Kusile Power Station

Quad Sector Gas Air Heater Scope Of Work

Unit 1-6

Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
Air Heater															
0	**General**														
0.01	Site establishment for OP		X												
0.02	Site establishment for IN			X											
0.03	Site establishment for IR				X										
0.04	Site establishment for GO					X									
0.05	Site de-establishment for OP		X												
0.06	Site de-establishment for IN			X											
0.07	Site de-establishment for IR				X										
0.08	Site de-establishment for GO					X									
0.09	Open inspection doors top (5 off)		X	X	X	X									
0.10	Open inspection doors bottom (5 off) (scaffolding required in 4 areas but excluded)		X	X	X	X									
0.11	Close inspection doors top including fitting new seals		X	X	X	X									
0.12	Close inspection doors bottom including fitting new seals		X	X	X	X									
0.13	Open locating bearing guard			X	X	X									
0.14	Close locating bearing guard			X	X	X									
0.15	Retract axial seal door			X	X	X									
0.16	Re-engage axial seal door			X	X	X									
0.17	Remove stainless steel compensator cover plates			X	X	X									
0.18	Refit stainless steel compensator cover plates			X	X	X									
0.19	Open both pinion drive inspection doors			X	X	X									
0.20	Close both pinion inspection doors			X	X	X									
0.21	Open pin rack inspection door			X	X	X									
0.22	Close pin rack inspection door			X	X	X									
0.23	Clean view ports			X	X	X									

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Quad Sector Gas Air Heater Scope Of Work

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
1	**Air Heater Inspection OP**														
1.01	Visually inspect the air heater for any damage and erosion		X												
2	**Air Heater Inspection IN**														
2.01	a) Visually inspect air heater rotor b) Visually inspect radial seals for damage and erosion c) Visually inspect axial seals for damage and wear including holding strips d) Visually inspect circumferential seals e) Visually inspect sector plates f) Visually inspect axial seal plates g) Visually inspect top and bottom tyre for damage and erosion h) Visually inspect casing internally for damage and erosion i) Visually inspect drive system for oil leaks j) Visually inspect lubrication system for oil leaks. k) Visually inspect packs for damage, erosion and loose plates l) Visually inspect stay rods in ducting for damage and wear m) Visually inspect fire protection system for damage and erosion. n) Visually inspect the expansion joint covers for damage and wear. o) Visually inspect the hub seals for damage and wear p) Visually inspect the sootblower system for erosion and damage. q) Visually inspect spring pin to seal frame connection r) Inspect pin rack and drive system s) Inspect shaft seals t) Inspect cast iron wear shoes			X											

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Quad Sector Gas Air Heater Scope Of Work

Unit 1-6

Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
3	**Air Heater Inspection IR**														
3.01	a) Visually inspect air heater rotor b) Visually inspect radial seals for damage and erosion c) Visually inspect axial seals for damage and wear including holding strips d) Visually inspect circumferential seals for damage and wear e) Visually inspect sector plates for damage and erosion f) Visually inspect axial seal plates for damage and erosion g) Visually inspect top and bottom tyre for damage and erosion h) Visually inspect casing internally for damage and erosion i) Visually inspect drive system for oil leaks j) Visually inspect lubrication system for oil leaks. k) Visually inspect packs for damage, erosion and loose plates l) Visually inspect stay rods in ducting for damage and wear m) Visually inspect fire protection system for damage and erosion. n) Visually inspect the expansion joint covers for damage and wear. o) Visually inspect the hub seals for damage and wear p) Visually inspect the sootblower system for erosion and damage. q) Visually inspect spring pin to seal frame connection r) Inspect pin rack and drive system s) Inspect shaft seals t) Inspect cast iron wear shoes				X										

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Quad Sector Gas Air Heater Scope Of Work

