



Electricity Human Resources Canada is a non-profit organization supporting the human resources needs of the Canadian electricity sector.

Job Demands Assessment: Wind Turbine Technician



This project is funded by the Government of Canada's Sectoral Initiatives Program.

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The purpose of a Job Demands Assessment (JDA) is to document the bona fide essential duties of a task. These assessments can be used for:

- Return to work planning
- Allowing medical professionals to evaluate job offers for suitability
- Determining job and task suitability
- Determining the likelihood that a job or task contributed to an injury
- Assisting Rehabilitation Specialists set up effective treatment protocols
- Training employees
- Hiring practices and Post Offer Pre-employment hiring programs
- Identifying ergonomic hazards

Using the JDA

This JDA is purposely generic in nature to ensure applicability across various organizations. The JDA is meant to serve as a benchmark document that provides an overview of the most common physical demands associated with the occupation. Not all tasks could be observed during the assessment process; instead, the most common tasks have been assessed.

Where applicable, potential accommodations are noted to illustrate alternative means for achieving the required demand or action.

This JDA can be used by Medical Practitioners / Health Care Providers involved in return to work rehabilitation support, and workplace accommodations to identify the Major Essential Demands that can be Performed, Modified, or Avoided by an individual based on their capacity and ability.

Acknowledgements

This JDA was completed by [ERGO Inc.](#), an Ergonomics, Injury Prevention & Safety Consulting & Training Firm that has been providing Canadian companies with practical ergonomic and injury prevention solutions for over 25 years.

Electricity Human Resources Canada and ERGO Inc. would like to thank [Boralex](#) for allowing us onsite to complete the JDA at the Thames River Wind Site in Tilbury, ON (November, 2021).

Position: **Wind Turbine Technician**

Date of On-Site Assessment: **November 30 & December 1, 2021**

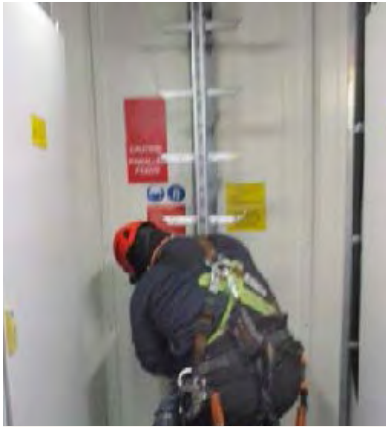
General Information

	<p>Statement of Overall Job Description: A Wind Turbine Technician is responsible for inspecting, maintaining, troubleshooting and repairing the mechanical and electrical components of a wind turbine. Approximately 75% of duties relate to planned preventative maintenance work, while 25% relate to corrective maintenance (troubleshooting and repairs). Some Technicians are based at a dedicated wind farm, while others may be part of a mobile crew that travels to various farms. All work is performed in teams of at least two Technicians.</p> <p>Tasks of an Electrical Maintenance Technician include:</p>	<p>Approx. % of Time Spent Performing Each Task</p>
<p>Job Description</p>	<p>1. Preparation & travel – Packing bags and vehicle with equipment, traveling to site, climbing tower (ladder, ladder assist, service elevator), hoisting equipment up the tower via winch, and accessing various areas of the turbine (climbing through hatches, external traverse of nacelle for some turbine models).</p>	<p>15-20% of shift Travel to site average 30-60 min Tower climb 5-20 minutes 5-10 min to access blades</p>
	<p>2. Testing of instruments – Performed at control panels and other electrical components to ensure electrical switches are working correctly when activated (e.g emergency stops, fans) and to troubleshoot issues (e.g. use of multimeters to test current). Part of preventative and corrective maintenance.</p>	<p>~20-25%</p>
	<p>3. Adjusting equipment and torquing bolts – Including torquing of bolts on all areas of the tower, turbine and inside blades, and checking the tightness of electrical connections. Part of preventative and corrective maintenance.</p>	<p>~20%</p>
	<p>4. Cleaning – Grease and oil is scraped from surfaces with a small scraper and surfaces are wiped clean. Part of preventative maintenance.</p>	<p>~20%</p>
	<p>5. Inspection of mechanical and electrical components – Visual and auditory inspection of components throughout the turbine. Part of preventative maintenance.</p>	<p>~20%</p>
	<p>6. Repair/replacement of components – removal and replacement of mechanical or electrical components (e.g. motors, relays, circuit boards, wiring) throughout the turbine.</p>	<p>~10-15%</p>
	<p>7. Computer tasks – completion of work orders and safety documentation, daily review of alarms from turbines.</p>	<p>5%</p>
<p>Division of Work</p>	<p>Technicians work in teams of at least two, with additional Technicians joining for more complex or heavy repair jobs.</p>	
<p>Work Load</p>	<p>Work performed on a single turbine may take 1 to 3 days depending on the scope of the maintenance work.</p>	
<p>Work Schedule</p>	<p>Varies by company. Typically, day shift Monday – Friday, 10 hour shifts. On call for evening and weekend issues.</p>	
<p>Work Environment</p>	<p>Description: Work performed at height, within the nacelle, along the vertical tower, within the spinner and inside the blades, on the exterior of the nacelle, and in the transformer area (outside or in the basement of the tower). Areas accessed via ladders and small access hatches (e.g 20 x 14" oval), towers 80-132 m high, crawl ~10 meters into blade. Standing and working surfaces are typically curved, often without footholds (except within the nacelle), and may be slippery; many work areas are tight without sufficient clearance to stand upright.</p>	
	<p>Working Heights: Floor to over shoulder level, occasional work overhead. Cabinets floor to 69" high, van storage floor – 58".</p> <p>Working Reaches: Typically, up to 24", up to 46" for transformer bolts. Obstructions and tight spaces (e.g. torquing bolts within the blade) may prevent Technician from being able to get closer to the work.</p>	

