fouling (hr·ft²·°F/BTU) 0.001054
 Shell-Side ho (BTU/hr·ft²·°F) 1,748.0
 Tube-Side hi (BTU/hr·ft²·°F) 2,445.7
 1/Wall Resis (BTU/hr·ft²·°F) 2,187.3
 LMTD Correction Factor 0.9837

U Overall (BTU/hr·ft²·°F) 394.2

Property	Shell-Side	Tube-Side
Velocity (ft/s)	4.54	10.19
Reynold's Number	1.116E+05	1.199E+05
Prandtl Number	1.90	3.86
Bulk Visc (lbm/ft·hr)	0.73	1.42
Skin Visc (lbm/ft·hr)	0.83	1.23
Density (lbm/ft³)	60.12	61.80
Cp (BTU/lbm·°F)	1.01	1.00
K (BTU/hr·ft·°F)	0.39	0.37

Shell Temp In (°F) 212.0
 Shell Temp Out (°F) 187.4
 Tav Shell (°F) 199.7
 Shell Skin Temp (°F) 180.4
 Tube Temp In (°F) 100.0
 Tube Temp Out (°F) 128.6
 Tav Tube (°F) 114.3
 Tube Skin Temp (°F) 129.6

** Reynolds Number Outside Range of Equation Applicability

!! With Zero Fouling The Test Heat Load Could Not Be Achieved

Attachment (3)

**UHS Temperature Limit Evaluation
Lineups from Previous EE**



PROTO-POWER CORPORATION
15 THAMES STREET

PHONE: (860) 446-9725

GROTON, CT 06340

FAX: (860) 448-4860

FAX COVER SHEET

FILE NO.: 11-365

DATE: 6/2/96

TOTAL PAGES (INCLUDING COVER SHEET): _____

TO: Rob DeWight

FROM: Peter Austin

DEPT. _____

FAX NO.: 1 (609) 339-1218

FAX NO.: (860) 448-4860

REFERENCE: _____

MESSAGE: Rob

Here are the results for a LOP/SSR. I figured you might need them. The
required VHS Temperature is 91.1°F.

Pete

To report transmittal problems or for confirmation, please call (860) 446-9725.

6/2/98 22:15

PROTO-FLO 4.01 by Proto-Power Corporation - Serial #PFL-0000

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Public Service Electric and Gas - G:\PSEG\11-385\NEW UHS\STACSUHS2 PDB - Revision 2.00

Hope Creek Generating Station - STACS

Flow Summary Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1A2E201 out	19.250	10,188.11			
1A1E201 out	19.250	9,706.06			
1CP210 out	19.250	10,001.00			
1AT203 out	1.500	41.60			
1AP210 out	19.250	9,969.40			
1AE205 out	19.250	9,514.38			
1DP210 out	19.250	9,645.00			
1BP210 out	19.250	9,881.35			
1B1E201 out	19.250	9,573.98			
1BE205 out	19.250	9,247.83			
1B2E201 out	19.250	9,914.86			
1AT205 recirc	1.939	22.87			
1BT205 recirc	2.067	24.77			
1AP202-1 out	0.957	23.32			
1AP202-2 out	0.957	9.87			
1CP202-1 out	0.957	28.46			
1CP202-2 out	0.957	10.33			
1CVH210 out	3.068	125.53			
1GVH210 out	3.068	131.05			
1EVH210 out	3.068	142.80			
1AVH210 out	3.068	142.06			

!! Reverse Flow Through Check Valve

** Flow Below Minimum

&& Pump Flow is Past End of Curve

\$\$ NPSH Available Below NPSH Required

6/2/98 22:15

PROTO-FLO 4.01 by Proto-Power Corporation - Serial #PFL-0000

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Public Service Electric and Gas - G:\PSEG\11-385\NEW UHS\STACSUHS2.PDB - Revision 2.00

Hope Creek Generating Station - STACS

Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1AVH209 out	3.068	77.14			
1BVH209 out	3.068	105.11			
1AVH208 out	1.939	32.13			
1BVH208 out	1.939	31.65			
1FVH210 out	3.068	148.07			
1BVH210 out	3.068	148.33			
1BP202-1 out	0.957	28.46			
1BP202-2 out	0.957	10.14			
1DP202-1 out	0.957	25.66			
1DP202-2 out	0.957	9.97			
1DVH210 out	3.068	144.20			
1HVH210 out	3.068	144.07			
1AVH213 out	4.026	417.44			
1GVH211 out	3.068	112.33			
1CVH211 out	3.068	111.79			
1FVH213 out	4.026	419.52			
1BVH213 out	4.026	423.14			
1CVH213 out	4.026	412.10			
1DVH213 out	4.026	414.98			
1EVH213 out	4.026	408.32			
1AK202 out	0.957	6.17			

!! Reverse Flow Through Check Valve

** Flow Below Minimum

&& Pump Flow is Past End of Curve

\$\$ NPSH Available Below NPSH Required

6/2/98 22:15

PROTO-FLO 4.01 by Proto-Power Corporation - Serial #PFL-0000

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Public Service Electric and Gas - G:\PSEG\11-385\NEW UHS\STACSUHS2.PDB - Revision 2.00

Hope Creek Generating Station - STACS

Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1BK202 out	0.957	5.94			
1AE202 out	7.981	1,178.39			
1BE202 out	7.981	1,153.79			
1HVB211 out	3.068	112.14			
1DVB211 out	3.068	111.59			
1FVB211 out	3.068	111.44			
1BVB211 out	3.068	111.56			
1AVB211 out	3.068	111.27			
1EVB211 out	3.068	111.24			
1AE328/1BE328 comb. out	0.546	10.94			
1AE328/1BE328 out	0.546	10.94			
1AK400 out	6.065	2,089.26			
1AVE412 out	6.065	450.72			
1EVE412	6.065	527.56			
1EVE412 out	6.065	528.03			
1AE408/405/404 out	7.981	1,081.12			
1CVE412 out	6.065	454.45			
1GVE412 out	6.065	532.40			
1CE408/405/404 out	7.981	1,090.13			
1BVE412 out	6.065	524.49			
1FVE412 out	6.065	524.49			

!! Reverse Flow Through Check Valve

** Flow Below Minimum

&& Pump Flow is Past End of Curve

\$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Flow Summary Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-6 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1DVE412 out	6.065	520.52			
1HVE412 out	6.065	607.22			
1BE408/405/404 out	7.981	1,075.25			
1BK400 out	6.065	1,842.72			
1DE408/405/404 out	7.981	1,068.88			
1AK403 out	6.065	569.50			
1BK403 out	6.065	580.78			
RE4859B2 out	0.957	12.75			
RE4859A2 out	0.957	11.78			

!! Reverse Flow Through Check Valve
** Flow Below Minimum&& Pump Flow is Past End of Curve
\$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

00E129	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco, Inc.	Model: ES-24/18096	Dwgs: PM050-0039-3
System Fluid:		
Heat Load =	500,000.00 BTU/hr	
00K107	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 06060	Dwgs: PM050-0022-5
System Fluid:		
Heat Load =	2,240,323.00 BTU/hr	
10C150	HX Type: Fixed Heat Load	HX Status: Off
Mfr:	Model:	Dwgs:
System Fluid:		
Heat Load =	0.00 BTU/hr	
10E1110	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco, Inc.	Model: 8A24A08072	Dwgs: P1-342287
System Fluid:		
Heat Load =	515,000.00 BTU/hr	
10E114	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Gen. Elect. Co.	Model: MDE0965400	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	42,300.00 BTU/hr	
10E129	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco, Inc.	Model: ES-24/18096	Dwgs: PM050-0039-3
System Fluid:		
Heat Load =	10,750.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

10K107	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 06060	Dwgs: PM050-0022-5
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	

1A1E118	HX Type: Fixed Heat Load	HX Status: Off
Mfr: DeLaval/TMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	0.00 BTU/hr	

1A1E201	HX Type: Shell & Tube	HX Status: On / in Flow Path		
Mfr: Graham Mfg. Co.	Model: 92-6-504 CGN	Dwgs: PM069Q-0058		
Tube Fluid: Brackish Water - 12 ppt		Shell Fluid: Fresh Water		
Shell Flow = 9,743.87	Shell Temperatures = 117.04°F - 99.75°F			
Tube Flow = 10,316.00	Tube Temperatures = 92.40°F - 108.75°F			
Construction Type: TEMA-G				
1 Shells, 0 Shell Passes, 4 Tube Passes				
Shell Min Area = 6.2530 ft ² , Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000				
Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft ² , K = 0.000				
Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50				
Tube Pitch = 0.9375 in	Tube Pitch Type = Triangular			
5,700 of 5,700 Tubes Active	UTubes = No			
Effective Area = 46,295.00 ft ²	Area Factor = 0.9849			
Fouling = 0.0000 (inside) 0.0012 (outside)	Hoff = 0.4888			
LMTD = 7.8059	LMTD Corrections FF = 0.7705 Fb = 1.0000			
Heat Load =	83,362,926.23 BTU/hr	UOverall = 299.38 BTU/hr/ft ² /°F		

1A2E118	HX Type: Fixed Heat Load	HX Status: Off
Mfr: DeLaval/TMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	0.00 BTU/hr	

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Ilope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1A2E201	HX Type: Shell & Tube	HX Status: On / in Flow Path		
Mfr: Graham Mfg. Co.	Model: 92-6-504 CGN	Dwgs: PM069Q-0058		
Tube Fluid: Brackish Water - 12 ppt		Shell Fluid: Fresh Water		
Shell Flow = 10,226.83	Shell Temperatures = 117.04°F - 100.21°F			
Tube Flow = 10,270.00	Tube Temperatures = 92.40°F - 109.18°F			
Construction Type: TEMA-G				
1 Shells, 0 Shell Passes, 4 Tube Passes				
Shell Min Area = 6.2530 ft ² , Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000				
Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft ² , K = 0.000				
Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50				
Tube Pitch = 0.9375 in	Tube Pitch Type = Triangular			
5,700 of 5,700 Tubes Active	UTubes = No			
Effective Area = 46,295.00 ft ²	Area Factor = 0.9849			
Fouling = 0.0000 (inside) 0.0012 (outside)	Hoff = 0.4888			
LMTD = 7.8351	LMTD Corrections FF = 0.7761 Fb = 1.0000			
Heat Load =	85,145,743.76 BTU/hr	U/Overall = 302.46 BTU/hr/ft ² /°F		

1AE1109	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Basco Inc.	Model: 8A43A08048	Dwgs: P1-342287
System Fluid:		
Heat Load =	0.00 BTU/hr	

1AE111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 264A4808	Dwgs: PM003-TR-18-5
System Fluid:		
Heat Load =	515,000.00 BTU/hr	

1AE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	42,300.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1AE115	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: H.K. Porter Co.	Model: T-140963X45	Dwgs: PE005-0012-9
System Fluid:		
Heat Load =	10,750.00 BTU/hr	
1AE116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 155B8243P001	Dwgs: PM003-T6-1-2
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	
1AE117	HX Type: Fixed Heat Load	HX Status: Off
Mfr: General Elect.	Model: MDE0924300	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE126	HX Type: Fixed Heat Load	HX Status: Off
Mfr: American Std.	Model: 5-046-17-168-3	Dwgs: N1-B31-S1-120
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE130	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE202	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Alfa-Laval Inc.	Model: A-20-BXS	Dwgs: PM071Q-0010
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

(Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1AE205	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Delta Southern	Model: 21A9227AN	Dwgs: NO-E11-B001-5
System Fluid: Fresh Water		
Tube Flow = 9,450.78	Tube Temperatures = 99.99°F - 128.22°F	
Heat Load =	132,500,000.00 BTU/hr	

1AE214	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	

1AE218	HX Type: Fixed Heat Load	HX Status: Off
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	0.00 BTU/hr	

1AE278	HX Type: Fixed Heat Load	HX Status: Off
Mfr: CVI Inc.	Model:	Dwgs: PM048Q
System Fluid:		
Heat Load =	0.00 BTU/hr	

1AE328	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Parker-Hanison	Model: HDTC-SS-6-2	Dwgs:
System Fluid:		
Shell Flow = 5.03	Shell Temperatures = 99.99°F - 122.00°F	
Heat Load =	55,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1AE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,080.45	Tube Temperatures = 115.94°F - 118.48°F	
Heat Load =	1,353,000.00 BTU/hr	

1AE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,077.93	Tube Temperatures = 105.82°F - 115.94°F	
Heat Load =	5,412,000.00 BTU/hr	

1AE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,076.60	Tube Temperatures = 99.99°F - 105.82°F	
Heat Load =	3,118,000.00 BTU/hr	

1AK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

1AK202	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: CVI Inc.	Model: C735-9909	Dwgs: PM048Q-0044-2
System Fluid: Fresh Water		
Tube Flow = 6.15	Tube Temperatures = 99.99°F - 116.37°F	
Heat Load =	50,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1AK400

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Carrier Corp.