Unit 1-6

Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
4	**Air Heater Inspection GO**														
4.01	a) Visually inspect air heater rotor b) Visually inspect radial seals for damage and erosion c) Visually inspect axial seals for damage and wear including holding strips d) Visually inspect circumferential seals for damage and wear e) Visually inspect sector plates for damage and erosion f) Visually inspect axial seal plates for damage and erosion g) Visually inspect top and bottom tyre for damage and erosion h) Visually inspect casing internally for damage and erosion i) Visually inspect drive system for oil leaks j) Visually inspect lubrication system for oil leaks. k) Visually inspect packs for damage, erosion and loose plates l) Visually inspect stay rods in ducting for damage and wear m) Visually inspect fire protection system for damage and erosion. n) Visually inspect the expansion joint covers for damage and wear. o) Visually inspect the hub seals for damage and wear p) Visually inspect the sootblower system for erosion and damage. q) Visually inspect spring pin to seal frame connection r) Inspect pin rack and drive system s) Inspect shaft seals t) Inspect cast iron wear shoes					X									

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Quad Sector Gas Air Heater Scope Of Work

Unit 1-6

Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
5	**Rotor Radial Seals**														
5.01	Remove the complete set of radial seals on the hot end														
5.02	Refit the complete set of radial seals on the hot end.														
5.03	Remove the complete set of radial seals on the cold end														
5.04	Refit the complete set of radial seals on the cold end.														
5.05	Remove 1 radial seal plate hot end														
5.06	Refit 1 radial seal plate hot end														
5.07	Remove 4 radial seal plate hot end														
5.08	Refit 4 radial seal plate hot end														
5.09	Remove 16 radial seal plate hot end														
5.10	Refit 16 radial seal plate hot end														
5.11	Remove 1 radial seal plate cold end														
5.12	Refit 1 radial seal plate cold end														
5.13	Remove 4 radial seal plate cold end														
5.14	Refit 4 radial seal plate cold end														
5.15	Remove 16 radial seal plate cold end														
5.16	Refit 16 radial seal plate cold end														
6	**Hub Seals**														
6.01	Remove the hub seals hot end														
6.02	Refit the hub seals hot end														
6.03	Remove the hub seals cold end														
6.04	Refit the hub seals cold end														
7	**Shaft Labyrinth Seals**														
7.01	Remove hot end shaft labyrinth seals														
7.02	Refit hot end shaft labyrinth seals														
8	**Axial Seals**														
8.01	Remove all the axial seals														
8.02	Refit all the axial seals														
8.03	Remove 4 axial seals														
8.04	Refit 4 axial seals.														
8.05	Remove all the axial seal holding strips														
8.06	Refit all the axial seal holding strips														
8.07	Remove 8 off the axial seal holding strips														
8.08	Refit 8 off the axial seal holding strips														

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Quad Sector Gas Air Heater Scope Of Work

Unit 1-6

Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
9	**Circumferential Seals Gas Side Hot End**														
9.01	Remove all the circumferential seals on the hot end gas side														
9.02	Refit all the circumferential seals on the hot end gas side including setting to correct seal settings														
9.03	Remove 8 sections off the circumferential seals gas side hot end														
9.04	Refit 8 sections off the circumferential seals gas side hot end including setting to correct seal settings														
9.05	Adjust complete hot end gas side circumferential seals to correct settings														
10	**Circumferential Seals Gas Side Cold End**														
10.01	Remove all the circumferential seals on the cold end gas side														
10.02	Refit all the circumferential seals on the cold end gas side including setting to correct seal settings														
10.03	Remove 8 sections off the circumferential seals cold end gas side														
10.04	Refit 8 sections off the circumferential seals cold end gas side including setting to correct seal settings														
10.05	Adjust complete cold end gas side circumferential seals to correct settings														
11	**Circumferential Seals Secondary Air Side Hot End Both Sectors**														
11.01	Remove all the circumferential seals on the hot end air side														
11.02	Refit all the circumferential seals on the hot end air side including setting to correct seal settings														
11.03	Remove 8 sections off the circumferential seals hot end air side														
11.04	Refit 8 sections off the circumferential seals hot end air side including setting to correct seal settings														
11.05	Adjust complete hot end air side circumferential seals to correct settings														
12	**Circumferential Seals Secondary Air Side Cold End Both Sectors**														
12.01	Remove all the circumferential seals on the cold end air side														

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Quad Sector Gas Air Heater Scope Of Work

