



GE Wind Energy 1.5s Wind Turbine Generator Hub Access Procedure

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REVISION SHEET

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1.0 PURPOSE

This procedure defines the method to safely enter the hub.

2.0 MATERIALS

Not Applicable.

3.0 REFERENCE DOCUMENTS

OSHA 29 CFR 1926.21 – Confined Spaces
OSHA 29 CFR 1926.416-430 – Lockout Tagout

4.0 PROCEDURE



Only personnel trained in confined space entry and lockout tagout are allowed to enter the hub!

The following steps must be performed prior to entering the hub, of the GE Wind Energy 1.5s Wind Turbine Generator to ensure a safe execution of work performed inside the hub. The crew persons must stay in constant radio contact.



The steps in "*italicized type*" are the responsibility of the Main Controller or Topbox Attendant. The steps in "regular type" are the responsibility of the person(s) executing the work inside the hub.

The Main Controller or Topbox Attendant through oral communication with the person(s) performing the "regular type" steps can complete all of the initial section of this checklist.


This checklist must be completed prior to hub entry and stored on file in the site supervisor's office for a period of one year after work completion.



5.0 HUB ENTRY CHECKLIST

Technician:		Technician:	
Row:	Pad:	Date:	Supervisor:
Reason for Hub Entry:			Initials
1. Verify wind speed mean value is below 15 m/sec). If the mean wind speed is above 15 m/sec. do not proceed.			
2. Stop the turbine by pressing the "Stop/reset" button located on the Main Controller door.			
3. Disconnect the Cat5 cables from the Hirschmann Switch to the Plant PC and the Bachmann PLC, and install the Cat5 crossover cable between the Plant PC and Bachmann PLC..			
4. Place the Service Key Switch into position (I) for maintenance or position (II) for repair. If necessary, yaw the turbine to allow access into the nacelle.			
5. Place a lockout tag on the E-stop button and climb the turbine.			
6. Prior to entering the nacelle from the tower place the Yaw Switch located on the Service Switch Box on the bedplate, into the Stop position. Climb into the nacelle and place the Yaw Switch into the "ON" position.			
7. Place the Hydraulic On/Off switch located on the Topbox Controller into the "ON" position, and manually rotate the hub to allow access to the nose cone hatch.			
8. Install the rotor lock on the brake disc located on the high-speed shaft.			
 THE LOW-SPEED SHAFT ROTOR LOCK SHOULD NOT BE ENGAGED WHEN ENTERING THE HUB, EVEN AS A BACK UP TO THE HIGH-SPEED SHAFT ROTOR LOCK. THE LOW-SPEED SHAFT ROTOR LOCK SHOULD ONLY BE USED WHEN REPAIR OF THE GEARBOX OR BRAKE PREVENTS USE OF THE HIGH-SPEED SHAFT ROTOR LOCK.			
9. Verify the rotor lock is engaged with the disc brake.			
10. Place a lockout tag on the rotor lock.			
11. Inspect all tie-off points (nose cone handrail) to ensure they are safe to use.			
12. Connect lanyard to the nose cone handrail.			
13. Open the nose cone hatch. Inspect the nose cone mounting hardware prior to entering the hub to ensure there is no loose or missing hardware.			
14. Enter the nose cone.			
15. Remove hub manhole cover.			
 WAIT ONE MINUTE PRIOR TO ENTERING HUB TO ALLOW AIR TRANSFER IN THE HUB (TO VENT POSSIBLE BATTERY GASES).			
16. Follow OSHA Confined Space Entry regulations. ✓			
17. Detach lanyard from harness to allow movement inside of hub.			



17. Enter the hub.	
18. If work is being performed on blades, switch the control switches to the "Off" position. After the control switches are set to "Off", switch the backup battery switches to the "Off" position. These switches are located on each axis box.	
19. <i>The Main Controller or Topbox Operator must continue to monitor the wind speed to ensure maximum mean value remains below 15 m/sec.</i>	
 IF THE MAIN CONTROLLER OR TOPBOX ATTENDANT OBSERVES 3 CONSECUTIVE 1 SECOND READINGS EQUAL TO OR GREATER THAN 20m/sec, INSTRUCT THE HUB SERVICE CREW TO EXIT THE HUB IMMEDIATELY.	
20. Upon completion of work inside the hub, verify all controller doors are secured and return the backup battery and control switches to the "On" position.	
21. Verify all tools, trash, etc. are removed from hub / nose cone area.	
22. Attach lanyard to harness and exit the hub.	
23. Install the hub manhole cover.	
24. Exit the nose cone. Close and latch the nose cone hatch and install the cotter pin.	
25. Enter the nacelle and disconnect lanyard from nose cone handrail.	
26. <i>Disengage the high-speed rotor lock and remove the lockout tag.</i>	
27. <i>Re-install the Cat5 cables from the Hirschmann Switch to the Plant PC and the Bachmann PLC.</i>	
28. Verify no errors are displayed in VisuPro. If no errors are present, return the turbine to the condition in which it was found prior to the execution of this procedure. If errors are displayed in VisuPro, correct the error. If unable to correct the errors, contact the site supervisor for further assistance.	