Personal Protective Equipment Hazard Assessment

An assessment of the typical hazards encountered on wind turbine construction site has been completed and the personal protective equipment needed to protect our employees from those hazards has been determined.

Personal protective equipment (PPE) is intended to protect, shield or isolate or employees from chemical and physical hazards. Engineering controls should be implemented where possible before PPE is used.

EYE AND FACE PROTECTION	
Hazard	Personal Protective Equipment
1. Wind, dust and loose particles	1. Safety glasses with side shields and/or impact resistant goggles. Prescription safety glasses will be purchased for employees when an employee wears corrective lens and performs tasks where eye protection is necessary. Contact lenses may be permitted but require the use of eye protection.
2. Chipping, grinding, machining, masonry chiseling, powered fastening, riveting, sanding, and other jobs with possible impact or flying debris hazards.	2. During all operations involving grinding, chipping, and buffing, or where material could separate and become a projectile, a face shield shall be worn in conjunction with safety glasses/goggles per the local hazard assessment. Chemical handling may require the use of specific face shields per the MSDS.
3. UV light	3. Safety sunglasses.
4. Welding arc	4. Welding helmets or welding shields with typical shades of 10-14.
5. Chemicals	5. Consult MSDS for appropriate body, eye, and face protection. Chemical goggles of shield.
6. Arc Flash/Electrical	6. Arc shield (15 cal/cm^2) face shield. Two layer arc flash hood recommended.

HEAD PROTECTION	
Hazard	Personal Protective Equipment
1. Falling objects	1. Hard hats meeting the criteria of ANSI Z89.1, latest edition
2. Electrical	2. Hard hats meeting the criteria of ANSI Z89.1, latest edition. Metal (conductive) hard hats prohibited.

HAND PROTECTION	
Hazard	Personal Protective Equipment
1. Chemicals (irritations, burns)	1. Refer to MSDS instructions for appropriate gloves or other PPE.
2. Thermal burns, frostbite, mechanical vibration, or lacerations from jagged or rough materials.	2. Refer to MSDS instructions for appropriate gloves or other PPE. Use appropriate gloves designed for the hazard.
3.General exposures.	3. Determined on a job specific basis. generally, leather gloves, or equivalent such as mechanics gloves. Cotton gloves may be used for certain tasks as determined by the Pre-Task-Planning Card. However, the use of cotton gloves is discouraged. Leather, mechanics gloves, or more substantially constructed gloves generally provide more protection than cotton gloves. See section 4.
4. Cutting, sawing, grinding, chipping, chiseling, rebar handling, thread cutting, using power tools, working with or around sharp objects,	4. Kevlar gloves, leather gloves, or equivalent such as mechanics gloves with sleeves if cutting operation is significant. The use of cotton gloves is prohibited.
5. Electric shock	5. Use approved gloves (rubber or special electrical) and or mats as required per NFPA 70E. Protective shields, barriers, or insulating materials must be used to avoid inadvertent contact with energized parts in confined spaces such as manholes or vaults. Conductive clothing or jewelry (such as, watch bands, bracelets, rings, key chains, necklaces, metalized aprons or metal headgear) shall not be worn. Only rubber insulating protective equipment such as insulating blankets, matting, covers, line hoses, gloves, and sleeves that are manufactured and tested per the specifications in the applicable American

HAND PROTECTION	
	Society for Testing and Materials (ASTM) standard shall be used. Requirements for the in-service care and use of rubber insulating equipment to assure the safety of personnel utilizing that equipment are: (a) Electrical protective equipment must be maintained in a safe, reliable condition through proper usage, inspections, cleaning, storage, and testing. (b) The insulating equipment shall not be used on voltages higher than it was designed for. (c) Insulating equipment shall be inspected for damage before each day's use and after any incident that may have caused damage. These inspections do not require documentation. Rubber insulating gloves must also be given an air test, along with the inspection. A visual inspection will not reveal "pinhole" defects in gloves. Even a pinhole will allow current to pass through the glove and cause electrical injury. To air test a rubber glove, roll the cuff to create an airtight seal and inflate the glove. If the glove deflates or will not hold air, it must be destroyed. (d) Insulating equipment with any defect that would degrade the insulating properties must not be used, and must be destroyed. (e) Insulating equipment must be kept properly cleaned of foreign substances. (f) Insulating equipment must be stored to protect it from light, temperature extremes, excessive humidity, ozone, and other damaging conditions. (g) Properly matched leather gloves must be worn over rubber insulating gloves to provide abrasion and puncture resistance. Leather protective gloves must be of a length to provide adequate arcing protection from the leather to exposed skin. (h) Electrical protective equipment must be electrically tested per the intervals described in the OUSSS safety standard in accordance with the requirements of the applicable ASTM standard. Insulating equipment failing to pass inspections or electrical tests must not be used and must be destroyed, except in limited repair situations. Repaired equipment must be electrically retested before use.

FOOT PROTECTION	
<u>Hazard</u>	<u>Personal Protective Equipment</u>
1. Slips on ladders, steps, or slick surfaces.	1. Protective footwear meeting the criteria of ANSI Z 41-latest edition. Work shoes or boots (heels recommended) with oil resistant soles if necessary.
2. Significant exposure to dropped or falling objects.	2. Protective footwear meeting the criteria of ANSI Z 41-latest edition.

OCCUPATIONAL NOISE EXPOSURE	
Hazard	Personal Protective Equipment
1. Exposure to noise levels greater than 85 dBA. Double hearing protection may be required if the area noise levels are such that the NRR of the single hearing protection used does not reduce the levels to 85dBA or less. Contact HSSE for assistance in this regard.	1. Hearing protection (plugs, muffs, or both) with an appropriate Noise Reduction Rating (NRR). Signs shall be posted at or before each location where continuous noise levels are at 85 dBA or greater. Various forms of hearing protection are available and must be worn in posted areas. Hearing protection must also be worn during operations that generate noise in excess of 85 dBA.

FALL PROTECTION	
Hazard	Personal Protective Equipment
1. Fall from elevation.	1. Harnesses, personal fall arrest systems, shock absorbing lanyards.

CHEMICAL HAZARDS -GENERAL	
Hazard	Personal Protective Equipment
1. Splashing from chemical handling	1. Face Shield, chemical goggles, gloves, aprons, etc., as indicated on the appropriate MSDS.

RESPIRATORY PROTECTION	
Hazard	Personal Protective Equipment
1. Oxygen deficient atmosphere such as a permit required confined space entry.	1. Self Contained Breathing Apparatus (SCBA) or supplied air respirator with egress bottle, pressure demand only.
2. Potential exposure to benzene, chlorine hydrogen sulfide, ammonia, or other substances exceeding the applicable Permissible Exposure Limit (PEL).	2. Self Contained Breathing Apparatus (SCBA) or supplied air respirator with egress bottle, pressure demand only. In atmospheres that potentially exceed the PEL but do not exceed the IDLH for the specific substance, the egress bottle for the supplied air respirator is optional.
3. Potential exposure to naturally occurring radioactive material.	3. Supplied air pressure demand SCBA. HEPA air purifying respirator within limits.

RESPIRATORY PROTECTION	
4. Potential exposure to asbestos	4. Check with HSE representative for limits on specific respirators. SCBA or supplied air respirator. Half mask with HEPA. Full mask with HEPA. PAPR with HEPA.
5. Potential exposure to organic solvents during spray painting.	5. SCBA or supplied air respirator with egress bottle if above IDLH.

GENERAL HAZARDS	
Hazard	Personal Protective Equipment
1. Regular clothing.	1. Rings, wrist watches, loose clothing, unsecured long hair and other loose accessories must not be worn within arm's reach of operating machinery, tools, electrical switch gear or locations where these present a hazard.
2. Moving vehicles and heavy equipment.	1. High visibility vest.