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Pictures of Main Job Tasks



Access Ladder



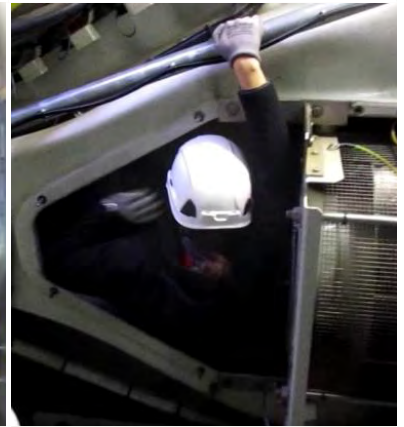
Work in Electrical Cabinet



Nacelle Control Panel



Opening Rotor Access Hatch



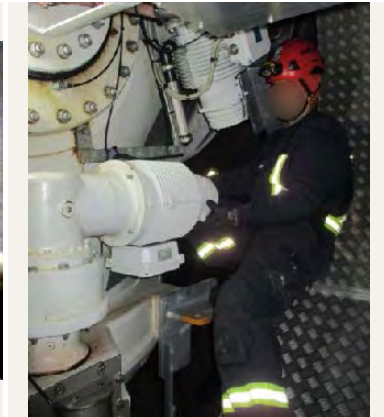
Climbing Through Hatch



Working on Rotor Control Box



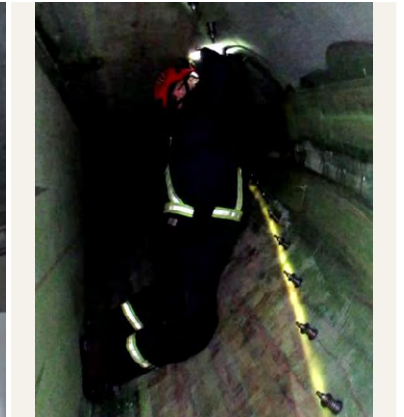
Climbing within Spinner



Working on Motor within Spinner



Working on Transformer



Torquing Blade Bolts

Disclaimer: Not all tasks within the Wind Turbine Technician occupation were being performed at the time of data collection. The data reported in this document is based on the measurement of available equipment, observation of 1 day of a 4-year master maintenance routine, as well as mock-ups of a range of corrective maintenance tasks and interviews with Wind Turbine Technicians. This PDA may not be 100% representative of any one job site, as demands may vary based on Company and location.