Unit 1-6

Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
12.02	Refit all the circumferential seals on the cold end air side including setting to correct seal settings														
12.03	Remove 8 sections off the circumferential seals cold end air side														
12.04	Refit 8 sections off the circumferential seals cold end air side including setting to correct seal settings														
12.05	Adjust complete cold end air side circumferential seals to correct settings														
13	**Cover Plates Hot End**														
13.01	Remove radial to circumferential cover plate air side														
13.02	Refit radial to circumferential cover plate air side														
13.03	Remove radial to circumferential cover plate gas side														
13.04	Refit radial to circumferential cover plate gas side														
14	**Cover Plates Cold End**														
14.01	Remove radial to circumferential cover plate air side														
14.02	Refit radial to circumferential cover plate air side														
14.03	Remove radial to circumferential cover plate gas side														
14.04	Refit radial to circumferential cover plate gas side														
15	**Seal Frame Beam 1 Hot End FFP Side**														
15.01	Remove the complete seal frame beam														
15.02	Refit the complete seal frame beam														
15.03	Remove one section of the seal frame beam														
15.04	Refit one section of the seal frame beam														
15.05	Remove four sections of the seal frame beam														
15.06	Refit four sections of the seal frame beam														
16	**Seal Frame Beam 2 Hot End**														
16.01	Remove the complete seal frame beam														
16.02	Refit the complete seal frame beam														
16.03	Remove one section of the seal frame beam														
16.04	Refit one section of the seal frame beam														
16.05	Remove four sections of the seal frame beam														
16.06	Refit four sections of the seal frame beam														
17	**Seal Frame Beam 3 Hot End**														
17.01	Remove the complete seal frame beam														
17.02	Refit the complete seal frame beam														
17.03	Remove one section of the seal frame beam														
17.04	Refit one section of the seal frame beam														
17.05	Remove four sections of the seal frame beam														
17.06	Refit four sections of the seal frame beam														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
18	**Seal Frame Beam 4 Hot End (Boiler Side)**														
18.01	Remove the complete seal frame beam														
18.02	Refit the complete seal frame beam														
18.03	Remove one section of the seal frame beam														
18.04	Refit one section of the seal frame beam														
18.05	Remove four sections of the seal frame beam														
18.06	Refit four sections of the seal frame beam														
19	**Seal Frame Beam 1 Cold End FFP Side**														
19.01	Remove the complete seal frame beam														
19.02	Refit the complete seal frame beam														
19.03	Remove one section of the seal frame beam														
19.04	Refit one section of the seal frame beam														
19.05	Remove four sections of the seal frame beam														
19.06	Refit four sections of the seal frame beam														
20	**Seal Frame Beam 2 Cold End**														
20.01	Remove the complete seal frame beam														
20.02	Refit the complete seal frame beam														
20.03	Remove one section of the seal frame beam														
20.04	Refit one section of the seal frame beam														
20.05	Remove four sections of the seal frame beam														
20.06	Refit four sections of the seal frame beam														
21	**Seal Frame Beam 3 Cold End**														
21.01	Remove the complete seal frame beam														
21.02	Refit the complete seal frame beam														
21.03	Remove one section of the seal frame beam														
21.04	Refit one section of the seal frame beam														
21.05	Remove four sections of the seal frame beam														
21.06	Refit four sections of the seal frame beam														
22	**Seal Frame Beam 4 Cold End (Boiler Side)**														
22.01	Remove the complete seal frame beam														
22.02	Refit the complete seal frame beam														
22.03	Remove one section of the seal frame beam														
22.04	Refit one section of the seal frame beam														
22.05	Remove four sections of the seal frame beam														
22.06	Refit four sections of the seal frame beam														
23	**Spring Pins Hot End**														
23.01	Remove all 25 off spring pin assemblies and actuators on the hot end														
23.02	Refit all 25 off spring pin assemblies and actuators on the hot end														

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Quad Sector Gas Air Heater Scope Of Work

