



ID	Task Name	Duration	Predecessors	W-6	W-5	W-4	W-3	W-2	W-1	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11
1	<b>Trent Phase 3 Generator Set - TYPICAL Installation Schedule - Single Unit ONLY</b>	<b>107.6 days</b>																		
2	<b>Site Prep Prior to Equipment Arrival</b>	<b>34 days</b>																		
3	Foundation Installation and Cure Time (Foundation & Anchoring System by Customer)	30 days																		
4	Inspect Cast Foundation and Anchoring System (hardware supplied by customer)	1 day	3																	
5	Set-up Site Office and Site Facilities	4 days	7SF-2 wks																	
6	<b>Pre-Installation</b>	<b>5 days</b>																		
7	Receive & Inspect Shipment with Customer (start with GT skid)	5 days																		
8	Apply Temporary Power to Generator Anti-Condensation Heaters/ Inspect for Moisture	0.5 days																		
9	<b>Generator Skid Pre-Installation Work:</b>	<b>2.5 days</b>																		
10	Uncrate Generator and Inspect for Damage and Moisture	0.5 days																		
11	Unpack Generator Enclosure / Base Assembly	0.5 days	10																	
12	Install Line and Neutral Cubicles per Manufacturer's Instructions	1.5 days	11																	
13	Restore Temporary Power to Generator & Main TB Anti-Condensation Heaters	0.25 days																		
14	Inspect Customer Control Room (MCC's should be in place prior to inspection)	1 day																		
15																				
16	<b>Installation &amp; Commissioning</b>	<b>63.2 days</b>																		
17	<b>Installation</b>	<b>28 days</b>																		
18	<b>Equipment Installation, Leveling, and Alignment</b>	<b>10.5 days</b>																		
19	Lift GT Skid onto Foundation and Install GT Enclosure to Generator Enclosure	1 day	7FS-3 days																	
20	Remove GT Enclosure Shipping Bracing	0.25 days	19																	
21	Lift Generator Skid onto Foundation	1 day	20,76																	
22	Lift, Position, and Level Main Lube Oil Cooler (supplied by customer)	1 day	21,19																	
23	<b>Skid Leveling and Alignment</b>	<b>7.5 days</b>																		
24	Level and Align Skids	2 days	73,19,76																	
25	<b>Drive-Train Alignment</b>	<b>1.5 days</b>																		
26	Install GT alignment jig for drive-train alignment	0.5 days	19,7																	
27	Align Drive-Train using jig and rotalign	1 day	26																	
28	Grout All Skids and Allow to Cure (48 hour cure assumed)	4 days	25																	
29	Align, Level, and Grout GT Mechanical Handling Skid in Place	2 days	28																	
30	Torque hold-down bolts	0.5 days	27																	
31	Verify Final Alignment (record required)/ Check drive-train components for soft-foot	0.5 days	30																	
32	<b>GT Exhaust Ducting Installation</b>	<b>1.75 days</b>																		
33	Rotate GT Exhaust to Horizontal Position (must be done prior to roof installation)	1 day	31																	
34	Install AAF-Supplied Exhaust Shroud to GT Enclosure	0.75 days	33																	
35	<b>Equipment Erection</b>	<b>16.5 days</b>																		
36	<b>Generator Enclosure Ventilation System</b>	<b>1.25 days</b>																		
37	Assemble Vent Silencer and Weatherhood Assy (on ground)	0.25 days	21,7																	
38	Install Generator Ventilation Filter Media	0.25 days	37,7																	
39	Lift Vent Silencer / Weatherhood Assembly onto Generator Enclosure	0.75 days	21,38																	
40	<b>CO2 Skid and Bottle Installation</b>	<b>2 days</b>																		
41	Set CO2 Skids (qty 2)	1 day	24,30,76																	
42	Install CO2 Bottles	1 day	41																	
43	<b>GT Enclosure Vent Fan/Motor Assembly and Installation</b>	<b>1 day</b>																		