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Summary of Major Essential Demands

For further details refer to the tables on the following pages

To be completed by Health Care Provider — Please check one:

	Able to Perform	Modification Required (Explain)	Unable to Perform
Occasional one- and two-handed lifting (typical 2-20 lbs, max. 75-146 lbs, (2 person lift or chainfall when able), floor to over shoulder, occasionally overhead.			
Occasional one- and two-handed carrying (typical 2-20 lbs, 75-146 lbs, (with 2 person, come along or chainfall when able). Occasional wearing of equipment weighing 15-30 lbs (including while ladder climbing). Typical walking distances 20-30 m at a time.			
Occasional one- and two-handed vertical and horizontal pushing/pulling with tools (torquing typical 10-50 lb. up to 100 lb), and pulleys & hatches (approx.10-20 lbs).			
Occasional sitting in vehicle (1-2 hours/shift), office chair (rare), and on ground (rare, for some work areas).			
Occasional to constant standing on flat, uneven, curved, and/or slippery surfaces; may have insufficient clearance to stand upright. Highest volume of standing for cabinet work, minimal if working within blade or spinner.			
Occasional walking between the truck and tower; may be on uneven or slippery terrain. Walking within the tower, inside the blade (stooped walking) and for external traverses; surfaces may be uneven, curved, and/or slippery. Typically, 20-30 meters at a time.			
Frequent to constant gripping/handling with both hands to handle tools and equipment. Simulated grip of 30-50 lbs to climb ladder.			
Occasional pinching/fingering with one and both hands to type and write; moderate forces to splice wires and use scraper.			
Occasional squatting , for low level task, to enter/exit hatches and in areas with limited head clearance. Typically, <5 min at a time, but may spend up to 1 hour crouched moving along length of equipment. Typically kneel if stationary location.			
Occasional kneeling , for low level work and work within the spinner and blades with limited clearance. Up to 1 hour at a time.			
Rare to occasional climbing of stairs, ladders, in/out of vehicles, through hatches, and over/through/around equipment. Ascending tower (80-132 m) takes 10-20 minutes (climb assist or elevator may be available). Limited hand and footholds in some areas.			
Occasional to frequent balancing while climbing, walking and working on uneven, curved, slippery surfaces. Surfaces may sway in wind.			
Occasional driving to the worksite. Typically, 1-2 hours/shift.			
Rare crawling , up to 20-30 m to access internal repairs, <5 min at a time, through access hatches and tight spaces.			
Moderate back repetition (all directions) with periods of static postures, particularly during work in tight spaces. Full range required.			
Low neck repetition (all directions) with periods of static postures for high visual demands and in tight work spaces. Full range required.			
Low bilateral shoulder repetition (all directions) with periods (~30 min) of high repetition (climbing, torquing, scraping grease) and periods of static postures, particularly for work over shoulder height or where obstructions or tight spaces prevent Technician from getting closer to the work area. Full range required.			
Low bilateral elbow repetition (all directions) with periods (~30 min) of high repetition (climbing, torquing) and static postures during tool use. Full range extension and pronation required.			
Low bilateral wrist repetition (all directions) with some static wrist postures during tool use and while crawling. Full range extension required.			
Excellent visual acuity, problem solving , and attention to detail (technical and for safety), as well as team communication critical to the task.			

