



Attached Document

COMPLETE GROUP DATA SHEETS

Flowserve Document Title: COMPLETE GROUP DATA SHEETS

Flowserve Document Number : COS-11-10P40213-1403
Customer Document Number : MM77713

Project Name : KEMPER COUNTY IGCC
Customer Name : MISSISSIPPI POWER COMPANY

End User : KEMPER COUNTY IGCC GF
Site/Location : KEMPER COUNTY IGCC

Flowserve Order/Line : COS-11-10P40213
Equipment Tag No. : MA-PU-3700 A/B
Equipment Type : WXH
Equipment Size : 4X12 WXH 10

Quantity : 2
Equipment Service : GI BOILER FEED

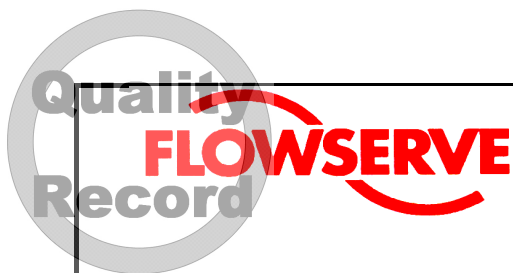
Please complete and return:			
Document Reviewed by:		Document Reviewed date:	
☐ APPROVED. NO ACTION REQUIRED			
☐ APPROVED. RE-SUBMIT AS FINAL.			
☐ APPROVED EXCEPT AS NOTED. DOCUMENT WILL BE MODIFIED AND RESUBMITTED AS FINAL.			
☐ REJECTED. CORRECT AND RE-SUBMIT FOR APPROVAL.			

OAN	OAN	ACH	C		14/10/2011
OAN	OAN	ACH	B		23/09/2011
OAN	OAN	ACH	A		06/06/2011
OAN	OAN	ACH	00		30/03/2011
PREPARED	CHECKED	APPROVED	Revision No.	Status/Desc	Date Approved

MM77713 C

Plant: Kemper County FLOWSERVE
Southern Company Generation
COS-11-10P40213-1403 Rev: C
MPC17954-0001

Approved



PROJECT: Kemper County IGCC - COS-11-10P40213

REV	By	Date
0	O.A	25/03/2011
1	O.A	06/06/2011
2	O.A	23/09/2011
3	O.A	14/10/2011

IS UNITS FEEDWATER PUMP

1 GENERAL

Service	Feedwater	Model	4x12WXH-10
Quantity	Two (2)	Type	WXH

2 DESIGN CONDITIONS

Fluid			Barometric absolute pressure (mbar,a)	1014
	Type	BFW	Ambient temperature (normal) (°C)	40,55
	Temperature (max / normal/ min) (°C)	179,44/115,22/15,53	Relative humidity (%)	85
	Density (kg/m3)	946	System design gauge pressure @ rated (bar,g)	227,62
	Vapor absolute pressure (bar,a)	9,5	System design temperature (°C)	179,44
			Location (Outdoor/ Indoor)	Outdoor

Operating conditions		Minimum flow	Guaranteed point	Shut Off (rated)	Runout flow
Flow	LP Outlet (m3/h)				
	IP Outlet (m3/h)				
	HP Outlet (m3/h)	56,78	218,04		261,65
TDH	LP Outlet (m)				
	IP Outlet (m)				
	HP Outlet (m)	2290,8	1844,04	2305,38	1614,35
Pressure	LP Outlet (bar,a)				
	IP Outlet (bar,a)				
	HP Outlet (bar,a)	212,2	170,8	214,2	149,6
Pressure at suction flange (bar,a)		4,2	4,22	4,2	4,22
Operating Temperature (° C)		115,22			
Speed (rpm)		3580	3580	3580	3580
NPSH required (m)		3,56	9,08	3,53	13,89
NPSH available (m)		27,83			
Pump efficiency (%)		31,71	75,9		71,58
Brake horsepower (KW)		816,79	1369,88		1519,32
First critical speed (rpm)		5370			
Specific speed of the first impeller (USA units)		909			
Suction specific speed of the first impeller (USA units)		8697			
Pump rotation		CCW			

3 CONSTRUCTION FEATURES

Number of stages	10			
Suction Nozzle	Position	Size	Class/ Rating	Faces
	☒ Top ☐ Side	6"	600#	☐ FF ☒ RF
LP Discharge Nozzle	Position	Size	Class/ Rating	Faces
	☐ Top ☐ Side			☐ FF ☐ RF
IP Discharge Nozzle	Position	Size	Class/ Rating	Faces
	☐ Top ☐ Side			☐ FF ☐ RF
HP Discharge Nozzle	Position	Size	Class/ Rating	Faces
	☒ Top ☐ Side	4"	1500#	☐ FF ☒ RF
First pump stage	☒ Single suction ☐ Double suction			
Shaft sealing	API PLAN:			
Bearings	Radial	☐ Ball ☒ Sleeve		
	Thrust	☐ Ball ☐ Sleeve ☒ KTB		
Coupling	☒ Flexible ☐ Rigid	Spacer	☒ Yes ☐ No	
Speed regulation	☐ Variable speed		☐ Hydraulic variator	
	☒ Constant speed		☐ Frequency variator	