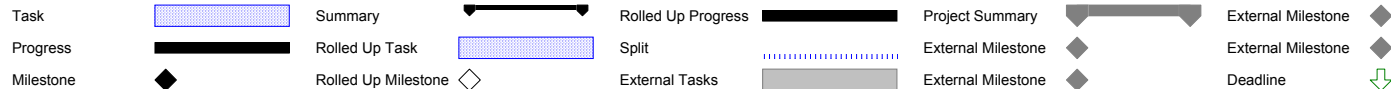
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Date: 10/1/04  
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Task		Summary		Rolled Up Progress		Project Summary		External Milestone	
Progress		Rolled Up Task		Split		External Milestone		External Milestone	
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44	Assemble Vent Fan/Motor Assemblies (on outlet ducting)	0.5 days	7																	
45	Install Vent Fan/Motor Assemblies on Unit Enclosure Roof (prior to roof installation)	0.5 days	44,7																	
46	<b>Air Inlet &amp; Filters</b>	<b>6.5 days</b>																		
47	<b>GT Combustion Intake Field Erection</b>	<b>6.5 days</b>																		
48	Erect Intake Support Steel Work including Cross-Bracing and Guides	1 day	45,76																	
49	Install Dust Chute and Secondary Fan Assembly onto Intake Support Steel on the GT Roof	0.5 days	48																	
50	Install Access Platform to Support Steel Work	0.5 days	49																	
51	Set Intake support Structure on Roof	0.5 days	50																	
52	<b>GT Intake System Field Erection (reference filter manufacturer's instructions)</b>	<b>5 days</b>																		
53	Set Section 1 to Section 2 on the ground	2 days	7																	
54	Set Section 3 to Section 1 on the ground	0.5 days	53																	
55	Set Section 4 to Section 3 and 2 on the ground	1 day	54																	
56	Set Section 5 to Section 4 on the ground	0.5 days	55																	
57	Set Section 6 to Section 4 and 5 on the ground	1 day	56																	
58	<b>GT Combustion Air and GT Vent Filter Media Installation</b>	<b>1 day</b>																		
59	Install Vent Filters	0.5 days	57																	
60	Install Combustion Air Filters	0.5 days	59																	
61	<b>GT Roof Panel Ducting Assembly and Installation</b>	<b>10.25 days</b>																		
62	<b>GT ICD Bleed Air Ducting</b>	<b>9.75 days</b>																		
63	Assemble ICD Bleed Air Ducting on Ground	1 day																		
64	Lift and Install ICD Bleed air ducting on unit enclosure roof	0.5 days	63,31,75																	
65	<b>GT Vent Exhaust Ducting</b>	<b>5.25 days</b>																		
66	Assemble Vent Exhaust Ducting	1 day	7																	
67	Lift and Install Vent Exhaust Ducting on GT Enclosure Roof	0.5 days	66,64,31,76																	
68	<b>Other Preparations to be Made Prior to Installation of the GT Enclosure Roof</b>	<b>1.5 days</b>																		
69	Position Roof Safely on Ground Supports Adequate to Support Assembled Load	1 day	7FS-3 days																	
70	Locate and bolt roof guides to GT enclosure	0.25 days	69																	
71	Fit Roof with External Runway Beam and Sliding Door Runway	0.25 days	69																	
72	Install ACAC 3-way TCV (if not part of roof assembly when shipped to site)	0.25 days	69																	
73	Install Dollinger Oil Demister (if not part of roof assembly when shipped to site)	0.25 days	69																	
74	Install Comb. & ICD Bleed Air Outlet Quick Release Flex Connections to Bleed Outlet Transition	0.5 days	69																	
75	<b>GT Enclosure Roof Installation</b>	<b>0.75 days</b>																		
76	Lift and Install GT Enclosure Roof	0.5 days	71,70,33,20																	
77	Remove Roof Shipping Bracing	0.25 days	76																	
78	<b>GT Combustion Filter Lift and Installation onto GT Roof Assembly</b>	<b>3.25 days</b>																		
79	Lift & Install Filter Assy including Platforms and Ladders to Roof Silencer & Steelwork	3 days	57,60,59,51,45,76																	
80	Remove Installation Guides from Support Steel	0.25 days	79																	
81	<b>Erect Other Package Externals</b>	<b>7.25 days</b>																		
82	Erect Exhaust Stack Structural Steel Support (customer)	2 days	33,34																	
83	Erect Exhaust Transition Elbow (customer)	2 days	82																	
84	Erect Exhaust Stack (customer)	3 days	83																	
85	Check Clearance Between Exhaust Transition Piece and Exhaust System	0.25 days	84																	
86	<b>Electrical Installation</b>	<b>27 days</b>																		

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Installation & Commissioning Schedule for One Unit  
Trent Phase 3 Generator Set