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Demand / Action		Check if Performed	Description & Potential Accommodations <i>*Accommodation options noted in green</i>
Sensory	Hearing / Speech:		In person with partner. May reach out to supervisor or Technical support, via cellphone.
	• Conversation	✓	Air monitors, cell phone lightning alerts, auditory indicators during inspection and troubleshooting (e.g. sound of fan, motor, sound when bolt it tapped).
	• Signals	✓	
	Vision:		To inspect components, both large and small (circuit boards). To read from computer or phone.
	• 20 inches or less	✓	To drive vehicle on site, to winch equipment up tower.
	• 20 feet or more	✓	To detect defects during inspections, e.g. changes to circuit boards indicating overheating. Some wiring colour coded, but often colour provides redundant coding (also labelled). Locks colour coded.
	• Colour	✓	To climb ladders, to connect wires, torquing bolts.
• Depth Perception	✓		
	Smelling	NE	May be used to troubleshoot issues, e.g. off gas from capacitor failure, burning smell from circuit board.
	Tactile / Feeling	✓	To torque bolt, to feel connections and bolts to check for tightness, use of feeler gauge to check bolt gapping.
Environment	Conditions of Work		Work at heights of 80-132 m accessed via ladder and in some towers service elevators. Majority of work indoors within nacelle, spinner, and blades, with only some towers requiring external traverse to access blades, and occasional work on external components both at height, (e.g. lights) and at ground level (outdoor transformers and cabinets). Areas accessed via hatches (all sizes and shapes), standing and work surface typically curved, with limited footholds and often without head clearance to stand upright. Only rarely is work performed within a space qualified as "confined space". Turbine sways in the wind.
	Temperature / Humidity		Exposure to all seasons and weather to access turbines. Majority of work conducted within turbine, with some ability to moderate the temperature with heaters and in some cases portable A/C units. Exposed to heat, cold, and wind. Internal blade work environment hot during summer months. Attempt to schedule more physically demanding work during cooler months.
	Noise		Minor noise from battery powered tools. Hearing protection not worn. Noise levels not measured.
	Vibration		Minimal from battery powered hand tools.
	Walking / Working Surface		Uneven terrain at base of tower (gravel, soil, ice), areas within the spinner and blade are curved with limited footholds and may be slippery and have tripping hazards along the length. Surfaces sway in higher wind conditions.
	Lighting		Use of headlamps and portable lighting. Dark inside spinner and blade lit by lights brought in.
	Electrical		Responsible for maintaining and repairing electrical components including transformer work. Lock-out tag-out procedures in place. Arc flash suit worn for some work.
	Sharp Objects		Tools (snips, utility knife). Potential for contact with sharp protrusions, e.g. hardened putty or resin while moving within the blade.
	Hot / Cold Hazards		Exposure to outdoor conditions for turbine access and any external traverse. Ladder may be cold to the touch in winter, nacelle casing becomes hot to the touch in summer. Heater, halogen lights and tools may become hot to the touch. Soldering iron.
	Chemical / Dust		Grease, cleaner, fuse grease, nitrogen tank, off gas from capacitor, transformer oil.
Tools	Moving Machinery / Equipment		Work vehicle, winches, service elevator, come along, mechanical turbine components (blades, rotor).
	Hand / Sharp Tools		Utility knife, battery powered drill and impact gun, manual wrenches and ratchets, snips, wire strippers, soldering iron, heat gun, hammer, feeler gauge, multimeter.
	Personal Protective Equipment		Varies by task. Safety boots, eye protection, gloves, long sleeve and pants (with kneepads), fall arrest harness, double leg lanyard, ladder fall arrest, ladder climb assist, hard hat, leather, nitrile, and/or electrical insulated gloves, knee/elbow pads, rescue kit. Some tasks may require arc protection suit, respirator, face shield, Tyvek suit.
	Other Equipment / Supplies		Lift bags, winches, come alongs, chain fall, soldering iron, nitrogen tank, fire extinguisher, vacuum, space heater, step ladder (for ground level cabinet work), nitrogen tank.

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Demand		Rate Requirement	Description of Tasks that Demand is Required & Potential Accommodations <i>*Accommodation options noted in green</i>
Legend: NE = Not Essential ND = Not Daily but essential 5% or less = Rare Essential 6-33% = Minor Essential Demand >33% = Major Essential Demand			
Cognitive	Reading:		
	• English	Minor	Reading of work orders, list of maintenance points, work and safety procedures, circuit diagrams, and other technical repair documents. Alphanumeric codes for alarms and material codes. French documentation in some provinces.
	• French	Varies by Province	
	• Other	No	
	Writing:		
	• English	Minor	Lock-out tags, completion and creation of work orders (materials, time, notes), safety documentation, typically on phone or on computer. French documentation in some provinces.
	• French	Varies by Province	
	• Other	No	
	Verbal Communication:		
	• English	Major	With team (Technicians) as well as supervisor and Technical support. In person and via phone. French documentation in some provinces.
	• French	Varies by Province	
	• Other	No	
	Supervising Others	Major	Responsible for the safety of their team.
	Working to Speed	Major	Work is time sensitive as there is pressure to get units back online. Due to high level safety and quality requirements, time is taken to perform the tasks carefully. Tasks may have expected completion times, but Technicians have some control over their task pacing.
	Self-Supervision/ Working Alone	Minor	Technicians always work in a team of at least two. However, they may be working in different areas of the turbine and not in direct visual contact (e.g. one in nacelle and one within blade).
	Computer Usage	Minor	Daily for safety documentation & completion/creation of work orders on mobile phone, laptop in vehicle, or at workstation in the shop.
	Math:		
	• Simple	Minor	Electrical math, typically performed in the head.
	• Complex	NE	
	Memory:		
• Short Term	Major	To track the progression of tasks, both from a safety and technical standpoint to ensure each step completed accurately before moving on. Procedural information – both technical (reference manuals & work instructions available) and safety procedures. Prior experience informs troubleshooting and repair work. Material codes, alarm codes.	
• Long Term	Major		
Organization	Major	Required to ensure all steps are completed in order and to technical and safety requirements. To ensure pack all required equipment as travelling up/down the tower is time (and energy) consuming.	
Decision Making	Major	Responsible for organization and completion of tasks. Troubleshooting may require complex problem analysis and decision making. Technical support may be available. Responsible for safety sensitive decisions during the performance of tasks.	
Attention to Detail	Major	Close attention to procedures, drawings, and alphanumeric data critical (multimeter and control panel readings, torque values). Required for safety of self and team and for completion of tasks to quality standards.	
Problem Solving	Major	Troubleshooting issues represents ~25% of work. Often diagnosing problems from many possible errors/failures. Pinpointing issues can be difficult. Technical support may be available. Responsible for problem solving in the event of an unexpected incident, e.g. onsite rescue.	
Emergency Management	ND	Responsible for self-rescue and rescue of team under any given condition. EMS not typically available until the team is back on the ground.	