Model: 19FA455B122022

Dwgs: PM723Q

System Fluid: Fresh Water

Tube Flow = 2,086.02

Tube Temperatures = 99.99°F - 107.26°F

Heat Load =

7,530,700.00 BTU/hr

1AK403

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Carrier Corp.

Model: 19FA441B1142020

Dwgs: PM723Q

System Fluid: Fresh Water

Tube Flow = 568.40

Tube Temperatures = 99.99°F - 108.90°F

Heat Load =

2,515,340.00 BTU/hr

1AP176

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Carrier Corp.

Model: 19FA999-1007-18

Dwgs: PM623-118

System Fluid:

Heat Load =

100,000.00 BTU/hr

1AP202-1

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 8X4C-12

Dwgs: N1-E11-C002-51

System Fluid: Fresh Water

Tube Flow = 23.15

Tube Temperatures = 99.99°F - 130.43°F

Heat Load =

350,000.00 BTU/hr

1AP202-2

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 992C430BX

Dwgs: N1-E11-C002-6

System Fluid: Fresh Water

Tube Flow = 9.86

Tube Temperatures = 99.99°F - 102.04°F

Heat Load =

10,000.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-5 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1AVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 450.25	Tube Temperatures = 99.99°F - 104.91°F	
Heat Load =	1,100,000.00 BTU/hr	

1AVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

1AVH116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0033-4
System Fluid:		
Heat Load =	530,000.00 BTU/hr	

1AVH208	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1572400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 32.11	Tube Temperatures = 96.88°F - 99.70°F	
Heat Load =	45,000.00 BTU/hr	

1AVH209	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1571400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 77.09	Tube Temperatures = 99.99°F - 103.00°F	
Heat Load =	115,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1AVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 141.97	Tube Temperatures = 99.99°F - 102.97°F	
Heat Load =	210,000.00 BTU/hr	

1AVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1AVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1B1E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

(Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV-1.0E-3 Temperature=5.0E-3

LOP/SSE

IB1E201	HX Type: Shell & Tube	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 92-6-504 CGN	Dwgs: PM069Q-0058
Tube Fluid: Brackish Water - 12 ppt		Shell Fluid: Fresh Water
Shell Flow = 9,610.60	Shell Temperatures = 114.24°F - 96.72°F	
Tube Flow = 10,106.00	Tube Temperatures = 89.21°F - 105.90°F	
Construction Type: TEMA-G		
1 Shells, 0 Shell Passes, 4 Tube Passes		
Shell Min Area = 6.2530 ft ² , Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000		
Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft ² , K = 0.000		
Tubes: Dun = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50		
Tube Pitch = 0.9375 in	Tube Pitch Type = Triangular	
5,700 of 5,700 Tubes Active	UTubes = No	
Effective Area = 46,295.00 ft ²	Area Factor = 0.9849	
Fouling = 0.0000 (inside) 0.0012 (outside)	Hoff = 0.4888	
LMTD = 7.9225	LMTD Corrections FF = 0.7698 Fb = 1.0000	
Heat Load =	83,389,813.35 BTU/hr	UOverall = 295.35 BTU/hr/ft ² /°F

IB2E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1B2E201	HX Type: Shell & Tube	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 92-6-504 CGN	Dwgs: PM069Q-0058
Tube Fluid: Brackish Water - 12 ppt		Shell Fluid: Frsh Water
Shell Flow = 9,952.29	Shell Temperatures = 114.24°F - 96.98°F	
Tube Flow = 10,190.00	Tube Temperatures = 89.21°F - 106.09°F	
Construction Type: TEMA-G		
1 Shells, 0 Shell Passes, 4 Tube Passes		
Shell Min Area = 6.2530 ft^2, Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000		
Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft^2, K = 0.000		
Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50		
Tube Pitch = 0.9375 in	Tube Pitch Type = Triangular	
5,700 of 5,700 Tubes Active	UTubes = No	
Effective Area = 46,295.00 ft^2	Area Factor = 0.9849	
Fouling = 0.0000 (inside) 0.0012 (outside)	Hoff = 0.4888	
LMTD = 7.9580	LMTD Corrections FF = 0.7747 Fb = 1.0000	
Heat Load =	85,083,411.22 BTU/hr	UOverall = 298.11 BTU/hr/ft^2/°F

1BE1109	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco Inc.	Model: 8A44A08048	Dwgs: P1-342287
System Fluid:		
Heat Load =	481,650.00 BTU/hr	

1BE111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 264A4808	Dwgs: PM003-TR-18-5
System Fluid:		
Heat Load =	9,360,000.00 BTU/hr	

1BE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	5,487,500.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1BE115	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: H.K. Porter Co.	Model: T-140963X45	Dwgs: PE005-0012-9
System Fluid:		
Heat Load =	515,000.00 BTU/hr	
1BE116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 155B8243P001	Dwgs: PM003-T6-1-2
System Fluid:		
Heat Load =	42,500.00 BTU/hr	
1BE117	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: MDE0924300	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	8,050,000.00 BTU/hr	
1BE126	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 5-0046-17-168-3	Dwgs: N1-B31-S1-120
System Fluid:		
Heat Load =	5,530,000.00 BTU/hr	
1BE130	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	42,300.00 BTU/hr	
1BE202	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Alfa-Laval Inc.	Model: A-20-BXS	Dwgs: PM071Q-0010
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1BE205	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Delta Southern	Model: 21A9227AN	Dwgs: N0-E11-B001-5
System Fluid: Fresh Water		
Tube Flow = 9,185.94	Tube Temperatures = 96.88°F - 125.89°F	
Heat Load =	132,500,000.00 BTU/hr	
1BE214	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	9,565.00 BTU/hr	
1BE218	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	10,750.00 BTU/hr	
1BE278	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model:	Dwgs: PM048Q
System Fluid:		
Heat Load =	6,000.00 BTU/hr	
1BE328	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Parker-Hanison	Model: HDTC-SS-6-2	Dwgs:
System Fluid:		
Shell Flow = 5.86	Shell Temperatures = 99.99°F - 118.90°F	
Heat Load =	55,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1BE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,074.60	Tube Temperatures = 112.91°F - 115.45°F	
Heat Load =	1,353,000.00 BTU/hr	

1BE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,072.16	Tube Temperatures = 102.74°F - 112.91°F	
Heat Load =	5,412,000.00 BTU/hr	

1BE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,070.87	Tube Temperatures = 96.88°F - 102.74°F	
Heat Load =	3,118,000.00 BTU/hr	

1BK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	

1BK202	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: CVI Inc.	Model: C735-9909	Dwgs: PM048Q-0044-2
System Fluid: Fresh Water		
Tube Flow = 5.92	Tube Temperatures = 96.88°F - 113.87°F	
Heat Load =	50,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1BK400	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA455B122022	Dwgs: PM723Q
System Fluid: Fresh Water		
Tube Flow = 1,839.58	Tube Temperatures = 96.88°F - 105.11°F	
Heat Load =	7,530,700.00 BTU/hr	

1BK403	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA441B1142020	Dwgs: PM723Q
System Fluid: Fresh Water		
Tube Flow = 579.73	Tube Temperatures = 96.88°F - 105.61°F	
Heat Load =	2,515,340.00 BTU/hr	

1BP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	

1BP202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid: Fresh Water		
Tube Flow = 28.30	Tube Temperatures = 96.88°F - 121.76°F	
Heat Load =	350,000.00 BTU/hr	

1BP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 10.14	Tube Temperatures = 96.88°F - 98.86°F	
Heat Load =	10,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1BVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 524.04	Tube Temperatures = 96.88°F - 101.10°F	
Heat Load =	1,100,000.00 BTU/hr	
1BVH113	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	0.00 BTU/hr	
1BVH116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0033-4
System Fluid:		
Heat Load =	530,000.00 BTU/hr	
1BVH208	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1572400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 31.63	Tube Temperatures = 96.88°F - 99.74°F	
Heat Load =	45,000.00 BTU/hr	
1BVH209	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1571400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 105.06	Tube Temperatures = 99.99°F - 102.20°F	
Heat Load =	115,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1BVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 148.25	Tube Temperatures = 96.88°F - 99.73°F	
Heat Load =	210,000.00 BTU/hr	
1BVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1BVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1C1E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid		
Heat Load =	400,000.00 BTU/hr	
1C2E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid		
Heat Load =	400,000.00 BTU/hr	
1CE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid		
Heat Load =	5,487,500.00 BTU/hr	

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Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

ICE130	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	42,300.00 BTU/hr	

ICE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,089.46	Tube Temperatures = 115.81°F - 118.32°F	
Heat Load =	1,353,000.00 BTU/hr	

ICE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,086.95	Tube Temperatures = 105.78°F - 115.81°F	
Heat Load =	5,412,000.00 BTU/hr	

ICE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,085.62	Tube Temperatures = 99.99°F - 105.78°F	
Heat Load =	3,118,000.00 BTU/hr	

ICK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	

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Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1CP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	

1CP202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid:		
Shell Flow = 28.29	Shell Temperatures = 99.99°F - 124.90°F	
Heat Load =	350,000.00 BTU/hr	

1CP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 10.32	Tube Temperatures = 99.99°F - 101.94°F	
Heat Load =	10,000.00 BTU/hr	

1CVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 453.99	Tube Temperatures = 99.99°F - 104.87°F	
Heat Load =	1,100,000.00 BTU/hr	

1CVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

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Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1CVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Filtr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 125.44	Tube Temperatures = 99.99°F - 103.20°F	
Heat Load =	200,000.00 BTU/hr	
1CVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Filtr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1CVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Filtr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
IDE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	5,487,500.00 BTU/hr	
IDE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,068.23	Tube Temperatures = 113.00°F - 115.56°F	
Heat Load =	1,353,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

IDE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,065.79	Tube Temperatures = 102.77°F - 113.00°F	
Heat Load =	5,412,000.00 BTU/hr	
IDE406	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,064.50	Tube Temperatures = 96.88°F - 102.77°F	
Heat Load =	3,118,000.00 BTU/hr	
IDK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	
IDP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	
ID'202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid: Fresh Water		
Tube Flow = 25.50	Tube Temperatures = 96.88°F - 124.49°F	
Heat Load =	350,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

IDP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 9.97	Tube Temperatures = 96.88°F - 98.90°F	
Heat Load =	10,000.00 BTU/hr	

IDVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 520.08	Tube Temperatures = 96.88°F - 101.13°F	
Heat Load =	1,100,000.00 BTU/hr	

IDVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

IDVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 144.11	Tube Temperatures = 96.88°F - 99.67°F	
Heat Load =	200,000.00 BTU/hr	

IDVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1DVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1EVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 527.56	Tube Temperatures = 99.99°F - 104.19°F	
Heat Load =	1,100,000.00 BTU/hr	

1EVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

1EVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 142.71	Tube Temperatures = 99.99°F - 102.96°F	
Heat Load =	210,000.00 BTU/hr	

1EVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1EVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1FVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 524.04	Tube Temperatures = 96.88°F - 101.10°F	
Heat Load =	1,100,000.00 BTU/hr	
1FVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1FVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 147.99	Tube Temperatures = 96.88°F - 99.73°F	
Heat Load =	210,000.00 BTU/hr	
1FVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1FVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1GVE412

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Trane Co.

Model: MDE1291600

Dwgs: PM731Q

System Fluid: Fresh Water

Tube Flow = 531.94

Tube Temperatures = 99.99°F - 104.16°F

Heat Load =

1,100,000.00 BTU/hr

1GVH210

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Amer. Air Fltr.

Model: MDE1570300

Dwgs: PM711Q

System Fluid: Fresh Water

Tube Flow = 130.96

Tube Temperatures = 99.99°F - 103.07°F

Heat Load =

200,000.00 BTU/hr

1GVH211

HX Type: Fixed Heat Load

HX Status: Off

Mfr: Amer. air Fltr.

Model: MDE1573500

Dwgs: PM711Q

System Fluid: Fresh Water

Heat Load =

0.00 BTU/hr

1HVE412

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Trane Co.

Model: MDE1291600

Dwgs: PM731Q

System Fluid: Fresh Water

Tube Flow = 606.78

Tube Temperatures = 96.88°F - 100.53°F

Heat Load =

1,100,000.00 BTU/hr

1HVE210

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Amer. Air Fltr.