Approved



	PROJECT: Kemper County IGCC - COS-11-10P40213		REV	By	Date
	IS UNITS FEEDWATER PUMP		0	O.A	25/03/2011
			1	O.A	06/06/2011
			2	O.A	23/09/2011
			3	O.A	14/10/2011
4	INSTRUMENTS AND ACCESSORIES OF PUMP				
5	MOTOR				
	Manufacturer	TECO			
	Power	1565,97KW			
	Speed (r.p.m.)	3600			
	Cooling fluid	Air			
6	INSTRUMENTS AND ACCESSORIES OF MOTOR				
7	PUMP MATERIALS				
	Casing	ASTM A487 CA6NM			
	Impellers	ASTM A487 CA6NM			
	Channel rings	ASTM A487 CA6NM			
	Shaft	ASTM A276 Ty 410 Cd T			
	Bearing housing	ASTM A216 Gr. WCB			
	Casing wear rings	ASTM A473 Ty 416			
	Impeller wear rings	AISI 420 + Laser Hard. (IR 655)			
	Bolting	ASTM A193 Gr B7 ; ASTM A194 Gr 2H			
	Soleplate	Carbon Steel			
8	OTHER REQUIREMENTS				

Approved



FLOWSERVE

PROJECT: Kemper County IGCC - COS-11-10P40213

USA UNITS
FEEDWATER PUMP

REV	By	Date
0	O.A	25/03/2011
1	O.A	06/06/2011
2	O.A	23/09/2011
3	O.A	14/10/2011

1 GENERAL

Service	Feedwater	Model	4x12WXH-10
Quantity	Two (2)	Type	WXH

2 DESIGN CONDITIONS

Fluid			Barometric absolute pressure (psi,a)		14,71	
	Type		BFW	Ambient temperature (normal) (°F)		105
	Temperature (max / normal/ min) (°F)		355/239,4/60	Relative humidity (%)		85
	Density (lbm/ft3 @ 239,4°F)		59,11	System design gauge pressure @ rated (psi,g)		3301,35
	Vapor absolute pressure (psi,a)		137,78	System design temperature (°F)		355
				Location (Outdoor/ Indoor)		Outdoor
Operating conditions			Minimum flow	Guaranteed point	Shut Off (rated)	Runout flow
	Flow	LP Outlet (gpm)				
		IP Outlet (gpm)				
		HP Outlet (gpm)	250	960		1152
	TDH	LP Outlet (ft)				
		IP Outlet (ft)				
		HP Outlet (ft)	7515,74	6050,00	7563,60	5296,43
	Pressure	LP Outlet (psi,a)				
		IP Outlet (psi,a)				
		HP Outlet (psi,a)	3077,07	2477,24	3106,71	2169,76
	Pressure at suction flange (psi,a)		60,91	61,20	60,91	60,91
	Operating Temperature (° F)		239,4			
	Speed (rpm)		3580	3580	3580	3580
	NPSH required (ft)		11,67	29,8	11,6	45,58
	NPSH available (ft)		91,3			
	Pump efficiency (%)		31,71	75,9		71,58
Brake horsepower (HP)		1095,33	1829		2037,44	
First critical speed (rpm)			5370			
Specificic speed of the first impeller (USA units)			909			
Suction specificic speed of the first impeller (USA units)			8697			
Pump rotation			CCW			

3 CONSTRUCTION FEATURES

Number of stages	10			
Suction Nozzle	Position	Size	Class/ Rating	Faces
	☒ Top ☐ Side	6"	600#	☐ FF ☒ RF
LP Discharge Nozzle	Position	Size	Class/ Rating	Faces
	☐ Top ☐ Side			☐ FF ☐ RF
IP Discharge Nozzle	Position	Size	Class/ Rating	Faces
	☐ Top ☐ Side			☐ FF ☐ RF
HP Discharge Nozzle	Position	Size	Class/ Rating	Faces
	☒ Top ☐ Side	4"	1500#	☐ FF ☒ RF
First pump stage	☒ Single suction ☐ Double suction			
Shaft sealing	API PLAN:			
Bearings	Radial	☐ Ball ☒ Sleeve		
	Thrust	☐ Ball ☐ Sleeve ☒ KTB		
Coupling	☒ Flexible ☐ Rigid	Spacer	☒ Yes ☐ No	
Speed regulation	☐ Variable speed		☐ Hydraulic variator	
	☒ Constant speed		☐ Frequency variator	

Approved



	PROJECT: Kemper County IGCC - COS-11-10P40213		REV	By	Date
	USA UNITS FEEDWATER PUMP		0	O.A	25/03/2011
			1	O.A	06/06/2011
			2	O.A	23/09/2011
			3	O.A	14/10/2011
4	INSTRUMENTS AND ACCESSORIES OF PUMP				
5	MOTOR				
	Manufacturer	TECO			
	Power	2100HP			
	Speed (r.p.m.)	3600			
	Cooling fluid	Air			
6	INSTRUMENTS AND ACCESSORIES OF MOTOR				
7	PUMP MATERIALS				
	Casing	ASTM A487 CA6NM			
	Impellers	ASTM A487 CA6NM			
	Channel rings	ASTM A487 CA6NM			
	Shaft	ASTM A276 Ty 410 Cd T			
	Bearing housing	ASTM A216 Gr. WCB			
	Casing wear rings	ASTM A473 Ty 416			
	Impeller wear rings	AISI 420 + Laser Hard. (IR 655)			
	Bolting	ASTM A193 Gr B7 ; ASTM A194 Gr 2H			
	Soleplate	Carbon Steel			
8	OTHER REQUIREMENTS				

Approved