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Demand / Action		Check if Performed	Duration	Frequency	Description & Potential Accommodations <i>*Accommodation options noted in green</i>	
Legend: NE = Not Essential ND = Not Daily Rare = 1-5% Occasional = 6-33% Frequent = 34-66% Constant = 67-100%						
Strength	Lifting	Two Hands	✓	Occasional <i>Note does not include tool holding time (see gripping below)</i>	<10 lifts of items >20 lbs /shift 10-30 lifts of items between 10-20 lbs/ shift Tools intermittent throughout the shift.	Objects: Tool bag (~15 lbs), tools (2-11 lbs), replacement components e.g. relay, capacitor box, control pitch box, motor (75 – 146 lbs), vacuum (11 lbs), grease pump 24 lbs, blade immobilization kit (60 lbs), rescue kit (45 lbs), PPE (see worn objects below). Weight Max: 75-146 lbs, use 2-people where able (not possible in some spaces), and use of chainfalls and come-alongs to hoist heavy components into position. Weight Typical: 2 – 20 lbs Range of Lift: Floor to over shoulder, occasionally overhead. May pass equipment through awkwardly positioned hatches to a second Technician.
		One Hand	✓			
	Carrying	Two Hands	✓	Occasional <i>Safety equipment worn Occasionally</i>	<10 lifts of items >20 lbs /shift 10-30 lifts of items between 10-20 lbs/ shift Tools intermittent throughout the shift.	Carried Objects: See above. Worn Objects: harness (12 lbs), helmet (1.8 lbs), may also tether tools (3-8 lbs), or small supplies bag to body (5-15 lbs). Weight Max: 75-146 lbs, use 2-people where able (not possible in some spaces), and use of chainfalls and come-alongs to hoist heavy components into position. Weight Typical: 2-20 lbs carried, 15-30 lbs worn Distance: Typically 20-30 m Handles Present: Varies
		One Hand	✓		<i>Safety equipment worn while ascending/descending and for select tasks</i>	
	Pushing/ Pulling	Two Hands	✓	Occasional	Varies with task Highest when torquing series of bolts. E.g. 50 bolts within blade torqued in 45 minutes.	Objects: open hatch (10-20 lbs), torque 45-460 Nm (requiring 15-103 lbs at the hand), pulleys & chainfalls Force Max: ~100 lbs Force Typical: 10-50 lbs Distance: Stationary arm work Handles Present: Varies
		One Hand	✓			
Mobility	Sitting	✓	Occasional	Few times/shift, typically <30 min at a time.	Drive 1-2 hours/shift depending on location. In vehicle or on floor during breaks or during some tasks. Infrequent work at desk in office.	
	Standing	✓	Occasional - Constant	Intermittent, up to 1+ hour at a time. Able to take breaks as needed.	Higher when working in electrical cabinets, minimal if working in blades or spinner. May include stooped standing, standing on curved and slippery surfaces.	
	Walking	✓	Occasional	Intermittent throughout shift	Between truck & tower, typically 30 m. <10 m within nacelle. Stooped walking within spinner & blade, walking for external traverse – may be required.	
	Foot Activation	✓	Occasional	Start and end of shift	To access site via truck. Typically, 1-2 hours on a daily basis.	
	Crouching/Squatting	✓	Occasional	Typically several times/hour; varies with task Intermittent throughout shift	To access spinner, blades, low cabinets. Typically, <5 min at a time, but may spend up to 1 hour in crouched position moving along equipment. Typically kneel if low level work required in single location for longer periods. Surface may not be level.	
	Kneeling	✓	Occasional	Few times/shift; up to few times/hour. Typically several times/hour; varies with task Intermittent throughout shift	To perform work within spinner, blade, low cabinets. Up to 1 hour at a time. Able to move around and take breaks, but may not be able to stand upright in work area. Knee pads worn. Surface may not be level.	
	Climbing	✓	Rare - Occasional	Typically Ascend & descend tower 2x/shift	Ascending tower (80-132 m) takes 10-20 min, may have climb assist or service elevator. Climb in/out of work van or truck. Through various sized access hatches (horizontal and vertical entry) with limited hand or footholds.	
	Balancing	✓	Occasional - Frequent	Intermittent throughout the shift	While climbing, walking, crouching, kneeling, and working on uneven terrain or internal curved surfaces, and/or slippery surfaces. Surface may sway in the wind.	
	Crawling	✓	Rare	Daily, few times per shift	Typically, <5 min at a time, through access hatches and tight spaces, e.g. rotor. Surface may not be level, with limited hand or footholds. Crawl up to 20-30 m into blade including military crawl. May lay prone for access for some tasks.	