Model: MDE1570300

Dwgs: PM711Q

System Fluid: Fresh Water

Tube Flow = 143.99

Tube Temperatures = 96.88°F - 99.67°F

Heat Load =

200,000.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE

1HVB211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	



PROTO-POWER CORPORATION
15 THAMES STREET

PHONE: (860) 446-9725

GROTON, CT 06340

FAX: (860) 448-4860

FAX COVER SHEET

FILE NO.: 11-385

DATE: 6/2/96

TOTAL PAGES (INCLUDING COVER SHEET): 31

TO: Rob DeNigro

FROM: Peter Anglin

DEPT. _____

FAX NO.: 1 (609) 339-1218

FAX NO.: (860) 448-4860

REFERENCE: _____

MESSAGE: Rob,

Here are the results for a LOP/SSE with an ECC failure. The required
VMS temperature is 86.6°F. I've just discovered that the cross-tied
configurations used LOCA SSWS flows rather than LOP SSWS flows. I'll
redo those when I finish the 1 and 1 SSWS run.

PA

To report transmittal problems or for confirmation, please call (860) 446-9725.

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Hope Creek Generating Station - STACS

Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1A2E201 out	19.250	10,168.22			
1A1E201 out	19.250	9,705.93			
1CP210 out	19.250	10,000.99			
1AT203 out	1.500	41.60			
1AP210 out	19.250	9,969.40			
1AE205 out	19.250	9,514.39			
1DP210 out	19.250	9,645.20			
1BP210 out	19.250	9,881.56			
1B1E201 out	19.250	9,574.05			
1BE205 out	19.250	9,249.01			
1B2E201 out	19.250	9,915.20			
1AT205 recirc.	1.939	22.87			
1BT205 recirc.	2.067	24.78			
1AP202-1 out	0.957	23.32			
1AP202-2 out	0.957	9.87			
1CP202-1 out	0.957	28.46			
1CP202-2 out	0.957	10.33			
1CVH210 out	3.068	125.53			
1GVH210 out	3.068	131.05			
1EVH210 out	3.068	142.80			
1AVH210 out	3.068	142.06			

!! Reverse Flow Through Check Valve

** Flow Below Minimum

&& Pump Flow is Past End of Curve

\$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1AVH209 out	3.068	77.14			
1BVH209 out	3.068	105.11			
1AVH208 out	1.939	32.13			
1BVH208 out	1.939	31.65			
1FVH210 out	3.068	148.08			
1BVH210 out	3.068	148.34			
1BP202-1 out	0.957	28.47			
1BP202-2 out	0.957	10.15			
1DP202-1 out	0.957	25.68			
1DP202-2 out	0.957	9.97			
1DVH210 out	3.068	144.21			
1HVH210 out	3.068	144.08			
1AVH213 out	4.026	417.44			
1GVH211 out	3.068	112.33			
1CVH211 out	3.068	111.79			
1FVH213 out	4.026	419.56			
1BVH213 out	4.026	423.17			
1CVH213 out	4.026	412.10			
1DVH213 out	4.026	415.01			
1EVH213 out	4.026	408.32			
1AK202 out	0.957	6.17			

!! Reverse Flow Through Check Valve
 ** Flow Below Minimum

&& Pump Flow is Past End of Curve
 \$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Flow Summary Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-1

LOP/SSE - EOB Failure

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1BK202 out	0.937	5.94			
1AE202 out	7.981	1,178.39			
1BE202 out	7.981	1,153.86			
1HVB211 out	3.068	112.15			
1DVB211 out	3.068	111.60			
1FVB211 out	3.068	111.45			
1BVB211 out	3.068	111.57			
1AVB211 out	3.068	111.27			
1EVB211 out	3.068	111.24			
1AE328/1BE328 comb. out	0.546	10.94			
1AE328/1BE328 out	0.546	10.94			
1AK400 out	6.065	2,089.26			
1AVE412 out	6.065	450.72			
1EVE412	6.065	527.56			
1EVE412 out	6.065	528.03			
1AE408/405/404 out	7.981	1,081.12			
1CVE412 out	6.065	454.45			
1GVE412 out	6.065	532.41			
1CE408/405/404 out	7.981	1,090.13			
1BVE412 out	6.065	524.52			
1FVE412 out	6.065	524.52			

!! Reverse Flow Through Check Valve
 ** Flow Below Minimum

&& Pump Flow is Past End of Curve
 \$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1DVE412 out	6.065	520.56			
1HVE412 out	6.065	607.27			
1BE408/405/404 out	7.981	1,075.35			
1BK400 out	6.065	1,842.96			
1DE408/405/404 out	7.981	1,068.99			
1AK403 out	6.065	569.50			
1BK403 out	6.065	580.84			
RE4859B2 out	0.957	12.75			
RE4859A2 out	0.957	11.78			

!! Reverse Flow Through Check Valve
** Flow Below Minimum

&& Pump Flow is Past End of Curve
\$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

10K107

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: American Std.

Model: 06060

Dwgs: PM050-0022-5

System Fluid:

Heat Load =

5,412,000.00 BTU/hr

1A1E118

HX Type: Fixed Heat Load

HX Status: Off

Mfr: DeLaval/IMO

Model: MDE1328000

Dwgs: PM012-0099

System Fluid:

Heat Load =

0.00 BTU/hr

1A1E201

HX Type: Shell & Tube

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 92-6-504 CGN

Dwgs: PM069Q-0058

Tube Fluid: Brackish Water - 12 ppt

Shell Fluid: Fresh Water

Shell Flow = 9,743.90

Shell Temperatures = 117.06°F - 99.68°F

Tube Flow = 7,363.00

Tube Temperatures = 87.96°F - 110.96°F

Construction Type: TEMA-G

1 Shells, 0 Shell Passes, 4 Tube Passes

Shell Min Area = 6.2530 ft², Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft², K = 0.000

Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50

Tube Pitch = 0.9375 in

Tube Pitch Type = Triangular

5,700 of 5,700 Tubes Active

UTubes = No

Effective Area = 46,295.00 ft²

Area Factor = 0.9849

Fouling = 0.0000 (inside) 0.0012 (outside)

Hoff = 0.4888

LMTD = 8.6049

LMTD Corrections FF = 0.7487 Fb = 1.0000

Heat Load =

83,768,336.04 BTU/hr

UOverall = 280.88 BTU/hr/ft²/°F

1A2E118

HX Type: Fixed Heat Load

HX Status: Off

Mfr: DeLaval/IMO

Model: MDE1328000

Dwgs: PM012-0099

System Fluid:

Heat Load =

0.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E+2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1A2E201	HX Type: Shell & Tube	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 92-6-504 CGN	Dwgs: PM069Q-0058
Tube Fluid: Brackish Water - 12 ppt		Shell Fluid: Fresh Water
Shell Flow = 10,226.85	Shell Temperatures = 117.06°F - 100.27°F	
Tube Flow = 7,332.00	Tube Temperatures = 87.96°F - 111.38°F	
Construction Type: TEMA-G		
1 Shells, 0 Shell Passes, 4 Tube Passes		
Shell Min Area = 6.2530 ft^2, Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000		
Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft^2, K = 0.000		
Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50		
Tube Pitch = 0.9375 in	Tube Pitch Type = Triangular	
5,700 of 5,700 Tubes Active	UTubes = No	
Effective Area = 46,295.00 ft^2	Area Factor = 0.9849	
Fouling = 0.0000 (inside) 0.0012 (outside)	Hoff = 0.4888	
LMTD = 8.5714	LMTD Corrections FF = 0.7548 Fb = 1.0000	
Heat Load =	84,933,112.89 BTU/hr	UOverall = 283.58 BTU/hr/ft^2/°F

1A2E109	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Basco Inc.	Model: 8A43A08048	Dwgs: P1-342287
System Fluid:		
Heat Load =	0.00 BTU/hr	

1A2E111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 264A4808	Dwgs: PM003-TR-18-5
System Fluid:		
Heat Load =	515,000.00 BTU/hr	

1A2E112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	42,300.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E+2 Friction=1.0E-5 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1AE115	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: H.K. Porter Co	Model: T-140963X45	Dwgs: PE005-0012-9
System Fluid:		
Heat Load =	10,750.00 BTU/hr	
1AE116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 155B8243P001	Dwgs: PM003-T6-1-2
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	
1AE117	HX Type: Fixed Heat Load	HX Status: Off
Mfr: General Elect.	Model: MDE0924300	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE126	HX Type: Fixed Heat Load	HX Status: Off
Mfr: American Std.	Model: 5-046-17-168-3	Dwgs: N1-B31-S1-120
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE130	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE202	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Alfa-Laval Inc.	Model: A-20-BXS	Dwgs: PM071Q-0010
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E+2 Friction=1.0E-5 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1AE205	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Delta Southern	Model: 21A9227AN	Dwgs: N0-E11-B001-5
System Fluid: Fresh Water		
Tube Flow = 9,450.78	Tube Temperatures = 100.01°F - 128.23°F	
Heat Load =	132,500,000.00 BTU/hr	
1AE214	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	
1AE218	HX Type: Fixed Heat Load	HX Status: Off
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE278	HX Type: Fixed Heat Load	HX Status: Off
Mfr: CVI Inc.	Model:	Dwgs: PM048Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE328	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Parker-Hanison	Model: HDTC-SS-6-2	Dwgs:
System Fluid:		
Shell Flow = 5.03	Shell Temperatures = 100.01°F - 122.01°F	
Heat Load =	55,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1AE404

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: American Std.

Model: 17072 CPT

Dwgs: PM018Q

System Fluid: Fresh Water

Tube Flow = 1,080.45

Tube Temperatures = 115.96°F - 118.49°F

Heat Load =

1,353,000.00 BTU/hr

1AE405

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: American Std.

Model: 19084 CPT

Dwgs: PM018Q

System Fluid: Fresh Water

Tube Flow = 1,077.93

Tube Temperatures = 105.84°F - 115.96°F

Heat Load =

5,412,000.00 BTU/hr

1AE408

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: American Std.

Model: 19198

Dwgs: PM018Q

System Fluid: Fresh Water

Tube Flow = 1,076.60

Tube Temperatures = 100.01°F - 105.84°F

Heat Load =

3,118,000.00 BTU/hr

1AK111

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Carrier Corp.

Model: 19FA553B5005932

Dwgs: PM623-0002-9

System Fluid:

Heat Load =

502,781.00 BTU/hr

1AK202

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: CVI Inc.

Model: C735-9909

Dwgs: PM048Q-0044-2

System Fluid: Fresh Water

Tube Flow = 6.15

Tube Temperatures = 100.01°F - 116.38°F

Heat Load =

50,000.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FLOW=1.0E-4 PCV=1.0E-3 Temperature=5.0E-2

LOP/SSE - EOB Failure

1AK400	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA455B122022	Dwgs: PM723Q
System Fluid: Fresh Water		
Tube Flow = 2,086.92	Tube Temperatures = 100.01°F - 107.28°F	
Heat Load =	7,530,700.00 BTU/hr	
1AK403	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA441B1142020	Dwgs: PM723Q
System Fluid: Fresh Water		
Tube Flow = 568.40	Tube Temperatures = 100.01°F - 108.92°F	
Heat Load =	2,515,340.00 BTU/hr	
1AP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	
1AP202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid: Fresh Water		
Tube Flow = 23.15	Tube Temperatures = 100.01°F - 130.44°F	
Heat Load =	350,000.00 BTU/hr	
1AP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 9.86	Tube Temperatures = 100.01°F - 102.05°F	
Heat Load =	10,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1AVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM721Q
System Fluid: Fresh Water		
Tube Flow = 450.25	Tube Temperatures = 100.01°F - 104.93°F	
Heat Load =	1,100,000.00 BTU/hr	
1AVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1AVH116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0033-4
System Fluid:		
Heat Load =	530,000.00 BTU/hr	
1AVH208	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1572400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 32.11	Tube Temperatures = 99.05°F - 101.87°F	
Heat Load =	45,000.00 BTU/hr	
1AVH209	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1571400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 77.09	Tube Temperatures = 100.01°F - 103.01°F	
Heat Load =	115,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1AVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 141.97	Tube Temperatures = 100.01°F - 102.99°F	
Heat Load =	210,000.00 BTU/hr	
1AVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1AVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1B1E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/TMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1B1E201

HX Type: Shell & Tube

HX Status: On / In Flow Path

Mfr: Graham Mfg. Co.