Unit 1-6

Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
23.03	Remove 5 off spring pin assemblies and actuators on the hot end														
23.04	Refit 5 off spring pin assemblies and actuators on the hot end														
23.05	Remove 1 off spring pin assembly and actuator on the hot end														
23.06	Refit 1 off spring pin assembly and actuator on the hot end														
23.07	Remove all 8 off hub spring pin assemblies on the hot end														
23.08	Refit all 8 off hub spring pin assemblies on the hot end														
23.09	Remove 5 off hub spring pin assemblies on the hot end														
23.10	Refit 5 off hub spring pin assemblies on the hot end														
23.11	Remove 1 off hub spring pin assembly on the hot end														
23.12	Refit 1 off hub spring pin assembly on the hot end														
23.13	Service the spring pin glands on all 33 off the spring pin assemblies hot end														
23.14	Service the spring pin glands on 5 off spring pin assemblies hot end														
23.15	Service the spring pin gland on 1 off spring pin assembly hot end														
24	**Spring Pins Cold End**														
24.01	Remove all (25 off) spring pin assemblies and actuators on the cold end														
24.02	Refit all (25 off) spring pin assemblies and actuators on the cold end														
24.03	Remove 5 off spring pin assemblies and actuators on the cold end														
24.04	Refit all 5 off spring pin assemblies and actuators on the cold end														
24.05	Remove 1 off spring pin assembly and actuator on the cold end														
24.06	Refit 1 off spring pin assembly and actuator on the cold end														
24.07	Remove all 8 off hub spring pin assemblies on the cold end														
24.08	Refit all 8 off hub spring pin assemblies on the cold end														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
24.09	Remove 5 off hub spring pin assemblies on the cold end														
24.10	Refit 5 off hub spring pin assemblies on the cold end														
24.11	Remove 1 off hub spring pin assembly on the cold end														
24.12	Refit 1 off hub spring pin assembly on the cold end														
24.13	Service the spring pin glands on all 33 off the spring pin assemblies cold end														
24.14	Service the spring pin glands on 5 off spring pin assemblies cold end														
24.15	Service the spring pin gland on 1 off spring pin assembly cold end														
25	**Spring Pins Axial Seals**														
25.01	Remove all 2 off spring pin assemblies and actuators on the axial seals														
25.02	Refit all 2 off spring pin assemblies and actuators on the axial seals														
25.03	Remove all 12 off spring pin assemblies on the axial seals														
25.04	Refit all 12 off spring pin assemblies on the axial seals														
25.05	Remove 4 off spring pin assemblies on the axial seals														
25.06	Refit 4 off spring pin assemblies on the axial seals														
25.07	Remove 1 off spring pin assembly on the axial seals														
25.08	Refit 1 off spring pin assembly on the axial seals														
25.09	Service the spring pin glands on all 14 off the spring pin assemblies on the axial seals														
25.10	Service the spring pin glands on 4 off spring pin assemblies on the axial seals														
25.11	Service the spring pin gland on 1 off spring pin assembly on the axial seals\														
26	**Stainless Steel Expansion Joints**														
26.01	Remove complete set of stainless steel expansion joints hot end					X									
26.02	Refit complete set of stainless steel expansion joints hot end					X									
26.03	Remove complete set of stainless steel expansion joints cold end					X									
26.04	Refit complete set of stainless steel expansion joints cold end					X									