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Legend: NE = Not Essential ND = Not Daily Rare = 1-5% Occasional = 6-33% Frequent = 34-66% Constant = 67-100%						
Dexterity	Gripping/Handling (Gross motor)					
	Right Hand	✓	Dominant: up to Constant	Intermittent throughout the shift.	Objects: Rigging/carabiners (4-5 lb press with thumb), tools, equipment, ladder rungs, steering wheel. See lifting above. Force Max: 50-60 lbs Force Typical: 10-30 lbs Simulated grip force: Climb ladder (30-50 lbs), squeeze ladder fall arrest pin (50-60 lbs), carabiner (10-30 lbs).	
	Left Hand	✓				
	Either	✓				Non dominant: Up to frequent
	Pinching/Fine Finger Movement					
	Right Hand	✓	Dominant: Occasional	Computer tasks 30 min/shift Scraper to clean grease up to 1 hour/shift	Objects: Buttons on control panels and circuit boards, to type on laptop, keyboard, or phone, to handle small wires, splice wires, to hold scraper to clean grease. Weight: Negligible grip for typing, writing, handling phone. Moderate grip to hold scraper to clean grease and to splice wires.	
	Left Hand	✓				
	Either	✓				Non dominant: Occasional
	Hand/Eye Coordination		✓	Frequent	Intermittent through the shift	While sanding, grinding, applying fiberglass, top coat and paint. To climb ladders and through access hatches.