Model: 92-6-504 CGN

Dwgs: PM069Q-0058

Tube Fluid: Brackish Water - 12 ppt

Shell Fluid: Fresh Water

Shell Flow = 9,611.57

Shell Temperatures = 116.42°F - 98.88°F

Tube Flow = 7,679.00

Tube Temperatures = 87.96°F - 109.92°F

Construction Type: TEMA-G

1 Shells, 0 Shell Passes, 4 Tube Passes

Shell Min Area = 6.2530 ft², Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft², K = 0.000

Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50

Tube Pitch = 0.9375 in

Tube Pitch Type = Triangular

5,700 of 5,700 Tubes Active

UTubes = No

Effective Area = 46,295.00 ft²

Area Factor = 0.9849

Fouling = 0.0000 (inside) 0.0012 (outside)

Hoff = 0.4888

LMTD = 8.5194

LMTD Corrections FF = 0.7498 Fb = 1.0000

Heat Load =

83,403,430.97 BTU/hr

UOverall = 282.03 BTU/hr/ft²/°F

1B2E118

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: DeLaval/IMO

Model: MDE1328000

Dwgs: PM012-0099

System Fluid:

Heat Load =

400,000.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1B2E201	HX Type: Shell & Tube	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 92-6-504 CGN	Dwgs: PM069Q-0058
Tube Fluid: Brackish Water - 12 ppt		Shell Fluid: Fresh Water
Shell Flow = 9,953.43	Shell Temperatures = 116.42°F - 99.19°F	
Tube Flow = 7,741.00	Tube Temperatures = 87.96°F - 110.12°F	
Construction Type: TEMA-G		
1 Shells, 0 Shell Passes, 4 Tube Passes		
Shell Min Area = 6.2530 ft ² , Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000		
Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft ² , K = 0.000		
Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50		
Tube Pitch = 0.9375 in	Tube Pitch Type = Triangular	
5,700 of 5,700 Tubes Active	UTubes = No	
Effective Area = 46.295.00 ft ²	Area Factor = 0.9849	
Fouling = 0.0000 (inside) 0.0012 (outside)	Hoff = 0.4888	
LMTD = 8.5293	LMTD Corrections FF = 0.7549 Fb = 1.0000	
Heat Load =	84,839,003.35 BTU/hr	UOverall = 284.62 BTU/hr/ft ² /°F

1BE1109	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco Inc.	Model: 8A44A08048	Dwgs: P1-342287
System Fluid:		
Heat Load =	481,650.00 BTU/hr	

1BE111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 264A4808	Dwgs: PM003-TR-18-5
System Fluid:		
Heat Load =	9,360,000.00 BTU/hr	

1BE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	5,487,500.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-4 FCV=1.0E-4 PCV=1.0E-2 Temperature=5.0E-3

LOP/SSE - EOB Failure

1BE115	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: H.K. Porter Co.	Model: T-140963X45	Dwgs: PE005-0012-9
System Fluid:		
Heat Load =	515,000.00 BTU/hr	
1BE116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 155B8243P001	Dwgs: PM003-T6-1-2
System Fluid:		
Heat Load =	42,500.00 BTU/hr	
1BE117	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: MDE0924300	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	8,050,000.00 BTU/hr	
1BE126	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 5-0046-17-168-3	Dwgs: N1-B31-S1-120
System Fluid:		
Heat Load =	5,630,000.00 BTU/hr	
1BE130	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	42,300.00 BTU/hr	
1BE202	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Alfa-Laval Inc.	Model: A-20-BXS	Dwgs: PM071Q-0010
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-1 Temperature=5.0E-3

LOP/SSE - EOB Failure

1BE205	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Delta Southern	Model: 21A9227AN	Dwgs: N0-E11-B001-5
System Fluid: Fresh Water		
Tube Flow = 9,185.76	Tube Temperatures = 99.05°F - 128.08°F	
Heat Load =	132,500,000.00 BTU/hr	
1BE214	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	9,565.00 BTU/hr	
1BE218	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	10,750.00 BTU/hr	
1BE278	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model:	Dwgs: PM048Q
System Fluid:		
Heat Load =	6,000.00 BTU/hr	
1BE328	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Parker-Hanison	Model: HDTC-SS-6-2	Dwgs:
System Fluid:		
Shell Flow = 5.86	Shell Temperatures = 100.01°F - 118.91°F	
Heat Load =	55,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1BE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,074.69	Tube Temperatures = 115.09°F - 117.63°F	
Heat Load =	1,353,000.00 BTU/hr	
1BE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,072.19	Tube Temperatures = 104.91°F - 115.09°F	
Heat Load =	5,412,000.00 BTU/hr	
1BE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,070.87	Tube Temperatures = 99.05°F - 104.91°F	
Heat Load =	3,118,000.00 BTU/hr	
1BK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	
1BK202	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: CVI Inc.	Model: C735-9909	Dwgs: PM048Q-0044-2
System Fluid: Fresh Water		
Tube Flow = 5.92	Tube Temperatures = 99.05°F - 116.06°F	
Heat Load =	50,000.00 BTU/hr	

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Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1BK400	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA455B122022	Dwgs: PM723Q
System Fluid: Fresh Water		
Tube Flow = 1,839.73	Tube Temperatures = 99.05°F - 107.29°F	
Heat Load =	7,530,700.00 BTU/hr	
1BK403	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA441B1142020	Dwgs: PM723Q
System Fluid: Fresh Water		
Tube Flow = 579.76	Tube Temperatures = 99.05°F - 107.78°F	
Heat Load =	2,515,340.00 BTU/hr	
1BP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	
1BP202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid: Fresh Water		
Tube Flow = 28.30	Tube Temperatures = 99.05°F - 123.94°F	
Heat Load =	350,000.00 BTU/hr	
1BP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 10.14	Tube Temperatures = 99.05°F - 101.04°F	
Heat Load =	10,000.00 BTU/hr	

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Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1BVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 524.06	Tube Temperatures = 99.05°F - 103.28°F	
Heat Load =	1,100,000.00 BTU/hr	
1BVH113	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	0.00 BTU/hr	
1BVH116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0033-4
System Fluid:		
Heat Load =	530,000.00 BTU/hr	
1BVH208	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1572400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 31.63	Tube Temperatures = 99.05°F - 101.92°F	
Heat Load =	45,000.00 BTU/hr	
1BVH209	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1571400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 105.06	Tube Temperatures = 100.01°F - 102.21°F	
Heat Load =	115,000.00 BTU/hr	

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Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1BVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Ftr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 148.25	Tube Temperatures = 99.05°F - 101.90°F	
Heat Load =	210,000.00 BTU/hr	
1BVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1BVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1C1E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/TMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	
1C2E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/TMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	
1CE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	5,487,500.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

ICE130	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amersk/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	42,300.00 BTU/hr	
ICE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,089.47	Tube Temperatures = 115.83°F - 118.34°F	
Heat Load =	1,353,000.00 BTU/hr	
ICE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,086.95	Tube Temperatures = 105.79°F - 115.83°F	
Heat Load =	5,412,000.00 BTU/hr	
ICE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,085.62	Tube Temperatures = 100.01°F - 105.79°F	
Heat Load =	3,118,000.00 BTU/hr	
ICK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

ICP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	
ICP202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid:		
Shell Flow = 28.29	Shell Temperatures = 100.01°F - 124.91°F	
Heat Load =	350,000.00 BTU/hr	
ICP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 10.32	Tube Temperatures = 100.01°F - 101.96°F	
Heat Load =	10,000.00 BTU/hr	
ICVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 453.99	Tube Temperatures = 100.01°F - 104.89°F	
Heat Load =	1,100,000.00 BTU/hr	
ICVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

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Hopk Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1CVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 125.44	Tube Temperatures = 100.01°F - 103.22°F	
Heat Load =	200,000.00 BTU/hr	
1CVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1CVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1DE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	5,487,500.00 BTU/hr	
1DE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,068.33	Tube Temperatures = 115.19°F - 117.74°F	
Heat Load =	1,353,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - ECB Failure

IDE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,065.83	Tube Temperatures = 104.95°F - 115.18°F	
Heat Load =	5,412,000.00 BTU/hr	

IDE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,064.51	Tube Temperatures = 99.05°F - 104.95°F	
Heat Load =	3,118,000.00 BTU/hr	

IDK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	

IDP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	

IDP202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: NI-E11-C002-51
System Fluid: Fresh Water		
Tube Flow = 25.51	Tube Temperatures = 99.05°F - 126.66°F	
Heat Load =	350,000.00 BTU/hr	

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Hopk Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1DP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 9.97	Tube Temperatures = 99.05°F - 101.07°F	
Heat Load =	10,000.00 BTU/hr	
1DVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 520.10	Tube Temperatures = 99.05°F - 103.31°F	
Heat Load =	1,100,000.00 BTU/hr	
1DVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1DVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 144.12	Tube Temperatures = 99.05°F - 101.85°F	
Heat Load =	200,000.00 BTU/hr	
1DVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1DVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1EVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 527.56	Tube Temperatures = 100.01°F - 104.21°F	
Heat Load =	1,100,000.00 BTU/hr	

1EVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

1EVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 142.71	Tube Temperatures = 100.01°F - 102.97°F	
Heat Load =	210,000.00 BTU/hr	

1EVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1EVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 RCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1FVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 524.06	Tube Temperatures = 99.05°F - 103.28°F	
Heat Load =	1,100,000.00 BTU/hr	
1FVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1FVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 147.99	Tube Temperatures = 99.05°F - 101.91°F	
Heat Load =	210,000.00 BTU/hr	
1FVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1FVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=2.0E-3

LOP/SSE - EOB Failure

1GVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 531.94	Tube Temperatures = 100.01°F - 104.17°F	
Heat Load =	1,100,000.00 BTU/hr	

1GVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 130.96	Tube Temperatures = 100.01°F - 103.08°F	
Heat Load =	200,000.00 BTU/hr	

1GVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1HVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 606.81	Tube Temperatures = 99.05°F - 102.70°F	
Heat Load =	1,100,000.00 BTU/hr	

1HVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 144.00	Tube Temperatures = 99.05°F - 101.85°F	
Heat Load =	200,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - EOB Failure

1HVH211

HX Type: Fixed Heat Load

HX Status: Off

Mfr: Amer. Air Fitr.

Model: MDE1573500

Dwgs: PM711Q

System Fluid: Fresh Water

Heat Load =

0.00 BTU/hr



PROTO-POWER CORPORATION
15 THAMES STREET

PHONE: (860) 446-9725

GROTON, CT 06340

FAX: (860) 448-4860

FAX COVER SHEET

FILE NO.: 11-325DATE: 6/3/98TOTAL PAGES (INCLUDING COVER SHEET): 30TO: Rob DeNigroFROM: Peter Arzina

DEPT. _____

FAX NO.: (860) 339-1216FAX NO.: (860) 448-4860

REFERENCE: _____

MESSAGE: Rob,

Here are results for the LOP/SEP with the SEP and redundant room coolers isolated. The EDG Room coolers ~~are~~ Throttle valves are all 25 % with approximately 2200 rpm to each and the RHE flow is 8675 gpm. The required VHS Temperature is 89.8 °F. I've included the pages of the manual valve report with the EDG room cooler throttle valves. Pat

To report transmittal problems or for confirmation, please call (860) 446-9725.

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Hope Creek Generating Station - STACS

Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1DP210 out	19.250	9,828.36			
1BP210 out	19.250	10,072.84			
1B1E201 out	19.250	9,757.52			
1BE205 out	19.250	9,132.09			
1B2E201 out	19.250	10,106.09			
1BT205 recirc.	2.067	24.62			
1AP202-1 out	0.957	22.57			
1AP202-2 out	0.957	9.55			
1CP202-1 out	0.957	27.32			
1CP202-2 out	0.957	9.92			
1CVH210 out	3.068	121.71			
1AVH210 out	3.068	139.50			
1AVH209 out	3.068	77.23			
1AVH208 out	1.939	31.85			
1BVH210 out	3.068	146.04			
1BP202-1 out	0.957	28.09			
1BP202-2 out	0.957	10.01			
1DP202-1 out	0.957	25.51			
1DP202-2 out	0.957	9.91			
1DVH210 out	3.068	146.55			
1FVH213 out	4.026	422.16			

!! Reverse Flow Through Check Valve

** Flow Below Minimum

&& Pump Flow is Past End of Curve

\$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFV - EDG Rm Clrs Throttled - Red Rm Clrs Iso

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1BVH213 out	4.026	425.79			
1CVH213 out	4.026	394.75			
1DVH213 out	4.026	417.57			
1BK202 out	0.957	5.98			
1DVH211 out	3.068	114.52			
1BVH211 out	3.068	114.68			
1AE328/1BE328 comb. out	0.546	12.20			
1AE328/1BE328 out	0.546	12.20			
1AVE412 out	6.065	235.64			
1EVE412	6.065	235.16			
1EVE412 out	6.065	235.64			
1AE408/405/404 out	7.981	1,074.33			
1CVE412 out	6.065	233.53			
1GVE412 out	6.065	233.53			
1CE408/405/404 out	7.981	1,064.76			
1BVE412 out	6.065	232.74			
1FVE412 out	6.065	232.74			
1DVE412 out	6.065	232.20			
1HVE412 out	6.065	232.19			
1BE408/405/404 out	7.981	1,061.10			
1BK400 out	6.065	1,587.89			

!! Reverse Flow Through Check Valve

** Flow Below Minimum

&& Pump Flow is Past End of Curve

\$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
TDE408/405/404 out	7.981	1,058.74			
1BK403 out	6.065	407.97			
RE4859B2 out	0.957	12.99			

!! Reverse Flow Through Check Valve

** Flow Below Minimum

&& Pump Flow is Past End of Curve

\$\$ NPSH Available Below NPSH Required

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Hope Creek Generating Station - STACS

Manual Valve Line-Up Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

Tag	Valve Type	Position	Actual **
V-0104	Ball	100.00%	
V-0105	Ball	100.00%	
V-0106	Ball	100.00%	
V-0107	Ball	100.00%	
V-0108	Ball	100.00%	
V-0109	Ball	100.00%	
V-0112	Plug	65.00%	
V-0116	Plug	70.00%	
V-0120	Plug	70.00%	
V-0124	Plug	65.00%	
V-0128	Plug	70.00%	
V-0132	Plug	65.00%	
V-0138	Butterfly	0.00%	
V-0139	Butterfly	100.00%	
V-0140	Butterfly	100.00%	
V-0141	Butterfly	0.00%	
V-0142	Ball	0.00%	
V-0143	Ball	100.00%	
V-0144	Ball	100.00%	
V-0145	Ball	100.00%	
V-0146	Ball	100.00%	
V-0147	Ball	0.00%	
V-0148	Ball	100.00%	
V-0149	Ball	0.00%	
V-0222	Plug	40.00%	
V-0223	Plug	40.00%	
V-0224	Plug	40.00%	
V-0225	Plug	40.00%	
V-0226	Plug	40.00%	
V-0227	Plug	40.00%	
V-0228	Plug	40.00%	
V-0229	Plug	40.00%	
V-0230	Plug	25.00%	
V-0231	Butterfly	100.00%	

** Actual Position for Partially Open Check Valves

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Hope Creek Generating Station - STACS

Manual Valve Line-Up Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3
LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

Tag	Valve Type	Position	Actual **
V-0233	Butterfly	100.00%	
V-0235	Butterfly	100.00%	
V-0237	Butterfly	100.00%	
V-0238	Ball	100.00%	
V-0241	Ball	100.00%	
V-0242	Plug	25.00%	
V-0244	Ball	100.00%	
V-0245	Plug	25.00%	
V-0247	Ball	100.00%	
V-0248	Plug	25.00%	
V-0250	Ball	100.00%	
V-0251	Plug	25.00%	
V-0253	Ball	100.00%	
V-0254	Plug	25.00%	
V-0256	Ball	100.00%	
V-0257	Plug	25.00%	
V-0259	Ball	100.00%	
V-0260	Plug	25.00%	
V-0270	Butterfly	71.56%	
V-0271	Butterfly	100.00%	
V-0272	Butterfly	100.00%	
V-0273	Butterfly	42.48%	
V-0275	Butterfly	57.55%	
V-0277	Butterfly	57.57%	
V-0278	Gate	100.00%	
V-0279	Gate	100.00%	
V-0280	Gate	100.00%	
V-0281	Plug	51.95%	
V-0282	Gate	100.00%	
V-0283	Gate	100.00%	
V-0284	Plug	51.63%	
V-0285	Gate	100.00%	
V-0286	Gate	0.00%	
V-0287	Plug	51.28%	

** Actual Position for Partially Open Check Valves

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

00E129	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco, Inc.	Model: ES-24/18096	Dwgs: PM050-0039-3
System Fluid:		
Heat Load =	500,000.00 BTU/hr	
00K107	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 06060	Dwgs: PM050-0022-5
System Fluid:		
Heat Load =	2,240,323.00 BTU/hr	
10C150	HX Type: Fixed Heat Load	HX Status: Off
Mfr:	Model:	Dwgs:
System Fluid:		
Heat Load =	0.00 BTU/hr	
10E1110	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco, Inc.	Model: 8A24A08072	Dwgs: P1-342287
System Fluid:		
Heat Load =	515,000.00 BTU/hr	
10E114	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Gen. Elect. Co.	Model: MDE0965400	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	42,300.00 BTU/hr	
10E129	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco, Inc.	Model: ES-24/18096	Dwgs: PM050-0039-3
System Fluid:		
Heat Load =	10,750.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

10K107	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 06060	Dwgs: PM050-0022-5
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	

1A1E118	HX Type: Fixed Heat Load	HX Status: Off
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	0.00 BTU/hr	

1A1E201	HX Type: Shell & Tube	HX Status: On / Not in Flow Path
Mfr: Graham Mfg. Co.	Model: 92-6-504 CGN	Dwgs: PM069Q-0058
Tube Fluid: Brackish Water - 12 ppt		Shell Fluid: Fresh Water
Construction Type: TEMA-G		
1 Shells, 0 Shell Passes, 4 Tube Passes		
Shell Min Area = 6.2530 ft ² , Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000		
Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft ² , K = 0.000		
Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50		
Tube Pitch = 0.9375 in	Tube Pitch Type = Triangular	
5,700 of 5,700 Tubes Active	UTubes = No	
Effective Area = 46,295.00 ft ²	Area Factor = 0.9849	
Fouling = 0.0000 (inside) 0.0012 (outside)	Hoff = 0.4888	
LMTD = 0.0000	LMTD Corrections FF = 0.0000 Fb = 0.0000	
Heat Load =	0.00 BTU/hr	UOverall = 0.00 BTU/hr/ft ² /°F

1A2E118	HX Type: Fixed Heat Load	HX Status: Off
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1A2E201

HX Type: Shell & Tube

HX Status: On / Not in Flow Path

Mfr: Graham Mfg. Co.

Model: 92-6-504 CGN

Dwgs: PM069Q-0058

Tube Fluid: Brackish Water - 12 ppt

Shell Fluid: Fresh Water

Construction Type: TEMA-G

1 Shells, 0 Shell Passes, 4 Tube Passes

Shell Min Area = 6.2530 ft², Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft², K = 0.000

Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50

Tube Pitch = 0.9375 in

Tube Pitch Type = Triangular

5,700 of 5,700 Tubes Active

UTubes = No

Effective Area = 46,295.00 ft²

Area Factor = 0.9849

Fouling = 0.0000 (inside) 0.0012 (outside)

Hoff = 0.4888

LMTD = 0.0000

LMTD Corrections FF = 0.0000 Fb = 0.0000

Heat Load =

0.00 BTU/hr

UOverall = 0.00 BTU/hr/ft²/°F

1AE1109

HX Type: Fixed Heat Load

HX Status: Off

Mfr: Basco Inc.

Model: 8A43A05048

Dwgs: P1-342287

System Fluid:

Heat Load =

0.00 BTU/hr

1AE111

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: General Elect.

Model: 264A4808

Dwgs: PM003-TR-18-5

System Fluid:

Heat Load =

515,000.00 BTU/hr

1AE112

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: General Elect.

Model: 114D8270

Dwgs: PM003-G-1-7

System Fluid:

Heat Load =

42,300.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Ctrs Throttled - Red Rm Ctrs Iso

1AE115	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: H.K. Porter Co.	Model: T-140963X45	Dwgs: PE005-0012-9
System Fluid:		
Heat Load =	10,750.00 BTU/hr	
1AE116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 155B8243P001	Dwgs: PM003-T6-1-2
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	
1AE117	HX Type: Fixed Heat Load	HX Status: Off
Mfr: General Elect.	Model: MDE0924300	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE126	HX Type: Fixed Heat Load	HX Status: Off
Mfr: American Std	Model: 5-046-17-168-3	Dwgs: N1-B31-S1-120
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE130	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Ametek/Whitlock	Model: 4-W18HI-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE202	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Alfa-Laval Inc.	Model: A-20-BXS	Dwgs: PM071Q-0010
System Fluid:		
Heat Load =	16,100,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Slip Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Ctrs Throttled - Red Rm Ctrs Iso

1AE205	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Delta Southern	Model: 21A9227AN	Dwgs: N0-E11-B001-5
System Fluid:		
Heat Load =	132,500,000.00 BTU/hr	
1AE214	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	
1AE218	HX Type: Fixed Heat Load	HX Status: Off
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE275	HX Type: Fixed Heat Load	HX Status: Off
Mfr: CVI Inc.	Model:	Dwgs: PM048Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE328	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Parker-Hanison	Model: HDTC-SS-6-2	Dwgs:
System Fluid:		
Shell Flow = 5.61	Shell Temperatures = 100.00°F - 119.73°F	
Heat Load =	55,000.00 BTU/hr	
1AE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1.073.66	Tube Temperatures = 116.06°F - 118.60°F	
Heat Load =	1,353,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Ctrs Throttled - Red Rm Ctrs Iso

1AE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1.071 14	Tube Temperatures = 105.87°F - 116.06°F	
Heat Load =	5,412,000.00 BTU/hr	
1AE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1.069.81	Tube Temperatures = 100.00°F - 105.87°F	
Heat Load =	3,118,000.00 BTU/hr	
1AK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1AK202	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9909	Dwgs: PM048Q-0044-2
System Fluid:		
Heat Load =	50,000.00 BTU/hr	
1AK400	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA455B122022	Dwgs: PM723Q
System Fluid:		
Heat Load =	7,530,700.00 BTU/hr	
1AK403	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA441B1142020	Dwgs: PM723Q
System Fluid:		
Heat Load =	2,515,340.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDCs X-Tied - No SFP - EDG Rm Ctrs Throttled - Red Rm Ctrs Iso

1AP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	

1AP202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid: Fresh Water		
Tube Flow = 22.40	Tube Temperatures = 100.00°F - 131.46°F	
Heat Load =	350,000.00 BTU/hr	

1AP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 9.55	Tube Temperatures = 100.00°F - 102.11°F	
Heat Load =	10,000.00 BTU/hr	

1AVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 235.16	Tube Temperatures = 100.00°F - 109.42°F	
Heat Load =	1,100,000.00 BTU/hr	

1AVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E+2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

1AVH116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0033-4
System Fluid:		
Heat Load =	530,000.00 BTU/hr	

1AVH208	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1572400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 31.82	Tube Temperatures = 100.00°F - 105.70°F	
Heat Load =	90,000.00 BTU/hr	

1AVH209	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1571400	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 77.13	Tube Temperatures = 100.00°F - 106.01°F	
Heat Load =	230,000.00 BTU/hr	

1AVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 139.33	Tube Temperatures = 100.00°F - 106.07°F	
Heat Load =	420,000.00 BTU/hr	

1AVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-3 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1AVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid:		
Heat Load =	0.00 BTU/hr	

1B1E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	

1B1E201	HX Type: Shell & Tube	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 92-6-504 CGN	Dwgs: PM069Q-0058
Tube Fluid: Brackish Water - 12 ppt		Shell Fluid: Fresh Water
Shell Flow = 9,801.78	Shell Temperatures = 119.69°F - 99.84°F	
Tube Flow = 10,106.00	Tube Temperatures = 91.10°F - 110.36°F	
Construction Type: TEMA-G		
1 Shells, 0 Shell Passes, 4 Tube Passes		
Shell Min Area = 6.2530 ft^2, Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000		
Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft^2, K = 0.000		
Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50		
Tube Pitch = 0.9375 in	Tube Pitch Type = Triangular	
5,700 of 5,700 Tubes Active	UTubes = No	
Effective Area = 46,295.00 ft^2	Area Factor = 0.9849	
Fouling = 0.0000 (inside) 0.0012 (outside)	Hoff = 0.4888	
LMTD = 9.0295	LMTD Corrections FF = 0.7691 Fb = 1.0000	
Heat Load =	96,201,131.38 BTU/hr	UOverall = 299.23 BTU/hr/ft^2/°F

1B2E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

1B2E201

HX Type: Shell & Tube

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 92-6-504 CGN

Dwgs: PM069Q-0058

Tube Fluid: Brackish Water - 12 ppt

Shell Fluid: Fresh Water

Shell Flow = 10,151.31

Shell Temperatures = 119.69°F - 100.13°F

Tube Flow = 10,190.00

Tube Temperatures = 91.10°F - 110.58°F

Construction Type: TEMA-G

1 Shells, 0 Shell Passes, 4 Tube Passes

Shell Min Area = 6.2530 ft², Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft², K = 0.000

Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50

Tube Pitch = 0.9375 in

Tube Pitch Type = Triangular

5.700 of 5.700 Tubes Active

UTubes = No

Effective Area = 46,295.00 ft²

Area Factor = 0.9849

Fouling = 0.0000 (inside) 0.0012 (outside)

Hoff = 0.4888

LMTD = 9.0683

LMTD Corrections FF = 0.7740 Fb = 1.0000

Heat Load =

98,139,000.95 BTU/hr

UOverall = 302.01 BTU/hr/ft²/°F

1BE1109

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Basco Inc.

Model: 8A44A08048

Dwgs: P1-342287

System Fluid:

Heat Load =

481,650.00 BTU/hr

1BE111

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: General Elect.

Model: 264A4808

Dwgs: PM003-TR-18-5

System Fluid:

Heat Load =

9,360,000.00 BTU/hr

1BE112

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: General Elect.

Model: 114D8270

Dwgs: PM003-G-1-7

System Fluid:

Heat Load =

5,487,500.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Ctrs Throttled - Red Rm Ctrs Iso

1BE115	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: H.K. Porter Co	Model: T-140963X45	Dwgs: PE005-0012-9
System Fluid:		
Heat Load =	515,000.00 BTU/hr	
1BE116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect	Model: 155B8243P001	Dwgs: PM003-T6-1-2
System Fluid:		
Heat Load =	42,500.00 BTU/hr	
1BE117	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect	Model: MDE0924300	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	8,050,000.00 BTU/hr	
1BE126	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std	Model: 5-0046-17-168-3	Dwgs: N1-B31-S1-120
System Fluid:		
Heat Load =	5,630,000.00 BTU/hr	
1BE130	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	42,300.00 BTU/hr	
1BE202	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Alfa-Laval Inc.	Model: A-20-BXS	Dwgs: PM071Q-0010
System Fluid:		
Heat Load =	8,200,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

1BE205	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Delta Southern	Model: 21A9227AN	Dwgs: N0-E11-B001-5
System Fluid: Fresh Water		
Tube Flow = 9,068.12	Tube Temperatures = 100.00°F - 129.42°F	
Heat Load =	132,500,000.00 BTU/hr	
1BE214	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	9,565.00 BTU/hr	
1BE218	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	10,750.00 BTU/hr	
1BE278	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model:	Dwgs: PM048Q
System Fluid:		
Heat Load =	6,000.00 BTU/hr	
1BE328	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Parker-Hanison	Model: HDTC-SS-6-2	Dwgs:
System Fluid:		
Shell Flow = 6.54	Shell Temperatures = 100.00°F - 116.94°F	
Heat Load =	55,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E+2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1BE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1.060.43	Tube Temperatures = 116.26°F - 118.83°F	
Heat Load =	1,353,000.00 BTU/hr	

1BE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,057.90	Tube Temperatures = 105.94°F - 116.26°F	
Heat Load =	5,412,000.00 BTU/hr	

1BE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,056.57	Tube Temperatures = 100.00°F - 105.94°F	
Heat Load =	3,118,000.00 BTU/hr	

1BK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	

1BK202	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: CVI Inc.	Model: C735-9909	Dwgs: PM048Q-0044-2
System Fluid: Fresh Water		
Tube Flow = 5.95	Tube Temperatures = 100.00°F - 116.91°F	
Heat Load =	50,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1BK400

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Carrier Corp.

Model: 19FA455122022

Dwgs: PM723Q

System Fluid: Fresh Water

Tube Flow = 1,584.61

Tube Temperatures = 100.00°F - 109.57°F

Heat Load =

7,530,700.00 BTU/hr

1BK403

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Carrier Corp.

Model: 19FA441B1142020

Dwgs: PM723Q

System Fluid: Fresh Water

Tube Flow = 406.86

Tube Temperatures = 100.00°F - 112.45°F

Heat Load =

2,515,340.00 BTU/hr

1BP176

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Carrier Corp.

Model: 19FA999-1007-18

Dwgs: PM623-118

System Fluid:

Heat Load =

100,000.00 BTU/hr

1BP202-1

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 8X4C-12

Dwgs: N1-E11-C002-51

System Fluid: Fresh Water

Tube Flow = 27.92

Tube Temperatures = 100.00°F - 125.24°F

Heat Load =

350,000.00 BTU/hr

1BP202-2

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 992C430BX

Dwgs: N1-E11-C002-6

System Fluid: Fresh Water

Tube Flow = 10.00

Tube Temperatures = 100.00°F - 102.02°F

Heat Load =

10,000.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

1BVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 232.26	Tube Temperatures = 100.00°F - 109.54°F	
Heat Load =	1,100,000.00 BTU/hr	
1BVH113	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	0.00 BTU/hr	
1BVH116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0033-4
System Fluid:		
Heat Load =	530,000.00 BTU/hr	
1BVH208	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1572400	Dwgs: PM711Q
System Fluid:		
Heat Load =	45,000.00 BTU/hr	
1BVH209	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1571400	Dwgs: PM711Q
System Fluid:		
Heat Load =	115,000.00 BTU/hr	
1BVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 145.86	Tube Temperatures = 100.00°F - 105.80°F	
Heat Load =	420,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1BVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE1573590	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1BVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

1C1E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/TMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	

1C2E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/TMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	

1CE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	5,487,500.00 BTU/hr	

1CE130	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid:		
Heat Load =	42,300.00 BTU/hr	

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Public Service Electric and Gas - GAPSEG11-385NEW UHS STACSUHS2.PDB - Revision 2.00

Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-3 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Ctrs Throttled - Red Rm Ctrs Iso

1CE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,064.09	Tube Temperatures = 116.20°F - 118.77°F	
Heat Load =	1,353,000.00 BTU/hr	

1CE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,061.56	Tube Temperatures = 105.92°F - 116.20°F	
Heat Load =	5,412,000.00 BTU/hr	

1CE408	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,060.23	Tube Temperatures = 100.00°F - 105.92°F	
Heat Load =	3,118,000.00 BTU/hr	

1CK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	

1CP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

1CP202-1	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid:		
Shell Flow = 27.15	Shell Temperatures = 100.00°F - 125.95°F	
Heat Load =	350,000.00 BTU/hr	

1CP202-2	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid: Fresh Water		
Tube Flow = 9.91	Tube Temperatures = 100.00°F - 102.03°F	
Heat Load =	10,000.00 BTU/hr	

1CVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 233.05	Tube Temperatures = 100.00°F - 109.50°F	
Heat Load =	1,100,000.00 BTU/hr	

1CVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	502,781.00 BTU/hr	

1CVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 121.54	Tube Temperatures = 100.00°F - 106.63°F	
Heat Load =	400,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-2 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1CVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1CVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1DE112	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid:		
Heat Load =	5,487,500.00 BTU/hr	
1DE404	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM016Q
System Fluid: Fresh Water		
Tube Flow = 1,058.07	Tube Temperatures = 116.29°F - 118.88°F	
Heat Load =	1,353,000.00 BTU/hr	
1DE405	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 19084 CPI	Dwgs: PM018Q
System Fluid: Fresh Water		
Tube Flow = 1,055.54	Tube Temperatures = 105.96°F - 116.29°F	
Heat Load =	5,412,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum(Q)=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Chrs Throttled - Red Rm Chrs Iso

1DE408

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: American Std

Model: 19198

Dwgs: PM018Q

System Fluid: Fresh Water

Tube Flow = 1,054.21

Tube Temperatures = 100.00°F - 105.96°F

Heat Load =

3,118,000.00 BTU/hr

1DK111

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Carrier Corp.

Model: 19FA553B5005932

Dwgs: PM623-0002-9

System Fluid:

Heat Load =

19,500,000.00 BTU/hr

1DP176

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Carrier Corp.

Model: 19FA999-1007-18

Dwgs: PM623-118

System Fluid:

Heat Load =

100,000.00 BTU/hr

1DP202-1

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 8X4C-12

Dwgs: N1-E11-C002-51

System Fluid: Fresh Water

Tube Flow = 25.34

Tube Temperatures = 100.00°F - 127.80°F

Heat Load =

350,000.00 BTU/hr

1DP202-2

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 992C430BX

Dwgs: N1-E11-C002-6

System Fluid: Fresh Water

Tube Flow = 9.90

Tube Temperatures = 100.00°F - 102.04°F

Heat Load =

10,000.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

(Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3)

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1DVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 231.72	Tube Temperatures = 100.00°F - 109.56°F	
Heat Load =	1,100,000.00 BTU/hr	
1DVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1DVH210	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid: Fresh Water		
Tube Flow = 146.38	Tube Temperatures = 100.00°F - 105.50°F	
Heat Load =	400,000.00 BTU/hr	
1DVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1DVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Cirs Throttled - Red Rm Cirs Iso

1EVE412

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Trane Co.

Model: MDE1291600

Dwgs: PM731Q

System Fluid: Fresh Water

Tube Flow = 235.16

Tube Temperatures = 100.00°F - 109.42°F

Heat Load =

1,100,000.00 BTU/hr

1EVH113

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Amer. Air Fltr.

Model: H36MPACYA

Dwgs: PM611A-0004-7

System Fluid:

Heat Load =

502,781.00 BTU/hr

1EVH210

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Amer. Air Fltr.

Model: MDE1570300

Dwgs: PM711Q

System Fluid:

Heat Load =

210,000.00 BTU/hr

1EVH211

HX Type: Fixed Heat Load

HX Status: Off

Mfr: Amer. Air Fltr.

Model: MDE1573500

Dwgs: PM711Q

System Fluid:

Heat Load =

0.00 BTU/hr

1EVH213

HX Type: Fixed Heat Load

HX Status: Off

Mfr: Amer. Air Fltr.

Model: MDE2478600

Dwgs: PM786Q

System Fluid:

Heat Load =

0.00 BTU/hr

1FVE412

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: Trane Co.

Model: MDE1291600

Dwgs: PM731Q

System Fluid: Fresh Water

Tube Flow = 232.26

Tube Temperatures = 100.00°F - 109.54°F

Heat Load =

1,100,000.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1FVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1FVH210	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	210,000.00 BTU/hr	
1FVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1FVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1GVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 233.05	Tube Temperatures = 100.00°F - 109.51°F	
Heat Load =	1,100,000.00 BTU/hr	
1GVH210	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	200,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-3 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

LOP/SSE - B Loop - 2 EDGs X-Tied - No SFP - EDG Rm Clrs Throttled - Red Rm Clrs Iso

1GVH211	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. air Ftr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid		
Heat Load =	135,000.00 BTU/hr	

1HVE412	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid: Fresh Water		
Tube Flow = 231.71	Tube Temperatures = 100.00°F - 109.56°F	
Heat Load =	1,100,000.00 BTU/hr	

1HVV210	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Ftr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	200,000.00 BTU/hr	

1HVV211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	



PROTO-POWER CORPORATION
15 THAMES STREET

PHONE: (860) 446-9725

GROTON, CT 06340

FAX: (860) 448-4860

FAX COVER SHEET

FILE NO.: 11-385DATE: 6/4/98TOTAL PAGES (INCLUDING COVER SHEET): 27TO: Rob DeMiguelFROM: Peter Anglin

DEPT. _____

FAX NO.: (609) 339-1218FAX NO.: (860) 448-4860

REFERENCE: _____

MESSAGE: Rob,

Here are results for normal operation with two loops. The required UHS
Temperature is 89.1 °F. The second SACS loop is at approximately 91.2 °F.

Peter

To report transmittal problems or for confirmation, please call (860) 446-9725.