TYPICAL
















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87	Pull cables to MCC (from main feed)	5 days	14																	
88	Pull Cable (package to Customer Control Room)	5 days	24																	
89	Megger cross-site cabling	2 days	88																	
90	Install External Cable Tray	3 days	88FS-7 days																	
91	Terminate Package Cabling	10 days	89																	
92	Megger Generator and Install Generator Main Terminal Box Cabling	2 days	21,89																	
93	<b>Fuel Gas Piping Installation (customer)</b>	<b>6 days</b>																		
94	Connect to Customer's Fuel Gas Supply Piping	6 days	24																	
95	<b>Pre-Commissioning</b>	<b>49.25 days</b>																		
96	<b>Mechanical Pre-Commissioning</b>	<b>31.75 days</b>																		
97	<b>GT L.O. System / Hyd. Start L.O. System</b>	<b>15.25 days</b>																		
98	Clean & Inspect GT / Hyd. Start L.O. System	0.5 days	24,76																	
99	Final Check of Valves, Solenoids, Pressure Regulators	0.5 days	98,154																	
100	Flush GT Lube Oil System	1 day	99,155,152,153,154																	
101	Restore System Piping	0.25 days	99																	
102	Prime GT Starter	0.25 days	100																	
103	<b>Generator Lube Oil System</b>	<b>3.25 days</b>																		
104	Clean & Inspect Generator L.O. System and Run Down Tanks (if present)	0.5 days	100																	
105	Final Check of Valves, Solenoids, Pressure Regulators	0.5 days	104																	
106	Flush Compressor L.O. System	1 day	91,152,153																	
107	Restore System Piping	0.25 days	106																	
108	<b>Control Oil System</b>	<b>2.25 days</b>																		
109	Clean and Inspect Control Oil System	1 day	106																	
110	Final Check of Valves, Solenoids, Pressure Regulators	1 day	109,154																	
111	Flush Control Oil System	1 day	91,152,153,109																	
112	Restore System Piping	0.25 days	111																	
113	<b>ACAC System</b>	<b>1.25 days</b>																		
114	Clean and Inspect ACAC System (flush if required)	1 day	24																	
115	Restore System Piping	0.25 days	114																	
116	<b>CO2 System</b>	<b>4 days</b>																		
117	Clean and Inspect CO2 Interconnecting Piping	0.5 days	41																	
118	Restore System Piping	0.5 days	117																	
119	Charge Bottles Locally if Shipped Empty	3 days	118																	
120	<b>Install Coupling and Gas Turbine</b>	<b>7.75 days</b>																		
121	Install Flex Coupling and Fit GT Intake Center Scroll	1 day	31,76																	
122	Assemble Engine Tooling and Move GT into Berth	2 days	24,121,27,29																	
123	<b>Install GT:</b>	<b>2.25 days</b>																		
124	Connect GT Piping (note: flushing must take place prior to final engine connections)	0.5 days	122																	
125	Connect GT Cabling including AIRS cabling, Barrier Box, Fuel Control, and Ignitor Box on Skid	0.5 days	122																	
126	Connect Intake Air and Exhaust Ducting Flexible Connections	0.25 days	122,85																	
127	<b>GT Combustion Air &amp; Vent Air System</b>	<b>1.75 days</b>																		
128	Lockwire All Nuts & Bolts in Plenum / Torque Check of Filter Nuts	0.5 days	126,79																	
129	Clean All GT Combustion Air Intake Components	0.5 days	128																	

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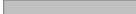


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130	Lock & Tag Plenum Door	0.5 days	129																	
131	Connect Instrument Air Supply Fittings to Filter Assembly	0.25 days	130																	
132	<b>Oil Mist Eliminator</b>	<b>0.5 days</b>																		
133	Complete Oil Mist Eliminator Checks	0.5 days	131,73																	
134	<b>Install GT Water Wash Tank</b>	<b>0.5 days</b>																		
135	Verify GT Water Wash Tank Hook-up	0.5 days	133																	
136	<b>Setup &amp; Cal Fuel Gas System</b>	<b>31.75 days</b>																		
137	Ensure All Gas Vents to Safe Atmosphere are Piped Separately	0.1 days	135																	
138	Ensure All Piping is Installed per Applicable Diagrams	0.25 days	137																	
139	Inspect Installed Detectors	0.1 days	138																	
140	<b>System Leak Test (if required)</b>	<b>0.7 days</b>																		
141	Blank off Fuel Gas Manifold at Rolls-Royce Control Skid	0.1 days	139																	
142	Pressurize System to Check for Leaks	0.25 days	141																	
143	Depressurize System	0.25 days	142																	
144	Remove Blanks from System & Restore System	0.1 days	143																	
145	Energize all Solenoids	0.25 days	153																	
146	Download Gas Valve Software	0.5 days	164																	
147	<b>Electrical &amp; Controls Pre-Commissioning</b>	<b>49.25 days</b>																		
148	<b>Test Electrical System</b>	<b>43.25 days</b>																		
149	Bond Skid and Verify Proper Ground (ground grid by customer)	5 days	91FS-10 days																	
150	Connect and Test Instrument, IS, and Dirty Grounds in the ECS, PCS, GCPP, and Fire System	1 day	149																	
151	Megger all motors and cables on GT and Generator Skid (QA/QC forms req'd)	3 days	150																	
152	Power up MCCs	1 day																		
153	Commission MCC's	2 days	152																	
154	Check all motors for proper phase rotation	2 days	153,91FS-7 days																	
155	Verify and energize lube oil heaters and set thermostat	2 days	153,154																	
156	Pre-Commission the HMI	1.5 days	153																	
157	Control System Loop Checks (ECS, PCS, GCPP)	<b>8 days</b>																		
158	Loop Checks (QA/QC forms required)	7 days	91FS-6 days																	
159	Ground Loop Checks (Remove Main Ground Ties)	1 day	158																	
160	<b>Uninterruptible Power Supply (UPS) - Provided by Customer</b>	<b>1.25 days</b>																		
161	Point-to-Point & Loop Checks (QA/QC forms to be completed)	1 day	159																	
162	UPS Power-up / Functional Checks	0.25 days	161																	
163	<b>Power-Ups</b>	<b>11 days</b>																		
164	Pacakge Control System (PCS)	3 days	162																	
165	Engine Control System (ECS)	3 days	164																	
166	Fuel Metering Valve (FMV)	2 days	165																	
167	Fire and Gas System	1 day	166																	
168	Oil and Debris Monitor (ODM)	1 day	167																	
169	Generator Control & Protection Panel (GCPP)	1 day	168																	
170	<b>Software Checks</b>	<b>14.25 days</b>																		
171	<b>Software Checks / Load Tuneable Changes for Site / HMI Screens Correct</b>	<b>14.25 days</b>	158,152																	
172	PCS	1 day	156																	

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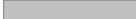

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173	ECS	1 day	172																	
174	Fire System	1 day	173																	
175	Safety System Verification	1 day	164																	
176	GCPP Relay Settings	1 day	169																	
177	<b>Functional Checks</b>	<b>16 days</b>																		
178	<b>Calibration</b>	<b>7.75 days</b>																		
179	Skid Instrumentation Calibration	5 days	158,159																	
180	Calibrate ECS, PCS and associated instrumentation	5 days	172																	
181	Thrust Piston Calibration	0.25 days	180																	
182	LPBOV Calibration	0.5 days	181																	
183	VSV and IGV Calibration	1 day	182																	
184	ODM	1 day	183																	
185	<b>Systems Pre-Commissioning</b>	<b>8.25 days</b>																		
186	Generator	1 day	184																	
187	Fire System	1 day	186																	
188	Control Oil System Checks with the engine installed (backup pump check)	0.5 days	187																	
189	Pulse Air Filter and Inlet Plenum Inspection	0.5 days	188																	
190	Vent Air System (backup fan check)	0.5 days	189																	
191	AIRS - valves, switches, TC's	1 day	190																	
192	Water Wash	0.25 days	191																	
193	CO2 Concentration Testing (if required)	2 days	192																	
194	Start System Checks - signal checks only (start speed, overspeed, etc)	1 day	193																	
195	Generator Lube Oil Pump Logic Check and Functional Check	0.5 days	194																	
196	<b>Final Preparations</b>	<b>3.25 days</b>																		
197	Ensure all Vibration Detectors and Shaft Position Sensors are installed	0.25 days	195																	
198	Check Speed Sensors & Accelerometers	0.25 days	197																	
199	Check all Protective Devices: Manual Devices and Control System Protective Devices	2 days	198																	
200	Check for Leaks, Loose Parts, Etc. in the Combustion Air Intake	0.25 days	199																	
201	Verify Ignition System Setup	0.25 days	200																	
202	Verify Generator Protection Setup	0.25 days	201																	
203	<b>Commissioning</b>	<b>14.2 days</b>																		
204	Simulate startup sequence	1 day	201																	
205	Install Test Equipment to Support Performance Testing Requirements	2 days	201																	
206	Purge and Pressurize Fuel Gas System	1 day	204																	
207	Obtain a Fuel Gas Sample and Send to Lab for analysis	0.25 days	206																	
208	Run unit to Sub-Synch Idle and perform P30 Shutdown	0.5 days	207																	
209	<b>Run Unit to operating range, check all parameters, shut down, verify conditions</b>	<b>12.2 days</b>																		
210	include pump/motor changeovers (vent fans, coolers)	0.4 days	206																	
211	check main lube oil pump transfer	0.2 days	210																	
212	verification of overspeeds	0.4 days	211																	
213	vibration analysis (if required)	1 day	212																	
214	<b>Create a 'Baseline' Datlog recording of startup and loaded condition</b>	<b>1.2 days</b>																		
215	to include speeds	0.4 days	213																	

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216	to include vibration	0.4 days	215																	
217	to include bearing pressures and temperatures	0.4 days	216																	
218	Generator Commissioning	2 days	217																	
219	UCP alarms and faults noted/corrected	1 day	218																	
220	Check all readings, verify correctness, rectify problems	0.5 days	219																	
221	4-hour lube oil consumption test	0.5 days	220																	
222	Unit Performance Test	2 days	221,205																	
223	Unit Integrity Test (if req'd)	1 day	222																	
224	Carryout plant S/D, ESD and F&G shutdown functionality	1 day	223																	
225	Unit Handover	1 day	224																	

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