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
26.05	Remove hubs section stainless steel expansion joints hot end														
26.06	Refit hub section stainless steel expansion joints hot end														
26.07	Remove hubs section stainless steel expansion joints cold end														
26.08	Refit hub section stainless steel expansion joints cold end														
26.09	Remove gas side complete section stainless steel expansion joints hot end			X	X										
26.10	Refit gas side complete section stainless steel expansion joints hot end			X	X										
26.11	Remove gas side complete section stainless steel expansion joints cold end			X											
26.12	Refit gas side complete section stainless steel expansion joints cold end			X											
26.13	Remove primary air section stainless steel expansion joints hot end			X											
26.14	Refit primary air section of stainless steel expansion joints hot end			X											
26.15	Remove primary air section stainless steel expansion joints cold end			X											
26.16	Refit primary air section stainless steel expansion joints cold end			X											
26.17	Remove one secondary air section stainless steel expansion joints hot end														
26.18	Refit one secondary air section stainless steel expansion joints hot end														
26.19	Remove one secondary air section stainless steel expansion joints cold end														
26.20	Refit one secondary air section stainless steel expansion joints cold end														
26.21	Remove both secondary air section stainless steel expansion joints hot end														
26.22	Refit both secondary air section stainless steel expansion joints hot end														
26.23	Remove both secondary air section stainless steel expansion joints cold end														
26.24	Refit both secondary air section stainless steel expansion joints cold end														
27	**Cast Iron Wear Seals Hot End**														
27.01	Remove Beam 1 (FFP Side) cover plates														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
27.02	Refit Beam 1 (FFP Side) cover plates														
27.03	Remove Beam 2 cover plates														
27.04	Refit Beam 2 cover plates														
27.05	Remove Beam 3 cover plates														
27.06	Refit Beam 3 cover plates														
27.07	Remove Beam 4 (Boiler Side) cover plates														
27.08	Refit Beam 4 (Boiler Side) cover plates														
27.09	Remove Beam 1 (FFP Side) corner cover strip at periphery			X	X	X									
27.10	Refit Beam 1 (FFP Side) corner cover strip at periphery			X	X	X									
27.11	Remove Beam 2 corner cover strip at periphery			X	X	X									
27.12	Refit Beam 2 corner cover strip at periphery			X	X	X									
27.13	Remove Beam 3 corner cover strip at periphery			X	X	X									
27.14	Refit Beam 3 corner cover strip at periphery			X	X	X									
27.15	Remove Beam 4 (Boiler Side) corner cover strip at periphery			X	X	X									
27.16	Refit Beam 4 (Boiler Side) corner cover strip at periphery			X	X	X									
27.17	Remove complete set of cast iron wear seals hot end					X									
27.18	Refit complete set of cast iron wear seals hot end					X									
27.19	Remove cast iron wear seals on Beam 1 (FFP Side) hot end														
27.20	Refit cast iron wear seals on Beam 1 (FFP Side) hot end														
27.21	Remove cast iron wear seals on Beam 2 hot end														
27.22	Refit cast iron wear seals on Beam 2 hot end														
27.23	Remove cast iron wear seals on Beam 3 hot end														
27.24	Refit cast iron wear seals on Beam 3 hot end														
27.25	Remove cast iron wear seals on Beam 4 (Boiler Side) hot end														
27.26	Refit cast iron wear seals on Beam 4 (Boiler Side) hot end														
27.27	Remove one cast iron wear seal hot end														
27.28	Refit one cast iron wear seal hot end														
27.29	Remove five cast iron wear seals hot end			X	X										
27.30	Refit five cast iron wear seals hot end			X	X										
27.31	Remove primary periphery section cast iron wear seals hot end														
27.32	Refit primary periphery section cast iron wear seals hot end														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
28	**Cast Iron Wear Seals Cold End**														
28.01	Remove Beam 1 (FFP Side) cover plates														
28.02	Refit Beam 1 (FFP Side) cover plates														
28.03	Remove Beam 2 cover plates														
28.04	Refit Beam 2 cover plates														
28.05	Remove Beam 3 cover plates														
28.06	Refit Beam 3 cover plates														
28.07	Remove Beam 4 (Boiler Side) cover plates														
28.08	Refit Beam 4 (Boiler Side) cover plates														
28.09	Remove Beam 1 (FFP Side) corner cover strip at periphery			X	X	X									
28.10	Refit Beam 1 (FFP Side) corner cover strip at periphery			X	X	X									
28.11	Remove Beam 2 corner cover strip at periphery			X	X	X									
28.12	Refit Beam 2 corner cover strip at periphery			X	X	X									
28.13	Remove Beam 3 corner cover strip at periphery			X	X	X									
28.14	Refit Beam 3 corner cover strip at periphery			X	X	X									
28.15	Remove Beam 4 (Boiler Side) corner cover strip at periphery			X	X	X									
28.16	Refit Beam 4 (Boiler Side) corner cover strip at periphery			X	X	X									
28.17	Remove complete set of cast iron wear seals cold end					X									
28.18	Refit complete set of cast iron wear seals cold end					X									
28.19	Remove cast iron wear seals on Beam 1 (FFP Side) cold end														
28.20	Refit cast iron wear seals on Beam 1 (FFP Side) cold end														
28.21	Remove cast iron wear seals on Beam 2 cold end														
28.22	Refit cast iron wear seals on Beam 2 cold end														
28.23	Remove cast iron wear seals on Beam 3 cold end														
28.24	Refit cast iron wear seals on Beam 3 cold end														
28.25	Remove cast iron wear seals on Beam 4 (Boiler Side) cold end														
28.26	Refit cast iron wear seals on Beam 4 (Boiler Side) cold end														
28.27	Remove one cast iron wear seal cold end														
28.28	Refit one cast iron wear seal cold end														
28.29	Remove five cast iron wear seals cold end			X	X										
28.30	Refit five cast iron wear seals cold end			X	X										
28.31	Remove primary periphery section cast iron wear seals cold end														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
28.32	Refit primary periphery section cast iron wear seals cold end														
29	**Rotor**														
29.01	Remove complete rotor hot end circumferential seal (tyre)														
29.02	Refit complete rotor hot end circumferential seal (tyre)														
29.03	Remove complete rotor cold end circumferential seal (tyre)														
29.04	Refit complete rotor cold end circumferential seal (tyre)														
29.05	Remove all rotor element pack support strips intermediate end														
29.06	Refit all rotor element pack support strips intermediate end														
29.07	Remove all rotor element pack support strips cold end														
29.08	Refit all rotor element pack support strips cold end														
29.09	Remove 50 off complete basket element pack support strips cold end			X	X										
29.10	Refit 50 off complete basket element pack support strips cold end			X	X										
29.11	Remove all element pack gap sealing strips hot end														
29.12	Refit all element pack gap sealing strips hot end														
29.13	Remove all element pack gap sealing strips cold end														
29.14	Refit all element pack gap sealing strips cold end														
29.15	Remove 50 off complete basket element pack sealing strips hot end			X	X										
29.16	Refit 50 off complete basket element pack sealing strips hot end			X	X										
29.17	Remove 50 off complete basket element pack sealing strips cold end			X	X										
29.18	Refit 50 off complete basket element pack sealing strips cold end			X	X										
29.19	Remove 10 off complete basket element pack sealing strips hot end			X	X										
29.20	Refit 10 off complete basket element pack sealing strips hot end			X	X										
29.21	Remove 10 off complete basket element pack sealing strips cold end			X	X										

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
29.22	Refit 10 off complete basket element pack sealing strips cold end			X	X										
29.23	Inspect complete rotor after element packs have been removed for damage and wear. Submit detailed report					X									
29.24	Carry out rotor radial and annular plate window repairs by cutting out and rewelding 5.0m in total of 10mm thick plate when packs are removed														
29.25	Carry out rotor radial and annular plate window repairs by cutting out and rewelding 20.0m in total of 10mm thick plate when packs are removed														
29.26	Carry out rotor radial and annular plate window repairs by cutting out and rewelding 50.0m in total of 10mm thick plate when packs are removed					X									
29.27	Carry out rotor radial and annular plate window repairs by cutting out and rewelding 100.0m in total of 10mm thick plate when packs are removed														
29.28	Carry out rotor radial and annular plate window repairs by cutting out and rewelding 5.0m in total of 12mm thick plate when packs are removed														
29.29	Carry out rotor radial and annular plate window repairs by cutting out and rewelding 20.0m in total of 12mm thick plate when packs are removed														
29.30	Carry out rotor radial and annular plate window repairs by cutting out and rewelding 50.0m in total of 12mm thick plate when packs are removed														
29.31	Carry out rotor radial and annular plate window repairs by cutting out and rewelding 100.0m in total of 12mm thick plate when packs are removed					X									
30	**Element Packs**														
30.01	Remove all element pack cover strips on the hot end on 4 sides on each basket					X									
30.02	Refit all element pack cover strips on the hot end on 4 sides on each basket					X									
30.03	Remove all the welded rotor radial sealing strips														
30.04	Refit all the welded rotor radial sealing strips														
30.05	Carry out a complete air heater pack change including all special equipment required i.e. forklifts, hoists, tractors, trailers etc.														
31	**High Pressure Washing - Elements**														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
31.01	Carry out complete air heater water washing with high pressure system from the cold end of the air heater for a duration of 72 hours including all equipment required														
31.02	Carry out complete air heater water washing with high pressure system from the cold end of the air heater for a duration of 96 hours including all equipment required														
31.03	Carry out complete air heater water washing with high pressure system from the cold end of the air heater for a duration of 120 hours including all equipment required														
32	**Bearings**														
32.01	Remove the guide bearing														
32.02	Refit the guide bearing														
32.03	Remove the support bearing														
32.04	Refit the support bearing														
32.05	Remove the shaft cooling water pivot and inspect														
32.06	Refit the shaft cooling water pivot														
32.07	Remove the labyrinth seal on the guide bearing														
32.08	Refit the labyrinth seal on the guide bearing														
32.09	Remove the labyrinth seal on the support bearing														
32.10	Refit the labyrinth seal on the support bearing														
32.11	Drain guide bearing oil in oil bath														
32.12	Refill guide bearing oil bath with oil														
32.13	Drain support bearing oil in oil bath														
32.14	Refill support bearing oil bath with oil														
33	**Drive System**														
33.01	Remove 1 drive motor					X									
33.02	Refit 1 drive motor					X									
33.03	Remove 2 drive motors					X									
33.04	Refit 2 drive motors					X									
33.05	Remove motor pinion gear														
33.06	Refit motor pinion gear														
33.07	Remove gearbox oil seal														
33.08	Refit gearbox oil seal														
33.09	Remove gearbox oil and refill gearbox with new oil through filtration unit			X	X	X									
33.10	Remove 1 complete gearbox and lower gearbox to ground level					X									
33.11	Refit 1 complete gearbox including lifting the gearbox up to the air heater level from ground level					X									

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Quad Sector Gas Air Heater Scope Of Work

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
33.12	Remove 2 complete gearbox and lower to gearbox to ground level					X									
33.13	Refit 2 complete gearbox including lifting the gearbox up to the air heater level from ground level					X									
33.14	Remove 1 drive pinion				X	X									
33.15	Turn and refit 1 drive pinion				X										
33.16	Refit 1 drive pinion					X									
33.17	Remove 2 drive pinions				X	X									
33.18	Turn and refit 2 drive pinions				X										
33.19	Refit 2 drive pinions					X									
33.20	Align 1 drive pinion height					X									
33.21	Align 1 drive pinion penetration					X									
33.22	Align 2 drive pinions height					X									
33.23	Align 2 drive pinions penetration					X									
34	**Pin Rack**														
34.01	Remove complete pin rack					X									
34.02	Refit complete pin rack to correct alignment					X									
34.03	Weld repair 2 off pin rack holding strips			X											
34.04	Weld repair 10 off pin rack holding strips				X	X									
34.05	Remove 2 off pin rack holding strips														
34.06	Refit 2 off pin rack holding strips														
34.07	Remove 10 off pin rack holding strips														
34.08	Refit 10 off pin rack holding strips														
35	**Ducting Hot End**														
35.01	Carry out window repairs of 5.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.			X											
35.02	Carry out window repairs of 10.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.				X	X									
35.03	Carry out window repairs of 50.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.					X									
35.04	Carry out window repairs of 1.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
35.05	Carry out window repairs of 5.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
35.06	Carry out window repairs of 10.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
35.07	Carry out window repairs of 20.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
35.08	Carry out window repairs of 5.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
35.09	Carry out window repairs of 10.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
35.10	Carry out window repairs of 20.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
36	**Ducting Cold End**														
36.01	Carry out window repairs of 5.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.			X											
36.02	Carry out window repairs of 10.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.				X	X									
36.03	Carry out window repairs of 50.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.					X									
36.04	Carry out window repairs of 5.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
36.05	Carry out window repairs of 10.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
36.06	Carry out window repairs of 20.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
36.07	Carry out window repairs of 1.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
36.08	Carry out window repairs of 5.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
36.09	Carry out window repairs of 10.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
36.10	Carry out window repairs of 20.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
37	**Transition Ducting Hot End**														
37.01	Carry out window repairs of 5.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.			X	X										
37.02	Carry out window repairs of 10.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.					X									
37.03	Carry out window repairs of 20.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
37.04	Carry out window repairs of 5.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
37.05	Carry out window repairs of 10.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
37.06	Carry out window repairs of 5.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
37.07	Carry out window repairs of 10.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
38	**Transition Ducting Cold End**														
38.01	Carry out window repairs of 5.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.			X	X										
38.02	Carry out window repairs of 10.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.					X									
38.03	Carry out window repairs of 20.0m in total of 6mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
38.04	Carry out window repairs of 5.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
38.05	Carry out window repairs of 10.0m in total of 8mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
38.06	Carry out window repairs of 5.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														
38.07	Carry out window repairs of 10.0m in total of 10mm thick ducting plate by cutting out and re-welding with new material. Excluding removal of cladding and insulation if required.														

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
39	**Sootblower System - Reciprocating**														
39.01	Inspect all the sootblower nozzles dimensionally and for erosion on the inside														
39.02	Inspect the sootblower pipe for damage and erosion														
39.03	Inspect the sootblower pipe erosion protection plates														
39.04	Inspect the sootblower support piping														
39.05	Inspect sootblower reciprocating system														
39.06	Remove complete sootblower lance														
39.07	Refit complete sootblower lance														
39.08	Remove 1m off worn sootblower erosion protection plates														
39.09	Refit 1m off new sootblower erosion protection plates														
39.10	Remove 5m off worn sootblower erosion protection plates														
39.11	Refit 5m off new sootblower erosion protection plates														
40	**Fire Protection System**														
40.01	Remove 1 fire protection system spray nozzle only excluding piping			X											
40.02	Refit 1 fire protection system spray nozzle			X											
40.03	Remove 5 fire protection system spray nozzles only excluding piping				X	X									
40.04	Refit 5 fire protection system spray nozzles				X	X									
40.05	Remove 10 fire protection system spray nozzles only excluding piping														
40.06	Refit 10 fire protection system spray nozzles														
40.07	Remove 1m of fire protection system piping including erosion protection														
40.08	Refit 1m of fire protection system piping excluding erosion protection														
40.09	Remove 5m of fire protection system piping including erosion protection														
40.10	Refit 5m of fire protection system piping excluding erosion protection														
40.11	Remove 10m of fire protection system piping including erosion protection														
40.12	Refit 10m of fire protection system piping excluding erosion protection														
40.13	Remove 1m of fire protection system erosion protection			X											

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Item No	Description	Spares and Consumables Required	OP	IN	IR	GO	Dur/ Htr (Hrs)	Dur/ Unit (Hrs)	SE	A	W	S/S	L	Price/ Htr	Price/ Unit
40.14	Refit 1m of fire protection system erosion protection			X											
40.15	Remove 5m of fire protection system erosion protection				X										
40.16	Refit 5m of fire protection system erosion protection				X										
40.17	Remove 10m of fire protection system erosion protection					X									
40.18	Refit 10m of fire protection system erosion protection					X									
40.19	Remove 1 fire protection system compensator bellow														
40.20	Refit 1 fire protection system compensator bellow														
40.21	Test fire protection system manually during air heater washing					X									
41	**Fire Detection System**														
41.01	Remove one thermocouple pocket			X											
41.02	Refit one thermocouple pocket			X											
41.03	Remove four thermocouple pockets				X	X									
41.04	Refit four thermocouple pockets				X	X									
41.05	Remove one thermocouple pocket erosion protection			X											
41.06	Refit one thermocouple pocket erosion protection			X											
41.07	Remove four thermocouple pocket erosion protection				X	X									
41.08	Refit four thermocouple pocket erosion protection				X	X									
42	**Seal Setting Cold Condition**														
42.01	Carry out complete cold condition setting of all the radial spring pins and actuators (66 Off)			X	X	X									
42.02	Carry out complete cold condition setting of 2 actuated spring pin assemblies and 12 off spring pin assemblies on the axial seals.			X	X	X									
43	**Seal Setting Hot Condition**														
43.01	Carry out complete hot condition seal setting of all the spring pins and actuators on the radial plates			X	X	X									
43.02	Carry out complete hot condition seal setting of all the spring pins and actuators on the axial plates			X	X	X									
44	**Commissioning**														
44.01	Check cooling water flow to shaft union is correct			X	X	X									
44.02	Test run air heater and ensure heaters runs freely			X	X	X									
44.03	Ensure that all the view ports are closed			X	X	X									

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