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Demand / Action		Check if Performed	Typical Posture Range of Motion (°)	Typical Repetition Rate/Hour	Description & Potential Accommodations <i>*Accommodation options noted in green</i>
Posture & Joint Position	Neck Movement				
	• Flexion (bent forward)	✓	<input checked="" type="checkbox"/> <20° <input checked="" type="checkbox"/> 20-45° <input checked="" type="checkbox"/> >45°	<input checked="" type="checkbox"/> <120 <input type="checkbox"/> 120-180 <input type="checkbox"/> >180 <input checked="" type="checkbox"/> STATIC	Static neck flexion for visually demanding tasks & data entry via phone. Typically, <45°, occasionally >45°. Extension for overhead work, e.g. torquing overhead bolts.
	• Extension (bent backwards)	✓	<input type="checkbox"/> <5° <input checked="" type="checkbox"/> >5°		
	• Rotation (twist)	✓	<input checked="" type="checkbox"/> <45° <input type="checkbox"/> >45°	<input checked="" type="checkbox"/> <120 <input type="checkbox"/> 120-180 <input type="checkbox"/> >180 <input checked="" type="checkbox"/> STATIC	Static twisting may be required for visual access in tight spaces.
	• Lateral Flexion (bent to side)	✓	<input type="checkbox"/> <5° <input checked="" type="checkbox"/> >5°	<input checked="" type="checkbox"/> <120 <input type="checkbox"/> 120-180 <input type="checkbox"/> >180 <input checked="" type="checkbox"/> STATIC	Static bending may be required for visual access in tight spaces.
	Back Movement				
	• Flexion (bent forward)	✓	<input checked="" type="checkbox"/> <20° <input checked="" type="checkbox"/> 20-45° <input checked="" type="checkbox"/> >45°	<input type="checkbox"/> <12 <input checked="" type="checkbox"/> 12-120 <input type="checkbox"/> >120 <input checked="" type="checkbox"/> STATIC	Static back flexion for low level work (low cabinets), climbing through hatches, and work in spaces without head clearance.
	• Extension (bent backwards)	✓	<input checked="" type="checkbox"/> <5° <input type="checkbox"/> >5°		
	• Rotation (twist)	✓	<input checked="" type="checkbox"/> <15° <input type="checkbox"/> 15-30° <input type="checkbox"/> >30°	<input type="checkbox"/> <12 <input checked="" type="checkbox"/> 12-120 <input type="checkbox"/> >120 <input checked="" type="checkbox"/> STATIC	Static twisting for access in tight spaces and where the floor surface is slippery/uneven, limiting foot movement.
	• Lateral Flexion (bent sideways)	✓	<input checked="" type="checkbox"/> <20° <input type="checkbox"/> 20-45° <input type="checkbox"/> >45°	<input type="checkbox"/> <12 <input checked="" type="checkbox"/> 12-120 <input type="checkbox"/> >120 <input checked="" type="checkbox"/> STATIC	Static bending may be required for access in tight spaces.
	Shoulder Movement (Dominant)				
	• Flexion (raised in front of body)	✓	<input type="checkbox"/> <45° <input checked="" type="checkbox"/> 45-90° <input checked="" type="checkbox"/> >90°	<input checked="" type="checkbox"/> <90 <input type="checkbox"/> 90-150 <input checked="" type="checkbox"/> >150 <input checked="" type="checkbox"/> STATIC	Periods (up to ~30 min) of repetitive flexion for ladder climbing (over 90°), torquing of bolts in front of body (up to 90°) or over shoulder level (>90°, e.g. in blade), scraping grease, and climbing in/through hatches and work spaces.
	• Extension (raised behind body)	✓	<input checked="" type="checkbox"/> <5° <input type="checkbox"/> >5°		
	• Abduction (raised to side)	✓	<input type="checkbox"/> <45° <input checked="" type="checkbox"/> 45-90° <input checked="" type="checkbox"/> >90°		
	• Adduction (across body)	✓	<input checked="" type="checkbox"/> <45° <input type="checkbox"/> 45-90° <input type="checkbox"/> >90°		
	• Rotation (turned in/out)	✓	<input type="checkbox"/> <5° <input checked="" type="checkbox"/> >5°		
	Shoulder Movement (Non-dominant)				
	• Flexion (raised in front of body)	✓	<input type="checkbox"/> <45° <input checked="" type="checkbox"/> 45-90° <input checked="" type="checkbox"/> >90°	<input checked="" type="checkbox"/> <90 <input checked="" type="checkbox"/> 90-150 <input type="checkbox"/> >150 <input checked="" type="checkbox"/> STATIC	Static flexion and abduction when working in spaces where obstructions or constraints prevent getting close to the work and for uppers areas of electrical cabinets. May reach behind the body to grasp tools and materials.
	• Extension (raised behind body)	✓	<input checked="" type="checkbox"/> <5° <input type="checkbox"/> >5°		
	• Abduction (raised to side)	✓	<input type="checkbox"/> <45° <input checked="" type="checkbox"/> 45-90° <input checked="" type="checkbox"/> >90°		
	• Adduction (across body)	✓	<input checked="" type="checkbox"/> <45° <input type="checkbox"/> 45-90° <input type="checkbox"/> >90°		
	• Rotation (turned in/out)	✓	<input type="checkbox"/> <5° <input checked="" type="checkbox"/> >5°		
	Elbow Movement (Dominant)				
	• Pronation/Supination (palm down/up)	✓	<input type="checkbox"/> Neutral <input type="checkbox"/> Partial <input checked="" type="checkbox"/> Full	<input checked="" type="checkbox"/> <120 <input type="checkbox"/> 120-180 <input type="checkbox"/> >180 <input checked="" type="checkbox"/> STATIC	Static pronation to climb ladders, to type, and work in control panel. Static extension where reach to work is increased.
	• Flexion/Extension (bent/straight)	✓	<input type="checkbox"/> Neutral <input type="checkbox"/> Partial <input checked="" type="checkbox"/> Full		
	Elbow Movement (Non-dominant)				
	• Pronation/Supination (palm down/up)	✓	<input type="checkbox"/> Neutral <input type="checkbox"/> Partial <input checked="" type="checkbox"/> Full	<input checked="" type="checkbox"/> <120 <input type="checkbox"/> 120-180 <input type="checkbox"/> >180 <input checked="" type="checkbox"/> STATIC	Repetitive flexion/extension for periods 10-30 min while ladder climbing and some torquing where the reach to the work is increased. Elbow rotation to scrape grease.
	• Flexion/Extension (bent/straight)	✓	<input type="checkbox"/> Neutral <input type="checkbox"/> Partial <input checked="" type="checkbox"/> Full		