6/4/98 12:22

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 Hope Creek Generating Station - STACS

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Flow Summary Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-7 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
1AE112 out	6.065	546.81			
1BE112 out	6.065	502.93			
1CE112 out	6.065	502.93			
1DE112 out	6.065	535.51			
1AVH113 out	4.026	204.61			
1BVH113 out	4.026	204.55			
1EVH113 out	4.026	204.75			
1DVH113 out	4.026	198.29			
1AVH116 out	4.026	214.95			
1CE118 out	3.068	154.39			
1BE118 out	3.068	144.58			
1AE118 out	3.068	137.90			
1BE126 out	7.981	1,230.18			
1AE126 out	7.981	1,224.14			
1BK111 out	13.250	3,500.31			
1AK111 out	13.250	3,500.30			
1DK111 out	13.250	3,500.22			
10C150 out	3.068	14.69			
10K107 out	1.939	162.68			
1CE130 out	0.957	18.00			
1AE130 out	0.957	16.70			

!! Reverse Flow Through Check Valve
 ** Flow Below Minimum

&& Pump Flow is Past End of Curve
 \$\$ NPSH Available Below NPSH Required

6/4/98 12:22

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Hope Creek Generating Station - STACS

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Flow Summary Report

Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

Flow Summary Title	Diameter (in)	Flow (gpm)	Minimum Flow (gpm)	NPSHA (ft)	NPSH Ratio
TBE130 out	0.957	18.00			
1AT216/1BT216 out	1.939	51.14			
1BK403 out	6.065	408.01			
RE4859B2 out	0.957	9.59			

!! Reverse Flow Through Check Valve
** Flow Below Minimum

&& Pump Flow is Past End of Curve
\$\$ NPSH Available Below NPSH Required

6/4/98 12:22

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

00E129	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco, Inc.	Model: ES-24/18096	Dwgs: PM050-0039-3
System Fluid:		
Heat Load =	574,700.00 BTU/hr	
00K107	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 06060	Dwgs: PM050-0022-5
System Fluid:		
Heat Load =	392,415.00 BTU/hr	
10C150	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr:	Model:	Dwgs:
System Fluid: Fresh Water		
Tube Flow = 14.42	Tube Temperatures = 95.00°F - 164.72°F	
Heat Load =	500,000.00 BTU/hr	
10E110	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Basco, Inc.	Model: 8A24A08072	Dwgs: P1-342287
System Fluid:		
Heat Load	9,360,000.00 BTU/hr	
10E114	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Gen. Elect. Co.	Model: MDE0965400	Dwgs: PM003-G-1-7
System Fluid: Fresh Water		
Tube Flow = 203.62	Tube Temperatures = 95.00°F - 98.87°F	
Heat Load =	392,000.00 BTU/hr	
10E129	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Basco, Inc.	Model: ES-24/18096	Dwgs: PM050-0039-3
System Fluid:		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

10K107

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: American Std.

Model: 06060

Dwgs: PM050-0022-5

System Fluid: Fresh Water

Tube Flow = 161.66

Tube Temperatures = 95.00°F - 122.86°F

Heat Load =

2,240,000.00 BTU/hr

1A1E118

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: DuLaval/TMO

Model: MDE1328000

Dwgs: PM012-0099

System Fluid: Fresh Water

Tube Flow = 137.74

Tube Temperatures = 95.00°F - 100.84°F

Heat Load =

400,000.00 BTU/hr

1A1E201

HX Type: Shell & Tube

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 92-6-504 CGN

Dwgs: PM069Q-0058

Tube Fluid: Brackish Water - 12 ppt

Shell Fluid: Fresh Water

Shell Flow = 10,304.47

Shell Temperatures = 106.90°F - 94.86°F

Tube Flow = 12,620.00

Tube Temperatures = 90.47°F - 100.33°F

Construction Type: TEMA-G

1 Shells, 0 Shell Passes, 4 Tube Passes

Shell Min Area = 6.2530 ft², Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft², K = 0.000

Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50

Tube Pitch = 0.9375 in

Tube Pitch Type = Triangular

5,700 of 5,700 Tubes Active

UTubes = No

Effective Area = 46,295.00 ft²

Area Factor = 0.9849

Fouling = 0.0000 (inside) 0.0012 (outside)

Hoff = 0.4888

LMTD = 5.4025

LMTD Corrections FF = 0.7981 Fb = 1.0000

Heat Load =

61,546,146.41 BTU/hr

UOverall = 308.31 BTU/hr/ft²/°F

6/4/98 12:22

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1A2E118

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: DeLaval/IMO

Model: MDE1328000

Dwgs: PM012-0099

System Fluid:

Heat Load =

502,781.00 BTU/hr

1A2E201

HX Type: Shell & Tube

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 92-6-504 CGN

Dwgs: PM069Q-0058

Tube Fluid: Brackish Water - 12 ppt

Shell Fluid: Fresh Water

Shell Flow = 10,810.80

Shell Temperatures = 106.90°F - 95.15°F

Tube Flow = 12,562.00

Tube Temperatures = 90.47°F - 100.62°F

Construction Type TEMA-G

1 Shells, 0 Shell Passes, 4 Tube Passes

Shell Min Area = 6.2530 ft², Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft², K = 0.000

Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50

Tube Pitch = 0.9375 in

Tube Pitch Type = Triangular

5,700 of 5,700 Tubes Active

UTubes = No

Effective Area = 46,295.00 ft²

Area Factor = 0.9849

Fouling = 0.0000 (inside) 0.0012 (outside)

Hoff = 0.4888

LMTD = 5.4412

LMTD Corrections FF = 0.8031 Fb = 1.0000

Heat Load =

63,008,246.26 BTU/hr

UOverall = 311.48 BTU/hr/ft²/°F

1A2E109

HX Type: Fixed Heat Load

HX Status: Off

Mfr: Basco Inc.

Model: 8A43A08048

Dwgs: P1-342287

System Fluid:

Heat Load =

0.00 BTU/hr

1A2E111

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: General Elect

Model: 264A4808

Dwgs: PM003-TR-18-5

System Fluid: Fresh Water

Tube Flow = 1,721.29

Tube Temperatures = 95.00°F - 105.93°F

Heat Load =

9,360,000.00 BTU/hr

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Hopewick Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1AE112	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid: Fresh Water		
Tube Flow = 544.41	Tube Temperatures = 95.00°F - 115.26°F	
Heat Load =	5,487,500.00 BTU/hr	

1AE115	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: H.K. Porter Co.	Model: T-140963X45	Dwgs: PE005-0012-9
System Fluid: Fresh Water		
Tube Flow = 66.05	Tube Temperatures = 95.00°F - 110.67°F	
Heat Load =	515,000.00 BTU/hr	

1AE116	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: General Elect.	Model: 155B8243P001	Dwgs: PM003-T6-1-2
System Fluid: Fresh Water		
Tube Flow = 10.00	Tube Temperatures = 95.00°F - 103.64°F	
Heat Load =	43,000.00 BTU/hr	

1AE117	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: General Elect.	Model: MDE0924300	Dwgs: PM003-G-1-7
System Fluid: Fresh Water		
Tube Flow = 1,157.54	Tube Temperatures = 95.00°F - 108.98°F	
Heat Load =	8,050,000.00 BTU/hr	

1AE126	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 5-046-17-168-3	Dwgs: N1-B31-S1-120
System Fluid: Fresh Water		
Tube Flow = 1,221.83	Tube Temperatures = 95.00°F - 104.26°F	
Heat Load =	5,630,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1AE130	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Armetek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid: Fresh Water		
Tube Flow = 16.68	Tube Temperatures = 95.00°F - 100.06°F	
Heat Load =	42,000.00 BTU/hr	
1AE202	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Alfa-Laval Inc.	Model: A-20-BXS	Dwgs: PM071Q-0010
System Fluid: Fresh Water		
Tube Flow = 1,310.80	Tube Temperatures = 91.19°F - 103.53°F	
Heat Load =	8,050,000.00 BTU/hr	
1AE205	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Delta Southern	Model: 21A9227AN	Dwgs: N0-E11-B001-5
System Fluid:		
Heat Load =	400,000.00 BTU/hr	
1AE214	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	
1AE218	HX Type: Fixed Heat Load	HX Status: Off
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AE278	HX Type: Fixed Heat Load	HX Status: Off
Mfr: CVI Inc.	Model:	Dwgs: PM048Q
System Fluid:		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

(Convergence Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1AE328	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Parker-Hanison	Model: HDTC-SS-6-2	Dwgs:
System Fluid:		
Heat Load =	1,353,000.00 BTU/hr	
1AE404	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid:		
Heat Load =	100,000.00 BTU/hr	
1AE405	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1AE408	HX Type: Fixed Heat Load	HX Status: Off
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AK111	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid: Fresh Water		
Tube Flow = 3,492.21	Tube Temperatures = 95.00°F - 106.22°F	
Heat Load =	19,500,000.00 BTU/hr	
1AK202	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9909	Dwgs: PM048Q-0044-2
System Fluid:		
Heat Load =	50,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1AK400	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA455B122022	Dwgs: PM723Q
System Fluid:		
Heat Load =	7,530,000.00 BTU/hr	
1AK403	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA441B1142020	Dwgs: PM723Q
System Fluid:		
Heat Load =	2,520,000.00 BTU/hr	
1AP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	
1AP202-1	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid:		
Heat Load =	90,000.00 BTU/hr	
1AP202-2	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430RX	Dwgs: N1-E11-C002-6
System Fluid:		
Heat Load =	10,000.00 BTU/hr	
1AVE412	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid:		
Heat Load =	880,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E+2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1AVH113	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid: Fresh Water		
Tube Flow = 204.41	Tube Temperatures = 95.00°F - 99.95°F	
Heat Load =	503,000.00 BTU/hr	
1AVH116	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0033-4
System Fluid: Fresh Water		
Tube Flow = 214.75	Tube Temperatures = 95.00°F - 99.71°F	
Heat Load =	503,000.00 BTU/hr	
1AVH208	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1572400	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1AVH209	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1571400	Dwgs: PM711Q
System Fluid:		
Heat Load =	107,139.00 BTU/hr	
1AVH210	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	211,655.00 BTU/hr	
1AVH211	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	138,696.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1AVH213

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Amer. Air Fltr

Model: MDE2478600

Dwgs: PM786Q

System Fluid:

Heat Load = 1,092,643.00 BTU/hr

1B1E118

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: DeLaval/IMO

Model: MDE1328000

Dwgs: PM012-0099

System Fluid: Fresh Water

Tube Flow = 144.42

Tube Temperatures = 95.00°F - 100.57°F

Heat Load = 400,000.00 BTU/hr

1B1E201

HX Type: Shell & Tube

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 92-6-504 CGN

Dwgs: PM069Q-0058

Tube Fluid: Brackish Water - 12 ppt

Shell Fluid: Fresh Water

Shell Flow = 7,162.11

Shell Temperatures = 94.80°F - 91.18°F

Tube Flow = 12,352.00

Tube Temperatures = 90.47°F - 92.58°F

Construction Type: TEMA-G

1 Shells, 0 Shell Passes, 4 Tube Passes

Shell Min Area = 6.2530 ft², Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft², K = 0.000

Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50

Tube Pitch = 0.9375 in

Tube Pitch Type: Triangular

5,700 of 5,700 Tubes Active

UTubes = No

Effective Area = 46,295.00 ft²

Area Factor = 0.9849

Fouling = 0.0000 (inside) 0.0012 (outside)

Hoff = 0.4888

LMTD = 1.3231

LMTD Corrections FF = 0.7582 Fb = 1.0000

Heat Load = 12,896,523.00 BTU/hr

UOverall = 277.68 BTU/hr/ft²/°F

1B2E118

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: DeLaval/IMO

Model: MDE1328000

Dwgs: PM012-0099

System Fluid:

Heat Load = 400,000.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1B2E201

HX Type: Shell & Tube

HX Status: On / in Flow Path

Mfr: Graham Mfg. Co.

Model: 92-6-504 CGN

Dwgs: PM069Q-0058

Tube Fluid: Brackish Water - 12 ppt

Shell Fluid: Fresh Water

Shell Flow = 7,413.13

Shell Temperatures = 94.80°F - 91.21°F

Tube Flow = 12,458.00

Tube Temperatures = 90.47°F - 92.62°F

Construction Type: TEMA-G

1 Shells, 0 Shell Passes, 4 Tube Passes

Shell Min Area = 6.2530 ft², Design Shell Velocity = 3.900 ft/s, Shell Diameter = 92.000Baffle Info: Spacing = 62.000 in, Thickness = 0.000 in, Area = 0.000 ft², K = 0.000

Tubes: Din = 0.694 in, Dout = 0.750 in, Length = 42.00 ft, K = 9.50

Tube Pitch = 0.9375 in

Tube Pitch Type = Triangular

5,700 of 5,700 Tubes Active

UTubes = No

Effective Area = 46,295.00 ft²

Area Factor = 0.9849

Fouling = 0.0000 (inside) 0.0012 (outside)

Hoff = 0.4888

LMTD = 1.3346

LMTD Corrections FF = 0.7634 Fb = 1.0000

Heat Load =

13,228,817.98 BTU/hr

UOverall = 280.48 BTU/hr/ft²/°F

1BE1109

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: Basco Inc.

Model: 8A44A08048

Dwgs: P1-342287

System Fluid:

Heat Load =

481,650.00 BTU/hr

1BE111

HX Type: Fixed Heat Load

HX Status: On / Not in Flow Path

Mfr: General Elect.

Model: 264A4808

Dwgs: PM003-TR-18-5

System Fluid:

Heat Load =

9,360,000.00 BTU/hr

1BE112

HX Type: Fixed Heat Load

HX Status: On / in Flow Path

Mfr: General Elect.

Model: 114D8270

Dwgs: PM003-G-1-7

System Fluid: Fresh Water

Tube Flow = 500.51

Tube Temperatures = 95.00°F - 117.04°F

Heat Load =

5,487,500.00 BTU/hr

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1BE115	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: H.K. Porter Co.	Model: T-140963X45	Dwgs: PE005-0012-9
System Fluid:		
Heat Load =	515,000.00 BTU/hr	

1BE116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: General Elect.	Model: 155B8243P001	Dwgs: PM003-T6-1-2
System Fluid:		
Heat Load =	42,500.00 BTU/hr	

1BE117	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: General Elect.	Model: MDE0924300	Dwgs: PM003-G-1-7
System Fluid: Fresh Water		
Tube Flow = 1,157.63	Tube Temperatures = 95.00°F - 108.98°F	
Heat Load =	8,050,000.00 BTU/hr	

1BE126	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: American Std.	Model: 5-0046-17-168-3	Dwgs: N1-B31-S1-120
System Fluid: Fresh Water		
Tube Flow = 1,227.87	Tube Temperatures = 95.00°F - 104.22°F	
Heat Load =	5,630,000.00 BTU/hr	

1BE130	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid: Fresh Water		
Tube Flow = 17.98	Tube Temperatures = 95.00°F - 99.69°F	
Heat Load =	42,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1BE202	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Alfa-Laval Inc.	Model: A-20-BXS	Dwgs: PM071Q-0010
System Fluid: Fresh Water		
Tube Flow = 1,347.45	Tube Temperatures = 91.19°F - 103.19°F	
Heat Load =	8,050,000.00 BTU/hr	
1BE205	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Delta Southern	Model: 21A9227AN	Dwgs: N0-E11-B001-5
System Fluid: Fresh Water		
Heat Load =	0.00 BTU/hr	
1BE214	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	9,565.00 BTU/hr	
1BE218	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model: C735-9934	Dwgs: PM048Q-0071-4
System Fluid:		
Heat Load =	10,750.00 BTU/hr	
1BE275	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: CVI Inc.	Model:	Dwgs: PM048Q
System Fluid:		
Heat Load =	6,000.00 BTU/hr	
1BE328	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Parker-Hanison	Model: HDTC-SS-6-2	Dwgs:
System Fluid:		
Heat Load =	55,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1BE404	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid:		
Heat Load =	1,353,000.00 BTU/hr	
1BE405	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	
1BE408	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid:		
Heat Load =	3,118,000.00 BTU/hr	
1BK111	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid: Fresh Water		
Tube Flow = 3,492.21	Tube Temperatures = 95.00°F - 106.22°F	
Heat Load =	19,500,000.00 BTU/hr	
1BK202	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: CVI Inc.	Model: C735-9909	Dwgs: PM048Q-0044-2
System Fluid: Fresh Water		
Tube Flow = 7.42	Tube Temperatures = 91.19°F - 104.73°F	
Heat Load =	50,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1BK400	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA455B122022	Dwgs: PM723Q
System Fluid: Fresh Water		
Tube Flow = 1,585.14	Tube Temperatures = 91.19°F - 100.74°F	
Heat Load =	7,530,000.00 BTU/hr	
1BK403	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA441B1142020	Dwgs: PM723Q
System Fluid: Fresh Water		
Tube Flow = 407.01	Tube Temperatures = 91.19°F - 103.63°F	
Heat Load =	2,520,000.00 BTU/hr	
1BP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	
1BP202-1	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid:		
Heat Load =	0.00 BTU/hr	
1BP202-2	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid:		
Heat Load =	0.00 BTU/hr	
1BVE412	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid:		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-3 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1BVH113	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid: Fresh Water		
Tube Flow = 204.35	Tube Temperatures = 95.00°F - 99.95°F	
Heat Load =	503,000.00 BTU/hr	
1BVH116	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0033-4
System Fluid:		
Heat Load =	530,000.00 BTU/hr	
1BVH208	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1572400	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1BVH209	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1571400	Dwgs: PM711Q
System Fluid:		
Heat Load =	107,139.00 BTU/hr	
1BVH210	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1BVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1BVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1C1E118	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid: Fresh Water		
Tube Flow = 154.23	Tube Temperatures = 95.00°F - 100.21°F	
Heat Load =	400,000.00 BTU/hr	
1C2E118	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: DeLaval/IMO	Model: MDE1328000	Dwgs: PM012-0099
System Fluid:		
Heat Load =	400,000.00 BTU/hr	
1CE112	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid: Fresh Water		
Tube Flow = 500.51	Tube Temperatures = 95.00°F - 117.04°F	
Heat Load =	5,487,500.00 BTU/hr	
1CE130	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Ametek/Whitlock	Model: 4-W18HT-4-A-CB	Dwgs: PM007-0031-3
System Fluid: Fresh Water		
Tube Flow = 17.98	Tube Temperatures = 95.00°F - 99.69°F	
Heat Load =	42,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1CE404	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid:		
Heat Load =	1,353,000.00 BTU/hr	
1CE405	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	
1CE408	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid:		
Heat Load =	3,118,000.00 BTU/hr	
1CK111	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid:		
Heat Load =	19,500,000.00 BTU/hr	
1CP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	
1CP202-1	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: NI-E11-C002-51
System Fluid:		
Heat Load =	90,000.00 BTU/hr	

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Hopc Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 PCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1CP202-2	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid:		
Heat Load =	10,000.00 BTU/hr	
1CVE412	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid:		
Heat Load =	880,000.00 BTU/hr	
1CVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: H36MPACYA	Dwgs: PM611A-0030-4
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1CVH210	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	200,957.00 BTU/hr	
1CVH211	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	138,696.00 BTU/hr	
1CVH213	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fitr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid:		
Heat Load =	1,092,643.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E+2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0F.3

Normal Operation - Two Loops

1DE112	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: General Elect.	Model: 114D8270	Dwgs: PM003-G-1-7
System Fluid: Fresh Water		
Tube Flow = 533.11	Tube Temperatures = 95.00°F - 115.69°F	
Heat Load =	5,487,500.00 BTU/hr	
1DE404	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 17072 CPT	Dwgs: PM018Q
System Fluid:		
Heat Load =	1,353,000.00 BTU/hr	
1DE405	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 19084 CPT	Dwgs: PM018Q
System Fluid:		
Heat Load =	5,412,000.00 BTU/hr	
1DE408	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: American Std.	Model: 19198	Dwgs: PM018Q
System Fluid:		
Heat Load =	3,118,000.00 BTU/hr	
1DK111	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Carrier Corp.	Model: 19FA553B5005932	Dwgs: PM623-0002-9
System Fluid: Fresh Water		
Tube Flow = 3,492.13	Tube Temperatures = 95.00°F - 106.22°F	
Heat Load =	19,500,000.00 BTU/hr	
1DP176	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Carrier Corp.	Model: 19FA999-1007-18	Dwgs: PM623-118
System Fluid:		
Heat Load =	100,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1DP202-1	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Graham Mfg. Co.	Model: 8X4C-12	Dwgs: N1-E11-C002-51
System Fluid:		
Heat Load =	0.00 BTU/hr	
1DP202-2	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Graham Mfg. Co.	Model: 992C430BX	Dwgs: N1-E11-C002-6
System Fluid:		
Heat Load =	0.00 BTU/hr	
1DVE412	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Trans Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1DVH113	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Filtr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid: Fresh Water		
Tube Flow = 198.09	Tube Temperatures = 95.00°F - 100.10°F	
Heat Load =	503,000.00 BTU/hr	
1DVH1210	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Filtr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1DVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Filtr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E+5 Sum Q=1.0E+2 Friction=1.0E+6 PCV=1.0E+4 PCV=1.0E+3 Temperature=5.0E+3

Normal Operation - Two Loops

1DVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1EVE412	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid:		
Heat Load =	880,000.00 BTU/hr	
1EVH113	HX Type: Fixed Heat Load	HX Status: On / in Flow Path
Mfr: Amer. Air Fltr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid: Fresh Water		
Tube Flow = 204.55	Tube Temperatures = 95.00°F - 99.94°F	
Heat Load =	503,000.00 BTU/hr	
1EVH210	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	211,655.00 BTU/hr	
1EVH211	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	138,696.00 BTU/hr	
1EVH213	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid:		
Heat Load =	1,092,643.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1FVE412	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1FVH113	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Ftr.	Model: H36MPACYA	Dwgs: PM611A-0004-7
System Fluid:		
Heat Load =	502,781.00 BTU/hr	
1FVH210	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1FVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1FVH213	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Ftr.	Model: MDE2478600	Dwgs: PM786Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1GVE412	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid:		
Heat Load =	880,000.00 BTU/hr	

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Hope Creek Generating Station - STACS

Heat Exchanger Data Report

Convergence: Pressure=1.0E-5 Sum Q=1.0E-2 Friction=1.0E-6 FCV=1.0E-4 PCV=1.0E-3 Temperature=5.0E-3

Normal Operation - Two Loops

1GVH210	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	200,957.00 BTU/hr	
1GVH211	HX Type: Fixed Heat Load	HX Status: On / Not in Flow Path
Mfr: Amer. air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	138,696.00 BTU/hr	
1HVE412	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Trane Co.	Model: MDE1291600	Dwgs: PM731Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1HVVH210	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1570300	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	
1HVVH211	HX Type: Fixed Heat Load	HX Status: Off
Mfr: Amer. Air Fltr.	Model: MDE1573500	Dwgs: PM711Q
System Fluid:		
Heat Load =	0.00 BTU/hr	

Attachment (4)

**UHS Temperature Limit Evaluation Lineups
(Microsoft Excel Spreadsheet)**

UHS/SSWS/SACS Limiting Configurations - LOCA/LIA

[illegible]

UHS/SSWS/SACS Limiting Configurations - LOP/SSE

A		B		C		D		E		F		G		H		I		J		K		L		M		N		O		P		Q		R		S		T		U		V		W		X		Y		Z																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Attachment 2
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CERTIFICATION FOR DESIGN VERIFICATION

Reference No. H-1-EG-MEE-1301

SUMMARY STATEMENT

A line-by-line check was performed per paragraph 3.1.3 of NC.DE-AP.ZZ-0010. The Verification Checklist was consulted in detail.

The approach taken, of exhaustively examining each possible approach to the problem of raising the permissible river water temperature, and then exhaustively examining each system and alignment cooled by the SACS system, is appropriate. The assumptions and inputs for the evaluation are correct.

The conclusion specifically addresses the purpose of the evaluation. I note the irony that while most of the systems proved capable of dealing with a SACS temperature of 100F, one particular lineup of the SACS system forces the continued use of 95F water.

The undersigned hereby certifies (in the right column) that the design verification for the subject document has been completed, the questions from the generic checklist have been reviewed and addressed as appropriate, and all comments have been adequately incorporated.

Design Verifier Assigned By *MM* Signature of Design Verifier / Date 5 Jun 98
(signature of Manager/Supervisor)

Design Verifier Assigned By _____ Signature of Design Verifier / Date _____
(signature of Manager/Supervisor)

Design Verifier Assigned By _____ Signature of Design Verifier / Date _____
(signature of Manager/Supervisor)

Design Verifier Assigned By _____ Signature of Design Verifier / Date _____
(signature of Manager/Supervisor)

* If the Manager/Supervisor acts as the Design Verifier, the signature of the next higher level of technical management is required.

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CERTIFICATION FOR DESIGN VERIFICATION

REFERENCE DOCUMENT NO. /REV. H-1-EG-MEE-1301			
COMMENTS		RESOLUTION	
The intent of the 3rd paragraph of section 6.7 is unclear: - which coolers isolate? - which EDG room coolers get cross-tied? - does the proposed 25% throttling apply to all EDG room coolers or only redundant coolers? Request you review this section.		Reworked and incorporated. <i>MAM</i>	
The final paragraph of section 6.16 is the heart of the conclusion. Recommend it be moved to section 7		Concur. Incorporated. <i>MAM</i>	
In section 6.4, the GE UHS work requires a reference.		Concur. Incorporated as reference 5.6.33 <i>MAM</i>	
In section 6.3, the design room temperature for the pipe chase requires a reference. Recommend DITS 7.5		Incorporated <i>MAM</i>	
Note typos, punctuation		Corrected <i>MAM</i> 5 Jun 98	
<i>MAM</i> SUBMITTED BY	5 Jun 98 DATE	<i>Robert W. B. J. P.</i> RESOLVED BY	6/5/98 DATE
		Acceptance of Resolution	