Position: **Wind Turbine Technician**

Date of On-Site Assessment: **November 30 & December 1, 2021**

Demand / Action		Check if Performed	Typical Posture Range of Motion (°)			Typical Repetition Rate/Hour	Description & Potential Accommodations <i>*Accommodation options noted in green</i>
Posture & Joint Position	Wrist Movement (Dominant)						
	• Flexion/Extension (bent up/down)	✓	<input type="checkbox"/> Neutral	<input type="checkbox"/> Partial	<input checked="" type="checkbox"/> >½ range	<input checked="" type="checkbox"/> <900 <input type="checkbox"/> 900-1800 <input type="checkbox"/> >1800 <input checked="" type="checkbox"/> STATIC	Moderate range of motion required for manipulation of tools, ulnar deviation most typical. Extension and ulnar deviation in dominant hand while scraping grease.
	• Deviations (bent to side)	✓	<input type="checkbox"/> Neutral	<input checked="" type="checkbox"/> Partial	<input type="checkbox"/> >½ range	<input checked="" type="checkbox"/> <900 <input type="checkbox"/> 900-1800 <input type="checkbox"/> >1800 <input checked="" type="checkbox"/> STATIC	
	Wrist Movement (Non-dominant)						
	• Flexion/Extension (bent up/down)	✓	<input type="checkbox"/> Neutral	<input type="checkbox"/> Partial	<input checked="" type="checkbox"/> >½ range	<input checked="" type="checkbox"/> <900 <input type="checkbox"/> 900-1800 <input type="checkbox"/> >1800 <input checked="" type="checkbox"/> STATIC	May fully extend wrist, especially while crawling and maneuvering within the blade. Postures typically static, with some dynamic movements.
• Deviations (bent to side)	✓	<input type="checkbox"/> Neutral	<input checked="" type="checkbox"/> Partial	<input type="checkbox"/> >½ range	<input checked="" type="checkbox"/> <900 <input type="checkbox"/> 900-1800 <input type="checkbox"/> >1800 <input checked="" type="checkbox"/> STATIC		

Disclaimer: This table outlines the most common and expected working postures. However, due to the nature of the tight and awkward spaces within the blades, as well as some of the tight and awkward access hatches, more extreme postures may occur than those noted above.

Position: **Wind Turbine Technician**

Date of On-Site Assessment: **November 30 & December 1, 2021**

Optional Form

Can be used for Accommodation and Return to Work. **To be completed by employee's medical practitioner/ health care provider (do not include diagnosis).**

Employee's Name:

Are there any medical/health conditions that account for absence(s) from the workplace or would affect the employee's ability to perform his/her duties?

Yes **No**

If yes, describe the employee's specific work-related limitations and/or restrictions.

Indicate duration of limitation(s) and/or restriction(s) identified above. **Permanent** **Temporary**

If temporary, what is the expected duration?

Is employee involved in treatment and/or taking medication that may affect his or her ability to work, including regular attendance, and/or performing certain duties? **Yes** **No**

If yes, describe the impact (i.e. medication may cause drowsiness, safety risk related to treatment, treatment requires intermittent absences from work.)

Are any further absences from work (e.g. surgery) anticipated at this time? **Yes** **No**

If yes, please specify:

When is the date of your next assessment?

Name and address of medical practitioner/health care provider completing this form:

