

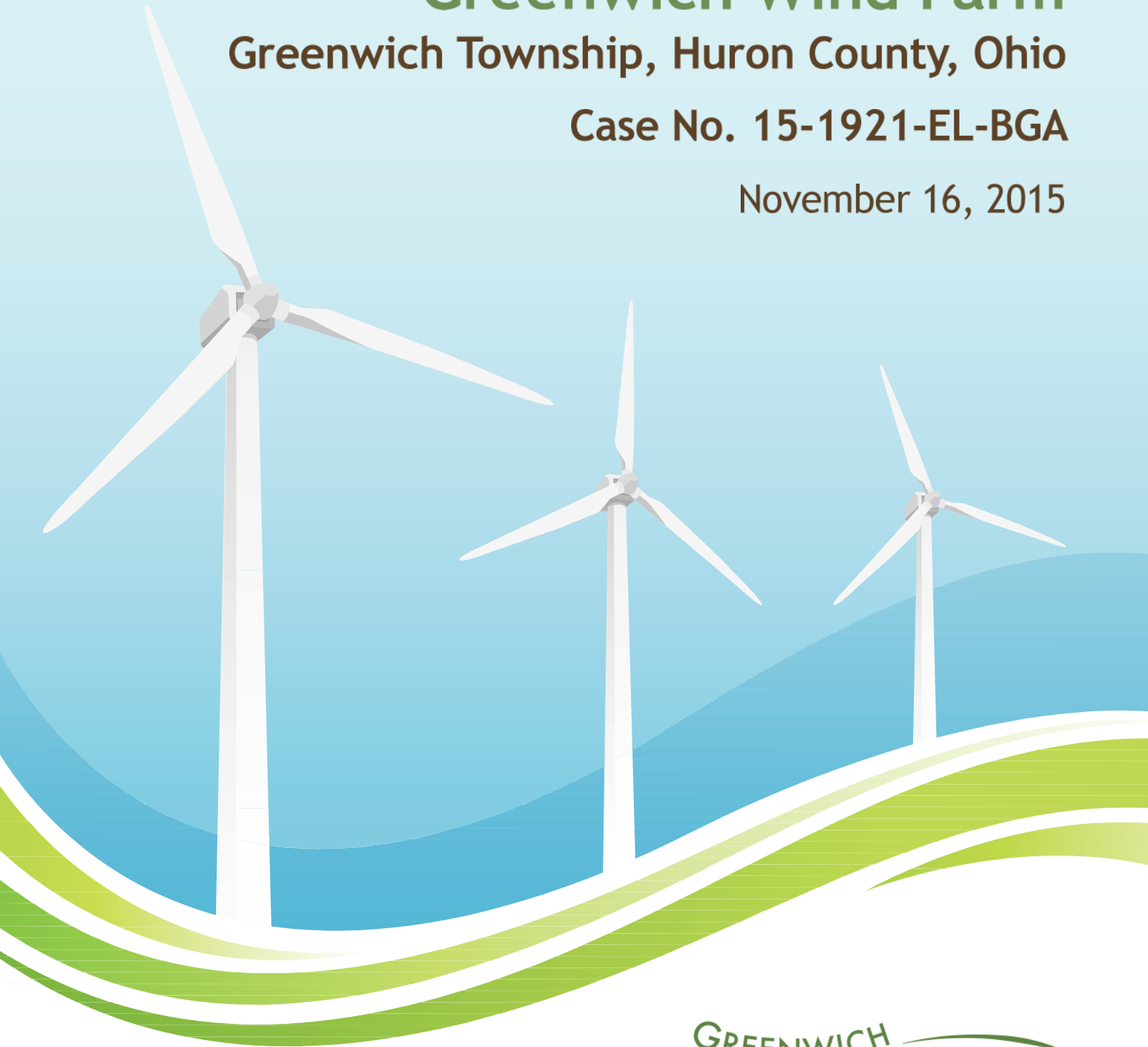
Application of 6011 Greenwich Windpark, LLC for an Amendment
to its Certificate of Environmental Compatibility

Greenwich Wind Farm

Greenwich Township, Huron County, Ohio

Case No. 15-1921-EL-BGA

November 16, 2015



GREENWICH WINDPARK

Submitted by 6011 Greenwich Windpark, LLC



COLUMBUS | CLEVELAND
CINCINNATI-DAYTON
MARIETTA

BRICKER & ECKLER LLP
100 South Third Street
Columbus, OH 43215-4291
MAIN: 614.227.2300
FAX: 614.227.2390

www.bricker.com
info@bricker.com

Sally W. Bloomfield
614.227.2368
sbloomfield@bricker.com

November 16, 2015

Via Hand Delivery

Ms. Barcy McNeal
Administration/Docketing
Ohio Power Siting Board
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3793

**Re: 6011 Greenwich Windpark, LLC,
Case No. 15-1921-EL-BGA**

Dear Ms. McNeal:

Attached for filing in the above-referenced case is a copy of the Application of 6011 Greenwich Windpark, LLC to Amend its Certificate of Environmental Compatibility granted August 25, 2014 in Case No. 13-990-EL-BGN. In addition, we have provided the Staff of the Ohio Power Siting Board ("Board") with five hard copies of the Application. Pursuant to Ohio Administrative Code Rule 4906-5-03(A)(3), the Applicant makes the following declarations:

Name of Applicant: 6011 Greenwich Windpark, LLC.
c/o Windlab Developments USA, Ltd
927 Wing Street
Plymouth, MI 48170

**Name/Location of
Proposed Facility:** Greenwich Windpark, a 60 MW wind farm
Greenwich Township
Huron County

**Authorized Representative
Technical:** Monica Jensen
Windlab Developments USA, Ltd.
927 Wing Street
Plymouth, MI 48170
Telephone: (734) 335-6219
E-Mail: monica.jensen@windlab.com

Case No. 15-1921-EL-BGA
November 16, 2015
Page 2

Authorized Representative

Legal:

Sally W. Bloomfield
Dylan Borchers
Bricker & Eckler LLP
100 South Third Street
Columbus, OH 43215
Telephone: 614-227-2368, -4914
Facsimile: 614-2990
sbloomfield@bricker.com
dborchers@bricker.com

Notarized Statement:

See Attached Affidavit of Monica Jensen
on behalf of 6011 Greenwich Windpark, LLC

Sincerely on behalf of
6011 GREENWICH WINDPARK, LLC



Sally W. Bloomfield

Attachment

**BEFORE
THE OHIO POWER SITING BOARD**

In the Matter of the Application of **6011
GREENWICH WINDPARK, LLC** for an
Amendment to its Certificate to Install and
Operate a Wind-Powered Electric Generation
Facility in Hueon County, Ohio.

)
)
) Case No. 15-1921-EL-BGA
)

AFFIDAVIT OF MONICA JENSEN, 6011 GREENWICH WINDPARK, LLC

STATE OF OHIO

: ss

COUNTY OF FRANKLIN

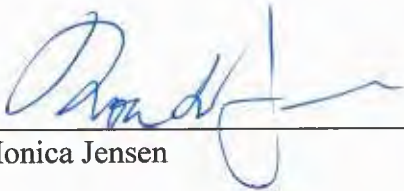
I, Monica Jensen, being duly sworn and cautioned, state that I am over 18 years of age and competent to testify to the matters stated in this affidavit and further state the following based upon my personal knowledge:

1. I am the Vice President, Development of Windlab Developments USA, Ltd, the sole member of 6011 Greenwich Windpark, LLC. and am authorized to execute this Affidavit.

2. I have reviewed the 6011 Greenwich Windpark, LLC Application for an Amendment to its Certificate to Install and Operate a Wind-Powered Electric Generation Facility in the above referenced case.

3. To the best of my knowledge, information and belief, the information and materials contained in the above-referenced Application are true and accurate.

4. To the best of my knowledge, information and belief, the above-referenced Application is complete.



Monica Jensen

Sworn to before and signed in my presence this 12th day of November, 2015.



Notary Public



KATHLEEN REARDON
Notary Public, State of Ohio
My Commission Expires March 21, 2018

Table of Contents

	<u>Page No.</u>
LIST OF FIGURES	i
LIST OF TABLES	ii
LIST OF ATTACHMENTS	iii
GLOSSARY	iv
4906-17-01 Applicability and Definitions.....	4
4906-17-02 Project Summary and Facility Overview	5
(A) Introduction:.....	5
(B) PROJECT SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT.....	5
(1) General Purpose of the Facility.....	6
(2) Facility Description.....	6
(3) Site Selection Process	6
(4) Principal Environmental and Socioeconomic Considerations	6
(5) Project Schedule.....	6
4906-17-03 Project Description and Schedule	7
(A) PROPOSED FACILITY DESCRIPTION	7
(1) Project Description.....	7
(a) Types of Turbines	7
(b) Land Area Requirements	7
(2) Description of Major Equipment	9
(3) Description of New Transmission Lines.....	9
(B) DETAILED PROJECT SCHEDULE	9
(1) Project Schedule.....	9
(a) Land Acquisitions and Land Rights.....	9
(b) Wildlife Studies/Surveys	10
(c) OPSB Application Preparation	10
(d) OPSB Application for Certificate Submittal.....	10
(e) Issuance of the OPSB Certificate.....	10
(f) Preparation of Final Design	10
(g) Facility Construction.....	10
(h) Placement of Facility in Service	10

	(2) Impact of Critical Delays	11
4906-17-04	Project Area Analyses	12
	(A) PROJECT AREA SITE SELECTION.....	12
	(1) Project Purpose	12
	(2) Constraint Map.....	12
	(B) SUMMARY TABLE OF EVALUATED SITES	12
	(C) OPTION TO PROVIDE THE SELECTION STUDY	12
4906-17-05	Technical Data	13
	(A) PROJECT AREA SITE	13
	(1) Geography and Topography	13
	(2) Aerial Photograph	13
	(3) Site Mapping/Existing Features Map.....	13
	(4) Geology and Seismology	13
	(5) Hydrology and Wind.....	13
	(B) LAYOUT AND CONSTRUCTION.....	13
	(1) Project Area Site Activities.....	13
	(2) Layout	13
	(3) Structures	14
	(a) Estimated Overall Dimensions	14
	(b) Construction Materials.....	14
	(c) Color and Texture of Facing Surfaces	14
	(d) Photographic Interpretation or Artist's Pictorial Sketches	14
	(e) Unusual Features.....	14
	(4) Plans for Construction.....	14
	(5) Future Plans	14
	(C) EQUIPMENT	14
	(1) Wind Powered Generation Equipment	14
	(2) Safety Equipment.....	15
	(a) Public Safety Equipment.....	15
	(b) Reliability of the Equipment.....	15
	(c) Turbine Manufacturer's Safety Standards	16
	(3) Any Other Major Equipment	16
	(D) REGIONAL ELECTRIC POWER SYSTEMS	16
4906-17-06	Financial Data	17

(A)	OWNERSHIP	17
(B)	CAPITAL AND INTANGIBLE COSTS	17
(C)	OPERATION AND MAINTENANCE EXPENSES	17
(D)	DELAYS.....	17
4906-17-07	Environmental Data	19
(A)	GENERAL	19
(B)	AIR.....	19
(C)	WATER	19
(D)	SOLID WASTE	19
4906-17-08	Social and Ecological Data	20
(A)	HEALTH AND SAFETY.....	20
(1)	Demographic Characteristics	20
(2)	Noise	20
(a)	Construction Noise Levels.....	20
(b)	Operational Noise Levels.....	20
(c)	Location of Noise-Sensitive Areas Within One-Mile of Facility ..	20
(d)	Mitigation of Noise Emissions During Construction & Operation	20
(3)	Water.....	20
(4)	Ice Throw	20
(5)	Blade Shear	21
(6)	Shadow Flicker	21
(B)	ECOLOGICAL IMPACT	24
(1)	Project Site Information.....	24
(a)	Facility Mapping.....	24
(b)	Vegetative Survey	24
(c)	Animal Life Survey.....	24
(d)	Summary of Ecological Studies.....	24
(e)	Major Species List	24
(2)	Construction.....	24
(a)	Impact of Construction	24
(b)	Impact of Construction on Major Species	25
(c)	Mitigation of Short and Long-term Construction Impacts	25
(3)	Operation.....	25
(a)	Estimate the Impact of Operation on Areas	25
(b)	Estimate the Impact of Operation on Major Species	25

(c)	Post-Construction Monitoring of Wildlife Impacts	25
(C)	ECONOMICS, LAND USE AND COMMUNITY DEVELOPMENT	25
(1)	Land Uses.....	25
(a)	Land Use Map.....	25
(b)	Residential Structures	26
(c)	Wind Turbine Structure Locations.....	26
(i)	Distance from base to property line	26
(ii)	Distance from blade to nearest residential structure	27
(iii)	Waiver of minimum setback	27
(d)	Impact of Proposed Facility	28
(e)	Identification of Structures to be Removed or Relocated	28
(f)	Plans for Future Use.....	28
(g)	Concurrent or Secondary Uses.....	28
(2)	Economics.....	28
(a)	Estimated Payroll	28
(b)	Estimated Employment	28
(c)	Estimated Tax Revenue	28
(d)	Estimated Economic Impact on Local Commercial & Industrial Activities	29
(3)	Impact on Public Services and Facilities	29
(4)	Impact on Regional Development	29
(D)	CULTURAL IMPACT	29
(1)	Landmarks of Cultural Significance and Recreational Areas	29
(2)	Estimated Impact on Landmarks	29
(3)	Consideration/Definition of Landmarks	29
(4)	Mapping Landmarks – Recreational Areas Within Five Miles	29
(5)	Impact on Recreational Areas Within One Mile.....	29
(6)	Visual Impacts and Mitigation Measures	29
(E)	PUBLIC RESPONSIBILITY	29
(1)	Public Information Program	29
(2)	Liability Insurance	29
(3)	Evaluation of Interference with Radio and Television	30
(4)	Evaluation of Interference with Military Radar Systems	30
(5)	Evaluation of Impact to Roads and Bridges	30
(6)	Plan for Decommissioning.....	30
(F)	AGRICULTURAL DISTRICT IMPACT	30
(1)	Agricultural District Mapping.....	30
(2)	Impact Assessment on Agricultural Land.....	30
(a)	Acreage Impacted	30
(i)	Field operations.....	31

	(ii)	Irrigation	31
	(iii)	Field drainage systems	31
	(b)	Proposed Mitigation Procedures	31
(3)		Viability Assessment	31

LIST OF FIGURES

- Figure 03-1. Proposed Project Schedule
- Figure 04-1. Constraints Map
- Figure 05-1. Site Layout
- Figure 08-1. Ecological Features
- Figure 08-2. Agriculture Resources

LIST OF TABLES

Table 03-1.	Impact Assumptions
Table 03-2.	Turbine Data Comparison
Table 08-1.	Structures Exceeding 30 Hours of Shadow Flicker Per Year
Table 08-2.	Impacts to Ecological Communities
Table 08-3.	Land Use Impacts
Table 08-4.	Impacts to Agricultural Land

LIST OF ATTACHMENTS

Exhibit A. Turbine Information

Exhibit A-1a Goldwind 2.5 MW GW121 Product Brochure

Exhibit A-1b Goldwind Safety Manual

Exhibit A-2a Gamesa 2.5 MW G114 Product Brochure

Exhibit A-2b Gamesa Safety Manual

Exhibit A-3a GE 2.5-120 Product Brochure

Exhibit A-3b GE Safety Manual

Exhibit B. Sound Survey and Noise Acoustic Assessment

Exhibit C. Shadow Flicker Report

Exhibit D. Microwave Study

Exhibit E. Ice Throw & Blade Shear Risk Assessment

GLOSSARY

List acronyms and abbreviations used in the Application, for example:

dBa	Decibels, A-weighted
MW	Megawatts
MWh	Megawatt hours
O&M	Operations and Maintenance
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
OPSB	Ohio Power Siting Board
USFWS	U.S. Fish and Wildlife Service
WDUSA	Windlab Developments USA, LTD

Introduction and Overview

Through this Amendment, the Applicant is proposing to amend the Certificate to add the Gamesa, General Electric, and Goldwind turbine as turbines suitable for this project. Since the preparation and filing of the Application in 2013, turbine technology has advanced for use in low wind speed areas. The three proposed turbines all provide an increase in energy production for the Project utilizing the approved physical locations represented in the Application. With the increase in energy production, one turbine location will be removed in order to achieve the permitted 60 MW production approved in Case No. 13-0990-EL-BGN. All proposed turbines meet Application setbacks and are subject to the Opinion, Order and Certification stipulations as ordered.

The certificated project included use of the Nordex N117 model, with a hub height of 91 meters (298 feet) and a rotor diameter of 117 meters (383 feet). The Gamesa G114 model will have a hub height of 93 meters (305 feet) and a rotor diameter of 114 meters (373 feet). The GE 2.5-120 model will have a hub height of 85 meters (279 feet) and a rotor diameter of 120 meters (394 feet). The Goldwind GW121 model will have a hub height of 90 meters (295 feet) and a rotor diameter of 121 meters (396 feet).

If the Gamesa G114 turbine is used, the total tip height will be 150 meters (492 feet), which is slightly greater than the total height of the Nordex model at 149.5 meters (490 feet) by one-half meter. The GE 2.5-120 turbine using an 85 meter hub height will be 145 meters (476 feet) in total tip height and less in total height than the certificated Nordex turbine. If the Goldwind GW121 turbine is used, the total tip height will be 150.5 meters (493 feet), which is slightly greater than the total height of the Nordex model at 149.5 meters (490 feet) by one meter.

Using the same modeling criteria as the Application, an updated noise assessment for the Gamesa G114, GE 2.5-120, and Goldwind GW121 turbines was completed. Model input results indicate that all proposed turbine models will remain below the nighttime 46 dBA + 5 dBA requirements as set forth in the Certificate. The Gamesa G114 and the GE 2.5-120 each have a maximum sound power level of 106 dB, which is slightly greater than the maximum sound power level of the Nordex N117 at 105 by one decibel. The Goldwind GW 121 has a maximum

sound power level of 108.9 dB, which is greater than that of the Nordex N117 model. However, it should be noted that this sound power level output is achieved in winds of 8 meters per second. As a result, any noise generated by the wind itself would mitigate turbine noise occurring at the nacelle/hub height of 90 meters (295 feet). Therefore, the project's operational noise level anticipated for all proposed turbines will comply with Certificate Stipulation 15.

(15) The facility shall be operated so that the facility noise contribution does not exceed the project area ambient nighttime L_{EQ} (46 dBA) by five dBA result at the exterior of any currently existing nonparticipating sensitive receptor. During daytime operations only from 7:00 a.m. to 10:00 p.m., the facility may operate at the greater of; the project area ambient nighttime L_{EQ} (46 dBA) plus five dBA; or the validly measured ambient L_{EQ} plus five dBA at the location of the sensitive receptor. After commencement of commercial operation, Greenwich shall conduct further review of the impact and possible mitigation of all facility-related noise complaints through its complaint resolution process.

Using the same modeling criteria as the Application, potential shadow flicker effects have been re-analyzed for the Gamesa G114, GE 2.5-120, and Goldwind GW121 turbines. The shadow flicker modeling for the Gamesa G114 predicts that 7 receptors will experience shadow flicker in excess of 30 hours per year, which is the same number of receptors modeled in the Nordex analysis. Modeling for the GE 2.5-120 predicts that 8 receptors will exceed 30 hours annually, which is slightly greater than the total number of receptors modeled in the Nordex analysis by one. Modeling for the Goldwind GW121 predicts 9 receptors exceeding 30 hours per year of shadow flicker, which is slightly greater than the total number of receptors modeled in the Nordex analysis by two.

Modeling results should be considered conservative, as they do not consider potential shading effects from nearby foliage, adjacent structures, window/door orientation, or "double counting" flicker. Therefore, the model over-predicts potential impacts and it is high likelihood that flicker experienced at these 7 to 9 receptors will be less. Furthermore, in the 2 to 3 instances where receptors only slightly exceed 30 hours it is anticipated that they will not actually exceed the

annual threshold. Therefore, the project's operational shadow flicker level for all proposed turbines is expected to comply with Certificate Stipulation 16.

(16) The facility shall be operated so that the turbine shadow flicker does not exceed 30 hours per year for any nonparticipating sensitive receptor. Applicant shall confirm with Staff that the minimization measure or mitigation has been completed for the two receptors that the model and site specific analysis showed to be in excess of 30 hours per year of shadow flicker. The analysis shall show how modeled shadow flicker impacts have been reduced to 30 or fewer hours per year for each such receptor. The analysis shall be provided to Staff at least 30 days prior to the preconstruction conference, for review and confirmation that it complies with this condition. This analysis may incorporate shadow flicker reductions from trees, vegetation, buildings, obstructions, turbine line of sight, operational hours, wind direction, sunshine probabilities and other mitigation confirmed by Staff to be in compliance with this condition. After commencement of commercial operations, Applicant shall conduct further review of the impact and possible mitigation of all facility-related shadow flicker complaints through its complaint resolution process.

Further information regarding the Greenwich Windpark, in addition to any information provided below, can be found in the Application and in the supplemental filings in the docket for Case No. 13-990-EL-BGN.

4906-17-01 Applicability and Definitions

6011 Greenwich Windpark, LLC ("the Applicant), a wholly-owned subsidiary of Windlab Developments USA, Ltd. (Windlab), is certified to construct the Greenwich Wind Farm (the Project), a wind-powered electric generation facility to be located in Huron County, Ohio. The Ohio Power Siting Board (OPSB) issued an Opinion, Order and Certificate in Case Number 13-0990-EL-BGN on August 25, 2014 for the construction of a 60 megawatt (MW) wind farm consisting of up to 25 wind turbines at the Greenwich Windpark in Huron County, Ohio. The original Application (the Application) for a Certificate of Environmental Compatibility and Public Need (the Certificate) was filed on December 23, 2013 and continuing through December 27, 2013.

The Applicant seeks to amend the Certificate through this Application for a Siting Certificate Amendment. Through this application, hereinafter referred to as the "Amendment", the Applicant is proposing to amend the Certificate to add the Gamesa G114 (2.5 MW) turbine, the GE 2.5-120 (2.5 MW) turbine, and the Goldwind GW121 (2.5 MW) turbine as turbines suitable for this project.

Reference is made to the information provided in the Application if the corresponding information provided by requirement of Chapter 4906-17 remains unchanged as a result of this Amendment.

The definitions in the Application continue to apply to this Amendment.

(A) Introduction:

6011 Greenwich Windpark, LLC (the Applicant), a wholly-owned subsidiary of Windlab Developments USA, Ltd. (Windlab), is certified to construct the Greenwich Wind Farm (the Project), a wind-powered electric generation facility to be located in Huron County, Ohio. The Ohio Power Siting Board (the OPSB) issued an Opinion, Order and Certificate in Case Number 13-0900-BGN on August 25, 2014 for the construction of a 60 megawatt (MW) wind farm consisting of up to 25 wind turbines at the Greenwich Wind Farm in Greenwich, Ohio. The original Application for a Certificate of Environmental Compatibility and Public Need (the Certificate) was filed on December 23, 2013 and continuing through December 27, 2013.

The Applicant seeks to amend the Certificate through this Amendment. Any change from the original Certificate is described in this Amendment.

(B) PROJECT SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT

Since the filing of the Application, Gamesa, General Electric, and Goldwind have introduced new turbine models to the market that are more efficient and cost effective designs for low and medium wind speeds sites than the turbine model approved in the Application. Given the characteristics of the wind at many of the intended turbine locations, these turbines would result in increased productivity for the project. The Applicant proposes to amend the list of possible turbine models for consideration, with the final turbine selection being made by the Applicant based on a combination of availability, efficiency, and cost. With any of the turbine models proposed, the turbine locations will remain in the exact same location and the total capacity of the Facility will not exceed the 60 MW as permitted under the Certificate. If the final model selected for construction has a greater generation output than that of the Nordex N117 2.4 MW model approved in the Certificate, the total number of turbine site locations will be reduced accordingly.

The Amendment does not seek changes in any other part of the Certificate as approved by the Board.

(1) General Purpose of the Facility

No change from Application.

(2) Facility Description

Through this Amendment, the Applicant is proposing to amend the list of possible turbine models for consideration. The three turbine models that are proposed are discussed further in Section 4906-17-03(A)(1)(a). With any of the proposed turbine models, the total capacity of the Greenwich Windpark facility will not exceed the 60 MW permitted under the Certificate. Therefore, if the final model selected for construction has a greater generation output than that of the model approved in the Certificate, the total number of turbine site locations will be reduced with accordingly. The proposed reduction in turbine site locations is shown on the updated Site Layout Map (Figure 05-1).

(3) Site Selection Process

No change from Application.

(4) Principal Environmental and Socioeconomic Considerations

No change from Application.

(5) Project Schedule

The Certificate for this Facility was issued in August 2014. Final designs and detailed construction drawings are anticipated to be completed in the first quarter of 2016 to be provided prior to the pre-construction conference. Construction is anticipated to begin in late-second quarter of 2016 and run through the end of 2016. The Facility is anticipated to be placed in service by the end of 2016 after operational testing is complete. The new project schedule is set forth in Section 4906-17-03(B)(1) of this Amendment.

(A) PROPOSED FACILITY DESCRIPTION

The Applicant is permitted to construct, own, and operate a wind-powered electric generation facility, along with a substation associated with the Facility. Except for the addition of the Gamesa G114 turbine, the GE 2.5-120 turbine, and the Goldwind GW121 turbine model, the information provided in the Application continues to apply to this Amendment and will not change as a result of this Amendment.

(1) Project Description

(a) *Types of Turbines*

Due to market factors such as availability and cost, a specific turbine model has not yet been selected for the Facility. The Nordex N117 was initially determined to be suitable for this site and was described in the Application. Given recent turbine technology advancements made since filing of the Application, three additional turbine models are under consideration in this Amendment: the Gamesa G114 (2.5 megawatts [“MW”]), the GE 2.5-120 (2.5 MW), and the Goldwind GW121 (2.5 MW). Information for each turbine model is included in Exhibit A of this Amendment. Table 03-2 presents the dimensions in feet and meters for each of the proposed models.

As previously mentioned, the Certificate granted by the OPSB allows construction of up to 25 wind turbines. The actual number of turbines constructed will depend on the capacity of the final turbine model selected, in order to reach a total generating capacity of 60 MW. Therefore, if the Gamesa G114, the GE 2.5-120, or the Goldwind G121 is selected, it is expected that up to 24 turbines will be constructed. With any of the turbine models proposed, the turbine locations will remain in the exact same location as permitted under the Certificate. As committed to in the filing made on December 24-27, 2013, the Applicant shall identify which of the turbine models has been selected before the preconstruction conference with the OPSB Staff.

(b) *Land Area Requirements*

No change from Application.

Table 03-1 provides the Application's Impact Assumptions which are unchanged.

Table 03-1. Impact Assumptions

Facility Components	Typical Area of Vegetation Clearing	Area of Total Soil Disturbance (temporary and permanent)	Area of Permanent (fill/structure) Disturbance
Wind Turbines and Workspaces	150' radius per turbine	150' radius per turbine	0.2 acre (pedestal plus crane pad & gravel skirt)
Access Roads	40' wide per linear foot of road	40' wide per linear foot of road	20' wide per linear foot of road
Buried Electrical Collection Cable	60' wide per linear foot of cable	60' wide per linear foot of cable	none
O&M Building (and associated storage yard)	3 acres	3 acres	3 acres
Laydown Yard	9.5 acres	9.5 acres	none
Substation	3 acres	3 acres	3 acres
Meteorological Towers	1 acre	0.03 acre	0.00002 acre

The Application estimated 241 acres of land to be temporarily disturbed during construction and approximately 28 acres permanently impacted. This estimate is based on construction of the certificated 25 turbine locations.

The three turbine technologies proposed all have a generating capacity of 2.5 MW, which will require usage of only 24 of the 25 certificated locations. Turbine 2 has been designated for removal if the technology chosen is rated at 2.5 MW (Gamesa G114, GE 2.5-120, or Goldwind GW121). Approximately 1,659 feet of permanent access road, 3,095.6 feet of collection line, and Turbine 2 construction area will no longer be required.

Removal of Turbine 2 and the associated pedestal, crane pad and gravel skirt, access road and collection line will reduce impacts by 7.5 acres; construction

impacts by 5.8 acres and permanent impacts by 1.7 acres. Overall, resulting in 234.2 acres of total disturbance, or approximately 0.5% of the total leased land.

(2) Description of Major Equipment

The proposed wind turbines are summarized below in Table 03-2; and are similar to the Nordex N117 that was approved in the Application.

Table 03-2. Turbine Data Comparison

Turbine Model	Nordex 2.4 N117	Goldwind GW121	Gamesa G114	General Electric GE 2.5-120
OPSB Status	Approved	Proposed	Proposed	Proposed
Rotor Diameter	117 m (383 feet)	121 m (396 feet)	114 m (373 feet)	120 m (393 feet)
Hub Height	91 m (298 feet)	90 m (295 feet)	93 m (305 feet)	85 m (278 feet)
Tip Height	149.5 m (490 feet)	150.5 m (493 feet)	150 m (492 feet)	145 m (475 feet)
Maximum Generation	2.4 MW	2.5 MW	2.5 MW	2.5 MW
Wind Speed at Cut-In	3.0 m/s	3.0 m/s	3.0 m/s	3.0 m/s
Wind Speed at Rated Power	12.0 m/s	11.0 m/s	14.0 m/s	12.0 m/s
Wind Speed at Cut-Out	20 m/s	22 m/s	20 m/s	20 m/s
Maximum Rotational Speed	13.2 rpm	13.2 rpm	13.07 rpm	13.0 rpm
Maximum Sound Power Level	105 dB	108.9 dB@ 8 m/s winds	106 dB	106 dB

(3) Description of New Transmission Lines

No change to the Application.

(B) DETAILED PROJECT SCHEDULE

(1) Project Schedule

Refer to Figure 03-1 for a chart of the proposed Project Schedule.

(a) Land Acquisitions and Land Rights

No Change to Application.

- (b) *Wildlife Studies/Surveys*
No Change to Application.
- (c) *OPSB Application Preparation*
No Change to Application.
- (d) *OPSB Application for Certificate Submittal*
No Change to Application.
- (e) *Issuance of the OPSB Certificate*
The OPSB Certificate was issued on August 25, 2014.
- (f) *Preparation of Final Design*
Final designs and detailed construction drawings will be completed prior to pre-construction conference first quarter 2016.
- (g) *Facility Construction*
Construction is anticipated to begin late second quarter of 2016 and be completed by the fourth quarter of 2016.
- (h) *Placement of Facility in Service*
Early December 2016.

Figure 03-1. Proposed Project Schedule

	2015	2016			
	4th QTR	1st QTR	2nd QTR	3rd QTR	4th QTR
Issuance of Amended Certificate					
Final Design & Engineering					
Pre-Construction Meeting					
Construction					
Commercial Operations					

(2) Impact of Critical Delays

The narrative of Impact of Critical Delays has not changed from the Application. However, specific delays impacting Greenwich is discussed in Section 4906-17-04 (D) Delays.

(A) PROJECT AREA SITE SELECTION

(1) Project Purpose

No change from Application.

(2) Constraint Map

No change from Application.

The Applicant proposes to adhere to all the approved Certificate setbacks for all proposed turbine technologies. In the Application, one residential setback required a waiver of minimum setback; that waiver has been executed and provided.

A constraint map of the Project Area showing setbacks, public roads, right-of-ways, streams, and wetlands for the worst case scenario (tallest of the proposed turbines) is provided as Figure 04-1.

(B) SUMMARY TABLE OF EVALUATED SITES

No Change from Application.

(C) OPTION TO PROVIDE THE SELECTION STUDY

No Change from Application.

(A) PROJECT AREA SITE

(1) Geography and Topography

No Change from Application.

(2) Aerial Photograph

No Change from Application.

(3) Site Mapping/Existing Features Map

No Change from Application.

(4) Geology and Seismology

No Change from Application.

(5) Hydrology and Wind

No Change from Application.

(B) LAYOUT AND CONSTRUCTION

(1) Project Area Site Activities

No Change from Application.

(2) Layout

The proposed layout of all Facility components is illustrated on the updated Site Layout map (Figure 05-1), which has been prepared at a 1:12,000 scale using 2011 NAIP aerial imagery as the base mapping.

The Certificate granted by the OPSB allows construction of up to 25 wind turbines. This Amendment will locate and construct the selected wind turbine in the exact locations referenced in the Application. There will be no changes to site locations.

The actual number of turbines constructed will depend on the capacity of the final turbine model selected in order to reach a total generating capacity of 60 MW. Therefore, if the Gamesa G114, the GE 2.5-120, or the Goldwind G121 is selected, (all 2.5 MW machines), 24 turbines certificated locations will be used. Turbine 2 has been identified

to be removed if one of these 2.5 MW options is chosen. As committed to in the filing made on December 24-27, 2013, the Applicant shall identify which of the turbine models has been selected before the preconstruction conference with the OPSB Staff.

(3) Structures

(a) *Estimated Overall Dimensions*

Dimensions of the proposed wind turbine models are provided in Table 03-2. There are no other changes in the overall dimensions of the Project Facilities.

(b) *Construction Materials*

No Change from Application.

(c) *Color and Texture of Facing Surfaces*

No Change from Application.

(d) *Photographic Interpretation or Artist's Pictorial Sketches*

No Change from Application.

(e) *Unusual Features*

No Change from Application.

(4) Plans for Construction

No Change from Application.

(5) Future Plans

No Change from Application.

(C) EQUIPMENT

(1) Wind Powered Generation Equipment

The Facility as described in Application remains the same. This Amendment seeks to add three turbine options, which are similar to the approved Nordex N117. Detailed information for the proposed models can be found in Table 03-2. In addition, information about the additional turbines models under consideration can be found in Exhibit A of this Amendment. Each turbine proposed consists of three major components; tower section, nacelle and rotor with blades, which are the same as the

Nordex turbine. All towers will be painted white and medium intensity aviation warning lights in accordance with Federal Aviation Administration regulations. Each of the proposed nacelles is constructed of steel, with a reinforced fiberglass shell that both protects internal machinery from the environment and dampens noise emissions.

(2) Safety Equipment

No Change from Application. Emergency coordination and preparation remain the same from the Application. The Greenwich Fire Department and North Central EMS are primary emergency responders.

(a) *Public Safety Equipment*

No Change from Application. Public safety concerns associated with Facility construction remain unchanged from Application. All turbines and electrical equipment will be installed according to NFPA 70E code standards prior to being brought on line. All turbines, including those proposed; contain built-in safety systems and 24 hour monitoring, which any failure/malfunction is sensed by the System Control and Data Acquisition system (SCADA). Under these conditions, the turbines would automatically shut down and Facility maintenance personnel would respond as appropriate.

(b) *Reliability of the Equipment*

No Change from Application. As discussed in the Application, all turbines, including the proposed turbines, are independently certified as meeting international design standards by independent product safety certification by Germanischer Lloyd and Underwriters Laboratories. These certifications require that wind turbines have a design life of at least 20 years for the specified wind regime. All turbines, including the proposed, are equipped with monitoring equipment (SCADA) that will automatically shut down the turbines in the event of excess blade vibrations or when speeds exceed maximum values. This includes monitoring the wind speed to power output ratio, which is used to determination ice accumulation, whereby if the ratio becomes too high, the turbine will automatically shut down. The final selection of turbine technology

will be regularly maintained on a preventative maintenance schedule to ensure continued operations.

(c) *Turbine Manufacturer's Safety Standards*

Exhibits A-1b, A-2b and A-3b consists of the manual considered representative for each of the proposed turbines and are representative of those to be used at the proposed Facility. Greenwich Windpark will provide staff with the appropriate safety manual once the turbine model is secured for the Facility.

(3) Any Other Major Equipment

No Change from Application.

(D) REGIONAL ELECTRIC POWER SYSTEMS

No Change from Application.

(A) OWNERSHIP

No Change from Application.

(B) CAPITAL AND INTANGIBLE COSTS

The detailed estimated Capital and Intangible Costs remain consisted with the \$1,998/KW as described in the Application. Selection of one of the proposed turbines, while reducing the cost of construction due to the usage of only 24 of 25 turbine locations, the slight increase in turbine cost from 2.4 to 2.5 MW turbine is approximately a net zero change.

(C) OPERATION AND MAINTENANCE EXPENSES

No Change from Application.

(D) DELAYS

In the Application, Greenwich proposed a commercial operations date of December 2015. However, upon receiving the Certificate, an intervener filed an Application for Rehearing post Certificate approval (September 2014). The OPSB did not rule on this motion for nearly 12 months. Although the motion for re-hearing was denied in August 2015, during this 12 month time period, the project was unable to capitalize on off-take contract opportunities, negotiations to secure the production tax credit and other financial discussions due to the risk of a rehearing being granted, which would further delay the project. In addition, one year of the five year certificate expiration time frame has lapsed and the project continues to absorb holding costs of approximately \$250,000 annually. The loss of the Production Tax Credit is valued over \$4,000,000 per year for the Project. A new second Application for Rehearing was docketed shortly after the Board's August 2015 denial. The OPSB denied the Second Application for Rehearing on November 12, 2015. Though the intervener had file a Notice of Appeal with the Ohio Supreme Court, which it later withdrew, it seems likely that it will refile the Notice of Appeal from the denial of its second application for rehearing. Though the Project continues to pursue PTC qualification for a 2016 build, the ongoing risk for re-hearing hampers clear commence construction, commercial operations dates and further erodes the efficacy of the Certificate. To date, Greenwich has not experienced any delays with regard to construction.

Furthermore, a Market Access Agreement was executed December 19, 2014 with Altenex to obligate the energy produced from the Greenwich Windpark to commercial, industrial and institutional power off-takers seeking direct power procurement. Altenex is the energy management network (market exchange) that Fortune 1000 companies, universities, and municipalities use to source clean power for their power portfolios. They provide comprehensive renewable energy advisory and procurement services to their clients, who include General Motors and Microsoft. The Greenwich Windpark plans to execute an agreement with one of the Altenex members to meet the requirements of Revised Code Section 4906.20 (B)(2)(f).

Approval of these additional turbines and favorable decision at the Ohio Supreme court in the event the intervenor files a Notice of Appeal will allow the Greenwich Project to clear the path toward final off-take execution and commencement of construction and commercial operations.

4906-17-07 Environmental Data

(A) GENERAL

No Change from Application.

(B) AIR

No Change from Application.

(C) WATER

No Change from Application.

(D) SOLID WASTE

No Change from Application.

(A) HEALTH AND SAFETY

(1) Demographic Characteristics

No Change from Application.

(2) Noise

(a) Construction Noise Levels

No Change from Application.

(b) Operational Noise Levels

Utilizing the same modeling criteria as the original Application, Windlab Limited Pty Ltd completed and prepared an updated noise assessment for each of the proposed turbines (Gamesa G114, GE 2.5-120, and Goldwind GW121) (see Exhibit B). Model inputs for all studies included the approved turbine locations, specific manufacturer power and noise emissions information, and a 2.0 km project boundary.

Results indicate that all proposed turbine models will remain below the nighttime 46 dBA + 5 dBA requirements as set forth in the Certificate.

(c) Location of Noise-Sensitive Areas Within One-Mile of Facility

No Change from Application.

(d) Mitigation of Noise Emissions During Construction & Operation

No Change from Application.

(3) Water

No Change from Application.

(4) Ice Throw

No Change from Application.

Utilizing the same modeling criteria as the Application, Windlab Limited Pty Ltd completed and prepared an updated ice throw assessment for each of the proposed turbine models (Gamesa G114, GE 2.5-120, and Goldwind GW121) (see Exhibit E). Model inputs for all studies included the approved turbine locations and specific manufacturer size and power information. The overall risk to the project by ice throw will be reduced, if one of the proposed models is selected, due to a decrease in the overall number of turbines.

(5) Blade Shear

No Change from Application.

Utilizing the same modeling criteria as the Application, Windlab Limited Pty Ltd completed and prepared an updated blade shear assessment for each of the proposed turbine models (Gamesa G114, GE 2.5-120, and Goldwind GW121) (see Exhibit E). Model inputs for all studies included the approved turbine locations and specific manufacturer size and power information. The overall risk to the project by blade shear will be reduced, if one of the proposed models is selected, due to a decrease in the overall number of turbines.

(6) Shadow Flicker

Utilizing the same modeling criteria as the Application, Windlab Limited Pty Ltd completed and prepared an updated shadow flicker assessment for each of the proposed turbines (Gamesa G114, GE 2.5-120, and Goldwind GW121) (see Exhibit C). Model inputs for all studies included the approved turbine locations and specific manufacturer rotor and height details.

As referenced in the Application, results of the model should be considered conservative for several reasons:

- It omits large topographical features that may obscure turbines from an observer, or that may shade a turbine at the precise time when a turbine is predicted to shade an observer.
- The possible screening effect of trees, barns and buildings, adjacent to residential structures, were not taken into consideration.

- The number and/or orientation of windows and doors, in residential structures, were not taken into consideration.
- It includes time that an observer would be shaded by the turbine nacelle, when in reality no shadow flickering would occur.
- The model “double counts” flicker duration in instances where two or more turbines are simultaneously causing shadow flicker to occur at one receptor.
- A residence/observer is defined as a one dimensional point, located 2 meters above ground level. Therefore, actual structure dimensions are not taken into consideration.
- The model calculations include the cumulative sum of shadow hours for all Facility turbines.

Model results of the three proposed turbines were in line with the certificated Nordex. The Nordex shadow flicker analysis predicted 7 houses may exceed the 30-hour annual threshold, whereas, the three proposed turbine models predict between seven and nine houses that may exceed 30-hours of shadow flicker annually. Of these 7 to 9 houses identified, two to three homes only slightly exceed the 30-hour annual threshold (by less than 2.5 hours annually). As the modeling assessment does not consider potential shading effects from nearby foliage, adjacent structures, window/door orientation, or “double counting” flicker, there is a high likelihood that flicker occurring at these 2 to 3 receptors — which only slightly exceed 30 hours per year — will not, in fact, exceed the annual threshold. Results of the shadow flicker analysis are summarized in Table 8-1.

Table 08-1. Structures Exceeding 30 Hours of Shadow Flicker Per Year

Proposed Turbines Receptor ID #	Approved Nordex Receptor ID #	Project Status	Turbine Location		Approved Model	Proposed Model		
			Easting	Northing		Goldwind GW121	GE 2.5 120	Gamesa G114
353	157	Involved Landowner	375226	4540411	Nordex N117	Shadow Flicker [hr/yr]	Shadow Flicker [hr/yr]	Shadow Flicker [hr/yr]
78	53	Non-Participating	377212	4544543		69	64.9	63
359	162	Non-Participating	375230	4539944		45.3	44.2	40.6
354	158	Involved Landowner	373019	4540404		43.6	41.9	39
314	126	Non-Participating	375095	4541542		43.5	43.1	39.6
77	52	Non-Participating	377339	4544584		36.5	35.7	33.5
76	51	Non-Participating	377229	4544617		36.3	35.6	32.1
305	n/a	Non-Participating	375215	4541767		32.6	31	30.1
361	n/a	Involved Landowner	373040	4539819		32.4	31.3	29.1
						30.2	29.8	26.5

Note: Receptor ID numbers differ due to the inclusion area (based on rotor diameter) used for turbine models at the time of each study.

(B) ECOLOGICAL IMPACT

No Change from Application.

(1) Project Site Information

(a) Facility Mapping

No Change from Application.

(b) Vegetative Survey

No Change from Application.

(c) Animal Life Survey

No Change from Application.

(d) Summary of Ecological Studies

No Change from Application.

(e) Major Species List

No Change from Application.

(2) Construction

(a) Impact of Construction

Removal of Turbine 2 reduced overall impacts by 7.5 acres. Temporary disturbances will be reduced 5.8 acres and permanent disturbances reduced by 1.7 acres. Table 08-2 below summaries overall ecological community impacts. The impact to ecological features is illustrated on the updated Figure 08-1.

Table 08-2. Impact to Ecological Communities

Land Use	Total Disturbance (acres)	Temporary Disturbance (acres)	Permanent Loss (acres)
Forestland	11.77	10.17	1.6
Residential/Developed	6.9	5.9	1.0
Pasture and Cropland	214.93	190.93	24
Farmstead Lands	0.6	0.4	0.2
Wetlands	0.6	0.5	0.1
Total	234.2	207.5	26.7

(b) *Impact of Construction on Major Species*

No Change from Application.

(c) *Mitigation of Short and Long-term Construction Impacts*

No Change from Application.

(3) Operation

No Change from Application.

(a) *Estimate the Impact of Operation on Areas*

No Change from Application.

(b) *Estimate the Impact of Operation on Major Species*

No Change from Application.

(c) *Post-Construction Monitoring of Wildlife Impacts*

No Change from Application.

(C) ECONOMICS, LAND USE AND COMMUNITY DEVELOPMENT

(1) Land Uses

(a) *Land Use Map*

No Change from Application.

(b) *Residential Structures*

The information regarding residential structures in relation to the boundary of the proposed facility in the Application remains unchanged as a result of this Amendment. However, one residence that was under construction during the time of the Application is now completed and occupied.

(c) *Wind Turbine Structure Locations*

The proposed Gamesa G114, GE 2.5-120 and Goldwind GW121 turbine technology options do not violate any of the property line setbacks and residential setbacks under the Board's rules at the time the original Application was filed.

All turbine locations will remain unchanged from the Application.

(i) *Distance from base to property line*

Per the Application, the minimum distance from a turbine's base to the property line of the wind farm facility must be at least 1.1 times the total height of the turbine as measured from its base to the tip of the blade at its highest point. The approved Nordex turbine's maximum turbine tip height of (149.5 m) 490.5 feet which produced a property line setback distance of 539.5 feet..

The maximum tip height of the proposed technologies is (150.5 m) 493.8 feet using the Goldwind GW121, which slightly increases the property line setback to 543 feet (1.1X 493.64 feet). The setback requirement of the Gamesa G114 and GE 2.5-120 are within the Goldwind increased property line setback requirements (492 and 475 feet respectively).

As approved in the Application, and continue to apply for this Amendment, 16 of the 25 proposed turbine locations, the minimum setback of the 1.1 times the structure height to the nearest adjacent property boundary is penetrated. (Turbines 1, 3, 4, 5, 6, 7, 9, 10, 12, 13, 14, 15, 17, 21, 22 and 25) The adjacent landowners to each of these turbines are participating landowners in the project and in many cases the

adjacent parcel is owned by the same landowner. A waiver of the minimum property line setback has been executed with each of these landowners. The remaining turbines comply with the increased setback distance of 543 feet to an uncontrolled, or non-participating, property.

(ii) Distance from blade to nearest residential structure

The criteria applied to the Application was subject Ohio Revised Code Section 4906.20 which was effective September 29, 2013. The minimum distance from a wind turbine to the exterior of the nearest habitable residential structure located on an adjacent property at the time of the Application must be no less than 1,125 feet in horizontal distance from the tip of the turbines blade at 90 degrees to the structure. A setback distance to residential structures of 1,312 feet was applied to the Project for the Nordex turbine under these guidelines.

The maximum rotor diameter of all the proposed turbines under consideration is approximately 396 feet (Goldwind GW121 rotor is 396 feet, Gamesa G114 rotor is 374 feet and GE 2.5-120 is 393 feet). Using this maximum blade length, the minimum setback requirement calculates to 1,323 feet from the turbine base to the exterior of the nearest habitable residential structure $[1,125 + (396/2)]$.

The proposed use of the Goldwind GW121, Gamesa G114 and GE 2.5-120 turbines in the certificated locations comply with the $1,125 + \frac{1}{2}$ rotor diameter required in the Application.

In addition, Turbine 9 in the Application impacted one residential structure that was under construction, but was not inhabited. This structure is now complete and a waiver of minimum setback by this participating residence has been executed.

(iii) Waiver of minimum setback

No Change from Application.

(d) *Impact of Proposed Facility*

Removal of Turbine 2 reduced overall land impacts by 7.5 acres. Temporary disturbances will be reduced 5.8 acres and permanent disturbances reduced by 1.7 acres. Table 08-3 below summaries overall land use impacts.

Table 08-3. Land Use Impacts

Land Use	Total Disturbance (acres)	Temporary Disturbance (acres)	Permanent Loss (acres)
Forestland	11.77	10.17	1.6
Residential/Developed	6.9	5.9	1.0
Pasture and Cropland	214.33	190.53	23.8
Farmstead Lands	0.6	0.4	0.2
Wetlands	0.6	0.5	0.1
Total	234.2	207.5	26.7

(e) *Identification of Structures to be Removed or Relocated*

No Change from Application.

(f) *Plans for Future Use*

No Change from Application.

(g) *Concurrent or Secondary Uses*

No Change from Application.

(2) Economics

(a) *Estimated Payroll*

No Change from Application.

(b) *Estimated Employment*

No Change from Application.

(c) *Estimated Tax Revenue*

No Change from Application.

(d) *Estimated Economic Impact on Local Commercial & Industrial Activities*

No Change from Application.

(3) Impact on Public Services and Facilities

No Change from Application.

(4) Impact on Regional Development

No Change from Application.

(D) CULTURAL IMPACT

(1) Landmarks of Cultural Significance and Recreational Areas

No Change from Application.

(2) Estimated Impact on Landmarks

No Change from Application.

(3) Consideration/Definition of Landmarks

No Change from Application.

(4) Mapping Landmarks – Recreational Areas Within Five Miles

No Change from Application.

(5) Impact on Recreational Areas Within One Mile

No Change from Application.

(6) Visual Impacts and Mitigation Measures

No Change from Application.

(E) PUBLIC RESPONSIBILITY

(1) Public Information Program

No Change from Application.

(2) Liability Insurance

No Change from Application.

(3) Evaluation of Interference with Radio and Television

An updated Microwave Path Study was completed by Comsearch for the Project area (see Exhibit D). There are no microwave paths in the Project area.

(4) Evaluation of Interference with Military Radar Systems

No Change from Application.

(5) Evaluation of Impact to Roads and Bridges

No Change from Application.

(6) Plan for Decommissioning

No Change from Application.

(F) AGRICULTURAL DISTRICT IMPACT

(1) Agricultural District Mapping

Figure 08-2 has been updated for this Amendment with the removal of Turbine 2 and depicts agricultural land and agricultural district land within the Project Area.

(2) Impact Assessment on Agricultural Land

(a) Acreage Impacted

Removal of Turbine 2 will reduce overall impacts by 7.5 acres. Temporary disturbances will be reduced 5.8 acres and permanent disturbances reduced by 1.7 acres. Table 08-4 below summarizes impacts to agricultural lands.

Table 08-4. Impacts to Agricultural Land

Agricultural Land	Total Disturbance (acres)	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Confined Feeding Operations	0	0	0
Cultivated Lands	195.63	172.43	23.2
Farmstead	0.6	0.4	0.2
Pasturelands	18.7	18.1	0.6
Total	214.93	190.93	24

(i) *Field operations*

No Change from Application

(ii) *Irrigation*

No Change from Application

(iii) *Field drainage systems*

No Change from Application

(b) *Proposed Mitigation Procedures*

No Change from Application

(3) Viability Assessment

No Change from Application

EXHIBIT A TURBINE INFORMATION

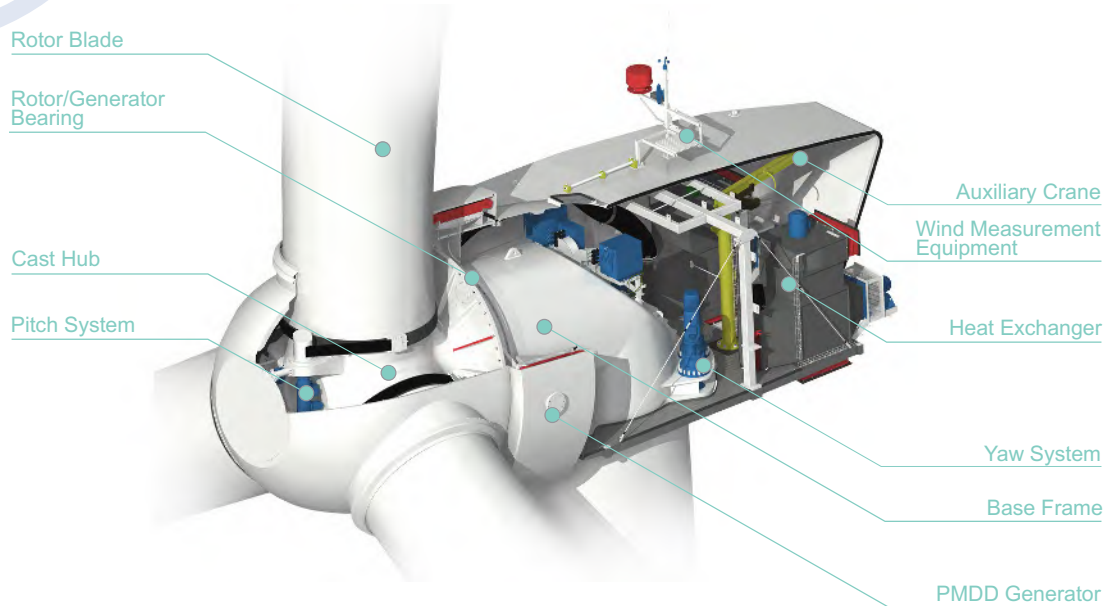
Exhibit A-1a Goldwind 2.5MW GW 121 Product Brochure



PMDD WIND TURBINE

2.5MW

2.5MW PMDD WIND TURBINE



GOLDWIND 2.5MW PERMANENT MAGNET DIRECT-DRIVE (PMDD) WIND TURBINE

HIGH POWER GENERATING EFFICIENCY

- Permanent magnet generator (PMG) eliminates the need for electrical field excitation and associated energy losses.
- PMG operates more efficiently at partial load compared to other generator types

HIGH POWER TO WEIGHT RATIO

- Goldwind 2.5MW wind turbines feature a smaller external diameter compared to wound rotor designs.
- The combination of a PMG and direct-drive technology results in lowest-in-class top head mass and reduced crane requirements.
- Single-bearing design allows for a smaller physical structure, further enabling easier transportation.

SUPERIOR POWER QUALITY AND GRID CODE COMPLIANCE

- Full power conversion, which allows for reactive power feed, ensures compliance with demanding grid code requirements and offer low-voltage and zero-voltage ride through capabilities
- Flexible control systems provide curtailment and ramp-rate control

ADVANCED PITCH-DRIVE BELT SYSTEM

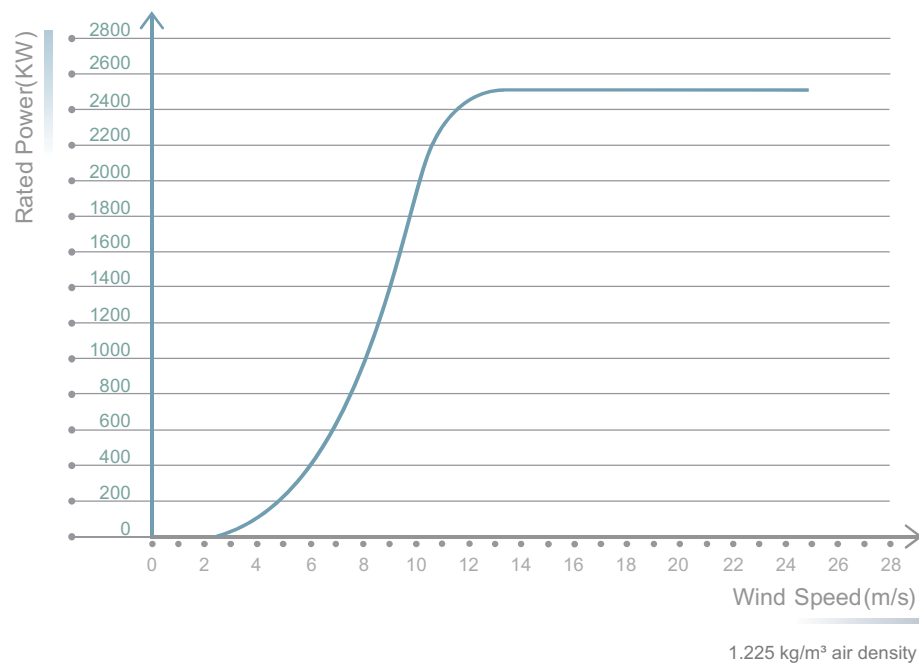
- Goldwind's advanced pitch-drive belt system eliminates localized wear experienced by gear-driven pitch systems, reducing the replacement of expensive parts and associated crane service requirements
- Ultra capacitors replace lead acid or gel batteries for Goldwind's pitch control system, offering higher power density, faster charge speed, wider operating temperature range, higher reliability, and reduced maintenance intervals compared to conventional battery systems.

SIGNIFICANTLY REDUCED MAINTENANCE COST AND TOTAL OPERATING EXPENDITURE

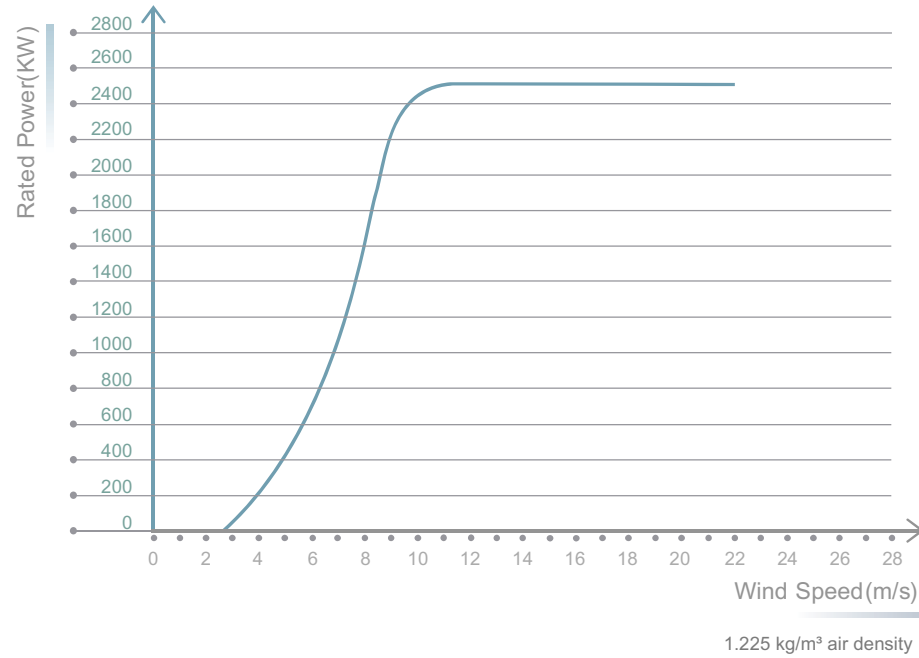
- The design principles of the 2.5MW PMDD wind turbine avoid sources of expensive faults that require crane mobilization
- The absence of high-current carbon brush slip-rings in the generator reduces faults, downtime and overall cost over the lifetime of the turbine
- Only one moving part in the drive train increases reliability compared to hundreds of total parts in a conventional gearbox including highspeed gears, bearings and couplings.
- The generator and rotor require only one bearing compared with more than 20 for conventional gearbox machines
- Automatic lubricating system for the yaw bearing reduces the frequency of unplanned maintenance

DYNAMIC POWER CURVE

GW 100/2500

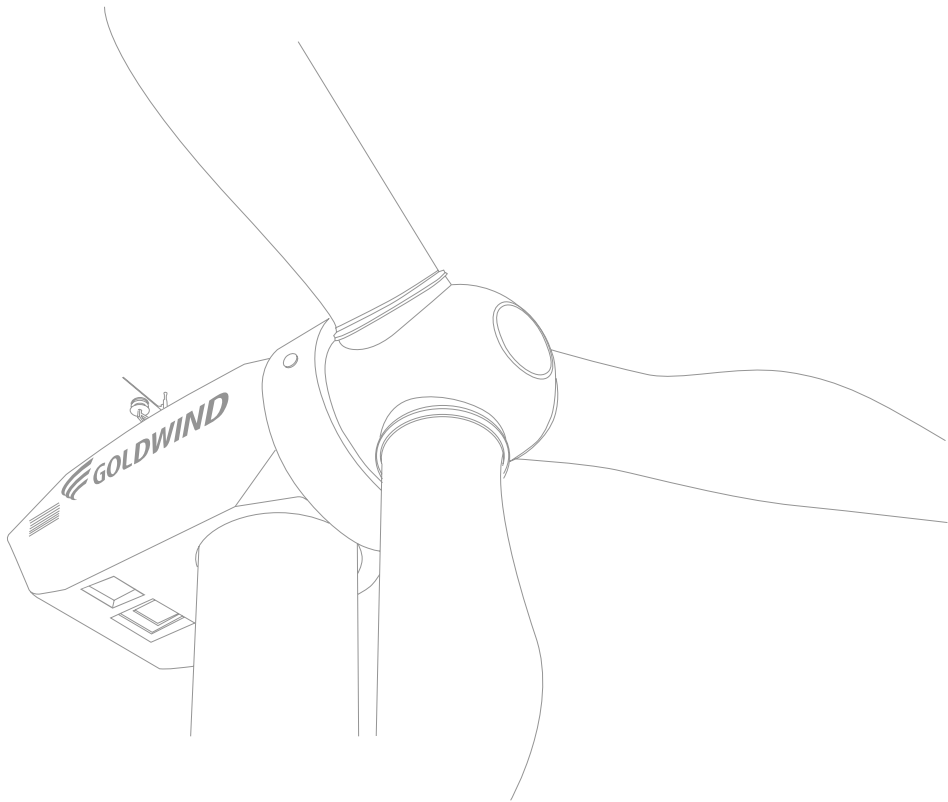
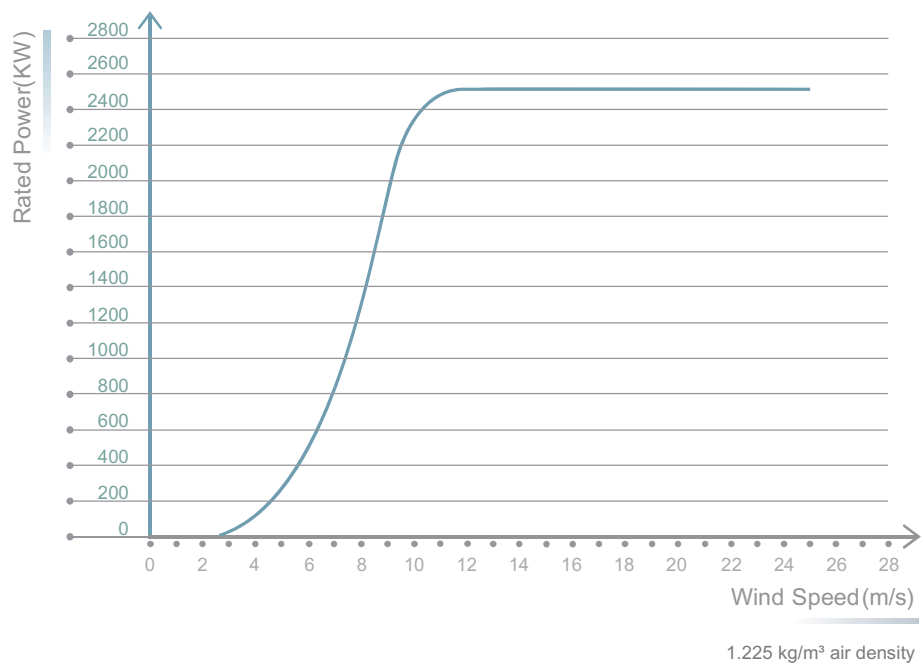


GW 121/2500



DYNAMIC POWER CURVE

GW 109/2500



GOLDWIND 2.5MW PMDD WIND TURBINE SERIES

GENERAL TECHNICAL SPECIFICATIONS

PARAMETER	GW 100/2500	GW 109/2500	GW 121/2500
Operation Parameters			
IEC Wind Class	IIA	IIA/IIIA	IIIB
Rated Power	2500kW		
Cut-in Wind Speed	3m/s		
Rated Wind Speed (Static)	11.1m/s	10.5m/s	9.3m/s
Cut-out Wind Speed (10 min avg.)	25 m/s	25 m/s	22 m/s
Rotor			
Diameter	100m	109m	121m
Number of Blades	3		
Swept Area	7823m ²	9516m ²	11595m ²
Power Control	Collective Pitch Control / Rotor Speed Control		
Safety System	Independent Blade Pitch Control Hydraulic Disk Brake Hydraulic Rotor Lock		
Generator	Permanent Magnet Direct Drive Synchronous Generator		
Rated Voltage	690V		
Yaw System	4 Induction Motors with Hydraulic Brakes		
Tower	Tubular Steel Tower		
Foundation	Flat Foundation (Others Possible)		
Converter	Full Power Converter (IGBT) Modular System		
Control System	Microprocessor Controlled with Remote Monitoring		





www.goldwindamerica.com
E-mail: info@goldwindamerica.com

Goldwind USA, Inc.
200 West Madison Street Suite 2800
Chicago, Illinois, USA
Tel: +1 312-948-8050
Fax: +1 312-948-8051
PC: 60601

Xinjiang Goldwind Science & Technology Co., Ltd
107 Shanghai Road, Economic & Technological Development Zone, Urumqi, Xinjiang
Tel: +86-(0)991-3767999
Fax: +86-(0)991-3762039
PC: 830026

Beijing Goldwind Science & Creation Windpower Equipment Co., Ltd.
No. 19 Kangding Road, Economic & Technological Development Zone, Beijing (I)
Tel: +86-(0)10-87857500
Fax: +86-(0)10-87857529
PC: 100176

No. 8 Boxing 1st Road, Economic & Technological Development Zone, Beijing (II)
Tel: +86-(0)10-67511888
Fax: +86-(0)10-67511983
PC: 100176

EXHIBIT A TURBINE INFORMATION

Exhibit A-1b Goldwind Safety Manual

Goldwind USA EHS Site Safety Plan & Policy	Page 1
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste



Goldwind USA EHS manual

November 2010

Goldwind USA EHS Site Safety Plan & Policy	Page 2
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Table of Contents

TOPIC	PROCEDURE NUMBER	PAGE
EHS Plan	GUSA EHS-1	3
Accident Reporting and Investigation	GUSA EHS-2	10
Confined Space Entry	GUSA EHS-3	29
Contractor Safety	GUSA EHS-4	46
Emergency Preparedness and Emergency Action Plan	GUSA EHS-5	62
Ergonomics	GUSA EHS-6	90
Fall Protection	GUSA EHS-7	105
Fire Safety	GUSA EHS-8	116
Hazard Communications	GUSA EHS-9	120
Hazardous Material Spill Control	GUSA EHS-10	123
Hot Work	GUSA EHS-11	128
Inspections and Housekeeping	GUSA EHS-12	134
Job Safety Analysis	GUSA EHS-13	142
Lock Out Tag Out and Electrical Safety Related Work Practices	GUSA EHS-14	147
Medical	GUSA EHS-15	162
Personal Protective Equipment	GUSA EHS-16	167
Tower Rescue and Emergency Response	GUSA EHS-17	178
Tower Climber Qualification	GUSA EHS-18	183

Goldwind USA EHS Site Safety Plan & Policy	Page 3
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

EHS PLAN AND POLICY

GUSA EHS-1

1.0 Purpose and Scope

- 1.1 Goldwind USA (Goldwind) is committed to providing a healthy and safe workplace for all, and protecting the environment. Safety, health, and protection of the environment must be made an integral part of all operations.
- 1.2 The Goldwind USA Environmental, Health and Safety (EHS) Plan, Policies and Procedures apply to all Goldwind USA service operations including work completed at customer sites. It includes requirements, general safety practices, responsibilities and management guidelines, along with a site-specific EHS policy.

2.0 Definitions

- 2.1 **Site Manager:** For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.

3.0 Procedure

3.1 Environmental, Health and Safety Program Guidelines

- 3.1.1 Goldwind USA recognizes that people are its most vital resource, and their safety and health is one of our principal responsibilities. Health, safety and protection of the environment must be an integral part of all business operations. Every reasonable effort will be made to create and maintain a safe and healthful work environment at each customer site and Goldwind USA service area.
- 3.1.2 Implementation of the Goldwind USA Environmental, Health and Safety policy requires the following:
 - 3.1.2.1 Effective management to ensure compliance with all applicable governmental regulations, Goldwind USA policies and customer requirements,
 - 3.1.2.2 Providing health, safety, and environmental planning prior to and during work assignments which is designed to anticipate and minimize hazards or incidents,
 - 3.1.2.3 Providing health, safety, and environmental training and instruction for assigned work, and

Goldwind USA EHS Site Safety Plan & Policy	Page 4
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.1.2.4 Making available necessary safety equipment, materials, etc., providing training in its care and use and ensuring use when required by workplace conditions.

3.1.3 This Environment, Health and Safety Manual contain safety and environmental procedures. Each procedure identifies purpose, scope, applicability, references and responsibilities. The 'Master' Controlled copy will be maintained in the EHS database (read-only), from which Uncontrolled copies can be printed or downloaded. Copies of applicable regulations can be accessed in the legal or EHS department.

3.1.4 In addition to this manual, each service area will separately implement the following if it is applicable to their services operations:

3.1.4.1 Emergency Response & Contingency Plan,

3.1.5 The service area must implement procedures and updates as they are communicated from Goldwind USA Corporate Headquarters.

3.1.6 A disciplinary policy has been established to address employee compliance with Environmental, Health and Safety work practices. All employees are expected to comply with all EHS work practices and procedures.

3.1.7 Specific information for each service area is documented in **Appendix A** and must be reviewed on an annual basis and updated when necessary. This review should be tracked at the Goldwind USA Corporate level.

3.1.8 In addition to this procedure, all employees are required to comply with Goldwind USA's Corporate Policy, Health, Safety & Environmental Practices, through their acknowledgement of the Goldwind USA Integrity Policy.

3.2 General Safety Practices

3.2.1 In the event of conflict between Goldwind USA safety procedures and Governmental standards, those of the governing authority prevail. For clarification of any EHS procedure, contact EHS Manager/Coordinator or Goldwind USA Corporate Headquarters personnel.

Goldwind USA EHS Site Safety Plan & Policy	Page 5
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.2.2 Overall, service area safety is a specific responsibility of the Site Manager responsible for the job. Site Safety Program requirements are described in this Manual. In the event of conflict between Goldwind USA safety requirements and customer rules, whichever is most protective of Goldwind USA employees will be adhered to until such conflicts are resolved.

3.2.3 If Federal or State regulations are less stringent than Goldwind USA guidance, use Goldwind USA guidance.

3.3 Site-Specific Environmental, Health and Safety Protection Policy

3.3.1 An Environmental, Health and Safety protection policy has been developed for each service area in Goldwind USA. This policy states the business commitment to safety, health and environmental excellence and indicates that all employees will be held accountable for policy implementation. The policy's intent is to provide a safe and healthy workplace for employees, as well as to protect the environment.

3.3.2 The service area specific Environmental, Health and Safety protection policy is contained in **Appendix A** of this procedure.

3.3.3 A final copy of the area specific policy shall be posted in all service areas. This policy must be reviewed annually and updated accordingly. This review should be tracked at the Goldwind USA Corporate level.

3.4 Service Area Safety Program

3.4.1 Overall, environmental, health and safety compliance is the responsibility of the site management team. Service Area Safety Programs shall include provisions related to the following:

3.4.1.1 Designated EHS Manager/Coordinator for each area,

3.4.1.2 Identification, notification and action leading to correction of potential safety hazards,

3.4.1.3 Employee EHS Meetings, Training and Orientation,

3.4.1.4 Appropriate safety inspections and audits,

3.4.1.5 Occupational injury and illness notification, investigation and reporting requirements. (See Accident Reporting and Investigation Procedure)

Goldwind USA EHS Site Safety Plan & Policy	Page 6
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.4.1.6 Hazard Communication Program and inspections, recordkeeping and postings.

4.0 Training

- 4.1 Managers are required to ensure that every employee receives appropriate safety training and orientation. Employees will be made aware of the EHS Plan and Policy, EHS Procedures and the Goldwind USA disciplinary policy instituted for their service operations. This training may be implemented utilizing a variety of methods such as safety and/or all-employee meetings or updates, creation of an EHS bulletin board to post pertinent postings and announcements, distribution of memos directly to all employees, or through other means as appropriate.

5.0 Auditing

- 5.1 Goldwind USA will conduct an annual audit of the area's EHS Plan & Policy. Additionally, management will periodically conduct audits to identify deficiencies and establish corrective actions.

6.0 Responsibilities

6.1 Goldwind USA Management shall:

- 6.1.1 Participate in and contribute toward an effective Environmental, Health and Safety program,
- 6.1.2 Provide resources to allow implementation of EHS procedures/programs.

6.2 Goldwind USA EHS Department shall:

- 6.2.1 Develop Environmental, Health and Safety (EHS) policies, programs, procedures and project plans and support their proper implementation,
- 6.2.2 Provide leadership and technical direction in all matters involving EHS protection,
- 6.2.3 Coordinate EHS audit activities and effect improvement where necessary,
- 6.2.4 Develop, oversee and implement EHS training activities, and

Goldwind USA EHS Site Safety Plan & Policy	Page 7
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

6.2.5 Periodically measure EHS performance and improve the effectiveness of EHS programs/procedures as required.

6.3 Site Manager shall:

6.3.1 Ensure that the manpower, equipment and materials necessary to meet job EHS requirements are available at the facility or project, when needed,

6.3.2 Implement the Goldwind USA EHS procedures,

6.3.3 Review all area EHS findings and ensure actions are taken to correct reported deficiencies,

6.3.4 Orient each employee by reviewing their specific safety responsibilities and making them aware of any special EHS requirements,

6.3.5 Investigate all accidents within five days of incident and file complete reports on each,

6.3.6 Review and sign the site-specific Environmental, Health and Safety Protection Policy, and

6.3.7 Designate an EHS Manager/Coordinator who will have the responsibility to ensure that the EHS Program is properly administered at the area, and

6.3.8 Participate in EHS processes, such as audits, inspections, reviews and training.

6.3.9 Complete the area-specific information in **Appendix A**,

6.3.10 Review and update the area specific information in **Appendix A** on an annual basis,

6.3.11 Ensure that the site-specific Environmental, Health and Safety Protection Policy is reviewed on an annual basis,

Goldwind USA EHS Site Safety Plan & Policy	Page 8
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

6.3.12 Ensure that the area EHS Protection Policy is posted in a well-traveled area and communicated to all employees, and

6.3.13 Coordinate the EHS Audit Program at their area.

6.4 Each Employee shall:

6.4.1 Work in a safe and environmentally conscientious manner,

6.4.2 Be familiar with and follow all EHS policies, procedures and EHS regulations pertinent to their job,

6.4.3 Where applicable, assist in the EHS Audit Program,

6.4.4 Communicate EHS policies to fellow coworkers,

6.4.5 Call attention to fellow employees of unsafe acts, and

6.4.6 Report unsafe conditions and practices to their Manager, Supervisor, EHS Manager/Coordinator.

7.0 References

GUSA EHS-5 Emergency Response & Contingency Plan

Goldwind USA's Corporate Policy, Health, Safety & Environmental Practices

8.0 Appendices

8.1.1 Appendix A Area-specific Information (*to be completed by Site Manager*) Area-Specific Environmental, Health and Safety Protection Policy

Goldwind USA Site Safety Plan & Policy	Page 9
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX A

SITE SPECIFIC EHS PLAN & POLICY INFORMATION

1. Name and Location of Site: _____
2. Name of Site Manager: _____
3. Name(s) of other key Managers at the Area: _____
4. Name of Goldwind USA EHS Manager/Coordinator: _____
5. Person/People Responsible for Disciplinary Action:
5. Method through which the EHS Plan & Policy is communicated to all employees at the Area:

☐ Posted on EHS bulletin board in the service center
☐ Distributed e-mail copies to all employees
☐ Other: stored on EHS Database

Information Completed By: _____ Date: _____

Goldwind USA Site Safety Plan & Policy	Page 10
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ACCIDENT REPORTING & INVESTIGATION

GUSA EHS-2

1. Purpose and Scope

- 1.1.1. This procedure outlines the Goldwind USA (Goldwind) Services Health and Safety Accident Reporting and Investigation program. It includes guidance for providing appropriate and timely notification, investigation, and reports regarding occupational injuries, illnesses, and related health and safety incidents that occur during Goldwind USA services operations.

2. Definitions

- 2.1. **Acute** – Severe, but of short duration; not chronic.
- 2.2. **Chronic** – Lasting a long time or recurring often.
- 2.3. **Day Away From Work (DAFW) Case** – Any injury or illness that involves workdays on which the employee would have worked but could not because of an occupational injury or illness.
- 2.4. **Employee Medical Record** – Any record concerning the health status of an employee which is created by or maintained by a physician, nurse or other health care personnel or technician. These records may include, but are not limited to:
 - 2.4.1. Medical and employment questionnaires or histories (including job description and occupational exposures),
 - 2.4.2. The results of medical examinations (pre-employment, pre-assignment, periodic, or episodic) and laboratory tests (including X-ray examinations and all biological monitoring),
 - 2.4.3. Medical opinions, diagnosis's, progress notes, and recommendations,
 - 2.4.4. Descriptions of treatments and prescriptions, and
 - 2.4.5. Employee medical complaints.
- 2.5. **Exposure or Exposed** – When an employee is subjected to a toxic substance (e.g. arsenic, cadmium, lead) or harmful physical agent (e.g. acid, caustic) in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.). This includes past and potential exposure, but does not include situations where the employer can demonstrate that the toxic substance or harmful physical agent is not used, handled, stored, generated, or present in the workplace in any manner different from typical non-occupational situations.

Goldwind USA Site Safety Plan & Policy	Page 11
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 2.6. **First Aid Treatment** – Treatment (and follow-up visits for the purpose of observation or dressing change) of minor scratches, burns, splinters, etc. that do not ordinarily require medical care. Such treatment is considered first aid even if provided by a physician or by registered professional personnel.
- 2.7. **Lost Work Day Case** – Any injury or illness, which involves days away from work (not counting the day when the accident happens), or days of restricted work activity or both.
- 2.8. **Medical Treatment** – Treatment administered by a physician or by registered professional personnel under the standing orders of a physician, other than first aid treatment.
- 2.9. **Near Accident** – Events in which serious personal injury or significant property damage was fortuitously avoided despite a 'close call'; something that happened or almost happened, but the employee or employees in the area were fortunate enough not to have been injured.
- 2.10. **NIOSH** – National Institute for Occupational Safety and Health; an agency of the United States (US) Department of Health and Human Services responsible for recommending health and safety standards.
- 2.11. **Non-Serious Incident** – Injuries or illnesses that require medical treatment, other than first aid, but do not otherwise meet the criteria of a serious incident (i.e. laceration that requires stitches, fracture).
- 2.12. **Occupational Illness** – Any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or disease, which may be caused by inhalation, absorption, ingestion or direct contact.
- 2.13. **Occupational Injury** – Any injury such as a cut, fracture, sprain, amputation, etc., which results from a work accident or from an exposure involving a single incident in the work environment. Conditions resulting from animal bites, such as insect or snakebites experienced while in the work environment or from one-time exposure to chemicals in the work environment are considered to be occupational injuries. Injuries experienced as a result of vehicle accidents that occur during travel status while on Company business are considered to be occupational injuries.
- 2.14. **OSHA** – Occupational Safety and Health Administration; an agency of the United States (US) Department of Labor.
- 2.15. **Record** – Any item, collection, or grouping of information, regardless of the form or process by which it is maintained (e.g., paper document, microfiche, microfilm, X-ray film, or computer file).

Goldwind USA Site Safety Plan & Policy	Page 12
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

2.16. **Recordable Injury** – Goldwind USA is using OSHA guidance to determine recordability for all injuries. This guidance can be found in **Appendix C**

2.17. **Restricted Work Activity Case** – Any injury or illness which results in any of the following:

- 2.17.1. The employee was assigned to another job on a temporary basis,
- 2.17.2. The employee worked at a permanent job less than full time (not including partial days off for medical follow-up visits), and
- 2.17.3. The employee worked at a permanently assigned job, but could not perform all duties normally required of an employee in that job assignment.

2.18. **Serious Incident** – Any one of the following:

- 2.18.1. Fatality,
- 2.18.2. Hospital stays other than emergency room treatment, including ‘turn for the worse’ cases leading to later hospitalization,
- 2.18.3. Injuries or illnesses not requiring overnight hospitalization that is likely to result in ten or more lost days away from work,
- 2.18.4. Hospitalization of 3 or more workers as a result of a single incident and regardless of length of stay or results of examination (includes emergency room visits for observation),
- 2.18.5. Exposure to toxic substances or radiation that requires reporting to any government agency, and
- 2.18.6. Significant ‘near accident’ when potential for severe injury is readily apparent.

3. Procedure

3.1. Incident Reporting

- 3.1.1. Employees will immediately report all serious incidents and non-serious incidents to one or all of the following: the Site Manager, employee’s Supervisor, Goldwind USA corporate Human Resources Manager, or designated Goldwind USA EHS Manager.
- 3.1.2. All serious incidents will be immediately reported (including weekends, holidays and at night) by the most direct means to the Goldwind USA designated EHS Manager.
- 3.1.3. All non-serious incidents will be reported to Goldwind USA designated EHS Manager/Coordinator within 24 hours of occurrence.

Goldwind USA Site Safety Plan & Policy	Page 13
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 3.1.4. For all serious and non-serious incidents and near misses, the supervisor must complete the 'Supervisor Accident Investigation Report' in **Appendix A** and the involved employee must complete the 'Employee's First Notice of Occupational Injury/Illness' **Appendix B**. These forms must be completed and submitted to the Goldwind USA designated EHS Manager/Coordinator within 24 hours of the incident or the following business day.
- 3.1.5. For any incident that is fatal to one or more employees, or that causes the hospitalization of three or more employees (regardless of length of stay, medical treatment provided, or the results of any tests or examinations administered) must be reported to the nearest OSHA area office within 8 hours after the occurrence of the incident. Goldwind USA designated EHS Manager will be consulted prior to government notification. The report must relate the circumstances of the accident, the number of fatalities and the extent of any injuries. The OSHA Area Director may require additional information and reports, and will usually arrange for a Compliance Officer to investigate the accident at the site or facility.
- 3.1.6. All serious and non-serious incidents will be reported to Goldwind USA corporate headquarters within 24 hours of occurrence or the next business day.

3.2. Incident Investigation Requirements

- 3.2.1. All serious, non-serious and first aid incidents occurring on all shifts will be investigated. This investigation must begin within 24 hours of the incident or the next business day.
- 3.2.2. Incident investigation teams should include involved employee(s), Site Manager, employee's Supervisor, Goldwind USA designated EHS Manager, and EHS team members trained in 'Incident Investigation'. This team can include other key persons, as the Site Manager feels necessary.
- 3.2.3. Investigations must be fact-finding, not fault finding. When possible, the names of eyewitnesses to the accident/incident should be recorded.
- 3.2.4. A claimant who commences legal action against the Company may obtain the results of an accident investigation. Accordingly, accident investigations must be properly documented. State only facts; do not editorialize. Indicate when inferences or assumptions are made. Any life-threatening accidents must be referred to the Site Manager who will obtain legal guidance from Goldwind USA corporate headquarters as needed.
- 3.2.5. A complete incident investigation should include the following documentation:
- 3.2.5.1. 'Supervisor Accident Investigation Report' form (**Appendix A**),

Goldwind USA Site Safety Plan & Policy	Page 14
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 3.2.5.2. 'Employee First Notice of Occupational Injury/Illness' form (**Appendix B**),
- 3.2.5.3. Regulatory required worker's compensation forms (if applicable),
- 3.2.5.4. Photographs taken immediately after an incident, when appropriate and feasible.
- 3.2.6. Photographs should show the accident scene (e.g., location of objects and persons, debris, severity of injury or damage, marks of damage, etc.).
- 3.2.7. Care should be taken that no foreign objects (those not present at the time of the accident/incident) appear in the photographs that might render the photographs objectionable or constituting posed photography.
- 3.2.8. All of the incident investigation documentation will be forwarded to the Goldwind USA corporate headquarters within 5 days of the incident.
- 3.2.9. If it is necessary to document an incident in more detail than is practicable on the referenced forms, the employee who is most familiar with the accident may be requested to prepare a detailed report, in addition to the initial report.
- 3.2.10. Incident reports or correspondence related to accidents must not be addressed to persons outside the Company, and copies must not be furnished to persons outside the Company except by permission of counsel. This includes informal statements related to accidents as well as accident reports. Company personnel must not correspond or talk with attorneys, insurance adjusters or other persons representing individuals or companies other than Goldwind USA or the Company's insurance carrier without the permission of Goldwind USA legal counsel.

3.3. Incident Investigation Guidance

- 3.3.1. Successful investigation interviewers generally ask the following questions:
 - 3.3.1.1. **Who** – The nature of the accident will determine the exact questions that should be asked. For example: Who was injured? Who installed the equipment? Who was responsible for it?
 - 3.3.1.2. **What** – The 'What' questions should lead the discussion into actions, events, and physical objects. For example: What happened? What did the people do? What equipment or facilities were involved?
 - 3.3.1.3. **Where** – The 'Where' questions have a way of helping to determine what caused the accident and discover the conditions that brought it about. For example: Where was each worker located? Where was the overhead crane? Where was the fire-fighting equipment?

Goldwind USA Site Safety Plan & Policy	Page 15
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 3.3.1.4. **When** – The answers to the ‘when’ questions should contain more information than a clock reading. Though time is important, relationships are often even more important. ‘When’ questions often elicit information on relationships between pairs of activities or events. For example: When was the SE100 switch checked for voltage? Was that before or after the test set was energized?
- 3.3.1.5. **How** – This type of question should provide information on the interaction and relationship among the activities and events (going beyond their timing and into the functional relationships among them). ‘How’ questions refer not only to the action of equipment but to action of the injured as well.
- 3.3.1.6. **Why** – Answer to ‘why’ questions should give clues as to corrective measures, since the answers will focus on unsafe acts or hazardous conditions.
- 3.3.2. The causes of an accident are normally a combination of simultaneous and sequential circumstances, all of which must have been present for the accident to happen. Any circumstance that contributes to an accident may be spoken of properly as one of the causes of the accident, making it only one circumstance of a combination. Specifically, the cause of an accident is any behavior, condition, act, or negligence without which the accident would not have happened. Hence, in seeking causes of an accident, remember that an accident may be the result of the interaction among otherwise innocuous conditions and events.
- 3.3.3. Accident ‘causes’ can be classified into three types: direct, indirect and contributing. Every accident is the result of at least one direct and one indirect cause. Some accidents may have many of each.
- 3.3.4. **Direct causes** are unsafe acts (doing something or failing to do something specified by law or dictated by safe practices) that brought about the accident. ‘Unsafe’, for this purpose, includes acts that are unusual, unexpected, improper, hazardous, or illegal. Examples of direct causes are:
- 3.3.4.1. Operating at a speed that may be too fast or too slow for existing conditions (e.g., rpm too high for the grinding wheel used),
 - 3.3.4.2. Mutual interference of adjacent operations,
 - 3.3.4.3. Motion or relative position that creates a hazardous situation,
 - 3.3.4.4. Capacity overload (human or machine),
 - 3.3.4.5. Inattention, which in turn prevents a successful evasive action under the existing conditions, and
 - 3.3.4.6. Faulty corrective action taken to avoid or to mitigate an impending accident after the danger was perceived.

Goldwind USA Site Safety Plan & Policy	Page 16
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.3.5. **Indirect causes** include irregular or unusual conditions that explain why the principal element (person or equipment) contributed a direct cause to the accident. Indirect causes are connected to the accident through the direct causes. Examples of indirect causes are:

3.3.5.1. Defective conditions, equipment, materials or structures. These conditions must have been present prior to the accident. (Those conditions that are coincident with the accident are often classified as direct causes.),

3.3.5.2. Unusual conditions of weather, visibility, controls or terrain, and

3.3.5.3. Conditions of personnel (by far the most common type of indirect cause) including permanent though correctable conditions, such as poor eyesight, lack of certain kinds of knowledge, or psychological faults and temporary conditions such as intoxication, physical exhaustion or emotional upset.

3.3.5.4. Inadequate codes and standards,

3.3.5.5. Lack of policy,

3.3.5.6. Failure of supervisors to perform their duties,

3.3.5.7. Lack of enforcement,

3.3.5.8. Faulty design or inadequate maintenance,

3.3.5.9. Inadequate job or task training, and

3.3.5.10. Lack of safety training.

3.4. **Near-Accident Reporting**

3.4.1. Near-accident and hazard reporting procedures have been developed to provide employees with a method for reporting unsafe work situations, activities, procedures, conditions, or equipment that could or almost have resulted in accidents.

3.4.2. Department employees are encouraged to report such events and potential accident-producing situations that, for any reason, have not been resolved, or even though addressed, the hazards to employees still exist.

3.4.3. Provisions must be made to ensure anonymity of the reporting employee. In these situations, indicate 'anonymous' in the name portion of the appropriate incident report.

3.4.4. Many studies have shown that there are significantly more near-accidents and potential accidents than there are actual incidents. Consequently, near-accident and hazard reports are needed to provide more complete information on where the dangers are and what corrective actions are needed to minimize risk of injury or illness.

Goldwind USA Site Safety Plan & Policy	Page 17
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.4.5. Near-accidents and hazards should be reported immediately, first verbally from an employee to their supervisor, then through a written report. The 'Supervisor Accident Investigation Report' in **Appendix A** should be used for the written communication. Completed near-accident and/or hazard reports shall be forwarded to the Goldwind USA Corporate Headquarters personnel within a week of the first notice.

3.4.6. Near-accident and hazard information may be used (anonymously) in safety information letters and safety meetings to convey the elements of possible danger to other employees so that they may be aware of the condition and thus work more safely.

3.5. Recordkeeping

3.5.1. All incidents and those that occur on a customer site must be evaluated for recordability utilizing the information contained in **Appendix C**.

3.5.2. Any Lost Work Day, Day Away From Work, Restricted Work or Medical Aid cases fit into the category of 'recordable' incidents. These are serious incidents that affect injury and illness statistics. Contact the Goldwind USA designated EHS Manager to discuss all 'recordable' incidents.

3.5.3. All service operations shall maintain an OSHA No. 300 log. All OSHA Recordable incidents will be recorded on this log. If work at a job site will continue more than two months, a separate OSHA No. 300 Log shall be maintained for that site. The site specific OSHA No. 300 Log will be maintained on a calendar year basis and an OSHA 300A summary report must be posted for the entire months of February, March and April (February 1 to May 1) following the year just completed.. The OSHA No. 300 Log, related incident documentation, employee exposure information and/or employee medical records must be made available for inspection and copying to OSHA representatives upon request. Goldwind USA Corporate Headquarters personnel will be consulted prior to the submission of any requested records. All Serious and Non-Serious Incident documentation, including the OSHA No. 300 Log, shall be retained for five years following the end of the year to which they apply.

3.5.4. The Goldwind USA Human Resources manager will arrange retention of employee medical records with the medical facility engaged to provide the examination service for an individual facility. Any records pertaining to employee exposures to toxic substances or harmful physical agents shall be retained in a controlled manner at the facility. These records must not be made available to anyone other than the employee or medical personnel.

3.5.5. All first aid incidents will be recorded on the 'First Aid Log' in **Appendix D**, which should be maintained near the first aid station.

Goldwind USA Site Safety Plan & Policy	Page 18
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.6. Corrective Action Implementation and Tracking

- 3.6.1. All root causes and corrective actions determined from incident investigations will be addressed by the Goldwind USA designated EHS Manager.
- 3.6.2. All regulatory corrective actions will be tracked to closure by the Goldwind USA designated EHS Manager.
- 3.6.3. Corrective actions will be implemented as quickly as possible following the incident.
- 3.6.4. Procedures and programs requiring modification as part of a corrective action will be updated as required.

3.7. Communication and Follow-Up

- 3.7.1. Results of all accident investigations will be communicated to involved employees immediately following the accident investigation conclusion.
- 3.7.2. Additionally, the results of all accident investigations will be communicated to all employees. This can be accomplished via safety and/or all-employee meetings or updates, posting on an EHS bulletin board or another method of communication.

4. Training

- 4.1. 'Employee Accident Reporting' training will be given to all employees upon initial assignment and upon demonstration of decreased proficiency. This training must include the following:
 - 4.1.1. Definitions of serious and non-serious incident, near accidents and first aid,
 - 4.1.2. Review of how to properly complete the 'Employee's First Notice of Occupational Injury/Illness' (**Appendix B**),
 - 4.1.3. Timing requirements for accident reporting,
 - 4.1.4. Recordability definitions, and
 - 4.1.5. 'First Aid Log' reporting.
- 4.2. 'Incident Investigation' training will be given to the service area EHS Coordinator, Operations Management, and all employees involved in accident investigation. This training will be tracked by the Goldwind USA designated EHS Manager. All trained employees are listed in the site-specific information section of this procedure in **Appendix E**.

Goldwind USA Site Safety Plan & Policy	Page 19
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 4.3. Refresher training will be performed upon demonstration of decreased proficiency.

5. Auditing

- 5.1. Each Goldwind USA operation site will conduct an annual audit of its Accident Reporting & Investigation program. This audit will include a review of each recordable incident that occurred in that region over the past year to check for complete forms, a thorough 'Root Cause/Corrective Action' review performed by trained persons and closure of identified action items.
- 5.2. Additionally, an annual review of the Goldwind USA company wide Accident Reporting & Investigation, will be performed, by the Goldwind USA designated EHS Coordinator.

6. Responsibilities

6.1. Site Manager shall:

- 6.1.1. Ensure that this Accident Reporting & Investigation program is implemented at their site
- 6.1.2. Ensure that all correction actions identified from accident investigations are implemented in a timely manner, complete the Supervisor Accident Investigation Report in Appendix A within 24 hours of incident and investigate all accidents within five days of incident and file complete reports on each.
- 6.1.3. Communicate the Incident information to the Goldwind USA EHS Coordinator.

6.2. EHS Coordinator shall:

- 6.2.1. Ensure that the OSHA No. 300 Log, company wide, is properly maintained,
- 6.2.2. Ensure that all incident and accident investigation records are properly maintained,
- 6.2.3. Participate in all accident investigations,
- 6.2.4. Schedule and/or instruct Incident investigation training, and
- 6.2.5. Complete and update the site-specific information in **Appendix F**.

Goldwind USA Site Safety Plan & Policy	Page 20
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

6.3. All Goldwind USA Service Employees shall:

6.3.1. Complete the Employee's First Notice of Occupational Injury/Illness (Appendix B) within 24 hours of incident, and

6.3.2. Participate in the accident investigation

6.4. Human Resource Manager/Responsible Individual shall:

6.4.1. Report incidents to the insurance carrier as needed.

7. References

7.1. GUSA EHS-15 Procedure Medical Services

7.2. OSHA Guidance Recordkeeping Guidelines for Occupational Injuries and Illnesses

8. Appendices

- | | |
|-----------------|--|
| 8.1. Appendix A | Supervisor Accident Investigation Report |
| 8.2. Appendix B | Employee First Notice of Occupational Injury/Illness |
| 8.3. Appendix C | OSHA Recordability Checklist |
| 8.4. Appendix D | First Aid Log |
| 8.5. Appendix E | Site-Specific Information (completed by Specialist) |

Goldwind USA Site Safety Plan & Policy	Page 21
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX A
Goldwind USA Incident/Accident Investigation Form

Incident Date:		Incident Time:	
Employee Name:		Employee Occupation:	
Location:		Supervisor:	
Contract Employee: Yes ☐ No ☐		Date Reported:	
Case Type: Injury ☐ Illness ☐		Medical Treatment: Y/N Yes ☐ No ☐	
Treatment by:		Treatment Date:	
Treatment Provided (Describe)	☐ Admission To Hospital	☐ Foreign Bodies Embedded In Eye	☐ Positive X-Ray Diagnosis
	☐ Antiseptics	☐ Foreign Bodies From Wound	☐ Prescription Medications
	☐ Butterfly Adhesive Dressing(s)	☐ Heat Therapy	☐ Soaking Therapy
	☐ Compresses	☐ Infection	☐ Sutures
	☐ Cutting Away Dead Skin	☐ Other (Specify)	
	☐ Whirlpool Bath Therapy		
Severity of Injury:	☐ No days Away From Work ☐ Days Away From Work		
Days Away From Work	(enter number only; leave blank if No Lost Time)	Days Restricted Work Activity	(enter number only; leave blank if No Lost Time)
Illness Type: (for illness cases only)	☐ Occupational Skin Disorder ☐ Dust Disease of the Lung ☐ Respiratory Conditions due to Toxic Agents ☐ Poisoning		
	☐ Disorders due to Physical Agents ☐ Disorders associated with Repeated Trauma ☐ All other occupational illnesses		
Accident Type:	☐ Bending/Leaning ☐ Caught in, on, under, between ☐ Climbing ☐ Contact with Caustics/toxics ☐ Contact with Electrical ☐ Contact with blades	☐ Falls, different level ☐ Falls, same level ☐ Lowering/Lifting ☐ Motor vehicle accident ☐ Other ☐ Pushing/Pulling Over-exertion	☐ Repetitive motion ☐ Rubbed or abraded ☐ Slip/Trip, no fall ☐ Stretching ☐ Struck against ☐ Twisting/Turning
Injury Type:	☐ Abrasion ☐ Amputation ☐ Bite/Infection ☐ Burn – heat or cold ☐ Burn - Chemical ☐ Burn - Electrical ☐ Other	☐ Conjunctivitis ☐ Contusion/Crush ☐ Dermatitis ☐ Exhaustion – Heat Stroke ☐ Foreign Body (sliver, chip, dust) ☐ Fracture/ Dislocation ☐ Ganglion/Cyst	☐ Hernia ☐ Musculoskeletal disorders ☐ Pain/Neuralgia ☐ Repetitive motion ☐ Sprain/Strain ☐ Threshold shift
Body Part:	☐ Abdomen/lower trunk/buttocks ☐ Ankle	☐ Finger(s) ☐ Foot ☐ Forearm	☐ Nerves ☐ Other ☐ Shoulder(s)

[illegible]

Goldwind USA Site Safety Plan & Policy	Page 23
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Immediate Cause:	☐ Awkward postures ☐ Congestion/restricted area ☐ Defective tool or equipment ☐ Explosion hazard ☐ Failure to secure ☐ Failure to use PPE properly ☐ Failure to warn ☐ Fire hazard ☐ Hazardous atmosphere	☐ Improper manual handling ☐ Improper position for task ☐ Improper speed ☐ Inadequate guards or barriers ☐ Inadequate lighting ☐ Inadequate warning system ☐ Inadequate PPE ☐ Made safety device inoperative ☐ Noise exposure ☐ Oil/solvent on shoes or floor	☐ Other ☐ Poor housekeeping ☐ Lack of attention ☐ Reactive chemical ☐ Repetitive motion ☐ Influence of alcohol, drugs ☐ Unfamiliar with activity ☐ Unknown ☐ Using defective equipment ☐ Using equipment improperly
	Root Cause: To be determined by formal Root Cause (Use the 5 Whys)		
Corrective action taken to correct immediate deficiency:			
Did investigation reveal that similar conditions exist in other wind turbines or work areas?			Yes ☐ No ☐

If similar conditions exist, indicate corrective action being taken to address them:	
What short term corrective actions need to be taken before root cause can be corrected for the long term?	
What long term corrective action measures need to be taken to correct the root cause?	
Employee Signature:	Date:
Lead Investigator Signature:	Date:
Manager Signature:	Date:
EHS Review Signature:	Date:

Goldwind USA Site Safety Plan & Policy	Page 24
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Instructions:

1. Document all safety incidents, accidents, and near-misses.
2. All non-serious incidents will be reported to Goldwind USA EHS Personnel within 24 hours of occurrence.
3. Serious accidents will be immediately reported (including weekends, holidays and at night) to Goldwind USA EHS Manager.
4. The employee's supervisor will complete the "Incident Investigation" form and the employee will complete the "Employee First Notice" form within 24 hours following the incident.
5. Submit completed forms to the EHS Manager/Coordinator
6. Human Resource Manager is responsible for filing accident claims

Goldwind USA Site Safety Plan & Policy	Page 25
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX B

Employee's First Notice of Occupational Injury/Illness

Name (Print): _____ Payroll No.: _____
Home Address: _____ Tel. No.: _____

Occupation: _____ Dept.: _____ Site: _____

Date & Time of Injury/Illness: _____

Were you at work when the injury/illness occurred? Yes ☐ No ☐

Give a brief description of the injury/illness:

Were there any witnesses? Yes ☐ No ☐

If yes, please supply names of witnesses: _____

Have you reported to the Goldwind USA corporate headquarters? Yes ☐ No ☐

To whom did you report the injury/illness? _____ Date/Time: _____

Did you see a private doctor for treatment? Yes ☐ No ☐ Date: _____

Do you expect to be losing time from work? Yes ☐ No ☐

Expected duration of your absence: Days: _____ Weeks: _____

Important Note:

If you expect to be losing time from work, you should obtain verification from your attending doctor and submit this to your supervisor as soon as possible.

I certify that the information submitted by me is true and correct and I understand that falsifying this document can lead to disciplinary action, including dismissal.

Employee signature: _____ Date: _____

Salary Exempt: ☐ Salary non-exempt: ☐ Hourly: ☐ SS N°/ID: _____

Goldwind USA Site Safety Plan & Policy	Page 26
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX C

OSHA Recordability Checklist

An occupational injury, caused by an instantaneous event in the work environment, is almost always recordable if at least one of the following items is checked:

1. Medical Treatment

- ☐ Treatment of **INFECTION** (application of nonprescription medication is considered first aid and not recordable)
- ☐ Application of **ANTISEPTICS** during second or subsequent visit
- ☐ **PUNCTURED EAR DRUM**
- ☐ Application of **SUTURES** (stitches)
- ☐ Removal of **FOREIGN BODIES EMBEDDED IN EYE** if more than irrigation or cotton swab is required
- ☐ Removal of **FOREIGN BODIES FROM WOUND** if procedure is more complicated than using tweezers or other simple techniques
- ☐ Use of **PRESCRIPTION MEDICATIONS**
- ☐ Use of **OVER THE COUNTER MEDICATIONS** at prescription strength
- ☐ Application of hot or cold **COMPRESS(ES)** during second or subsequent visit to medical personnel
- ☐ **CUTTING AWAY DEAD SKIN** (surgical debridement)
- ☐ Use of **WHIRLPOOL BATH THERAPY** during second or subsequent visit to medical personnel
- ☐ **PHYSICAL THERAPY SESSIONS**
- ☐ **POSITIVE X-RAY DIAGNOSIS** (fractures, broken bones, etc.)
- ☐ **ADMISSION TO A HOSPITAL** or equivalent medical facility for medical treatment involving more than observation.
- ☐ Series of treatments given by a **CHIROPRACTOR**

2. θ Loss of Consciousness

3. Restriction of Work or Motion

- ☐ Light duty / restricted work activity (if extending beyond day of injury)
- ☐ Days away from work

4. θ Transfer to another job (as result of an injury)

IF ONE ITEM ABOVE IS CHECKED, THE WORK-RELATED INJURY IS ALMOST ALWAYS RECORDABLE

- ☐ An occupational illness (a case resulting from anything other than an instantaneous event in the work environment) is recordable ONLY IF IT MEETS THE GENERAL RECORDING CRITERIA. Work-related illnesses usually occur over time, and result in both acute and chronic illnesses caused by inhalation, direct contact, etc. An example of the difference between a recordable injury and a recordable illness is hearing loss. If a loss of hearing resulted from an explosion (an instantaneous event) and it fits into one of the injury recordability criteria above, it is a recordable injury. If a loss of hearing resulted from exposure to industrial noise over a period of time, it is a recordable illness.

Goldwind USA Site Safety Plan & Policy	Page 27
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX D

First Aid Log

Date	Description of Incident	First Aid Items Used

** This form is to record first aid treatment only. It is not to be used in place of the 'Employee's First Notice of Occupational Injury/Illness' form.*

Goldwind USA Site Safety Plan & Policy	Page 28
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX E

SITE SPECIFIC ACCIDENT REPORTING & INVESTIGATION INFORMATION

Name and Location of Site: _____

Site Manager: _____

Goldwind EHS Manager/Coordinator: _____

List employees who have been 'Incident Investigation' trained and date of training:

Only the following employees can lead accident/incident investigations.

Name: _____

Name: _____

Name: _____

Name: _____

Name: _____

Name: _____

Name: _____

Name: _____

Name: _____

Information Completed By: _____

Date: _____

Goldwind USA Site Safety Plan & Policy	Page 29
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

CONFINED SPACE ENTRY

GUSA EHS-3

1. Purpose & Scope

- 1.1. This procedure outlines Goldwind USA Confined Space Entry program. The purpose of this procedure is to:
 - 1.1.1. Safeguard personnel against health and safety hazards associated with working within confined spaces.
 - 1.1.2. Identify and evaluate confined space hazards and establish requirements for safe entry into permit-required and non-permit required confined spaces.
 - 1.1.3. Establish requirements for safe entry into Permit-Required and Non-Permit Confined Spaces at all Goldwind USA services operations.
 - 1.1.4. Provide guidance to all Goldwind USA and contractor employees.

2.0 Definitions

2.1 Attendant - An individual stationed outside a permit-required confined space who monitors the Authorized Entrants and who performs all Attendants' duties assigned in this procedure.

2.2 Authorized Entrant - An employee who is authorized by the Service Area Manager or designee to enter a permit-required confined space.

2.3 Confined space - A space that meets the following requirements:

- 2.3.1** Is large enough and so configured that an employee can bodily enter and perform assigned work;
- 2.3.2** Has limited or restricted means for entry or exit (for example: tanks, vaults, and vessels are space that may have limited means of entry);
- 2.3.3** Is not designed for continuous employee occupancy.

2.4 Confined Space Entry Permit - A form that is required to be completed and posted at the entrance to a permit-required confined space prior to entry into that space. The permit shall be completed by the Entry Supervisor for entries involving **only** on-site employees and by the Contractor Supervisor for any entry involving a Contractor.

2.5 Engulfment - The surrounding and effective capture of a person by a liquid or finely divided (flowable solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

2.6 Entry - The action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the

Goldwind USA Site Safety Plan & Policy	Page 30
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

entrant's body breaks the plane of an opening into the space.

2.7 Entry Supervisor - A Site Manager, EHS coordinator or designee responsible for determining if acceptable entry conditions are present at a permit-required confined space where entry is planned, for authorizing entry and overseeing entry operations, for terminating entry as required by this procedure, and for filling out the confined space entry permit. For entries involving Contractors, the Entry Supervisor shall be a qualified Contractor employee.

2.8 Hazardous Atmosphere - An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from or more of the following causes:

- 2.8.1** Flammable gas, vapor, or mist in excess of 10% of its Lower Flammable Limit (LFL);
- 2.8.2** Airborne combustible dust at a concentration that meets or exceeds its LFL;
- 2.8.3** Atmospheric oxygen concentration below 19.5% or above 23.5%;
- 2.8.4** Atmospheric concentration of any substance for which a dose or permissible exposure limit could result in employee exposure in excess of its dose or Permissible Exposure Limit.
- 2.8.5** Any other atmospheric conditions that is immediately dangerous to life and health.

2.9 Lower Explosive Level (LEL) - Lowest concentration of a gas, vapor, dust or mist, which will ignite in air.

2.10 Non-permit confined space - A confined space that does not contain, or with respect to hazardous atmospheres, have the potential to contain any hazard capable of causing death or serious physical harm.

2.11 Permissible Exposure Limit (PEL) - Atmospheric concentration of any substance for which a dose is published in Subpart Z, *Toxic and Hazardous Substances*, of 29 CFR 1910.1000.

2.12 Permit-required confined space - A confined space that has one or more of the following characteristics:

- 2.12.1** Contains or has a potential to contain a hazardous atmosphere;
- 2.12.2** Contains a material that has the potential for engulfing an entrant;
- 2.12.3** Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- 2.12.4** Contains any other recognized serious safety or health hazard.

2.13 Retrieval System - The equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Goldwind USA Site Safety Plan & Policy	Page 31
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.0 Evaluation of the Workplace

3.1 The site manager or designee shall evaluate the workplace and determine the spaces that are permit-required and non-permit required. The site shall use the Confined Space Inventory Form (**Appendix A**) to record all applicable information regarding hazardous atmospheres, associated hazards, personal protective equipment required to enter the space and rescue equipment required to be on hand for each space identified. Determinations and dates the space was tested will be made available to entrants/contractors upon request.

3.2 Non-Permit Required Confined Space

- 3.2.1** An Attendant is not required for a non-permit confined space. However, no employee shall alone in any spaces at the service site. The buddy system should be adhered to at all times when working at the WTG.
- 3.2.2** Air monitoring is required initially in order to classify the space, as a non-permit required confined space. This air monitoring information will be recorded on the Confined Space Entry Permit (**Appendix B**) for documentation purposes. Page 2 of the Confined Space Entry Permit on which monitoring data was recorded will then be filed with the service site's Confined Space Inventory Form in the EHS Files. As long as conditions do not change, no additional air monitoring is required. However, if there is ever a question about the condition of the atmosphere in the space, consult the Site Manager and/or EHS coordinator, and retest the atmosphere. See Section 5.3 and 6.0 for criteria for testing of a confined space.
- 3.2.3** The following instructions will be followed for conducting any regular type of work in the hub.
 - 3.2.3.1** If one field technician (FT) entered the hub, the second FT has to be in direct proximity (nacelle).
 - 3.2.3.2** If two FTs entered the hub a third FT is necessary to control the work in direct proximity (nacelle).
 - 3.2.3.3** The tower rescue equipment is required to be in the nacelle.

3.3 Permit-Required Confined Space

- 3.3.1** For service areas with permit-required confined spaces, the service area shall:
 - 3.3.1.1** Develop communication procedures to be used by Authorized Entrants and Attendants to maintain contact during the entry.

Goldwind USA Site Safety Plan & Policy	Page 32
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.3.1.2 Identify the rescue and emergency services that can be summoned and the means for summoning those services.

3.3.1.3 Develop any other information necessary, given the circumstances of the particular permit-required confined space, in order to ensure employee safety.

3.3.1.4 Develop and implement procedures to coordinate entry operations when employees of more than one employer are working simultaneously as Authorized Entrants in a permit-required confined space.

3.3.2 Labeling of permit-required confined spaces

3.3.2.1 The service site will inform employees exposed to permit-required confined spaces by posting danger signs. The sign must be posted by the entry point of the permit-required confined space. The sign must be clearly and permanently labeled.

3.3.2.2 The sign shall not be placed on a hatch cover or in any area where the sign can be covered from view. When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and protect each employee in the space from foreign objects entering the space.

3.4 Pre-Entry Requirements

NOTE: No person shall enter a permit-required confined space without a fully equipped standby person available immediately outside the space entrance to maintain contact visually, or to communicate verbally with the entrants inside the space and to summon assistance in the event of an emergency.

3.4.1 Where possible, the space must be ventilated of a potentially hazardous atmosphere.

3.4.2 Temporary lighting used in the space shall be of vapor proof design, with heavy cords and insulation in good condition. All electrical equipment will be used with GFCI.

3.4.3 The Entry Supervisor shall identify equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be used during the entry. Utilize the Pre-Entry Checklist in **Appendix C** in preparing for entry. **Note:** This is not an exhaustive list and may not be the only necessary pre-entry steps.

3.4.4 At least one attendant will be present at each Permit-required Confined Space.

3.5 Entry Requirements

3.5.1 Entry Process

3.5.1.1 A Confined Space Sign In/Sign Out Log (see example in

Goldwind USA Site Safety Plan & Policy	Page 33
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Appendix E) will be kept at the entry portal of the space and all employees/Contractors will sign this log each time they enter or exit the permit-required confined space.

3.5.2 Entry Permit

3.5.2.1 Prior to permit-required confined space entry, a Confined Space Entry Permit must be completed. The Entry Supervisor shall fill out the permit for entry into permit-required confined spaces by on-site employees **only**. The Contractor Supervisor shall fill out the Confined Space Entry Permit (**Appendix B**) for any entry involving a Contractor. The site service manager, or designee must authorize all entries into confined spaces.

3.5.2.2 The Confined Space Entry Permit shall be posted at the entry to the permit-required confined space and is in effect for the duration of work in the space, but shall not exceed one shift.

3.5.2.3 The Goldwind USA Confined Space Entry Permit includes:

- 3.5.2.3.1 Identification of the confined space;
- 3.5.2.3.2 Purpose of the entry;
- 3.5.2.3.3 Date and duration of the permit;
- 3.5.2.3.4 List of Authorized Entrants;
- 3.5.2.3.5 Name of the current Attendant(s) and the Entry Supervisor;
- 3.5.2.3.6 A list of hazards in the permit-required confined space;
- 3.5.2.3.7 A list of measures to isolate the permit-required confined space and eliminate or control the hazards (LOTO, purging, inerting, ventilating);
- 3.5.2.3.8 The acceptable entry conditions and air monitoring results into the permit-required confined space;
- 3.5.2.3.9 The results of tests initiated by the person(s) performing the tests, their names or initials, and an indication of when the tests were performed;
- 3.5.2.3.10 The rescue and emergency services available and the means to summon them;
- 3.5.2.3.11 Communication procedures for Attendants and entrants;
- 3.5.2.3.12 Any required equipment (such as respirators, communication, alarms, etc.);
- 3.5.2.3.13 Any other necessary information; and

Goldwind USA Site Safety Plan & Policy	Page 34
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.5.2.3.14 Any additional permits (such as hot work) for the permit-required confined space.

3.5.2.4 The Confined Space Entry Permit in **Appendix B** contains all of the required information listed above.

3.5.2.5 The current Attendant may not enter or leave the permit-required confined space entrance until properly relieved by someone who is properly trained in confined space entry and briefed on the hazards of that particular confined space.

3.5.3 Testing of a confined space

3.5.3.1 The following requirements for testing a confined space apply to those entries that will be performed by **Goldwind USA employees only**. For entries that will be performed by or will involve Contractors, the requirements in Section 6.0 apply.

3.5.3.2 The Entry Supervisor, or a trained site employee, shall test the atmosphere of the confined space immediately prior to employee entry with a calibrated direct-reading instrument. A written record of test results from air monitoring must be made on the Confined Space Entry Permit. The Entrant must have the opportunity to observe this testing if so desired and has the right to request reevaluation.

3.5.3.3 All service areas will purchase and maintain on-site test equipment that can properly perform these tests.

3.5.3.4 Test equipment shall be calibrated in accordance with manufacturer's requirements. Test equipment shall also be field checked immediately prior to each use. All instrument calibrations shall be recorded on a Instrument Calibration Log.

3.5.3.5 All available means must be utilized to evaluate the confined space atmosphere without entering the space (i.e., extension probes, remote sensors, or insertion of the test equipment).

3.5.3.6 Multiple points of testing shall be taken along the path of entry (a minimum every 1.5 m (5 feet) until the desired work location is reached). Entry into the space is permitted to perform this requirement when other means have been exhausted.

3.5.3.7 **There may be no toxic atmosphere within the space whenever any employee is inside the space.** Therefore, if a toxic material content is known or expected to exceed the PEL, entry is not permitted.

3.5.3.8 Entry into a permit-required confined space is allowed under the following conditions

Goldwind USA Site Safety Plan & Policy	Page 35
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 3.5.3.8.1 Oxygen count is within the 19.5% to 23.5% level.
- 3.5.3.8.2 LEL is less than 10%.
- 3.5.3.8.3 Level of any substance found in Subpart Z of 29 CFR 1910.1000, Table Z-1, *Limits for Air Contaminants*, is less than the PEL.
- 3.5.3.9 If the LEL is above 10%, ventilate the space until the LEL is less than 10%. If this condition is not possible, no one may enter the space unless it is an emergency situation and there are no ignition sources.
- 3.5.3.10 If, as a result of testing, it is determined that oxygen deficiency and/or dangerous air contamination **does not** exist, entry into the space may proceed. Re-testing must be done if the space has been vacant for more than one (1) hour or at the change of a shift to ensure that oxygen deficiency and/or dangerous air contamination has not developed.
- 3.5.3.11 No hot work such as welding or bringing compressed gas cylinders are permitted in confined spaces.
- 3.5.3.12 If, as a result of testing, it is determined that oxygen deficiency and/or dangerous air contamination **does** exist, and cannot be eliminated by existing ventilation, entry by site personnel is not allowed.
- 3.5.3.13 Continuous forced air ventilation shall be used as follows:
 - 3.5.3.13.1 The forced air ventilation shall be directed to ventilate the immediate areas where a hazardous atmosphere is confirmed or suspected, and where an employee will be present. It shall continue until all employees have left the space.
 - 3.5.3.13.2 The air supply for the forced air ventilation must be from a clean source.
 - 3.5.3.13.3 An employee may enter the space after air monitoring has confirmed that forced air ventilation has eliminated any hazardous atmosphere.
- 3.5.3.14 If a hazardous atmosphere is detected:
 - 3.5.3.14.1 Each employee shall immediately leave the confined space.
 - 3.5.3.14.2 The confined space shall be evaluated to determine how the hazardous atmosphere developed.

Goldwind USA Site Safety Plan & Policy	Page 36
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.5.3.14.3 Measures will be taken to correct the cause of the recurrence of the hazardous environment before re-entry takes place.

3.5.4 Reclassification of a permit-required confined space:

3.5.4.1 A space classified by the service site as a permit-required confined space may be reclassified as a non-permit-required confined space only if:

3.5.4.1.1 The space has an actual or potentially hazardous atmosphere, **and** that hazardous atmosphere within the space has been eliminated without entry into the space.

3.5.4.1.2 It may remain a non-permit-required confined space for as long as the atmospheric hazards are eliminated.

3.5.4.1.3 The testing that reclassified the permit-required confined space as a non-permit-required confined space must be documented on the air monitoring section of the Confined Space Entry Permit (**Appendix B**) and reclassified on the service region/area's Confined Space Inventory Form (**Appendix A**).

Note: A Permit Required Confined Space cannot be reclassified as a Non-Permit Required Confined Space if the hazardous atmosphere is only being controlled and not eliminated (i.e. forced ventilation).

3.6 Contractor Requirements For Entry Into A Confined Space

3.6.1 Where a Contractor is used to perform work involving permit-required confined space entry, the Contractor will provide to the service site a copy of the Contractor's Confined Space Entry Procedure and training documentation to prove that each employee who will be entering the confined space has current training that meets applicable country regulatory requirements. They will also be familiar with and follow all of the Contractor Environment, Health and Safety Rules that are also identified in EHS Procedure Contractor Safety

3.6.2 If the Contractor cannot provide his/her own rescue services, the Contractor must notify his/her service site representative prior to arriving on-site so that the service site can assist in locating rescue services.

3.6.3 The Goldwind USA service site Confined Space Entry Permit is to be used, regardless of who performs the actual entry.

3.6.4 The Contractor Supervisor will sign the Contractor Work Permit and obtain a Confined Space Entry Permit from the service area manager or designee. The Contractor is responsible for

Goldwind USA Site Safety Plan & Policy	Page 37
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

completing all sections of the permit and returning it to the service area manager or designee for review.

- 3.6.5** The Contractor Supervisor shall designate a qualified and trained Entry Supervisor and Attendant(s) to oversee entry activities into the confined space.
- 3.6.6** The Contractor must perform air monitoring of the confined space to ensure a safe environment is established prior to entry into the space. It is recommended that service area personnel re-test the atmosphere in the space to confirm the air monitoring results obtained by the Contractor.
- 3.6.7** The site manager or designee shall accompany the Contractor Supervisor to the space entrance to post the completed Confined Space Entry Permit.
- 3.6.8** The site service area manager or designee must authorize entry into the confined space in order for the Contractor's work to begin.

3.7 Rescue Services

- 3.7.1** Rescue services must be coordinated ahead of time and may be provided by on-site employees or an off-site service for any site that has permit-required confined spaces. The emergency number must be clearly identified on the permit and posted throughout the Service site.
- 3.7.2** Outside rescue services must be made aware of the hazards of the confined spaces, must have access to comparable permit spaces or afforded the opportunity to practice at the service site where they will be doing the rescue in order to develop rescue plans and practice rescues.
- 3.7.3** If local outside rescue services are not available, on-site teams must be properly equipped and receive the same training as Authorized Entrants, plus training in the use of personal protective and rescue equipment and first aid, including CPR. They must practice simulated rescues at least annually.
- 3.7.4** Hospital or treatment facilities must be provided with any MSDS or other information in a permit-required confined space hazard exposure situation that may aid in the treatment of rescued employees.

3.8 Training

- 3.8.1** All employees who are involved in confined space entry operations will be trained in all aspects of this procedure, as well as for specific service site procedures and programs, such as the EHS Procedure Hub Entry Procedure, and Lockout/Tagout. Training shall include and the proper use and calibration of required monitoring devices for permit-required confined spaces.
- 3.8.2** Refresher training will be conducted every two years or more frequently if program changes have occurred.

Goldwind USA Site Safety Plan & Policy	Page 38
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.8.3 Each Authorized Entrant's qualifications for confined space entry shall be evaluated on an annual basis.

3.8.4 If the service site has an on-site rescue team, they will be trained initially and then annually thereafter, as well as perform annual drills.

3.9 Auditing

3.9.1 Confined Space Entry Permits must be retained for one year to facilitate review of the Confined Space Entry Procedure and reviewed annually for completeness and accuracy.

3.9.2 Instrument calibration documentation will be reviewed annually.

3.10 Responsibility

3.10.1 Site Manager, or his designee, is responsible for:

3.10.1.1 Evaluating the workplace and determining the spaces that are permit-required and non-permit required.

3.10.1.2 Ensuring that all necessary site personnel are trained on this procedure and adhere to all of its requirements.

3.10.1.3 Ensuring that this procedure is administered properly.

3.10.1.4 Ensuring that disciplinary actions are taken for any violation of this procedure.

3.10.2 The Lead Technician (of 2 man crew), or designee, is responsible for:

3.10.2.1 Posting the Confined Space Entry Permit at the entrance to the space to be entered.

3.10.2.2 Authorizing entries into a permit-required confined space.

3.10.2.3 Contractors entering a permit confined space (contractors can only enter with a trained Goldwind USA employee)

3.10.2.4 Ensuring that Contractors adequately complete the Confined Space Entry Permit.

3.10.2.5 Confirming Contractor air monitoring results prior to Contractor entry.

3.10.2.6 Assisting the Contractor in locating rescue services if the Contractor cannot provide his/her own rescue services.

3.10.3 The Entry Supervisor is responsible for:

3.10.3.1 Filling out and authorizing entry into permit-required

Goldwind USA Site Safety Plan & Policy	Page 39
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

confined spaces by on-site employees.

- 3.10.3.2 Knowing the hazards of confined spaces.
- 3.10.3.3 Explaining why the space(s) is classified as a permit-required confined space (describe the hazards, etc.).
- 3.10.3.4 Verifying that all tests have been conducted and all procedures and equipment are in place before endorsing a permit.
- 3.10.3.5 Terminating entry if necessary, canceling permits, and verifying that rescue services are available and the means for summoning them are operable.
- 3.10.3.6 Removing unauthorized individuals who enter the confined space.
- 3.10.3.7 Determining, at least when shifts change, that acceptable conditions, as specified in the permit, continue.
- 3.10.3.8 Verifying readiness of work area and equipment to be used in a permit-required confined space entry.
- 3.10.3.9 Ensuring that all parties involved in confined space entry are fully aware of and trained in their duties, responsibilities, and the hazards associated with the operation **PRIOR TO ANY PERMIT- REQUIRED CONFINED SPACE ENTRY.**
- 3.10.3.10 Explaining to Contractor Workers that the Goldwind USA service area/operation contains permit-required confined spaces and that entry to those spaces is allowed only through compliance with the Service site's confined space entry permit process.
- 3.10.3.11 Coordinating entry operations with the Contractor, when both the Contractor's employees and the site's employees will be working together in or near the permit-required confined space(s).
- 3.10.3.12 Periodically checking on Contractors during any permit-required confined space work.

3.10.4 The Attendant to a confined space is responsible for:

- 3.10.4.1 Knowing the hazards of confined spaces and recognizing behavioral effects of potential exposures.
- 3.10.4.2 Communicating with the control room before entry into the space to confirm correct procedures are in place, and all hazards have been eliminated.
- 3.10.4.3 Maintaining continuous count and identification of Authorized Entrants.
- 3.10.4.4 Remaining outside the space until relieved and

Goldwind USA Site Safety Plan & Policy	Page 40
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

communicating with entrants as necessary to monitor their status.

3.10.5 Authorized Entrants are responsible for:

3.10.5.1 Knowing the hazards he/she may face, being able to recognize signs or symptoms of exposure, and understanding the consequences of exposure to hazards.

3.10.5.2 Knowing how to use any needed equipment, communicating with Attendants as necessary, alerting Attendants to the warning signs or the existence of a hazardous condition.

3.10.5.3 Knowing how to exit as quickly as possible whenever ordered or alerted (by alarm, warning sign, or prohibited condition) to do so.

3.11 References

GUSA EHS-4 Contractor Safety Procedure

GUSA EHS-14 Lockout/Tagout Procedure

3.12 Appendices

Appendix A – Goldwind USA Service Operations Confined Space Inventory Form

Appendix B - Example Confined Space Entry Permit

Appendix C - Pre-Entry Checklist

Goldwind USA Site Safety Plan & Policy	Page 42
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Appendix B

Date:

Confined Space Entry Permit

In the Event of
Emergency Call 911

1. General Information:	
CONFINED SPACE LOCATION:	
REASON FOR PERMIT:	
All concerns associated with this Confined Space Entry have been appropriately addressed. Work is hereby authorized to begin	
ENTRY SUPERVISOR:	
DATE/TIME ISSUED:	DATE/TIME EXPIRED:

2. Entrants:

3. Attendants(s) & Shift Duration

5. Confined Space Pre-Entry List:

CHECKLIST INSTRUCTIONS: THE ENTRY SUPERVISOR SHALL ANSWER AND INITIAL EACH CHECKLIST ITEM AS IT IS COMPLETED. THE ENTRY SUPERVISOR SHALL AUTHORIZE WORK TO BEGIN BY SIGNING BELOW, ONLY AFTER ALL CHECKLIST ITEMS HAVE BEEN APPROPRIATELY ADDRESSED. THE ENTRY SUPERVISOR SHALL CANCEL THE PERMIT BY SIGNING BELOW AFTER WORK IS COMPLETED, OR IF CONDITIONS ARISE THAT ARE OUT OF COMPLIANCE WITH THE CHECKLIST.

		Yes	No	N/A	Initials
1.	Have all personnel been appropriately trained and instructed in CSE procedures?	☐	☐	☐	
2.	Have emergency communication and action procedures been identified and explained?	☐	☐	☐	
3.	Have all hazardous sources of energy been locked/tagged out?	☐	☐	☐	
4.	Is a Hot Work Permit required?	☐	☐	☐	
5.	Are ventilators positioned and operating properly?	☐	☐	☐	
6.	Are the ventilators in use sufficient to maintain an atmosphere free from contaminants?	☐	☐	☐	
7.	Is the gas detector within calibration limits and operating properly?	☐	☐	☐	
8.	Is the space and surrounding area free of harmful	☐	☐	☐	

Goldwind USA Site Safety Plan & Policy	Page 43
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

☐	vapors and gases?	☐	☐	☐	☐
9.	Is the appropriate fall protection/retrieval equipment been installed and inspected?	☒	☒	☒	☐
10.	Has the body harness been donned and properly inspected?	☒	☒	☒	☐
11.	Is a fire extinguisher available?	☒	☒	☒	☐
12.	Is explosion-proof equipment required (i.e. lighting, radios)	☒	☒	☒	☐
13.	Is an appropriately maintained First Aid Kit available?	☒	☒	☒	☐
14.	Is the entry area secured and marked with barriers?	☒	☒	☒	☐
16.	Is other PPE necessary (i.e. hard hat, SAR, etc.)?	☐	☐	☐	☐

7. List of Potential Hazards of the Space:	8. List Safety Equipment Required:
9. Method of Attendant/Entrant Communication:	10. Method for Contacting Emergency Services Personnel:

11.	Atmosphere Readings	Note: Conduct 1st reading before ventilating space											
Gas Readings	1st reading:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:	Time:
O2													
CO													
H2S													
LEL													

1	Confined space work is complete. This permit is hereby canceled:	
2.		
☐		
☐		
☐	Entry Supervisor's Signature	Date and Time

Goldwind USA Site Safety Plan & Policy	Page 44
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Appendix C

CONFINED SPACE EVALUATION FORM

Name of Evaluator: _____
 Site Location: _____
 Space Location: _____

Evaluation Date: _____

Tower # For Space

Check here ☐ if this space is not listed in Appendix A (inventory).	Check here ☐ if this is a re-evaluation of a space listed in Appendix A (inventory).
--	---

Check here ☐ if the space is labeled identifying it as a **“Permit-Required Confined Space”**

Mark all applicable characteristics:

- ☐ The space is of adequate size and configured so one can bodily enter.
- ☐ The space has limited or restricted means of entry or exit.
- ☐ The space is not designed for continuous human occupancy.

When using this form you must evaluate the confined space in its typical condition (prior to controlling any hazards). Example: If a space typically contains live electrical cables and a potential hazardous atmosphere then both hazards must be listed. If YES is checked for questions 1-7, then the space must be classified as Permit Required

Note: You must answer all of the following questions.

		Yes	No	NA
1.a	Does the confined space contain moving parts?	☐	☐	
.b	Can the moving parts be locked out prior to entry?	☐	☐	☐
2.a	Does the confined space contain electrical hazards?	☐	☐	
.b	Can the electrical hazards be locked out prior to entry?	☐	☐	☐
3.a	Does the confined space contain hydraulic or pneumatic hazards?	☐	☐	
.b	Can the hydraulic or pneumatic hazards be locked out prior to entry?	☐	☐	☐
4.a	Does the confined space contain a solid or liquid engulfment hazard?	☐	☐	
.b	Can the engulfment hazard be eliminated prior to entry?	☐	☐	☐
5.a	Does the confined space contain converging walls or other internal structures that could constrict an entrant's diaphragm?	☐	☐	
.b	Can this hazard be eliminated prior to entry?	☐	☐	☐
6.a	Does the confined space contain any other recognized serious safety hazard due to energy sources such as suspended beams or dies?	☐	☐	
.b	Can this hazard be eliminated prior to entry?	☐	☐	☐
7.a	Does the confined space contain or have the potential to contain a hazardous atmosphere	☐	☐	

Goldwind USA Site Safety Plan & Policy	Page 45
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

If monitoring conducted LEL ____ O ₂ ____ CO ____ H ₂ S ____ Other _____	
.b	Can the atmospheric hazards be controlled by using forced air ventilation? ☐ ☐ ☐

Some conditions that would cause question 7.a to be answered "Yes":

- ♦ Combustion equipment being operated in or around the confined space.
- ♦ Working with cleaners, glues, or other chemicals in or around the confined space.
- ♦ The presence of organic matter or other debris within the confined space.
- ♦ Workers welding in or around the confined space.
- ♦ The presence of natural gas or other chemical lines within or around the confined space.

A NEW EVALUATION MUST BE COMPLETED IF ENTRY CONDITIONS CHANGE

Permit Required Confined Space Category:

Non-Permit Confined Space ☐ Yes ☐ No

Signature of Evaluator ↗

Goldwind USA Site Safety Plan & Policy	Page 46
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

CONTRACTOR SAFETY

GUSA EHS-4

1.0 Purpose & Scope

- 1.1 The purpose of this procedure is to establish a method of ensuring that qualified contractors, visitors and delivery personnel are safe and adhere to all Environmental, Health and Safety (EHS) rules and regulations while working or visiting Goldwind USA sites or customer locations.

2.0 Definitions

- 2.1 **Competent Person** – One who is qualified to perform a specified task as proven through documented completion of training and by demonstrating the capability to perform such task.
- 2.2 **Confined Space** – Any space large enough and so configured that an employee can bodily enter and perform assigned work, but is not intended for continuous human occupancy, and has a limited means for entry or exit.
- 2.3 **Contractor** – Any person or organization working at a Goldwind USA service site or Goldwind USA project site under a Site purchase order or contract.
- 2.4 **Contractor Supervisor(s)** – Any contractor worker in charge of work, regardless of title or classification.
- 2.5 **EHS Incident** – A regulatory recordable injury/illness, lost time accident, or fatality, including that of a contractor; an environmental permit violation; hazardous material spill; or other emergency such as fire, explosion, bomb threat, etc.
- 2.6 **Service Site** – The site, all associated equipment, structures and property.
- 2.7 **Site Manager**- For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.
- 2.7 **Site Representative** – The designated employee who is responsible for being the contractor's main point of contact while at the Goldwind USA service site. For Level I contractors, the site representative will evaluate their safety qualifications, ensure that all contractors have reviewed and understand Goldwind USA EHS rules and procedures, conduct pre-job safety meetings with the contractor supervisor prior to work activities and perform weekly contractor inspections.

Goldwind USA Site Safety Plan & Policy	Page 47
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

2.8 HEPA (High Efficiency Particulate Absolute) – A filter which removes from air 99.97% or more of mono-disperse dioctylphthalate (DOP) particles having a mean particle diameter of 0.3 micrometer. Common use = "HEPA filter", i.e. high efficiency particulate air filter.

2.9 Higher Risk Operation – Work that has a high risk of resulting in a serious employee exposure, injury or death or an environmental violation. Higher risk operations include, but are not limited to the following:

- Confined Space Entry
- Construction Work (including parking lot or roof repair)
- Crane and/or Hoist Operations
- Demolition Work
- Disturbing Asbestos or other fibrous material
- Electrical Work
- Excavation Work
- Installation or Removal of Equipment or Machinery
- Hot Work
- Lockout/Tagout (LOTO)
- Plumbing Work (involving major piping breaks or disruptions)
- Respiratory Protection
- Scaffold Erection
- Welding Operations
- Working at Heights

2.10 Level I Contractor Worker(s) – Every regular, temporary, or part-time contractor, including subcontractors, contracted by a Goldwind USA service site that has the potential to perform a higher risk operation. This distinction is based on the contractor's job scope, not the size of the contract company.

2.11 Level II Contractor Worker(s) – Every regular, temporary, or part-time contractor, including sub-contractors, contracted by a Goldwind USA service site that does not have the potential to perform a higher risk operation. This distinction is based on the contractor's job scope, not the size of the contract company. Examples of Level II contractor workers are administrative personnel, delivery personnel, food services, laundry, security, other incidental service personnel such as sales/vendor visitors and computer consultants, among other incidental low hazard service providers.

2.12 Near-Miss Incident – An event that nearly resulted in an EHS incident.

2.13 Industrial Code – A code that places all business establishments into industrial categories for statistical and research purposes.

2.14 Sign-In Book – A sign-in book maintained for the purpose of recording contractors and visitors at any time, which includes: name, date, company, time of check-in and check-out.

Goldwind USA Site Safety Plan & Policy	Page 48
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

2.15 **Supplier** – A vendor company that provides goods, equipment, services (not related to operations and maintenance).

2.16 **Visitor** – Any person who is not a Goldwind USA employee or a regular, temporary, or part time contractor worker on Goldwind USA service site property.

3.0 Procedure

3.1 Level I Contractor Bid Solicitation

3.1.1 When contract bidding will not be performed, Level I contractors will still be required to submit the 'Contractor Environment, Health and Safety Qualification Form' and any requested information in order to be allowed to perform work at the Site.

3.1.2 Each Goldwind USA service site shall include the 'Contractor Environment, Health and Safety Qualification Form' (**Appendix A**), along with a copy of this procedure with each bid solicitation for any work to be performed at the region/area by a Level I contractor. The qualification form requests the following:

- Basic safety information,
- Any additional information required to be submitted by the contractor in order to be considered for the bid,
- Any items which must be provided to the region/area upon award of the contract (i.e. Certificate of Insurance, proof of training documentation).

3.1.3 If the contractor will be performing work that will require a LOTO, involve electrical work or entrance into a confined space, the contractor must provide proof of training (i.e. a copy of the corresponding training certificate) for all workers who will be performing that work. The documentation must indicate that the training provided meets all requirements under the applicable standards.

3.1.4 Level I contractors will complete the required sections on the 'Contractor Environment, Health and Safety Qualification Form', sign and submit the form (including any required attachments) with their quote. The signature on this form certifies that the contractor and all of their workers or sub-contractors will adhere to all applicable regulations and this procedure.

3.1.5 Level I contractor companies that have no more than ten (10) employees at any time during the calendar year do not need to submit specific documentation, as identified on the qualification

Goldwind USA Site Safety Plan & Policy	Page 49
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

form. They do, however, still need to complete the form and be pre-qualified prior to performing work at the Site.

- 3.1.6 On rare occasions, when a site emergency exists, the Site may use Level I contractors who have not been pre-qualified. The project leader must contact the EHS Manager/Coordinator to verbally notify them whenever this provision is enacted. If this is only a one-time occurrence, no additional action is required. If this is a reoccurring event, the project leader must submit a pre-qualification package in order to get that contractor qualified through the standard process.

3.2 Level I Contractor Review and Selection

- 3.2.1 The 'Level I Contractor Environment, Health and Safety Qualification Form' and additional submittals will be reviewed by the area EHS Coordinator or designee as part of the selection process to evaluate the safety qualifications of the contractor.
- 3.2.2 Only pre-qualified and approved Level I contractors can perform work for Goldwind USA, either at a service site or at a project site.
- 3.2.3 Level I contractors can be qualified for a three-year time period, after which the qualification form must be updated by the contractor and re-submitted. All procedures and/or training documentation submitted by a contractor should be maintained for at least three years.
- 3.2.4 All qualified Level I contractors must be reviewed on an annual basis to ensure that all information submitted on the qualification form remains accurate and that there are no changes or circumstances that would lead to their disqualification.
- 3.2.5 Level I contractors with a poor safety record (i.e. above the industry injury and illness average for their SIC) or inadequate safety programs, may be disqualified from the bidding process or required to upgrade their programs in order to qualify. Contractors with acceptable health and safety submittals will be approved as qualified to proceed in the selection process.
- 3.2.6 Upon award of the contract, the contractor will then supply the Goldwind USA with any additional requested documentation as indicated on the 'Contractor Environment, Health and Safety Qualification Form' (i.e. MSDS, Certificate of Insurance, etc.).

3.3 Contractor Pre-Job Requirements

- 3.3.1 All Level I contractors are required to meet all the requirements as listed in this procedure while performing work at a Goldwind USA

Goldwind USA Site Safety Plan & Policy	Page 50
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

site. By signing the qualification form, they verify that all of their current employees (and any employees hired in the future) that will work at a Goldwind USA service area are aware of these requirements. Failure to comply with these rules can result in immediate removal from the site or disqualification from future bids.

- 3.3.2 All contractor workers are required to meet all the requirements as listed in this procedure while performing work at a Goldwind USA site. Failure to comply with these rules can result in immediate removal from the site or disqualification from future bids.
- 3.3.3 All contractors who will remain at the Goldwind USA site for longer than five minutes must sign in/out in the site sign-in book. This sign-in book shall contain, at a minimum, the person's name, date, company, time of check-in, and time of checkout. The sign-in book shall be retained at the service site for a minimum of three (3) years.
- 3.3.4 At check-in, all contractor workers must receive a site safety orientation. Additionally, these contractor workers must sign a training acknowledgment form attesting to their understanding and adherence to these rules. The service site may add to these rules to include site-specific requirements, such as parking instructions. However, Site contractor EHS policies and procedures must be at least as stringent as those included in this procedure.
- 3.3.5 After the orientation given, the contract worker is considered 'qualified' to perform work at that site. This qualification is valid for one year.
- 3.3.6 All contractors will be assigned a Goldwind USA site representative.
- 3.3.7 The Goldwind USA site representative will conduct a pre-job safety meeting with the Level I contractor supervisor prior to the start of work activities to ensure compliance with this procedure and coordination with site activities. The site representative will discuss the following topics, at minimum:
 - Scope of the job,
 - Hazards associated with the job,
 - PPE and/or equipment requirements,
 - Chemicals to be used (complete list and associated MSDS' must be provided to the site representative),
 - Any applicable confined spaces,
 - Expectations of the contractor workers,
 - Location and correct operation of the nearest fire alarm and fire extinguisher,

Goldwind USA Site Safety Plan & Policy	Page 51
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- Location of fire exits, and
- Emergency coordination.

The contractor supervisor must relay this information to the contractor workers before beginning work.

3.4 Contractor Inspections, Oversight, and Disciplinary Actions

- 3.4.1 The site representative, or designee, will monitor the Level I contractor worker's performance through inspections. Frequency of inspections will depend on the period of time that the Level I contractor is on site. They must be conducted for all Level I contractors who are on-site consecutively for more than one week (five 8-hour working days).
- 3.4.2 If a Level I contractor is at the service site consecutively for one week or longer (five 8-hour working days), they shall perform safety meetings with their own employees at least weekly. Should a safety concern be raised, the contractor shall address it immediately. The contractor shall record safety meeting information (agenda and attendants) and provide a copy of this information to the site representative.
- 3.4.3 All Level I contractors shall also perform safety inspections, at least weekly, of his/her contractor worker's activities if the contractor is on-site consecutively for longer than one week (five 8-hour working days). Should a safety concern be identified, the contractor supervisor must address it immediately. Inspections shall be documented by the contractor. A copy of the completed checklist shall be given to the site representative the same day the inspection was performed. Any discrepancies and assigned corrective actions must be indicated on the checklist. The site representative will follow up to ensure that all corrective actions have been implemented.
- 3.4.4 Violations of the contractor EHS rules observed by the site representative or another employee will be documented. The notice will be completed by the site representative and reviewed with the contractor supervisor.
- 3.4.5 Safety infractions will be re-evaluated to verify completion of corrective action(s). Any blatant disregard for health and safety issues or repeated violations will require disciplinary action. Disciplinary action may include contractor dismissal or work stoppage at cost to the contract firm.
- 3.4.6 If there is a dispute about an infraction, the matter will be settled at the Site Manager's discretion.

Goldwind USA Site Safety Plan & Policy	Page 52
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.4.7 The Site Manager, or designee, may bar or remove from the service site any contractor worker who violates any provision of this procedure or who otherwise engages in conduct which is likely to cause an EHS incident.

3.4.8 The contractor shall not re-assign any barred or removed contractor worker to perform work at the service site without the express, advance approval of the Site Manager, or designee.

3.4.9 Nothing contained herein shall make Goldwind USA or their employees or other subcontractors, a joint or co-employer of any contractor worker.

3.4.10 The contractor shall be solely responsible for discipline of contractor workers.

3.5 Contractor Illness, Injury or Accident

3.5.1 The contractor supervisor is responsible for reporting all EHS incidents (including any work-related injury/illness or near miss) to the Goldwind USA Site Manager as soon as they become known.

3.5.2 After reporting the incident to the Goldwind USA Site Manager, the contractor supervisor shall follow their own incident reporting and investigation procedures. At the completion of the investigation, a copy of the report and investigation shall be provided to the site representative and/or EHS Coordinator.

3.6 Truck Drivers

3.6.1 Truck drivers, whose purpose is to deliver equipment for repair, pick-up equipment that has been repaired or other large items to be shipped, do not need to sign in and out of the site sign-in book, or sign the EHS rules.

3.6.2 Truck drivers must adhere to all site EHS rules. They will be made aware of the EHS rules via a posting near where they enter the site. At this location, a copy of the rules will be available for all truck drivers.

3.6.3 Truck drivers must wear safety glasses with side shields. Safety shoes are also required if they will be in a shop work area, outside of an established aisle. Truck drivers should remain in the area of their truck.

3.7 Visitors

Goldwind USA Site Safety Plan & Policy	Page 53
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.7.1 All visitors must sign in and out of the site sign-in book and adhere to all site Goldwind USA EHS policies and procedures.

3.7.2 Visitors must wear safety glasses with side shields, ear plugs and hard hats in required areas. Safety shoes are also required if they will be in a shop work area, outside of an established aisle.

3.8 Recordkeeping

3.8.1 When generated, the following contractor safety records shall be maintained for each contractor for three years:

- Completed 'Level I Contractor Health and Safety Qualification Form' and attachments **Appendix A**
- Completed 'Contractor Health and Safety Inspection Checklist(s)'
- Records of Weekly Safety Meetings
- 'Contractor Health and Safety Infraction Notice(s)', if necessary
- All incident forms and supporting documentation, if necessary
- All LOTO and confined space entry documentation, if applicable

3.8.2 Contractor approval information and training documentation shall be kept up to date and maintained in a centralized location, which is identified on the site-specific information

4.0 Training

4.1 Each Level I contractor will be required to provide documentation verifying their employees have been trained on the applicable regulatory standards, along with the hazards inherent to the nature of their work performed on-site, as per Section 3.1.2 of this procedure.

4.2 All site representatives, EHS Coordinators and Site Supervisors/Site Managers must be trained on the details of this procedure.

5.0 Auditing

Goldwind USA will conduct an annual audit of the site's Contractor Safety program. Any deficiencies found in the Contractor Safety program must be addressed and closed in a timely manner. Any overall issues found with this Contractor Safety procedure must be communicated to the Goldwind USA designated EHS Coordinator for review and correction.

6.0 Responsibilities

Goldwind USA Site Safety Plan & Policy	Page 54
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

6.1 Site Manager shall:

- 6.1.1 Ensure the implementation of this Contractor Safety program,
- 6.1.2 Designate a site representative for each contractor that comes on site, and
- 6.1.3 Settle any contractor infraction disputes.
- 6.1.4 Evaluate the safety qualifications of Level I contractors assigned to them as part of the contractor selection process,
- 6.1.5 Ensure that all Level I contractor workers assigned to them have reviewed, understand and acknowledge their understanding of the following:
 - Level I Contractor Environmental, Health and Safety Rules (**Appendix A**),
 - Applicable EHS procedures for the work they will be performing, and
 - Applicable sections of the site's 'Emergency Response and Contingency Plan'.
- 6.1.6 Conduct a pre-job safety meeting with the Level I contractor supervisor(s) prior to the contractor(s) performing work and obtaining documentation that all contractor workers are qualified for the tasks to be executed, and**
- 6.1.7 Conduct weekly Level I contractor EHS inspections, if contractor will be working consecutively longer than a week, of those contractor workers assigned to them and document any discrepancies using the contractor supplied 'Contractor Health and Safety Inspection Checklist'.

6.2 Contract Company shall:

- 6.2.1 Assign qualified contractor supervisor(s) and competent people for all work activities, and**
- 6.2.2 If a Level I contractor, supply the Site with a copy of their company written health and safety plan, a HAZCOM program and any other requested documentation.

6.3 Contractor Supervisors shall:

- 6.3.1 Carry out all activities safely, maintain a safe and healthy work environment and ensure compliance with all applicable laws and this procedure,

Goldwind USA Site Safety Plan & Policy	Page 55
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

6.3.2 Verify that all contractor workers are qualified for the tasks to be executed,

6.3.3 Ensure that each contractor worker is trained to the OSHA regulatory standards and procedures applicable to the work that is to be performed at the site,

6.3.4 Ensure that each contractor worker adheres to all of the contractor EHS rules and service site procedures,

6.3.5 Identify, communicate to site personnel, and implement all additional control measures required to fully comply with laws or are needed to protect personnel against potential work-related hazards that may not be addressed in this procedure,

6.3.6 Report all injuries, illnesses, EHS incidents and near misses immediately to the site representative, and

6.3.7 Conduct safety meetings at least weekly for their employees on jobs lasting more than one week.

6.4 Contractor Workers shall:

6.4.1 Comply with all applicable OSHA regulations, and

6.4.2 Comply with all applicable Goldwind USA contractor EHS policies and procedures.

6.5 Goldwind USA designated EHS Coordinator shall:

6.5.1 Evaluate the safety qualifications of Level I contractors as part of the contractor selection process,

6.5.2 Review and update the site-specific information in annually.

6.6 All Employees shall:

Ensure that any deviation by any contractor worker from site procedures or the contractor EHS rules is promptly reported to the site manager and/or Goldwind USA designated EHS Coordinator.

7.0 References

GUSA EHS-2 Accident Reporting & Investigation Procedure
GUSA EHS-16 Personal Protective Equipment Procedure
GUSA EHS-3 Confined Space Entry Procedure
GUSA EHS-11 Hot Work Procedure
GUSA EHS-15 Medical Services Procedure

Goldwind USA Site Safety Plan & Policy	Page 56
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

GUSA EHS-14 Lockout/Tagout Procedure

GUSA EHS-5 Emergency Response & Contingency Plan Procedure

8.0 Appendices

Appendix A Level I Contractor Environmental, Health and Safety
Qualification Form

Goldwind USA Site Safety Plan & Policy	Page 57
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX A

CONTRACTOR SAFETY QUALIFICATION QUESTIONNAIRE

Company Name: _____
 NAICS / SIC #: _____
 Address: _____

Type of Business / Services Provided:

Contact Person: _____ Title: _____

Phone # _____ Fax# _____ Email _____

OSHA 300A SAFETY INFORMATION (attach copies of OSHA 300 logs)
 (most recent 3 years)

20__ 20__ 20__

Information Required	20__	20__	20__
A. Total Number of OSHA Recordable Incidents			
B. OSHA Recordable Incident Rate			
C. Number of Lost Time Incidents/Illnesses			
D. Lost Time Incident Rate			
E. Number of days away from work			
F. Number of Fatalities			
G. TOTAL EMPLOYEE HOURS WORKED			

Note: for B and D Rates – use the formula:

Number of Incidents (A or C) multiplied by 200,000, then divided by # of employee hours worked.

Where is the OSHA 300/300A Log maintained?

Who maintains the OSHA 300/300A Log?

Goldwind USA Site Safety Plan & Policy	Page 58
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

EXPERIENCE MODIFICATION RATE (EMR) (provided by your insurance carrier)
List your worker's compensation EMR for the most recent 3 years. (**attach a copy**)

Location	20__	20__	20__
Corporate			
Local			

OSHA CITATIONS:

Has your company received any OSHA citations in the last 3 years?
Yes No **If yes, please attach copies.**

SAFETY GOALS AND OBJECTIVES:

Do you have Company safety goals and objectives?
Yes No **Please attach copy.**

Do you have a written Health and Safety program/manual?
Yes No **Please attach the Table of Contents only.**

Do you have a written Hazard Communication Program?
Yes No **Please attach copy.**

SAFETY MEETINGS

Do you hold safety meetings for supervisors? Yes No
If yes, how often? _____

Who conducts safety meetings? (title) _____

Do you hold daily safety tool box meetings? Yes No

Who conducts daily safety meetings? (title) _____

SAFETY INSPECTIONS

Do you conduct field safety inspections to determine compliance with applicable federal, state, local, and company regulations/procedures? Yes No
Please attach sample copy of inspection form.

If so, who conducts the inspection? _____

Are inspection reports generated? Yes No
If yes, what is the distribution of the inspection reports?

Do you have a follow-up system to track items identified during safety inspections?
Yes No If so, explain follow-up system procedures:

Goldwind USA Site Safety Plan & Policy	Page 59
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

SAFETY TRAINING AND ORIENTATION

Do you have a documented pre-job or new employee Health & Safety Orientation Program? Yes No

How many hours of Health & Safety orientation/training are conducted? _____

What is the frequency of this training? _____

Who Conducts this training (name, title)? _____

Does the training/orientation include the following? *Indicate last date this training was provided or place NA if training not applicable.

Topic	Yes	No	N/A	Last Date
Company Safety Policy				
Company Safety Rules				
Company Safety Record				
Confined Space				
Demolition				
Driving Safety				
Electrical Safety				
Emergency Procedures				
Excavations				
Fire Protection				
First Aid				
Hazard Communication				
Housekeeping				
Injury Reporting				
Job Safety Analysis				
MSDS				
Personal Protective Equipment				
Respiratory Protection				
Rigging Safety				
Safety Meeting Attendance				
Scaffolding				
Toxic Substances				
Use of Explosives				
Welding and Cutting				
Work Hazard Recognition				

Do you have a documented occupational Health & Safety training program for newly hired or promoted first line supervisors or foremen? Yes No

Who conducts training (name, title)? _____

Goldwind USA Site Safety Plan & Policy	Page 60
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Does the new foreman safety-training program include the following?

Topic	Yes	No
Injury/Incident/Near-Miss Investigation		
Emergency Procedures		
First Aid Procedures		
Hazard Communication		
Hazard Recognition		
Incident Reporting		
Job Safety Analysis		
New Employee Orientation		
Respiratory Protection		
Safe Work Practices		
Tailgate/Tool Box Safety Meeting		
Other, Specify		

Does your company hold regularly scheduled safety meetings for employees?

Yes No If Yes, how often? _____

Who conducts these meeting (title)? _____

Who documents these meetings? _____

Is the content and attendance at these meetings documented? Yes No

Where is documentation filed? _____

Does your company document that appropriate employees are certified and/or adequately trained in the following areas?

Topic	Yes	No	N/A
Asbestos Abatement			
Crane Operator			
Commercial Driver's License			
Confined Spaces			
Electrician/Lineman			
Fork Lift Operator			
Hazardous Waste Operations			
Heavy Equipment Operator			
Instrument Technician			
Scaffolding			
Trenching, Shoring, Excavation			
Welder			

SUPERVISOR/FOREMAN ACCOUNTABILITY

During foreman performance reviews, do you use safety as a criterion for rating purposes? Yes No

Goldwind USA Site Safety Plan & Policy	Page 61
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

SAFETY INCENTIVES

Does your company have a safety incentive program?

Yes No **If Yes, please attach description of program.**

ALCOHOL/SUBSTANCE ABUSE PROGRAM

Does your company have an existing Drug and Alcohol Program?
(must be company wide, not just for the purposes of work here)

Yes No **If Yes, please attach a copy of the program.**

INJURY/INCIDENT INVESTIGATION

Does your company conduct injury, incident, and near miss investigations?

Yes No

Who conducts investigations (name, title)? _____

INJURY/INCIDENT REPORTS

Are injury/incident reports circulated to field supervision and responsible managers?

Yes No

If so, designate levels. _____

Please provide sample copy of investigation form.

Acknowledgment

I agree that the information provided in this document is complete and accurate.

Name

Title

Date

Company Name

REQUIRED DOCUMENTS ATTACHED

- Copy of last 3 years OSHA 300 Logs
- Copy of EMR (most current 3 years)
- Copy of any OSHA citations (last 3 years)
- Copy of Safety Goals and objectives
- Copy of Health and Safety Program table of contents
- Copy of Hazard Communication Program
- Copy of field safety inspection form
- Copy of Drug and Alcohol program
- Copy of Injury/Incident investigation form

Goldwind USA Site Safety Plan & Policy	Page 62
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

EMERGENCY PREPAREDNESS AND EMERGENCY ACTION PLAN

GUSA EHS-5

1.0 Purpose and Scope

- 1.1 This procedure outlines the course of action associated with emergencies, evacuations, and fire prevention. This instruction applies to all personnel doing business at any Goldwind USA (Goldwind) service sites or customer locations.
- 1.2 The procedure includes activities at the service center as well as working in the wind turbine tower.

2.0 Definitions

- 2.1 **Emergency Coordinator**-The Site Manager or designated alternate who will be the Goldwind USA person in charge during any site emergencies.
- 2.2 **Emergency Escape Equipment (EEE)** – The bag containing the rope and braking system used in case of an emergency escape from the top of the WTG tower.
- 2.3 **Evacuation Meeting Location**- A designated area where all employees will assemble during a site evacuation emergency.
- 2.4 **Fire Detection System** – An outside firm or a site monitoring system that detects and sends out a warning in the event of a fire.
- 2.5 **Fuel/Ignition Sources** – Any material, chemical, etc. that has the potential to increase the size, or possibly start, a fire (i.e. boxes, skids, rags, oil, fuel, paint, etc.).
- 2.6 **Hazardous Materials**– Any chemical meeting the hazardous criteria of being toxic, flammable, or corrosive defined by country regulations.
- 2.7 **Highly Combustible Materials** – Any material or chemical that will readily catch fire (i.e. fuel, oily rags, etc.).
- 2.8 **Reportable Quantity (RQ)** – A designated quantity of a chemical that is reportable to a regulatory agency.
- 2.9 **Site Manager**: For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.
- 2.10 **Small Spill** – A spill of less than 20L (5 gallons), which can be completely cleaned and contained using a Spill Kit.

Goldwind USA Site Safety Plan & Policy	Page 63
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

2.11 **Tornado Shelter Location** – Interior room without windows that is designated as a safe haven during tornadoes.

2.12 **Tornado Warning** - A tornado has been sighted, take cover immediately.

2.13 **Tornado Watch** - Conditions are favorable for a tornado.

2.14 **WTG** - Wind Turbine Generator

3.0 Procedure

3.1 See Site-Specific Template in **Appendix A** - Site Emergency Preparedness and Fire Prevention Plan for service centers and WTG operations.

3.2 Field Technicians must always have a form of communication with the service center when they are climbing the WTG towers. Cell phones or radio communications must be established for all field technicians before they begin to climb.

4.0 Training

4.1 All Goldwind USA employees must be trained in the site's Emergency Preparedness and Fire Safety Procedure. (Goldwind USA EHS-8 Procedure).

4.2 Designated Goldwind USA employees shall be trained on Oil Spill Prevention and the site-specific spill plans, and/or portable fire extinguishers (where applicable).

4.3 Goldwind USA services personnel involved with climbing and working in the wind turbine towers must receive training in the emergency escape equipment (EEE) and procedures to escape from the towers, including how to prevent fires while working inside the towers.

5.0 Recordkeeping

5.1 All associated paper files and documentation shall be kept in the Goldwind USA Corporate Headquarters. Additional non-paper type files will be located on the Goldwind USA internal corporate database.

6.0 Auditing

6.1 Goldwind USA Corporate Health and Safety will review this procedure annually.

7.0 Responsibilities

Goldwind USA Site Safety Plan & Policy	Page 64
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

7.1 Site Managers shall:

- 7.1.1 Ensure overall procedure implementation and coordination,
- 7.1.2 Ensure Goldwind USA Headquarters is contacted in the event of an injury, fire, chemical spill, or major emergency,
- 7.1.3 Determine when an evacuation should take place, and
- 7.1.4 Account for every employee during an evacuation.
- 7.1.5 Ensure adequate emergency response/escape equipment is available at the site/towers.

7.2 EHS Manager/Coordinator shall:

- 7.2.1 Identify the proper emergency escape equipment to be used by service personnel and visitors.
- 7.2.2 Determine if a reportable quantity has been spilled and contact the applicable regulatory agencies, as necessary.
- 7.2.3 Determine if an emergency spill response team should be deployed.
- 7.2.4 Complete, and update annually, the site-specific information listed in **Appendices B and C**.
- 7.2.5 Review this procedure annually,
- 7.2.6 Ensure all inspections and associated recordkeeping are completed,
- 7.2.7 Ensure all fire drills and associated recordkeeping are completed,
- 7.2.8 Ensure all evacuation drills and associated recordkeeping are completed,
- 7.2.9 Ensure all training and associated recordkeeping is completed, and
- 7.2.10 Enter all events/incidents into the EHS Reporting System.

7.3 Goldwind USA Employees shall:

- 7.3.1 Follow the emergency procedures listed in **Appendix A**,
- 7.3.2 Notify the Site Manager immediately of any possible emergency,

Goldwind USA Site Safety Plan & Policy	Page 65
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

7.3.3 Control fuel and ignition sources,

7.3.4 Contact the appropriate response personnel in the event of an emergency (ambulance, fire department, police department, etc.).

8.0 References - Fire Safety Procedure. (Goldwind USA EHS-8 Procedure).

9.0 Appendices

- 9.1 Appendix A Emergency Preparedness and Fire Prevention Plan
- 9.2 Appendix B Site Contacts
- 9.3 Appendix C Site Specific Information

Goldwind USA Site Safety Plan & Policy	Page 66
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Appendix A

Goldwind USA Emergency Preparedness and Emergency Action Plan

In accordance with the provisions of the Goldwind USA Corporate Policy and in support of the Company-wide emphasis on full environmental compliance and minimizing risks to employee health and safety, the Goldwind USA Service Site, located in _____ has adopted this Emergency Preparedness and Emergency Action Plan.

This plan has been completed, reviewed, and approved for implementation by the following individuals:

<i>Title, Name and Signature</i>	<i>Site Location</i>	<i>Date</i>
Site Manager:		
EHS Manager / EHS Coordinator:		
Other1:		
Other 2:		

1.0 Site Description

1.1 See Site Description in **Appendix C**.

2.0 Location of Copies of the Emergency Preparedness and Fire Prevention Plan

2.1 A copy of the Emergency Preparedness and Fire Prevention Plan will be located at each Goldwind USA service site, in the office of the Site Manager, EHS Manager/Coordinator, and in a common area so each employee has access to it.

2.2 Additionally, a copy of the plan will be sent to the local Fire Department and local Emergency Response Committee (and any other emergency response agency that is expected to respond) if required.

Goldwind USA Site Safety Plan & Policy	Page 67
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.0 Chemical Use & Storage

- 3.1 The following chemicals may typically be expected to be found at this service site:

(Enter a list of chemicals typically used at specific sites.)

- 3.2 The storage locations of these materials can be found on the Site Map located in **Appendix C**. All containers will be marked or labeled to identify the contents of the container.

4.0 Chemical/Hazardous Waste Storage

- 4.1 Typical chemical wastes that are generated at this site are:

(Enter a list of chemical wastes generated at specific sites.)

- 4.2 Wastes may be accumulated in small quantities at the point of generation. If designated waste accumulation areas (or satellite storage areas) have been established, they can be found on the Site Map in **Appendix C**.
- 4.3 Wastes are typically accumulated in 200 L (55-gallon) drums that are stored within a secondary containment. As these containers are filled, they are moved to the designated hazardous waste storage area as identified in the Site Map.
- 4.4 The chemical and hazardous waste storage areas are inspected weekly to prevent releases, explosions, and fires. (GUSA EHS-9 Hazard Communications Procedure)

5.0 Potential Emergencies

- 5.1 The Site Manager will be designated as the Emergency Coordinator unless otherwise specified in **Appendix B**. The Site Manager will be notified immediately in the event of an emergency. If the emergency is within the capabilities of site personnel, the Emergency Coordinator will coordinate response activities. If the emergency is beyond the capabilities of site personnel, appropriate outside agencies and emergency responders will be notified. These agencies and their corresponding phone numbers are listed in **Appendix B**.
- 5.2 Emergency actions to be taken for various types of identified emergencies are detailed on the following pages.

Goldwind USA Site Safety Plan & Policy	Page 68
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 1

Fire and Explosion

1.0 Potential for Fire & Safe Operating Procedures

- 1.1 Potential ignition sources at this Goldwind USA service site are:
(Insert potential ignition sources at your site here)
- 1.2 It is required that all fuel and ignition sources (flammable materials) be removed from the site or reduced as much as practically possible.
- 1.3 Smoking is only allowed in designated areas as identified in **Appendix C**.
- 1.4 It is prohibited to introduce any flammable materials/chemicals into the WTG towers. Exceptions will only be made by the Services EHS Manager or Site Manager.
- 1.5 Combustible materials such as gearbox oil must be stored in appropriate containers with caps (properly labeled) while being transferred between the top and bottom of the tower.

2.0 Control of Fuel Sources

- 2.1 All trash must be placed in designated containers.
- 2.2 Flammable liquids must be stored in approved containers and placed in flammable liquid storage cabinets when not in use.
- 2.3 Accumulations of paper, cardboard, or other highly combustible materials should be kept to a minimum.
- 2.4 Areas around fire extinguishers, exits, and electrical panels must be kept clear and unobstructed.
- 2.5 Combustible material should always be stored away from any ignition sources.
- 2.6 When transferring flammable liquids from one container to another, always ground and bond the containers to prevent a static electricity spark.

3.0 Control of Ignition Sources

- 3.1 Do not use equipment that has exposed wiring, cracked or damaged switch plates.
- 3.2 Use only approved extension cords for temporary wiring.
- 3.3 Never use extension cords in place of permanent wiring.

Goldwind USA Site Safety Plan & Policy	Page 69
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.4 Do not use cords that are damaged or frayed.

3.5 Do not load motors beyond their capacity.

3.6 Smoking is allowed in designated areas only and all butts must be disposed of in designated containers.

3.7 Smoking is NOT allowed in the WTG nacelle or hub.

3.8 If smoke or smoldering is detected, disconnect the power supply.

3.9 When performing welding, cutting or open flame operations outside a designated weld area, a special hot work permit is required (see Goldwind USA EHS Procedure– Hotwork).

3.10 Inspections

3.10.1 The following inspections of Fire Protection Equipment must be completed. All inspections are to be tracked at the Goldwind USA Corporate level

3.10.1.1 Automatic Sprinkler System requires annual inspections by a qualified person.

3.10.1.2 Emergency Lighting requires semi annual inspections – verify that the emergency lighting will engage during an emergency situation.

3.10.1.3 Fire Detection Systems require annual inspections – verify that the detection systems will engage in the event of a real emergency. This inspection is usually completed by a detection company.

3.10.1.4 Fixed Extinguishing Systems require annual inspections – these include standpipes, etc. Ensure all systems are in complete working order.

3.10.1.5 Portable Fire Extinguishers in the service centers require monthly inspections– verify all extinguishers have the required charge, are in the correct locations and properly marked.

3.10.1.6 Portable Fire Extinguishers also require an periodic maintenance inspection based on the country specific regulations by a qualified person, as well as periodic hydrostatic testing depending on the type of extinguisher.

Goldwind USA Site Safety Plan & Policy	Page 70
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 3.10.1.7 Fire extinguishers in the WTG will be inspected each time the turbines are maintained according to state specific regulations

4.0 Response to A Fire

4.1 Response to a Fire in the Service Center

- 4.1.1 The first employee discovering a fire shall pull the nearest fire alarm and/or dial the site emergency number as listed in **Appendix B**. If the employee has the appropriate fire extinguisher training, and the fire is incipient, the employee can try to fight the fire.
- 4.1.2 Evacuate the immediate area.
- 4.1.3 Notify the Site Manager, who will direct the fire department to the proper location.
- 4.1.4 The Site Manager and designated personnel will ensure the evacuation of personnel has been successfully completed and that all personnel are accounted for.
- 4.1.5 People should assemble at the designated Evacuation Meeting Location as described in **Appendix C**.
- 4.1.6 The Site Manager will also ensure that equipment is shutdown as necessary.
- 4.1.7 The local fire department and the Site Manager will determine when normal operations can be resumed.

4.2 Response to a Fire in the WTG Tower

- 4.2.1 **See GUSA EHS-17 Tower Emergency Rescue Procedure**

4.3 Response to a Fire at Substation / Transformer:

- 4.3.1 Call the site emergency number immediately. Fire department must be called immediately to contain this type of fire.
- 4.3.2 Do not try to extinguish the fire due to high voltage hazards. Cannot use conventional fire extinguishers.
- 4.3.3 Report the fire to Customer representative and appropriate utility company.

Goldwind USA Site Safety Plan & Policy	Page 71
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

4.4 Respond to fire which is out of control

- 4.4.1 Barricade hazardous area: safe distance 4 x radius of rotor.

5.0 Fire Drills

5.1 The service center will **conduct at least one fire drill quarterly**. This also enables the local fire department to get a chance to become familiar with our site and be more prepared in the event of an actual emergency. Most fire departments are more than willing to help out with fire drills. Conducting a fire drill involves the following steps:

- 5.1.1 Plan the drill.
- 5.1.2 Coordinate with the local fire department and fire detection company.
- 5.1.3 Conduct the drill.
- 5.1.4 Ensure the appropriate evacuation takes place.
- 5.1.5 Time the evacuation.
- 5.1.6 Check the site for people who did not leave, areas where the alarm can't be heard, or other potential problems.
- 5.1.7 Give employees the OK to come back inside.
- 5.1.8 Critique the drill with the local fire department if they are present.
- 5.1.9 Write up a brief report of how the drill went and keep it in your site EHS files.

6.0 Emergency Evacuation

6.1 Evacuation from the Service Center:

- 6.1.1 A site evacuation map must be posted in commonly used locations inside the service center. (lunch rooms, offices, bathrooms, etc).
- 6.1.2 A designated Evacuation Meeting Location must be identified for each service center. A Back-Up Evacuation Meeting Location must also be identified in case the primary Evacuation Meeting Location is affected by the emergency (i.e.—wind direction during a fire makes the original Evacuation Meeting Location unusable.)

Goldwind USA Site Safety Plan & Policy	Page 72
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 6.1.3 All service center personnel must receive training of the site's emergency evacuation procedures within the first week of employment at the Service Site.

6.2 During an evacuation the designated Emergency Coordinator shall:

- 6.2.1 Keep exits marked, clear and accessible at all times.
- 6.2.2 Instruct employees not to try to fight any fire (unless incipient), but simply to report it immediately.
- 6.2.3 Notify employees of any evacuation and then verify that all employees are safely at the Evacuation Meeting Location.
- 6.2.4 Comply with any instructions from the Fire Department.
- 6.2.5 Consult with the Fire Department / EHS as the situation permits and/or warrants.
- 6.2.6 Consult with the Fire Department to determine the extent of any evacuation necessary.
- 6.2.7 Supervise any evacuation that is ordered.
- 6.2.8 Respond to direction from the Fire Department / EHS and maintain communication with others.
- 6.2.9 Verify that isolated areas are checked for personnel.
- 6.2.10 Conduct head count to ensure everyone is accounted for. The designated Emergency Coordinator will notify the fire department if any persons are thought to be inside the building.
- 6.2.11 The local fire department Fire Chief and the designated Emergency Coordinator will determine when normal operations can be resumed.

6.3 During an evacuation Employees shall:

- 6.3.1 Evacuate the building from the nearest exit.
- 6.3.2 Report to the designated site Evacuation Meeting Location outside of the building as listed in **Appendix C**.

6.4 Evacuation from the WTG Tower:

- 6.4.1 Drills from the WTG shall be twice per year.
- 6.4.2 These drills shall be scheduled and reported to the Goldwind USA Corporate Headquarters

6.5 Evacuation from the Service Center:

Goldwind USA Site Safety Plan & Policy	Page 73
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 6.5.1 Drills from the Service Center shall be conducted quarterly
- 6.5.2 These drills shall be scheduled and reported to the Goldwind USA Corporate Headquarters

Goldwind USA Site Safety Plan & Policy	Page 74
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 2

Medical Emergency

1.0 Emergency Injury or Illness in the Service Center:

- 1.1 If emergency medical attention is required for an employee, call the local emergency medical services as listed in **Appendix B**.
- 1.2 Notify the Site Manager and customer EHS Coordinator of the injury/illness.
- 1.3 An ambulance shall be used to transport the victim to the appropriate hospital emergency room.
- 1.4 The Site Manager or injured employees Manager shall fill out an accident investigation report and the employee, if able, shall fill out an Employee First Notice of Injury (Goldwind USA: Accident Reporting & Investigation).
- 1.5 All accident investigation reports will be sent to the Goldwind USA Corporate Headquarters where the determination shall be made as to whether or not the accident will be an OSHA Recordable, or if it is an OSHA Reportable.

2.0 Emergency Injury or Illness in the WTG Tower:

- 2.1 Evacuation plans shall be initiated to remove the employee from the tower.
- 2.2 Call the site emergency number immediately to request external aid from the fire department, etc.
- 2.3 Depending on the injury/illness, if the employee requires immediate medical aid, apply 1st Aid/CPR to the employee, or use resources in the 1st aid kit if appropriate.
- 2.4 If the TES (Tower Evacuation System) are available, use it to lower the employee down the tower after applying immediate treatment.
- 2.5 If the TES is not available, continue to treat the employee with available resources until rescue team can transfer the injured employee to the bottom.
- 2.6 Emergency Coordinator assembles the site rescue team and ensures external emergency services have been contacted.

Goldwind USA Site Safety Plan & Policy	Page 75
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

3.0 Non-emergency Injury or Illness

- 2.6.1 If the employee needs attention by a doctor on a non-emergency basis, the Site Manager will ask the employee if he/she wants to see a doctor.
- 2.6.2 The Site Manager or EHS Coordinator will arrange transportation and designate someone to accompany the employee to the doctor.
- 2.6.3 Goldwind USA Corporate Headquarters must be called immediately.
- 2.6.4 The Site Manager shall fill out an accident investigation report and the employee, if able, shall fill out an Employee First Notice of Injury (Goldwind USA: Accident Reporting & Investigation).
- 2.6.5 All accident investigation reports will be sent to the Goldwind USA Corporate Headquarters where the determination shall be made as to whether or not the accident will be an OSHA Recordable.

Goldwind USA Site Safety Plan & Policy	Page 76
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 3

Chemical Spill or Leak

1.0 Response to a Chemical Spill at the Service Center:

- 1.1 The Site Manager should be notified immediately.
- 1.2 Every effort will be made to prevent spills from entering the sewer system and local waterways. Personnel working with chemicals or responding to a spill shall wear proper personal protective equipment, such as safety goggles, gloves, etc.
- 1.3 Only trained personnel in spill response shall respond to a chemical spill or leak. All others must notify the Site Manager immediately.
- 1.4 For larger spills, additional assistance will be obtained from outside emergency responders or spill cleanup contractors. Spill response materials are kept at the site for small spills. The locations of these spill kits are identified on the Site Map in **Appendix C**.

2.0 SWIM

- 2.1 **Stop the Spill**—Up-righting a container, closing a valve, or shutting down the equipment.
- 2.2 **Warn Others**—to stay clear of the area.
- 2.3 **Isolate the spill area**—Keep personnel out of the area.
- 2.4 **Minimize** exposure and the spread of the spill. Place absorbent materials around the spill to contain its spread. Do not stand in the spilled material while doing this.

3.0 Response to a Chemical Spill in the WTG Tower:

- 3.1 The Site Manager shall be notified immediately.
- 3.2 Ensure spill absorbent material is available in each service truck and use it to contain the leak.
- 3.3 If leak cannot be stopped at the turbine by mechanical means, try to contain the leak as much as possible.
- 3.4 Notify Site Manager immediately for guidance in clean-up procedures and regulatory notification.
- 3.5 Notify a cleaning tower company to clean the outside of the tower if the leak has migrated to the outside of the tower.

Goldwind USA Site Safety Plan & Policy	Page 77
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

- 3.6 Contain the leak at the bottom of the tower with absorbent material, clay, etc. and put contaminated soil, absorbents in properly labeled containers.

4.0 The primary concerns for responding to chemical spill emergencies are:

- 4.1 Ensure the safety of all employees.
- 4.2 Notify appropriate emergency organizations to properly respond to the emergency. (i.e., fire department, ambulance, local/state environmental regulatory authority).
- 4.3 Get emergency assistance to anyone who has been exposed to the hazardous chemicals.
- 4.4 Prevent any spills from entering the sanitary and storm sewers.
- 4.5 Minimize site personnel exposure to the hazardous chemicals by only allowing qualified personnel to respond to the emergency.
- 4.6 Investigate to determine the cause, effect and damage, if any, and take steps to correct.
- 4.7 Arrange for timely clean up of the chemical spill to minimize the potential of contaminating the environment or further contamination of the site.

5.0 Notifications

5.1 The Site Manager must:

- 5.1.1 Immediately notify the service manager to provide all necessary information to establish the extent of the emergency, including:
 - 5.1.2 Amount spilled/leaked,
 - 5.1.3 Chemical(s) involved,
 - 5.1.4 Time spill/leak occurred, and
 - 5.1.5 Where spill/leak occurred.
 - 5.1.6 If a spill impacted soil, water, etc.
 - 5.1.7 Person responding to spill/leak.
 - 5.1.8 The Fire Department shall be notified should a spill occur that is not controllable by the employees in the immediate area and requires the evacuation of the building.
 - 5.1.9 Should the spill occur in the site and evacuation is necessary, all employees shall immediately evacuate the building to the designated Evacuation Meeting Location.

Goldwind USA Site Safety Plan & Policy	Page 78
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

5.2 Reportable Quantities

5.2.1 If a reportable quantity has been released, Goldwind USA or the Customer will notify the appropriate regulatory agencies, as applicable:

- The National Response Center
- The State Emergency Response Commission
- The Local Emergency Planning Committee

5.2.2 Once the extent of the chemical spill has been determined, the Site Manager, Goldwind USA Corporate and Customer will make the decision as to the appropriate emergency spill response team.

5.3 Spills that reach the sewer system

5.3.1 The Customer representative shall contact the applicable Sewer District. A detailed written statement describing the causes of the discharge and the measures being taken to prevent future occurrence must follow this notification.

Goldwind USA Site Safety Plan & Policy	Page 79
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 4

Hurricane

1.0 Hurricanes involve high winds and heavy rains which often result in power failures, inaccessible roads and structural damage to buildings. Hurricanes generally occur from August through October.

2.0 To prepare for a hurricane, the following must be completed:

2.1 Cover all large windows with shutters or plywood.

2.2 Clear out important paperwork from desk drawers, wrap them in plastic, and store on a high shelf.

2.3 Cover affected equipment, such as

- 2.3.1 Computers and related Equipment (Printers, Monitors, etc.)
- 2.3.2 Fax Machines
- 2.3.3 Photocopiers
- 2.3.4 Electrical devices (Strip Plugs, Power or Extension Cords, etc.)

2.4 Unplug all affected equipment from wall.

2.5 Move the affected equipment away from any unprotected windows or doors.

2.6 Cover affected equipment with plastic sheeting and/or bags.

2.7 Move the affected equipment that is on the ground to the top of desks if possible.

2.8 Backup all data from your Computer and take backup media off site, the data you save on the network drives will be protected.

3.0 In the event of a possible Hurricane in the US, connect to the FEMA Website at <http://www.fema.gov/fema/trop.htm>. This site will be active during the Hurricane season and will have up-to-the-minute hurricane information. The Goldwind USA Site Manager will determine if evacuation is necessary.

Goldwind USA Site Safety Plan & Policy	Page 80
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 5

Tornado

1.0 Tornadoes involve highly localized, extremely destructive high winds. Tornadoes generally travel from southwest to northeast. Tornado warnings and watches may only be forecast within hours of a tornado actually occurring. However, tornadoes may touch down with little warning, and therefore, preparation time may be minimal.

1.1 Each site must have a radio and a designated person who is responsible for monitoring the radio during inclement weather for tornado announcements, where geographically applicable.

1.2 The bulletin will then be identified as a tornado “watch” or a tornado “warning” (severe thunderstorms and other weather conditions are also announced).

1.2.1 **Watch:** Continue to monitor the radio closely.

1.2.2 **Warning:** In the event of a tornado warning proceed immediately to the site specific gathering location. Take the weather alert radio to the tornado shelter area, and continue to monitor it until the warning is over.

2.0 During a Tornado Warning, all Employees shall:

2.1 Clear off important paperwork and remove from the top of desks and store in a secure spot.

2.2 Turn off equipment and machines.

2.3 Move affected equipment away from any unprotected windows or doors.

2.3.1 Computers and related Equipment (Printers, Monitors, etc.)

2.3.2 Fax Machines

2.3.3 Photocopiers

2.3.4 Electrical Devices (Strip Plugs, Power or Extension Cords, etc.)

2.4 Avoid elevators and extinguish open flames. If you are at a location that has an elevator, do not use it during an emergency.

2.5 Meet at the Tornado Shelter Location.

2.6 Monitor the weather radio that should be located in each site.

2.7 Crouch down and cover yourself from falling debris. Use either a jacket or cushion.

2.8 Take a look around for equipment that may fall or tip over in the area and stay clear.

2.9 Do not evacuate the building until told to do so.

When designating a Tornado Shelter Location please consider the following:

- Interior rooms and halls on the lowest floor are the safest,
- Stay away from glass enclosed places or areas with wide-span roofs such as auditoriums, theaters, and warehouses,
- A corner would be safer than the middle of the wall, and
- A bathroom, closet, office, or maintenance room with short walls would be the safest area, especially if it was on the north or east side of the building

Goldwind USA Site Safety Plan & Policy	Page 81
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 6

Earthquake

1.0 In the event of an earthquake the following shall occur:

- 1.1 Take cover to protect yourself from injury.
- 1.2 If there is overhead glass in the area, cover yourself from falling debris.
- 1.3 Take a look around for equipment that may fall or tip over in the area and stay clear.
- 1.4 Do not run from buildings during an earthquake. Most injuries occur outside from flying debris, falling objects or from downed high-voltage wires.
- 1.5 Avoid elevators and extinguish open flames. If you are at a location that has an elevator, do not use it during an emergency.
- 1.6 DO NOT smoke or light a match/lighter, as there may be ruptured gas lines.
- 1.7 Once the initial shock is over, calmly walk out of the building to the site's Evacuation Meeting Location. Do not reenter the building until the structural damage has been assessed.

When designating an Earthquake Shelter Location please consider the following:

- Safe areas include: doorways, under doorsills, or beside heavy upright beams
- Try to get under the nearest heavy table, desk, bench or machine.

Goldwind USA Site Safety Plan & Policy	Page 82
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 7

Flood

1.0 Flooding can occur as a result of either long-term, sustained precipitation or short-term intense weather events. Monitoring of emergency broadcasts is important to ensure proper preparation for such events.

2.0 Prepare for a flood by:

2.1 Secure work area and turn off equipment and machines.

2.2 Cover all large windows with shutters or plywood.

2.3 Clear out important paperwork from desk drawers wrap them in plastic and store on a high shelf. Affected equipment during a flood are:

2.3.1 Computers and related Equipment (Printers, Monitors, etc.)

2.3.2 Fax Machines

2.3.3 Photocopiers

2.3.4 Electrical Devices (Strip Plugs, Power or Extension Cords, etc.)

2.4 Unplug all affected equipment from wall.

2.5 Cover affected equipment with plastic sheeting or plastic bags.

2.6 Backup all data from your computer and take backup media off site, the data you save on the network drives will be protected.

Goldwind USA Site Safety Plan & Policy	Page 83
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 8

Bomb Threat

Note:
All bomb threats must be taken seriously!!!

1.0 The person receiving the call shall:

- 1.1 Notify the Site Manager immediately.
- 1.2 Listen very carefully, assisted, if possible, by another person who will take careful notes to ensure getting the exact language of the message. Pay special attention to if the caller is a man or a woman, any distinguishing accents, and any background noises that might be heard (children, traffic, etc.).
- 1.3 See if another person can get the call traced, by contacting the police department, while the caller is kept on the phone.
- 1.4 Attempt to get the caller to repeat the message several times to elicit further information as to:
 - 1.4.1 Who the caller is
 - 1.4.2 Location of the calling party
 - 1.4.3 Where the device may be hidden
 - 1.4.4 When it is scheduled to detonate
 - 1.4.5 Why Goldwind USA is being bombed

2.0 The Site Manager shall:

- 2.1 Evacuate the site immediately.
- 2.2 Contact the Police Department listed in **Appendix B**.

Goldwind USA Site Safety Plan & Policy	Page 84
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 9

Lightning / High Winds

1.0 Weather forecasts must be consulted at the beginning of each work shift or the day before in order to prepare for any inclement weather.

2.0 No work shall be scheduled in the WTG towers if thunderstorms, lightning, rain, hail, snow is in the near term forecasts.

2.1 All WTG maintenance work in the towers must be postponed until the weather clears up.

3.0 Working in WTG Towers during Storms:

3.1 As weather conditions develop and are favorable for the formation of thunderstorms, use extreme caution when working in the field paying special attention to the developing weather conditions.

3.2 Site personnel should understand when, where, and how thunderstorms develop. If there is thunder heard in an approaching cloud, all work up-tower work will be stopped and all personnel will climb down and seek shelter.

3.3 It is everyone's responsibility to make sure that **all** personnel are notified of lightening in the area.

3.4 Contact the Site Manager or designee to inform them of lightning sightings.

3.4.1 The Site Manager then notifies all personnel in the field that lightning is in the area.

3.4.2 If employee cannot get a hold of the Site Manager, then it becomes the responsibility of the person who had the sighting to notify all affected employees.

3.5 **Every** crew must respond by radio or other communications, acknowledging they have received the warning.

3.6 The Site Manager will decide if the employees should return to headquarters or wait in service trucks for the storm to pass.

3.7 All work on tall, conductive structures will be stopped (this will include and is not limited to HV transmission lines, SCADA infrastructure, MET towers, or WTGs).

3.8 Adequate shelter may include service trucks. This acts as a faraday cage to protect against lightning strikes.

Goldwind USA Site Safety Plan & Policy	Page 85
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

4.0 Working WTG Towers During High Winds:

- 4.1** High wind speed is normally associated with thunderstorms. Wind may increase rapidly with little to no advanced warning. Use caution and be aware of debris that can and will be moved by the high wind.
- 4.2** Use care when seeking shelter in a service truck. High winds can severely damage doors. Always park vehicles facing the wind to minimize the chance of the doors catching the wind while opening.
- 4.3** Stay away from glass whenever possible. Sheer winds in a storm can blow trucks over. If winds get severe enough, pull over to a safe location and point truck into wind.
- 4.4** It is the responsibility of all employees to report severe wind changes out in the field i.e. severe directional change or severe increase in wind speed.
- 4.5** NO work is allowed in the WTG when there are steady winds of 15m/s (40mph), or over a 10-minute average or more (authorization must be obtained from a Goldwind supervisor).

Goldwind USA Site Safety Plan & Policy	Page 86
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

ATTACHMENT 10 **OTHER EMERGENCIES**

1.0 Power Outage

1.1 Employees should notify the Site Manager, if the outage is not immediately apparent.

1.2 The employees involved should take immediate steps to:

- 1.2.1 Ensure the safety of personnel.
- 1.2.2 Restore service.
- 1.2.3 Investigate to determine cause, effect and damage, if any, and take steps to correct.
- 1.2.4 If required, call the local utility company. The site-specific utility company is listed in **Appendix A**.

3.0 Demonstrations or Civil Disturbances (Including Picketing)

3.1 Any employee seeing evidence of a demonstration within the immediate area of the site shall inform the Site Manager who will in turn notify the Customer management.

4.0 Media Requests

4.1 In the event of an EHS incident that gains media attention, **NO ONE** at the site shall have any contact with the media before contacting the Customer and Goldwind USA Corporate headquarters.

Goldwind USA Site Safety Plan & Policy	Page 87
Date of Implementation/Last Revision: 11-1-10	Approved by: B. Lacoste

Appendix B

Emergency Contact Information

Site Emergency Number

Emergency Number (at site)	Phone Number/Business

Site Specific Contacts

Title	Contact	Phone Number
Site Manager		Work: Mobile:
Goldwind USA EHS Coordinator		Work: Mobile:
Site Emergency Coordinator		Work: Mobile:
Customer Representative		Work: Mobile:

Emergency Contacts

Agency	Phone Number
Fire Department	
Police Department	
Ambulance Service	
Hospital	
Electric Utility Company	
Spill Response Team	
Sewer District	
State Emergency Response Com. (US only)	
Local Emergency Planning Com. (US only)	
National Response Center (US only)	
OSHA	

Goldwind USA Site Safety Plan and Procedure	Page 88
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

Appendix C

Service Area/Center Specific Information

The Goldwind USA service site is located at *(name and location of service area/center)*. The service site employs approximately *(insert number)* people working in *(insert number)* shifts. The site, a drawing of which is included, encompasses *(insert number)* square yards.

Work at the service area/center includes:

(Provide a description of the type of work performed at the site)

The site is co-located with _____. The co-located site performs the following type of work (if applicable): _____

Service Center Evacuation Meeting Location:*(list)*

Alternate Evacuation Meeting Location:*(list)*

Tornado Shelter Location:*(list)*

Earthquake Shelter Location: *(list)*

Fire Protection Equipment

Service Center Specific Fire Detection System(s): ☐ Pull Box to Fire Department
☐ Automatic to Site
☐ None

Service Center Specific Fire Alarm System(s): ☐ Manual Activation
☐ Automatic Activation
☐ None

Service Center Specific Fire Suppression System(s):

- ☐ Portable A,B,C Fire Extinguishers
- ☐ Portable CO2 Fire Extinguishers
- ☐ Sprinkler System – Office
- ☐ Sprinkler System – Shop
- ☐ Sprinkler System – Other_____
- ☐ Emergency Lighting – Office
- ☐ Emergency Lighting – Shop
- ☐ Illuminated Exit Signs
- ☐ None

Portable fire extinguishers, emergency eyewashes, safety showers, emergency first aid kits, and emergency spill response kits are located throughout the site. The location of this equipment is identified on the service center Map.

Goldwind USA Site Safety Plan and Procedure	Page 89
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

Insert Site Map as next page and indicate the following:		
Waste Accumulation Areas	90-day Storage Areas	Spill Kit Locations
Chemical Storage Locations	Emergency Eyewashes	Safety Showers
Portable Fire Extinguishers	First Aid Kits	Fire Alarms

Information Completed By: _____

Date: _____

Goldwind USA Site Safety Plan and Procedure	Page 90
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

ERGONOMICS

GUSA EHS-6

1.0 Purpose and Scope

- 1.1 This procedure establishes an ergonomics program for Goldwind USA to prevent the occurrence of work-related musculoskeletal disorders, reduce the severity of work-related musculoskeletal disorders through early medical management or control measures, and to ensure employee involvement in identifying exposures to ergonomic risk factors in the workplace.

2.0 Definitions

- 2.1 **Acute** – Severe, but of short duration; not chronic.
- 2.2 **Administrative Controls** – Procedures that significantly limit daily exposure to ergonomic stresses by control or manipulation of the work schedule or manner in which work is performed. The following are examples of administrative controls: Job rotation, use of rest breaks or alternative tasks, increase in task variability, redesign of work methods, and reduction in the number of repetitions.
- 2.3 **Carpal Tunnel Syndrome (CTS)** – A condition caused when pressure on the median nerve results in numbness or pain in the distribution of the median nerve. The median nerve runs through the carpal tunnel and supplies sensation to the thumb, index and middle fingers.
- 2.4 **Chronic** – Lasting a long time or recurring often; not acute.
- 2.5 **Engineering Controls** – Physical changes to work stations, equipment, materials, or any other relevant aspect of the work environment, which reduce or prevent exposure to workplace risk factors.
- 2.6 **Epicondylitis** – A condition caused by a tendon moving over a bone in a person's wrists or elbows, causing inflammation; commonly known as tennis or golfer's elbow.
- 2.7 **Ergonomics** – A science devoted to designing jobs and workplaces in ways to fit the job to the person, rather than the person to the job. The evaluation and design of workplaces, environments, jobs, tasks, equipment, and processes in relationship to human capabilities and interactions in the workplace achieve this.
- 2.8 **Improper Posture** – A deviation from the neutral position of a particular joint. Examples include twisting, bending, kneeling, squatting, and stooping.
- 2.9 **Lower Back Pain** – A condition caused by the back not resting in neutral position (a slight "S" curvature in the back). The natural curve of the spine keeps the bones from pressing on the disks between each vertebra. In the

Goldwind USA Site Safety Plan and Procedure	Page 91
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

neutral position, the vertebrae rest on these disks. Arching the back or slouching compresses the disks. When the disks are compressed, pain or discomfort can occur.

2.10 **Site Manager:** For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.

2.11 **Tendonitis** – A condition caused by a sudden motion or cumulative trauma, which causes the tendons to fray, resulting in inflammation. The most common area for this is in the elbow. The inflammation restricts circulation and causes swelling.

2.12 **Workplace Risk Factors** – Actions in the workplace, workplace conditions, or a combination thereof that may cause or aggravate a work-related musculoskeletal disorder. Workplace risk factors include the following:

2.12.1 Repetitive, forceful or prolonged exertions

2.12.2 Frequent or heavy lifting

2.12.3 Pushing, pulling, or carrying heavy objects

2.12.4 Fixed or awkward work posture

2.12.5 Contact stress

2.12.6 Localized or whole body vibration

2.12.7 Cold temperatures

2.12.8 Poor lighting

2.12.9 These workplace risk factors can be intensified by work organization characteristics, such as:

2.12.9.1 Inadequate work-rest cycles

2.12.9.2 Excessive work pace and/or duration

2.12.9.3 Unaccustomed work

2.12.9.4 Lack of task variability

2.12.9.5 Machine-paced work

2.13 **Work-related Musculoskeletal Disorder (WMSD)** - Any injury or illness of the muscles, tendons, ligaments, peripheral nerves, joints, cartilage (including intervertebral disks), bones and/or supporting blood vessels, in either the upper or lower extremities or back, which are associated with musculoskeletal disorder workplace risk factors. A WMSD can be the result of an acute or instantaneous event, such as a slip or fall. Examples of WMSDs are trauma disorders, repetitive strain injuries or illnesses, repetitive motion injuries or illnesses, and repetitive stress injuries or illnesses.

Goldwind USA Site Safety Plan and Procedure	Page 92
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

3.0 Procedure

3.1 Hazard Identification and Information

- 3.1.1 All current and new employees shall be provided training and information about work-related musculoskeletal disorders (WMSDs) and WMSD hazards. Employees shall be given information on how to recognize the signs and symptoms of WMSDs and the importance of early reporting. The 'Ergonomic Risk Checklist' in **Appendix A** can be helpful to identify potential areas of concern or areas that may require further analysis.
- 3.1.2 Employees must report WMSD signs, symptoms, and hazards to their supervisor, EHS Manager/Coordinator Service Manager.

3.2 Evaluation of Ergonomic Hazards in the Workplace

- 3.2.1 All ergonomic hazards in the workplace shall be identified, prioritized and evaluated as part of the hazard assessment process as described in EHS Procedures Personal Protective Equipment (PPE) and Job Safety Analysis.
- 3.2.2 Ergonomic evaluations should be considered based on observations, employee complaints and a medical review of injuries. The operation should select members for The Ergonomics Team to cover an appropriate range of job (i.e. administrative, manufacturing, services, maintenance, engineering, EHS, medical (if available))
- 3.2.3 The Ergonomics team shall meet on a regularly schedule basis and publish meeting minutes.
- 3.2.4 The Ergonomics team shall establish and publish a charter.
- 3.2.5 The Ergonomics team shall be allocated adequate resources to perform the activities they deem necessary.
- 3.2.6 The Ergonomics team shall endeavor to review all jobs with ergonomic risk factors; they shall publish a schedule of job reviews in their minutes.
- 3.2.7 The ergonomics team shall use a structured evaluation process (i.e. STEPS) whenever possible for consistency.
- 3.2.8 The ergonomics team shall work to develop specific ergonomic guidelines (maximum forces, reaches, heights, etc) for the design and installation of new job processes, workstations, and equipment

Goldwind USA Site Safety Plan and Procedure	Page 93
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 3.2.9 An EHS Screening Checklist, including a review of potential ergonomic risk factors, shall be completed for modifications (changes or additions of processes and equipment).
- 3.2.10 If a hazard assessment is conducted for a particular job task, an evaluation of the employee's ergonomic stresses shall be completed.
- 3.2.11 Job-related stresses associated with ergonomic problems that should be considered include:
 - 3.2.11.1 Repetitive motions
 - 3.2.11.2 Improper postures
 - 3.2.11.3 Improper lifting
 - 3.2.11.4 Poor tool design
 - 3.2.11.5 Working with bent wrists
 - 3.2.11.6 Poor lighting and glare
 - 3.2.11.7 Shift work
 - 3.2.11.8 High-demand, low-control work
 - 3.2.11.9 Repetitive climbing.
- 3.2.12 The EHS / Ergo Team will coordinate a review of injury patterns to determine potential ergonomic risks that may exist across the business unit.

3.3 Ergonomic Hazard Control Measures

- 3.3.1 Feasible measures (interim and permanent) to control the WMSD hazards shall be determined. Basic hazard control principles and strategies for typical ergonomic hazardous situations are provided in **Appendix B**.
- 3.3.2 The preferred approach to prevent and control WMSD's is to design the job (including the workstation layout, selection and use of tools, and work methods) to take into account both the capabilities and limitations of the workforce.
- 3.3.3 Ergonomic controls should be developed with affected employees and investigated for feasibility, effectiveness and cost in the following order:
 - 3.3.3.1 Engineering Controls
 - 3.3.3.2 Work Practice Modifications
 - 3.3.3.3 Administrative Controls
 - 3.3.3.4 Personal Protective Equipment

Goldwind USA Site Safety Plan and Procedure	Page 94
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

3.4 Ergonomic Injury Management

- 3.4.1 An employee shall immediately report signs or symptoms of a WMSD to their supervisor.
- 3.4.2 The supervisor shall follow EHS Procedure – Accident Reporting, Investigation and Follow-Up, as required.
- 3.4.3 Medical provider shall have access to functional job profiles and/or written job descriptions for each job at the service area
- 3.4.4 The service policy on injury/illness reporting shall require immediate reporting of all injuries related to work.
- 3.4.5 Injury documentation shall include site medical ask specific questions to identify possible ergonomic risk factors in employees job process.
- 3.4.6 Medical personnel shall be included in ergonomic teams whenever possible and visit the services areas (as feasible).
- 3.4.7 The company shall have a documented return to work process, which includes:
 - 3.4.7.1 Protocols for management of ergonomics injury/illness followed by site medical.
 - 3.4.7.2 Work restrictions shall require enforcement by management to verify that the employee's condition does not worsen while assigned to modified work.
 - 3.4.7.3 Regular communication is required between injured employees health care provider(s) and site medical or medical / case management representatives.

4.0 Training

- 4.1 All employees shall receive either Ergonomics Awareness for Industrial Workers training, based on their job function
- 4.2 Ergonomics Team Members and other site personnel who will be performing Ergonomics Assessments shall receive Ergonomics Team Training (STEPS) training. .
- 4.3 All Ergonomics Training shall be tracked by Goldwind USA.

Goldwind USA Site Safety Plan and Procedure	Page 95
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

5.0 Auditing

- 5.1 Each Goldwind USA services site will conduct an annual audit of the site's ergonomics program.
- 5.2 Additionally, those performing the tasks with guidance provided by EHS Procedures Personal Protective Equipment and Risk Assessments shall periodically evaluate hazard assessments.
- 5.3 Goldwind USA Corporate Headquarters shall annually review and update this procedure.

6.0 Responsibilities

- 6.1 Goldwind USA **EHS Coordinator** shall:

- 6.1.1 Annually review this procedure and update as necessary.
- 6.1.2 Provide general ergonomics guidance.
- 6.1.3 Review injury patterns relating to ergonomics.

- 6.2 **Site Manager** shall:

- 6.2.1 Ensure the implementation of this ergonomics program.
- 6.2.2 Ensure that the Ergonomics Team is allocated adequate resources to perform the activities they deem necessary.
- 6.2.3 Use the EHS screening checklist or involve EHS/ergo team in changes to processes and equipment to ensure ergonomics risk factors are addressed up front whenever possible.
- 6.2.4 Use design guidelines produced by ergonomics team to minimize ergonomics hazards when designing processes or equipment for the operation.
- 6.2.5 Re-enforce timely injury reporting and thorough incident investigations driving for root cause.
- 6.2.6 Verify employees on modified work are complying with work restrictions so as not to injure or impede the healing process by working modified duty.

- 6.3 **Ergonomics Team (i.e. Safety Team)** shall:

- 6.3.1 Manage the ergonomics program for their operation.

Goldwind USA Site Safety Plan and Procedure	Page 96
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

6.3.2 Ensure that employees and supervisors receive the appropriate ergonomics training.

6.3.3 Ensure that ergonomics is considered during hazard assessments.

6.3.4 Receive ergonomics training.

6.4 **EHS Coordinator** shall:

6.4.1 Receive ergonomics training.

6.4.2 Maintain all documentation and records associated with this program.

6.4.3 Complete and update the operation-specific information in **Appendix C** on an annual basis.

7.0 References

- 7.1 GUSA EHS-2 Accident Reporting, Investigation Procedure
- 7.2 GUSA EHS-16 Personal Protective Equipment (PPE) Procedure
- 7.3 GUSA EHS-13 Job Safety Analysis Procedure

8.0 Appendices

- Appendix A General Ergonomic Risk Analysis Checklist
- Appendix B Typical Ergonomic Hazard Control Principles
- Appendix C Operation-Specific Information

Goldwind USA Site Safety Plan and Procedure	Page 97
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

Appendix A

GENERAL ERGONOMIC RISK ANALYSIS CHECKLIST

A "yes" response indicates that an ergonomic risk factor may be present which requires further analysis.

	Yes	No
Manual Material Handling		
Is there lifting of loads, tools, or parts?		
Is there lowering of tools, loads, or parts?		
Is there overhead reaching for tools, loads, or parts?		
Is there bending or twisting at the waist to handle tools, loads, or parts?		
Physical Energy Demands		
Do tools and parts weigh more than 10 pounds (4.5 kilograms)?		
Is reaching greater than 20 inches (50.8 centimeters)?		
Is bending, stooping, or squatting a primary task activity?		
Is lifting or lowering loads, walking or carrying loads a primary task activity?		
Is stair or ladder climbing with loads a primary task activity?		
Is pushing or pulling loads or reaching overhead a primary task activity?		
Do any of the tasks require five or more complete work cycles to be done within a minute?		
Do workers complain that rest breaks and fatigue allowances are insufficient?		
Other Musculoskeletal Demands		
Do manual jobs require frequent, repetitive motions?		
Do work postures require frequent bending of the neck, shoulder, elbow, wrist, or finger joints?		
For seated work, do reaches for tools and materials exceed 15 inches (38.1 centimeters) from the worker's position?		
Is the worker unable to change his or her position often?		
Does the work involve forceful, quick, or sudden motions?		
Does the work involve shock or rapid buildup of forces?		
Is finger-pinch gripping used?		
Do job postures involve sustained muscle contraction of any limb?		

Goldwind USA Site Safety Plan and Procedure	Page 98
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

	Yes	No
Computer Workstation		
Do operators use computer workstations for more than 4 hours a day?		
Are there complaints of discomfort from those working at these stations?		
Is the chair or desk nonadjustable?		
Is the display monitor, keyboard, or document holder nonadjustable?		
Does lighting cause glare or make the monitor screen hard to read?		
Is the room temperature too hot or too cold?		
Is there irritating vibration or noise?		
Environment		
Is the temperature too hot or too cold?		
Are the worker's hands exposed to temperatures less than 70 °Fahrenheit (21 ° Celsius)?		
Is the workplace poorly lit or is there glare?		
Is there excessive noise that is annoying, distracting, or producing hearing loss?		
Is there upper extremity or whole body vibration?		
Is air circulation too high or too low?		
General Workplace		
Are walkways uneven, slippery, or obstructed which could lead to odd body positioning?		
Is housekeeping poor which could lead to odd body positioning?		
Is there inadequate clearance or accessibility for performing tasks?		
Are stairs cluttered or lacking railings that could lead to odd body positioning?		
Tools		
Is the handle too small or too large?		
Does the handle shape cause the operator to bend the wrist in order to use the tool?		
Is the tool hard to access?		
Does the tool weigh more than 9 pounds (4.1 kilograms)?		
Does the tool vibrate excessively or cause excessive kickback to the operator?		
Does the tool become too hot or too cold?		

Goldwind USA Site Safety Plan and Procedure	Page 99
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

	Yes	No
Gloves		
Do the gloves require the worker to use more force when performing job tasks?		
Do the gloves provide inadequate protection?		
Do the gloves present a hazard of catch points on the tool or in the workplace?		
Administration		
Is there little worker control over the work process?		
Is the task highly repetitive and monotonous?		
Does the job involve critical tasks with high accountability and little or no tolerance for error?		
Are work hours and breaks poorly organized?		

Location: _____ Date: _____

Name: _____ Signature: _____

Goldwind USA Site Safety Plan and Procedure	Page 100
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

Appendix B

TYPICAL ERGONOMIC HAZARD CONTROL PRINCIPLES

General Workstations

1. Make the workstation adjustable, enabling both large and small persons to fit comfortably and reach materials easily.
2. Locate all materials and tools in front of the worker to reduce twisting motions. Provide sufficient workspace for the whole body to turn.
3. Avoid static loads, fixed work postures, and job requirements in which operators must frequently or for long periods:
 - Lean to the front or the side.
 - Hold a limb in a bent or extended position.
 - Tilt the head forward more than 15 degrees.
 - Support the body's weight with one leg.
4. Set the work surface above elbow height for tasks involving fine visual details and below elbow height for tasks requiring downward forces and heavy physical effort.
5. Provide adjustable, properly designed chairs with the following features:
 - Adjustable seat height.
 - Adjustable up and down backrest, including a lumbar (lower-back) support.
 - Padding that will not compress more than an inch under the weight of a seated individual.
 - Chair that is stable to floor at all times (5-leg base).
6. Allow the workers, at their discretion, to alternate between sitting and standing. Provide floor mats or padded surfaces for prolonged standing.
7. Support the limbs. Provide elbow, wrist, arm, foot, and back rests as needed and feasible.
8. Design the primary work area so that arm movements or extensions of more than 15 inches (38.1 centimeters) are minimized.
9. Provide dials and displays that are simple, logical, and easy to read, reach, and operate.
10. Eliminate or minimize the effects of undesirable environmental conditions such as excessive noise, heat, humidity, cold, and poor illumination.

Goldwind USA Site Safety Plan and Procedure	Page 101
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

Repetitive Hand and Wrist Tasks

1. Reduce the number of repetitions per shift.
2. Maintain neutral (handshake) wrist positions:
 - Design jobs and select tools to reduce extreme flexion or deviation of the wrist.
 - Avoid inward and outward rotation of the forearm when the wrist is bent to minimize elbow disorders (i.e., tennis elbow).
3. Reduce the force or pressure on the wrists and hands:
 - Wherever possible, reduce the weight and size of objects that must be handled repeatedly.
 - Avoid tools that create pressure on the base of the palm which can obstruct blood flow and nerve function.
 - Avoid repeated pounding with the base of the palm.
 - Avoid repetitive, forceful pressing with the fingertips.
4. Design tasks so that a power rather than a finger pinch grip can be used to grasp materials. Note that a pinch grip is five times more stressful than a power grip.
5. Avoid reaching more than 15 inches (38.1 centimeters) in front of the body for materials:
 - Avoid reaching above shoulder height, below waist level, or behind the body to minimize shoulder disorders.
 - Avoid repetitive work that requires full arm extension (i.e., the elbow held straight and the arm extended).
6. Provide support devices where awkward body postures (elevated hands or elbows and extended arms) must be maintained. Use fixtures to relieve stressful hand/arm positions.
7. Select power tools and equipment with features designed to control or limit vibration transmissions to the hands, or alternatively design work methods to reduce time or need to hold vibrating tools.
8. Provide for protection of the hands if working in a hot or cold environment. Heat and cold can cause loss of manual dexterity and increased grip strength requirements. Furnish a selection of glove sizes and sensitize users to problems of forceful over-gripping when worn.
9. Wear gloves that fit. Gloves reduce both strength and dexterity. Tight-fitting gloves can put pressure on the hands, while loose-fitting gloves reduce grip strength and pose other safety hazards (e.g., snagging).

Goldwind USA Site Safety Plan and Procedure	Page 102
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

10. **Select and use properly designed hand tools (e.g., grip size of tool handles should accommodate majority of workers).**

Hand Tool Use and Selection

1. Maintain straight wrists. Avoid bending or rotating the wrists. Remember; bend the tool, not the wrist. A variety of bent-handle tools are commercially available.
2. Avoid static muscle loading. Reduce both the weight and size of the tool. Do not raise or extend elbows when working with heavy tools. Provide counter-balanced support devices for larger, heavier tools.
3. Avoid stress on soft tissues. Stress concentrations result from poorly designed tools that exert pressure on the palms or fingers. Examples include short-handled pliers and tools with finger grooves that do not fit the worker's hand.
4. Reduce grip force requirements. The greater the effort to maintain control of a hand tool, the higher the potential for injury. A compressible gripping surface rather than hard plastic may alleviate this problem.
5. Whenever possible, select tools that use a full-hand power grip rather than a precision finger grip.
6. Maintain optimal grip span. Optimum grip spans for pliers, scissors, or tongs, measured from the fingers to the base of the thumb, range from 6 to 9 centimeters (2.4 to 3.5 inches). The recommended handle diameters for circular-handle tools such as screwdrivers are 3 to 5 centimeters (1.2 to 2.0 inches) for power grip and 0.75 to 1.5 centimeters (0.3 to 0.6 inches) when a precision finger grip is needed.
7. Avoid sharp edges and pinch points. Select tools that will not cut or pinch the hands even when gloves are not worn.
8. Avoid repetitive trigger-finger actions. Select tools with large switches that can be operated with all four fingers. Proximity switches are the most desirable triggering mechanism.
9. Isolate hands from vibration. Excessive vibration can cause reduced blood circulation in the hands, causing a painful condition known as white-finger syndrome.

Lifting and Lowering Tasks

1. Optimize material flow through the workplace by:
 - Reducing manual lifting of materials to a minimum.
 - Establishing adequate receiving, storage, and shipping facilities.
 - Maintaining adequate clearances in aisle and access areas.
2. Eliminate the need to lift or lower manually by:

Goldwind USA Site Safety Plan and Procedure	Page 103
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- Mechanically lift, if possible.
 - Palletizing handling of raw materials and products.
 - Using unit load concept (bulk handling in large bins or containers).
3. Reduce the weight of the lift:
 - Reducing the weight and capacity of the container.
 - Reducing the load in the container.
 - Limiting the quantity per container to suppliers.
 - Lifting with co-worker(s).
 4. Optimize the lift:
 - Lift with back straight and legs bent versus legs straight and back bent.
 - Center of gravity should not be more than twenty inches from the body.
 - Changing the shape of the object or container so that it can be held closer to the body.
 - Providing grips or handles for enabling the load to be held closer to the body.
 5. Convert load lifting, carrying, and lowering movements to a push or pull by providing:
 - Conveyors
 - Ball caster tables
 - Hand trucks
 - Four-wheel carts

Administrative Controls

1. Rotate workers through several jobs with different physical demands to reduce the stress on limbs and body regions.
2. Rotate workers through jobs that are physically tiring.
3. Train workers to recognize ergonomic factors and implement techniques to reduce the stress and strain associated with the work activity.

Goldwind USA Site Safety Plan & Procedure	Page 104
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

Appendix C

OPERATION-SPECIFIC ERGONOMICS INFORMATION

6. Name and Location of Service Site: _____
7. Name of Site Manager: _____
8. Name of EHS Coordinator: _____
9. Location of all Ergonomics documentation: _____

10. List keys areas of attention as recommended by this procedure:

11. List recommended improvement to mitigate ergonomic hazards:

Information Completed By: _____

Date: _____

Goldwind USA Site Safety Plan & Procedure	Page 105
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

FALL PROTECTION

GUSA EHS-7

1.0 Purpose and Scope

- 1.1 The purpose of this procedure is to establish expectations for ensuring Goldwind USA employees, contractors and visitor personnel are provided with safe access to elevated work locations within the wind tower. Falls in both general industry and construction are one of the leading causes of workplace fatalities and serious injuries. To protect the safety of our employees take a proactive approach to address fall hazards in our workplaces through the use of selected fall protection controls. These goals are accomplished through:
 - 1.1.1 Comprehensive fall hazard assessments.
 - 1.1.2 Proper selection, use and maintenance of fall protection controls.
 - 1.1.3 Employee fall protection training.

2.0 Application

- 2.1 This policy applies when fall hazards are present when work is conducted at unprotected heights at or exceeding four 4 feet above a lower level or when work is conducted at unprotected heights where dangerous equipment or processes are located below.

3.0 Definitions

- 3.1 **Anchorage Point:** The anchor point (or “tie off” point) is the secure point of attachment for the connection device of the fall protection system. The anchor point is typically a beam (or trolley on beam) or other similarly sturdy support structure located above or at an even level with the user. Anchor points positioned above the user are preferable because they reduce the distance of free fall. The connection to the anchor point should be a direct connection with a locking snap-hook with a spring-loaded keeper, cross arm strap, eye bolt or other method to properly secure the connection device. The anchor point must be capable of withstanding a static force of 5,000 pounds (22,300 N), increased by a factor of .2 (20%) for each additional lanyard.
- 3.2 **Connector:** A device that is used to connect parts of a personal fall arrest system or positioning device system together such as lanyard, horizontal or vertical lifeline, or retractable lifeline. Must have a minimum strength of 5,000 pounds and a locking snap-hook with a spring-loaded, double action keeper to prevent the hook from accidentally opening, called “roll-out”.
- 3.3 **Deceleration Device:** Any mechanism, such as a rope grab, shock-absorbing lanyard or self-retracting lifeline, which serves to dissipate a substantial

Goldwind USA Site Safety Plan & Procedure	Page 106
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

amount of energy during the fall arrest, or otherwise limits the energy imposed on the employee during fall arrest.

- 3.4 Deceleration Distance: The additional vertical distance a falling person travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which a deceleration device begins to operate.
- 3.5 Fall Arrest System: A system including but not limited to an anchor point, connection device and a body belt or body harness used to arrest an employee in a fall from a working level.
- 3.6 Fall Hazard: Any situation in which a fall from an elevated height could result in an injury. Work being conducted (without standard guardrails or similar protection) at four 4 feet, (1.2 meters) above the lower level or work being conducted at unprotected heights below four 4 feet, (1.2 meters) when work is conducted above dangerous equipment or processes. Per OSHA, fall hazards are present at four 4 (1.2meters) feet in general industry and at six 6 feet, (1.8 meters) in construction.
- 3.7 Free Fall Distance: The distance a user falls before a fall protection system begins the arresting (stopping) process.
- 3.8 Full Body Harness: Straps that secure about the person in a manner that distributes the fall-arrest forces over at least the thighs, pelvis, waist, chest and shoulders with a means for attaching the harness to other components of a personal fall arrest system.
- 3.9 Guardrail System: A barrier erected to prevent employees from falling to a lower level. Consists of top rail, mid rail and toe board at all exposed edges or openings
- 3.10 Hole: A void or gap 2 inches (5 cm) wide in the floor or other working surface.
- 3.11 Lanyard: A flexible line of rope, wire rope or strap that generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchor point.
- 3.12 Lifeline: A component consisting of a flexible line for connection to an anchor point at one end to hang vertically (vertical lifeline), or for connection to anchor points at both ends to stretch horizontally (horizontal lifeline), and that serves as a means for connecting other components of a personal fall arrest system to the anchor point.
- 3.13 Opening: A gap or void (30 inches high and 18 inches wide, 75 cm high and 45 cm wide) in the wall or partition, through which an employee can fall to a lower level. Openings can be in walls or floors.
- 3.14 Positioning Device System: A body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning backwards.

Goldwind USA Site Safety Plan & Procedure	Page 107
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 3.15 **Qualified Person:** One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.
- 3.16 **Restraint System:** System designed to physically restrain user from reaching a point where a fall could occur. System limits the length of the connection device or positioning of the anchor to prevent the user from reaching the point of the fall hazard (i.e. edge of an unguarded platform or roof). Restraint system consists of: Body Wear (full body harness), Connecting Device (i.e. restraint lanyard), and Anchor Point.
- 3.17 **Retrieval System:** A retrieval system is designed to retrieve a user from a location above the position of the user. Largest use is for confined space applications. A retrieval system consists of: Body Wear (full body harness), Connecting Device (i.e. retractable lifeline or lifeline and winch), and an Anchor Point
- 3.18 **Rope Grab:** A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest a fall. Also called a vertical lifeline, only one user per vertical lifeline is allowed.
- 3.19 **Self-Retracting Lifeline/Lanyard:** A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under minimal tension during normal employee movement and which, after onset of a fall, automatically locks the drum and arrests the fall.
- 3.20 **Site Manager:** For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.
- 3.21 **Snap-hook:** A connector consisting of a hook-shaped member with a normally closed keeper or similar arrangement, which may be opened to permit the hook to receive an object and when released automatically closes to retain the object.
- 3.22 **Suspension System:** A suspension system is designed to lower and support a user at an elevated height, typically in an activity where both hands need to be free to perform work. Suspension System includes: Body Wear (full body harness), Connecting Device (i.e. rebar lanyard), Anchor Point, and Positioning Device (i.e. boatswain's chair).
- 3.23 **Unprotected Height:** Where there is a potential for a fall to occur and no standard guardrails or similar protection exists.
- 3.24 **Walking/Working Surface:** Any surface, whether horizontal or vertical, on which an employee walks or works, including but not limited to floors, roofs, ramps, bridges, runways and framework.
- 3.25 **Warning Lines:** Used when permanent guardrails are not feasible to warn of an exposed fall area (i.e. unprotected roof edge).

Goldwind USA Site Safety Plan & Procedure	Page 108
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

4.0 Procedure

4.1 Fall Hazard Assessment

4.1.1 A comprehensive fall hazard survey of a typical wind tower highlights a number of areas where fall hazards exist. These areas include

4.1.1.1 The fixed ladder system used for access to the tower platforms and nacelle

4.1.1.2 The integrated tower platform

4.1.1.3 The Nacelle

4.1.1.4 The Hub; and

4.1.1.5 The Nacelle roof

4.2 The engineered safety approach for the elimination or mitigation of these hazards includes:

4.2.1 The installation and required use of a ladder climbing system design to provide 100% fall protection to the climber

4.2.2 The installation of OSHA compliant guard rails around platform openings

4.2.3 The installation and identification of approved fall protection anchor points throughout the tower including the nacelle roof

5.0 Fall Protection Systems

5.1 When fall hazards cannot be eliminated, they must be controlled through the use of personal protective equipment. When fall controls are chosen, they will:

5.1.1 Provide proper protection for the employee.

5.1.2 Follow manufacturer's recommendations.

5.1.3 Be selected by a qualified individual.

5.1.4 Utilize an appropriate anchor point that has been reviewed for rating, clearance and safe access for tie off and removal.

5.2 The characteristics of an appropriate anchor point are as follows:

5.2.1 Capable of supporting 5000lbs per attached person

5.2.2 Free of rough or sharp edges that can damage connectors

5.2.3 Positioned at a height to maintain free fall of six 6 feet, or less

Goldwind USA Site Safety Plan & Procedure	Page 109
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 5.2.4 Positioned at a height to prevent the user from contacting the ground equipment below, electrical sources, or other hazardous conditions accounting for free fall distance, deceleration distance and worker height.
- 5.2.5 Positioned to prevent swing into surrounding structures or equipment in the event of a fall.
- 5.3 Anchorage Connections or Tie-Offs are accomplished by means of attaching the users fall protection lanyard to an approved Engineered Anchor attachment point with a locking snap-hook. Should it be determined that the potential free-fall distance may exceed six feet, choose a higher anchor point. Never tie a knot in a lanyard to limit free fall, it may fail. Also, utilize only double locking/action snap hooks for positive attachment to an approved anchor point; never wrap a connecting device around an anchor point, it may fail.
- 5.4 WTGs have many locations requiring the use of fall protection controls. These locations will be labeled with a sign reading "Notice–Fall Protection Controls Required" or other similar warning.

6.0 Fall Arrest Systems

- 6.1 Fall Arrest Systems are passive and designed to activate when a fall has occurred. Users must calculate the fall distance to effectively minimize injury. For example, a user 6 feet (1.8 meters) tall with a 3 foot (0.9 meters) lanyard needs to be anchored > 9 feet (2.7 meters) above the ground for the fall arrest system to properly engage. Fall Arrest Systems shall be arranged such that the free fall distance does not exceed six 6 feet (1.8 meters). *User height + connector length > distance of fall*
- 6.2 A typical basic Fall Arrest System includes a full body harness, a connection device such as the recommended Y-lanyard or two-leg lanyards, and an approved anchor connection point. The connector or D-ring on a full body harness should be midway between the user's shoulders. A Y-lanyard or two-leg lanyard is recommended because many access points in the WTG require the user to comply with a 100% tie-off method. This method dictates that the user always be attached to at least one anchor point at all times. When transitioning from one anchor point location to another, the user will attach the second leg of the lanyard to the next anchor point before disengaging from the attached anchor point. Thus providing that the user will at no time be disconnected from an anchor point.

7.0 Positioning Systems

- 7.1 Positioning systems are designed to provide a user with freedom of movement, horizontally or vertically, while secured to a fall protection device. In a WTG these systems are normally confined to use on the fixed ladder used to access the upper levels of the tower. For positioning systems, allow a maximum of two

Goldwind USA Site Safety Plan & Procedure	Page 110
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

2 feet (0.6 meters) of free fall. On the ladder application, this system comprises of an attached vertical cable, positioned in the center of the ladder between the rails. The user attaches to this vertical cable through means of a carrier/trolley device that is attached to the users chest or front D-ring of the full body harness. As the user climbs the ladder, the carrier/trolley rides the cable. Should the user fall, the carrier/trolley engages or grips the cable thereby preventing the uncontrolled free fall of the user.

8.0 Selection and Use of Fall Protection Equipment

- 8.1 When fall protection controls are chosen, they shall:
 - 8.1.1 Provide proper protection for the employee.
 - 8.1.2 Be used according to manufacturer's recommendations.
 - 8.1.3 Be selected by a qualified person.

9.0 Selection Criteria

- 9.1 The following influencing factors should be considered when selecting fall protection equipment:
 - 9.1.1 Severity and magnitude of the fall hazard.
 - 9.1.2 Number and frequency of employees exposed to the fall hazard.
 - 9.1.3 Permanent or temporary fall hazard.
 - 9.1.4 Need for user mobility (vertical and horizontal) to perform the job task.
 - 9.1.5 Location of fixed anchor points or availability of temporary anchor points.
 - 9.1.6 Safe falling distance available above the lower level or equipment accounting for free fall and deceleration distance.
 - 9.1.7 Potential for the user to swing into other hazards in the event of a fall.
 - 9.1.8 Manufacturer's use limitations for the fall protection equipment.
 - 9.1.9 Work being performed increasing the potential for a fall (on an ledge or edge).
 - 9.1.10 Environmental conditions increasing the potential for a fall (rain, snow, ice, high winds)
 - 9.1.11 Rescue in the event of a fall.

Goldwind USA Site Safety Plan & Procedure	Page 111
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

10.0 Inspection, Maintenance and Care

10.1 All fall protection equipment will be inspected to ensure the equipment is properly functioning. The best resource for equipment inspection is the manufacturer's recommendations or instructions.

10.2 Pre-Use Inspection

- 10.2.1 At minimum, equipment will be visually inspected prior to each use.
- 10.2.2 Harness: Inspect for cuts, burns, chemical damage, abrasions, stretching, frayed fibers or edges, pulled stitches or other signs or wear
- 10.2.3 Harness Buckles, D-Rings and Grommets: Inspect for proper function, elongation, distortion, loose components, rust, cracks, free movement, or other signs of wear or malfunctioning.
- 10.2.4 Lanyards: Inspect for cuts, burns, chemical damage, abrasions, stretching, frayed fibers or edges, pulled stitches or other signs or wear.
- 10.2.5 Lanyard Hardware: Inspect for proper function, elongation, distortion, loose components, rust, cracks, free movement, or other signs of wear or malfunctioning. Inspect spring-loaded keeper on the locking snap-hook for proper functioning, seating and spring closure.
- 10.2.6 Shock Absorber: Inspect shock absorber and cover for any signs of wear affecting the functioning of the shock absorber. Examine the shock absorber for signs of elongation, deployment or the warning flag.
- 10.2.7 Ropes and Cables: Inspect for cuts, burns, chemical damage, abrasions, stretching, frayed fibers or edges, rust, pulled stitches or other signs of wear.
- 10.2.8 Mechanical Fall Protection Components (retractable lifelines, winches, etc.): Inspect for proper functioning.
- 10.2.9 Anchor Point: Inspect for cracks, rusting or other signs of support deterioration. Inspect for proper and secure attachment.
- 10.2.10 Remove from service any equipment found to be defective until it is replaced or properly repaired.

Goldwind USA Site Safety Plan & Procedure	Page 112
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

11.0 Post-Fall Inspection

- 11.1 Re-inspect all components for proper functionality. Shock absorbing lanyards, retractable lifelines and the like must be returned to manufacturers for re-certification following their use in a fall situation.

12.0 Maintenance

- 12.1 All fall protection equipment shall be cleaned and maintained in a good working order following each use. Equipment that is exposed to harmful chemicals may be surface-washed in warm water and allowed to air dry in a clean, location. Body Wear equipment (harnesses) can be cleaned in warm water with a mild soap. Thoroughly rinse with fresh water following any detergent cleaning. All mechanical parts will be checked for tightness, rusting, cuts, abrasions, etc.

13.0 Repairs

- 13.1 Only a manufacturer-qualified individual shall be allowed to perform repairs.

14.0 Storage

- 14.1 All fall protection equipment shall be properly stored when not in use in a clean, dry location, protected from UV radiation.

15.0 Use

- 15.1 Workers should use only full body harnesses with lanyards of an appropriate length. For a worker who could be exposed to a direct fall hazard, such as when performing work on the Nacelle Roof, two lanyards must be used to ensure the employee is always securely tied off to an anchor point.

16.0 Training

- 16.1 All persons required to use fall protection shall complete Fall Protection Competent training prior to exposure to any fall hazard. This training shall include a full understanding of this procedure. *In addition to this, work performed on a WTG requires the completion of a Tower Climber qualification course as well.*

17.0 Program Review

- 17.1 Goldwind USA shall review this procedure on an annual basis to ensure the continued effectiveness of the Fall Protection program. The basic elements of this review should include but not be limited to:
- 17.2 Ensure all warnings or labels are legible.
- 17.3 Ensure all equipment is inspected prior to use.
- 17.4 Promptly report any new fall hazards brought to their attention for assessment.

Goldwind USA Site Safety Plan & Procedure	Page 113
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 17.5 Ensure fall control equipment is properly used and maintained by employees and contractors.
- 17.6 Immediately stop work upon identification of a potential fall hazard until such time as appropriate fall protection can be implemented.
- 17.7 Ensure anchorage points are properly identified and of suitable strength per regulatory requirements.
- 17.8 Ensure employees and contractors potentially exposed to fall hazards have received proper notification and training.

18.0 Responsibilities

18.1 Goldwind USA EHS Coordinator shall:

- 18.1.1 Annually review this procedure and update as necessary.
- 18.1.2 Provide general Fall Protection guidance.
- 18.1.3 Review incident patterns relating to this procedure.

18.2 Site Manager shall:

- 18.2.1 Ensure the implementation of this Fall Protection program.
- 18.2.2 Use these procedure guidelines to minimize fall hazards when assigning work activities to site employees.
- 18.2.3 Re-enforce to all workers the required use of 100% fall protection when working at elevations.
- 18.2.4 Verify employees are complying with this procedure.

Goldwind USA Site Safety Plan & Procedure	Page 114
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

19.0 Basic Worker Safety Guidelines for Safe WTG Access

- 19.1 Review the WTG fall hazard assessment and ensure appropriate controls are in place to prevent fall hazards
- 19.2 Review the site specific WTG Emergency Rescue Plan
- 19.3 Ensure that the WTG has been effective LOTO
- 19.4 Ensure that there is a means of contacting outside help from any point within the WTG should an emergency arise
- 19.5 Ensure you are properly trained in the fall protection program and equipment as required by your job.
- 19.6 Identify any newly determined fall hazards to your supervisors and EHS immediately.
- 19.7 Adhere to the fall control protection requirements set forth in this plan regarding, training, use, inspection, maintenance and storage of fall control equipment.
- 19.8 Do not use ladder rungs as anchorage attachment points-they are not rated anchorage points
- 19.9 Fit your full body harness snugly prior to climbing
- 19.10 ALWAYS ensure a 3-point contact while climbing or descending the ladder
- 19.11 Utilize the rest in platforms located approximately every 50 feet
- 19.12 Do not climb with items in your pockets-items can fall out. Use tool pouches or climbing bags for storage of portable tools or needed accessories.
- 19.13 Only one (1) climber per tower section at any time
- 19.14 When you reach a tower platform you must attach to an anchorage point BEFORE detaching from your ladder safety system
- 19.15 ALWAYS close hatches behind you as you climb
- 19.16 Do not stand under a ladder as a co-worker climbs
- 19.17 Always wear a hard hat with chin strap and approved safety glasses when access a WTG
- 19.18 Always wear leather palm or synthetic gloves appropriate for climbing
- 19.19 Do not access a WTG in adverse weather conditions. (Strong rain, surface freeze or snow)

Goldwind USA Site Safety Plan & Procedure	Page 115
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

19.20 Do not access towers when lightning has been reported in the area

19.21 Do not access the Nacelle roof with speed wind above 15 m/s

19.22 Before entering the hub, verify that the rotor LOTO procedure has been completed.

Goldwind USA Site Safety Plan & Procedure	Page 116
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

FIRE SAFETY

GUSA EHS-8

1. Purpose

1.1. This Fire Safety Plan (FSP) is intended to help control or reduce the possibility of fire and to specify the type of equipment to use in the event of fire in a Goldwind USA Wind Tower Generator (WTG). This plan addresses the following issues:

- 1.1.1. Major anticipated fire hazards associated with WTG.
- 1.1.2. Potential ignition sources for fires and their control procedures.
- 1.1.3. The type of fire protection equipment or systems that can control a fire

This plan requires that all affected personnel be informed of the plan's purpose, preferred means of reporting fires and other emergencies, types of evacuations to be used in various emergency situations, and the fire detection and alarm system installed in the WTG. The plan is closely tied to the Tower Rescue plan where procedures are described for the emergency escape from a WTG.

2. Workplace Fire Hazards

- 2.1. The first step towards an effective FSP is to assure that hazardous accumulations of combustible waste materials are controlled so that a fast developing fire, rapid spread of toxic smoke, or an explosion will not occur. WTG workers should be made aware of the hazardous properties of materials in their workplaces, and the degree of hazard each poses.
- 2.2. Fire prevention measures must be developed for all fire hazards found. Once employees are made aware of the fire hazards in their work areas, they must be trained in the fire prevention measures developed and use them in the course of their work. For example, oil soaked rags must be treated differently than general paper trash. In addition, large accumulations of waste paper or corrugated boxes, etc., can pose a significant fire hazard. Accumulations of materials that can cause large fires or generate dense smoke that are easily ignited or may start from spontaneous combustion are the types of materials with which this fire safety plan is concerned. Matches, welder's sparks, cigarettes and similar low-level energy ignition sources may easily ignite such combustible materials. All WTG workers should be monitor housekeeping to reduce and control fuel source hazards such as accumulation of flammable and combustible materials like trash, oily rags, or any other fire hazard.

Goldwind USA Site Safety Plan & Procedure	Page 117
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

3. Emergency Evacuation in the Event of a Fire

3.1. The following matrix explains the recommended evacuation procedure in the event of a WTG fire

Fire Location	Evacuation Method
Fire at the base of the tower with workers above	Utilize TES to evacuate outside the tower to ground level. Immediately evacuate a safe distance from the WTG
Fire in the Nacelle with workers below	Immediately descend the ladder to ground level and evacuate a safe distance from the WTG
Fire in the Nacelle with workers above or exterior	Utilize TES to evacuate outside the tower to ground level. Immediately evacuate a safe distance from the WTG

4. Fire Protection Equipment

4.1. The Fire Protection Equipment devices installed in the tower and Nacelle of the WTG are CO2 (Carbon Dioxide) fire extinguishers. CO2 extinguishers are designed for use on Class B (liquid) and Class C (electrical) fires. They have been selected for this application because they are most effective for the types of fires anticipated in a WTG. Dry chemical ABC fire extinguishers, although effective for this application, may present an additional safety hazard when used in a tight confined area. Once released under pressure, the ABC extinguisher's dry powder creates a visibility and respiratory hazard that may compound the emergency event. This additional hazard may render it difficult for a worker to escape the fire area.

4.2. ***It is important to note that fire extinguishers are designed for emergency escape purposes only. You should never attempt to extinguish a fire if it is beyond the incipient stage, if you do not know what is burning or fueling the fire, or if you can safely evacuate from the fire without the use of a fire extinguisher.***

5. Fire Extinguisher Use

5.1. Should it be necessary to use a fire extinguisher for emergency escape purposes:

5.1.1. **Pull the Pin** at the top of the extinguisher. The pin releases a locking mechanism and will allow you to discharge the extinguisher.

5.1.2. **Aim at the base of the fire**, not the flames. This is important - in order to put out the fire, you must extinguish the fuel.

Goldwind USA Site Safety Plan & Procedure	Page 118
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

5.1.3. **Squeeze the lever slowly.** This will release the extinguishing agent in the extinguisher. If the handle is released, the discharge will stop.

5.1.4. **Sweep from side to side.** Using a sweeping motion, move the fire extinguisher back and forth until the fire is completely out.

Operate the extinguisher from a safe distance, several feet away, and then move towards the fire once it starts to diminish. Be sure to read the instructions on your fire extinguisher - different fire extinguishers recommend operating them from different distances. **Remember: Aim at the base of the fire, not at the flames**

6. Maintenance of Fire Protection Equipment

6.1. Fire extinguishers must be visually inspected on a monthly basis to ensure they will function properly if needed. Fire extinguishers should undergo a complete inspection annually by a qualified technician. Fire extinguishers should be mounted above a floor and clearly marked. Access to a fire extinguisher should never be blocked.

7. Training

7.1. In the event of a fire, WTG workers should know what type of evacuation is safest. **The primary means of evacuation from the WTG is to descend the tower ladder way as per normal safe climbing procedures.**

7.2. The secondary means of evacuation covered in this procedure are to be used only in the event that the primary means is infeasible. Infeasibility may include a fire down tower that blocks the ladder way.

7.3. Fire Prevention Training, conducted on initial assignment, should include:

7.3.1. What to do if worker discovers a fire

7.3.2. Types of fires

7.3.3. Types of fire prevention equipment

7.3.4. Location of fire prevention equipment

7.3.5. How to use fire prevention equipment

7.3.6. Limitations of fire prevention equipment

7.3.7. Proper care and maintenance of assigned fire prevention equipment

7.4. Workers must demonstrate an understanding of the training and the ability to use the equipment properly before they are allowed to perform work requiring the use of the equipment.

Goldwind USA Site Safety Plan & Procedure	Page 119
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

8. Responsibilities

8.1. Goldwind USA **EHS Coordinator** shall:

8.1.1. Annually review this procedure and update as necessary.

8.1.2. Provide general Fire Protection guidance.

8.1.3. Review incident patterns relating to this procedure.

8.2. **Site Manager** shall:

8.2.1. Ensure the implementation of this Fire Protection program.

8.2.2. Use these procedure guidelines to minimize fire hazards when assigning work activities to site employees.

8.2.3. Verify employees are complying with this procedure.

Goldwind USA Site Safety Plan & Procedure	Page 120
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

HAZARD COMMUNICATIONS

GUSA EHS-9

1. Purpose

- 1.1. Goldwind USA is complying with the requirements of OSHA's Hazard Communication Standard by compiling a list of hazardous chemicals, cataloging MSDSs, ensuring that chemical product containers are properly labeled, and training our site employees and contractors. In addition, we provide this same information to subcontractors involved in a specific project so that they may provide this information and train their employees.
- 1.2. This program applies to all Goldwind USA site operations where employees may be exposed to hazardous substances under normal working conditions or during an emergency situation.
- 1.3. Under this program, our employees are informed of the contents of the Hazard Communication Standard, the hazardous properties of chemicals with which they work, safe handling procedures, and measures to take to protect themselves from these chemicals.

2. Hazardous Chemical Evaluation Procedure

- 2.1. Goldwind USA maintains a list of inventory of all hazardous chemicals known to be present in our workplace.
- 2.2. The hazardous chemicals on the list can cover a variety of physical forms including liquids, solids, gases, vapors, fumes, and mists. An accurate identification of the hazardous chemicals requires an actual inventory of the facility. Goldwind USA conducts this inventory annually.

2.3. Material Safety Data Sheets

- 2.3.1. All supplying vendors are required to submit to the site a current Material Safety Data Sheets (MSDS) for any hazardous chemical product supplied. If the MSDS is not received at time of first shipment the vendor is contacted immediately with a request for the MSDS.
- 2.3.2. Material Safety Data Sheets (MSDSs) are fact sheets for chemicals that pose a physical or health hazard in the workplace. MSDSs provide our employees with specific information on the chemicals they use.
- 2.3.3. Goldwind USA maintains a master copy of the MSDSs for chemical products used within Goldwind USA operations at Goldwind USA headquarters.
- 2.3.4. Additional MSDS are maintained at our sites and are also carried in company service vehicles where chemical products are stored or transported. The EHS Manager or Site Manager must clear all new chemical product procurements for the company.

2.4. Labels and Other Forms of Warning

Goldwind USA Site Safety Plan & Procedure	Page 121
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 2.4.1. All hazardous chemical containers must be properly labeled. Our labels are legible and prominently displayed, though their sizes and colors can vary.
- 2.4.1.1. Labels list at least
- 2.4.1.1.1. the chemical identity,
 - 2.4.1.1.2. appropriate hazard warnings, and
 - 2.4.1.1.3. the name and address of the manufacturer, importer or other responsible party.
- 2.4.1.2. The warning labeling system used on containers is the Hazardous Materials Identification System (HMIS) labeling system. The system utilizes a numerical hazard rating system, labels with colored bars, and training materials to inform workers of chemical hazards in the workplace.
- 2.4.1.3. Personal protective equipment recommended by the product manufacturer for the safe handling and use by workers is supplied to all affected Goldwind USA employees. (See EHS Procedure Personal Protective Equipment)
- 2.4.1.4. All chemical containers, including subsidiary containers that contain transferred chemicals are required to be labeled accordingly. If employees transfer chemicals from a labeled container to a portable container that is intended only for their **IMMEDIATE** use, no labels are required on the portable container. If employees transfer chemicals from a labeled container to a portable container that is **not intended only for their IMMEDIATE use**, appropriate labels are required on the portable container.
- 2.4.1.5. A monthly inspection is conducted at all Goldwind USA sites and in all company service vehicles to ensure that if labels fall off or become unreadable they are immediately replaced with containers have the appropriate labeling.

3. Training

- 3.1. All Goldwind USA site employees will receive initial Hazard Communications training and any necessary retraining on the Hazard Communication Standard and the safe use of those hazardous chemicals by the EHS Manager or his designate. "
- 3.2. This training program instructs on how to read and understand the information on labels and MSDSs, determine how the information can be obtained and used in their own work areas, and understand the risks of exposure to the chemicals in their work areas as well as the ways to protect them.

3.3. Training Content

- 3.3.1. Training content is organized so all Goldwind USA employees receive the same level of training on Hazard Communication annually. In addition to this annual training, we conduct Tool Box Talks periodically as refresher level training.

Goldwind USA Site Safety Plan & Procedure	Page 122
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

3.3.2. The training plan emphasizes these elements:

- 3.3.2.1. Summary of the standard and this written program, including what hazardous chemicals are present, the labeling system used, and access to MSDS information and what it means.
 - 3.3.2.2. Chemical and physical properties of hazardous materials (e.g., flash point, reactivity) and methods that can be used to detect the presence or release of chemicals (including chemicals in unlabeled pipes).
 - 3.3.2.3. Physical hazards of chemicals (e.g., potential for fire, explosion, etc.).
 - 3.3.2.4. Health hazards, including signs and symptoms of exposure, associated with exposure to chemicals and any medical condition known to be aggravated by exposure to the chemical.
 - 3.3.2.5. Procedures to protect against hazards (e.g., engineering controls; work practices or methods to assure proper use and handling of chemicals; personal protective equipment required, and its proper use, and maintenance; and procedures for reporting chemical emergencies).
- 3.3.3. New employees at the time of their initial assignment. If new chemical products are introduced to the company inventory, all employees promptly receive training on that new product.

4. Responsibilities

4.1. Site Manager

- 4.1.1. The Site Manager or his designate is responsible for ensuring that all hazardous chemical containers are properly labeled and updated, as necessary. Our program ensures that newly purchased materials are checked for labels prior to use.

4.2. EHS Manager

- 4.2.1. The EHS Manager or his designate will refer to the corresponding MSDS to assist employees in verifying label information.

Goldwind USA Site Safety Plan & Procedure	Page 123
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

HAZARDOUS MATERIAL SPILL CONTROL

GUSA EHS-10

1. Purpose

- 1.1. The purpose of this policy is to set forth Goldwind USA procedures regarding the response to a release (spill) of hazardous materials and hazardous wastes at our operation sites. The intent is to ensure every employee is aware of safe work practices pertaining to hazardous materials and hazardous wastes and receive the appropriate level of training to ensure competency.
- 1.2. The practice of the Goldwind USA is to take all practical steps to safeguard employees, contractors, and the general public from accidents and personal injuries and to ensure that the integrity of the environment is not compromised by improper disposal of hazardous wastes.

2. Definitions

- 2.1. The following definitions apply to this procedure:
 - 2.1.1. Hazardous materials are new materials that have been determined to be hazardous by the Department of Transportation of the state having jurisdiction.
 - 2.1.2. Hazardous wastes are used materials that have been determined to be hazardous based on laboratory analysis by the EPA or by the state having jurisdiction.
 - 2.1.3. Site Manager: For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.

3. Hazardous Spill Response and Countermeasures

- 3.1. In all instances of chemical spills, the Goldwind USA Hazardous Spill Response and Countermeasures plan will be followed.
- 3.2. A spill is considered any discharge of any quantity of oil or chemicals that occurs accidentally or intentionally. Upon verification of a spill, the Site Manager or EHS Manager will be notified immediately.
- 3.3. The employee discovering the spill should determine if any immediate hazards to safety or life exist. Address any such emergency condition first. Typically this would involve initiating alarm and evacuation procedures.
- 3.4. If necessary, the area of the spill, plus a three-foot buffer zone shall be cordoned off and access to the area restricted. If appropriate, warning signs may also be put in place.
- 3.5. If it can be done safely, stop the source of the spill.

Goldwind USA Site Safety Plan & Procedure	Page 124
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

3.6. If it can be done safely, contain the spill.

3.7. Personal Protective Equipment

3.7.1. All employees attempting to stop or contain a spill are required to don the appropriate Person Protective Equipment (PPE) prior to initiating a response.

3.7.2. PPE includes

3.7.2.1. Disposable chemical coveralls,

3.7.2.2. Protective eye and face wear,

3.7.2.3. Chemical protective gloves,

3.7.2.4. Chemical protective footwear, and

3.7.2.5. Respiratory protection as warranted.

3.7.3. Information regarding the specific requirements for PPE can be found in the MSDS for the released chemical.

3.7.4. PPE is located in the chemical spill kits

3.8. Containment Materials

3.8.1. Containment Materials include

3.8.1.1. Booms,

3.8.1.2. Drain covers,

3.8.1.3. Salvage drums, etc.

3.8.2. Absorbent Materials

3.8.2.1. Absorbent Materials include

3.8.2.1.1. Absorbent mats,

3.8.2.1.2. Absorbent wipes,

3.8.2.1.3. Absorbent socks,

3.8.2.1.4. Absorbent beads, and

3.8.2.2. Containment and Absorbent materials can be found in the Spill Kits.

3.8.3. DOT approved drums must be used to contain solids and liquid materials

Goldwind USA Site Safety Plan & Procedure	Page 125
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

4. Decontamination

4.1. Decontamination must begin **IMMEDIATELY** after the spill is contained

4.1.1. Decontamination of porous surfaces is carried out as follows:

- 4.1.1.1. Excess oil is removed, using a shovel or scraper, and an absorbent is applied.
- 4.1.1.2. A solvent is sprayed or sprinkled over the affected area and worked in with a broom or a scrubbing brush.
- 4.1.1.3. The absorbent material is spread over the surface and removed from the affected area with a shovel or broom and placed in a container that is properly labeled. Any excess solvent must be collected and placed in a DOT approved drum(s) with the UN designation and marked with the appropriate label.
- 4.1.1.4. Steps 3.1.1.1 through 3.1.1.3 above are repeated at least two times, or more, until all oil/liquid condensates are removed.
- 4.1.1.5. All contaminated surfaces must be decontaminated.
Decontamination does not mean the mere spreading of solvents or other fluid over the surface, nor does this requirement mean a once over wipe with a soaked cloth. Rather, a volume of solvents or other fluid sufficient to cover the contaminated surface completely must be used in two separate washes and rinses. All fluids used in the decontamination process will be considered contaminated and must be collected and dispose of following the steps outlined in this policy.

4.1.2. Decontamination of nonporous surfaces is carried out as follows:

- 4.1.2.1. Excess surface oil is removed with an adequate absorbent.
- 4.1.2.2. Solids are swept up and placed in appropriate containers.
- 4.1.2.3. A solvent is sprayed or sprinkled on the surface and worked in with a long-handled broom or scrubbing brush.
- 4.1.2.4. The solvent is removed from the surface using adequate absorbent which is removed from the affected area with a shovel or broom and placed in a container or drum properly labeled.
- 4.1.2.5. Steps 3.1.2.1 through 3.1.2.4 above are repeated at least two times, or more, until all oil is removed.

4.2. Under no circumstances should contaminated materials become airborne. Compressed air or pressure washing must not be used in the cleaning process.

4.3. All reusable materials such as small tools and equipment are cleaned by immersion in a pail of solvent.

Goldwind USA Site Safety Plan & Procedure	Page 126
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 4.3.1. The items cleaned are double washed/rinsed using a sparse amount of clean water.
- 4.3.2. Both the used solvent and the water are collected in leak-proof containers, marked with the appropriate label, and removed to the designated storage area.
- 4.4. Porous materials, such as wood and concrete that cannot be completely decontaminated shall be replaced. The contaminated materials, if removed, are placed in a leak-proof drum that is labeled accordingly.
- 4.5. Contaminated soil is removed to a depth not less than six inches below the wet-surface line. In addition, any area on which visible traces of a spill can be seen shall be cleaned, including a one-foot buffer zone beyond the visible contaminated area(s). The affected soil is disposed of in a leak-proof salvage drum that is labeled accordingly.
- 4.6. Waste solids and liquids should be kept separated to facilitate disposal of the contaminated materials.
- 4.7. All salvage drums or containers containing hazardous materials shall be removed for the site by the designated hazardous waste disposal company.

5. Notification Responsibilities

5.1. Employees

- 5.1.1. Employees discovering the spill must notify the Site Manager in a timely fashion.

5.2. Site Manager

- 5.2.1. The Site Manager shall:
 - 5.2.1.1. Assess the situation and make appropriate arrangements for additional support for stopping the spill, containing the spill, clean up and disposal as required
 - 5.2.1.2. Coordinate the Goldwind USA employee response to the event
 - 5.2.1.3. Ensure the safety of the employees affected by the spill and responding to the spill
 - 5.2.1.4. Report the incident in a timely manner to the Goldwind USA EHS Manager
 - 5.2.1.5. Forward written incident report to the Manager of Operations detailing the nature of the incident, and amount of material spilled and collected.

5.3. EHS Manager

- 5.3.1. The EHS manager shall:
 - 5.3.1.1. Report the incident as required by the authority having jurisdiction
 - 5.3.1.2. Ensure that the incident has been resolved effectively and to the satisfaction of the authority having jurisdiction
 - 5.3.1.3. Conduct an Incident Investigation to determine the root cause of the event

Goldwind USA Site Safety Plan & Procedure	Page 127
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 5.3.1.4. Coordinate any additional requirement concerning the packaging, labeling, storage, or disposal of hazardous wastes or materials and any record keeping and/or spill notification requirements for contaminated materials will, if applicable.

6. References

GUSA EHS-2 Accident Reporting and Investigation Procedure
GUSA EHS-16 Personal Protective Equipment Procedure
GUSA EHS-9 Hazard Communications Procedure

Goldwind USA Site Safety Plan & Procedure	Page 128
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

HOT WORK GUSA EHS-11

1. Purpose and Scope

- 1.1. This Goldwind USA EHS procedure outlines the program for inspection, issuance and posting of permits in order to establish the proper precautions to be taken for the prevention of fires during welding, cutting, and flame-producing operations in service center or a customer site.
- 1.2. This procedure applies to all operations at Goldwind USA sites or customer sites that do not have a hot work program in place. Goldwind USA employees and outside contractors performing hot work activities in Goldwind USA areas of operations shall comply with this procedure.

2.0 Definitions

- 2.1 **Combustible Gas Test** – A type of atmospheric measurement using combustible gas indicator/oxygen meter to determine the presence or absence of a combustible atmosphere.
- 2.2 **Designated Welding Area** – An area that was designed for welding, cutting, and brazing work. This is typically an area such as a welding shop.
- 2.3 **Fire Blanket** – A blanket made of flame resistance materials used to retard ignition and restrict the spread of a fire.
- 2.4 **Fire Watch** – A person assigned to monitor Hot Work activities for indications of fire, to enable rapid response actions.
- 2.5 **Hot Work** – Work that involves welding, cutting, or other flame-producing operation.
- 2.6 **Hot Work Permit** – The written authorization from the EHS Coordinator or responsible designee, to perform operations, which are capable of providing a source of ignition (e.g. welding, cutting, burning, and heating) outside of a Designated Welding Area.
- 2.7 **Permit –Required Hot Work Zone(s)** – Area(s), which are not designed for hot work. Hot work to be performed in these areas requires a permit.

Goldwind USA Site Safety Plan & Procedure	Page 129
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

2.8 Restricted Work Activities - Designated work activities involving specified potentially hazardous equipment or conditions, such as low and high voltage electrical equipment, hot work and confined spaces.

2.9 Site Manager: For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.

3.0 Procedure

3.1 Preparing for Hot Work Permit Activities

- 3.1.1 When Hot Work must be performed outside of a Designated Hot Work Area, the employee (either Goldwind USA or Contractor) must notify the EHS Coordinator, or their designee that a Hot Work Permit is needed.
- 3.1.2 The employee and EHS Coordinator or designee is responsible for completing the Hot Work Permit. An example Hot Work Permit is provided in **Appendix A**.
- 3.1.3 The Hot Work Permit details the location of the Hot Work, the type of work to be performed, and hazards associated with the work, and is used to ensure that adequate preparations for Hot Work activities have been taken.
- 3.1.4 The employee and the EHS Coordinator or designee must inspect the Hot Work Zone to evaluate whether the Hot Work activity can be safely conducted. Inspection of the Hot Work Zone shall cover all items listed on the permit and include any special procedures/stipulations where applicable.
- 3.1.5 The EHS Coordinator or designee will perform a combustible gas test before issuing a Hot Work Permit where flammable gases may be present.
- 3.1.6 Work in the area shall be prohibited when the lower explosive limit (LEL) is greater than 10% and/or oxygen content is greater than 23.5%.
- 3.1.7 Combustible materials shall be removed 35' (0.9m) from hot work areas or covered with fire retardant barriers, e.g. flameproof covers, or shielded with metal or curtains.
- 3.1.8 All flammable and combustible liquids shall be removed from the area where the hot work will take place.
- 3.1.9 At least one 20 pound (9.1 kilograms) fully charged ABC portable fire extinguisher, or other appropriate fire extinguishing equipment, shall be in the vicinity for immediate use.
- 3.1.10 Fire watches are required whenever conditions constitute a potential for development of a significant fire when performing welding or cutting, including when any of the following conditions exist:

Goldwind USA Site Safety Plan & Procedure	Page 130
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 3.1.11 Appreciable combustible material in building construction or contents, closer than 35 feet (10 meters) to the point of operation, which cannot be adequately shielded.
- 3.1.12 Appreciable combustibles are more than 35 feet (10 meters) away but are easily ignited by sparks.
- 3.1.13 Wall or floor openings within a 35 foot/10 meter radius (3D radius: up, down, left, & right) such as grated floors on a turbine deck, which expose combustible material in adjacent areas including concealed spaces in wall or floors.
- 3.1.14 Combustible materials are adjacent to the opposite side of the metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation
- 3.1.15 Where welding or cutting is performed overhead and hot material may fall to the ground, precautions should be taken to ensure that molten metal, sparks, and slag do not fall to floors below. The area below should be barricaded or roped off to prevent people from walking underneath.
- 3.1.16 Gas cylinders shall be secured upright, and kept away from molten metal and slag while in use. When not in use for hot work, cylinder caps shall be secured in place, and the main valves of these cylinders shall be shut off.
- 3.1.17 Prior to initiation of Hot Work:
 - 3.1.17.1 All preserved rotors, bearings, and other parts shall be cleaned, (steam or sand-blasted) before proceeding to pre-heat, weld, cut, etc
 - 3.1.17.2 Prior to commencement of welding, cutting, or burning, all hazards shall be corrected and special precautions implemented as specified on the permit.
 - 3.1.17.3 Prior to performing Oxy-Acetylene welding, welders shall verify that the check-valves are properly installed (attached to the regulator, not the torch).
- 3.1.18 Permits are valid only for the day of issue, unless otherwise specified on the permit.
- 3.1.19 Hot Work that is conducted in a Designated Welding Areas does not require Hot Work Permits. These areas shall be determined by the Site Manager
- 3.1.20 Designated Welding Areas shall be free of combustible materials, flammable liquids, etc. and shall be provided with curtains or barriers.
- 3.1.21** Contractors performing hot work shall be advised on the location of flammable materials or hazardous conditions of which they might not be aware, as part of their pre-job briefing at the site (see also GUSA EHS-4 Contractor Safety Procedure).

Goldwind USA Site Safety Plan & Procedure	Page 131
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

3.2 Performing Hot Work

- 3.2.1.1 Personnel performing the work are responsible for checking the Hot Work Permit to see if it is current, valid, and properly signed. Work shall not begin if any signatures are missing, or the permit is incomplete or has expired.
- 3.2.1.2 The permit shall remain accessible or posted within the job area until all work is completed.
- 3.2.1.3 If a Fire Watch is required, he/she will monitor for fires in the Hot Work Zone during the whole time the Hot Work activity is conducted and for 30-minutes following completion of the Hot Work.
- 3.2.1.4 The Fire Watch will have a fire extinguisher immediately accessible while Hot Work is being conducted. Only dedicated extinguishers should be used for fire watch.
- 3.2.1.5 If the Fire Watch observes a potential fire hazard or conditions change, he/she will notify the personnel conducting the Hot Work activity to stop working. The Fire Watch will notify the EHS Coordinator or designee of the potential hazard.
- 3.2.1.6 The Fire Watch will respond to a fire within the limits of his/her emergency response training and the capacity of the equipment available. If the Fire Watch does not have adequate training or equipment to respond to a fire, he/she will sound the fire alarm and notify the designated Emergency Coordinator of the need for emergency action and evacuation.
- 3.2.1.7 The fire watch will report all fires and use of the fire extinguisher to the EHS Coordinator or designee as soon as possible.

3.3 Completion of Hot Work

- 3.3.1 The work area and all adjacent areas where sparks might have spread shall be inspected for at least 30 minutes after the work is completed to ensure no fire hazards exist. This shall be done by the Fire watch, or by the employee responsible for the hot work.
- 3.3.2 Once the 30-minute watch is complete, the Fire Watch will sign the Hot Work Permit and return it to the EHS Coordinator or designee.
 - 3.3.2.1 If a Fire Watch was not applicable, the EHS Coordinator or designee upon completion of the work shall sign the Hot Work Permit. Hot Work Permits shall be kept on file for a minimum of one year by the Site Manager.

Goldwind USA Site Safety Plan & Procedure	Page 132
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

4.0 Training

4.1 All employees assigned to perform Hot Work shall receive Welding, Cutting and Brazing and Hot Work Permits training. Additionally, all personnel involved in the issuance of Hot Work Permits shall also receive Hot Work Permits training. This training will be tracked at Goldwind USA corporate headquarters

4.2 All employees assigned to perform Hot Work shall be qualified.

5.0 Responsibilities

5.1 The **Site Manager** shall:

5.1.1 Ensure that all personnel are trained in this procedure and adhere to all of its requirements.

5.1.2 Ensure all personnel assigned to perform Hot Work are qualified.

5.2 The **EHS Coordinator** or designee shall:

5.2.1 Approve all Hot Work Permits.

5.2.2 Verify that the employees assigned to Hot Work are qualified for the work activity.

5.2.3 Retain and file used Hot Work Permits for one year

5.2.4 Determine if a Fire Watch is applicable for Hot Work being performed.

5.2.5 Sign off to close the Hot Work Permit if the Fire Watch was not required.

5.3 The **Fire Watch** shall:

5.3.1 Monitor the Hot Work zone during activity

5.3.2 Monitor the Hot Work Zone for 30 minutes after Hot Work is completed

5.3.3 Sign the completed Hot Work Permit and return it to the EHS Coordinator.

5.4 **Reference:**

5.4.1 GUSA EHS-5 Emergency Preparedness and Fire Prevention Procedure

5.4.2 GUSA EHS-4 Contractor Safety Procedure

Goldwind USA Site Safety Plan & Procedure	Page 133
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

Appendix A

Goldwind USA HOT WORK PERMIT

Date _____ Time _____

Name of Person(s) Performing Work _____

Specific Location of Work _____

Yes No

- | | | |
|--------------------------|--------------------------|--|
| ☐ | ☐ | Cutting or welding permitted in an area that has been made fire safe. |
| ☐ | ☐ | All movable fire hazards in the vicinity have been taken to a safe place. |
| ☐ | ☐ | Guards used to contain the heat, sparks and slag if fire hazards cannot be removed. |
| ☐ | ☐ | Floor or wall openings or cracks, open doorways and windows protected or closed. |
| ☐ | ☐ | Fire extinguisher available for instant use. |
| ☐ | ☐ | Fire watch in areas where other than a minor fire might develop such as around combustible material. Fire watch shall continue for 30 minutes beyond completion of the hot work. |
| ☐ | ☐ | Floors swept clean of combustible material for a radius of 35'. |
| ☐ | ☐ | Combustible floors have been kept wet, covered with damp sand or protected by fire resistant shields. |
| ☐ | ☐ | Welding/cutting done only in areas authorized by management. No welding/cutting in sprinkled building when sprinkler system is impaired or in presence of explosive atmosphere, or in area of storage of readily ignitable material. |
| ☐ | ☐ | Dusts and conveyor systems that might carry sparks to distant combustibles protected or shutdown. |
| ☐ | ☐ | Cutter/welder is trained in safe operation of equipment and the safe use of the process. |
| ☐ | ☐ | Any on-site contractors advised about flammable material or hazardous conditions of which they may not be aware. |
| ☐ | ☐ | Welding or cutting containers: |
| ☐ | ☐ | Container thoroughly cleaned and ventilated; |
| ☐ | ☐ | Any pipe lines or connections to containers disconnected or blanked. |
| ☐ | ☐ | PPE used as needed– e.g., eye protection, helmet, protective clothing, respirator, gloves. |
| ☐ | ☐ | Warning sign posted to warn other workers of hot metal. |
| ☐ | ☐ | Appropriate ventilation provided. |
| ☐ | ☐ | When working in confined spaces a permit has been issued as per 1910.146. |

For specific requirements refer to General Industry Standards 1910.146; 1910.252; .253; .254 and .272 and Construction Standards 1926.803; .350; .352 and .353.

Authorized Signature - Supervisor

This Permit is canceled as of

Date/ Time

Authorized Signature - Supervisor

Goldwind USA Site Safety Plan & Procedure	Page 134
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

INSPECTIONS AND HOUSEKEEPING

GUSA EHS-12

1.0 Purpose and Scope

- 1.1 This procedure outlines the Goldwind USA Inspections and Housekeeping program. It includes guidance for general workplace inspections, along with inspection requirements. The objective is to review safety and housekeeping conditions to help ensure conformance with safety program requirements and to identify EHS needs.

2.0 Procedure

2.1 Housekeeping Inspections

- 2.1.1 All workers are responsible for maintaining good housekeeping in their work area. Individual employees will be responsible for conducting a basic inspection of their immediate work area on a daily basis and for maintaining a safe, clean and orderly work area.
- 2.1.2 If any equipment or tool (including employee personal tools) is found to be unsafe during an inspection, the equipment or tool must be removed from service and have a yellow 'Caution – Do Not Use' tag placed on it until it is repaired or replaced. Additionally, the employee should notify their supervisor to schedule repair or removal of the tool.
- 2.1.3 Housekeeping inspections should be performed in Wind Turbine Generator (WTG) on a **monthly** basis, at a minimum. These inspections should be done more frequently if maintaining good housekeeping is an issue. For months when a more detailed and thorough general workplace inspection is performed, no housekeeping inspection is required.
- 2.1.4 The form included in **Appendix A** or an equivalent form can be used to document these inspections.

2.2 Equipment Specific and Inspections

- 2.2.1.1 Equipment specific and workplace inspections should be developed and implemented as necessary to address certain equipment or issues within each workspace, to ensure the hazards are recognized and controlled, and for regulatory compliance.
- 2.2.1.2 Specific inspections should be conducted for the following areas or equipment (list is not all encompassing), at a minimum:

Goldwind USA Site Safety Plan & Procedure	Page 135
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

- 2.2.1.2.1 Cranes, hoists and lifting devices
- 2.2.1.2.2 Electrical tools and equipment (extension cords and plug-connected equipment; also employee's personal tools used.)
- 2.2.1.2.3 Fall protection devices (harnesses and lanyards)
- 2.2.1.2.4 Fire protection systems
- 2.2.1.2.5 Flammable storage area(s)
- 2.2.1.2.6 Ladders

- 2.2.2 Much of the equipment listed above needs to be inspected on a daily basis, prior to use. Guidance and forms for specific workplace or equipment inspections can be found in the procedure that corresponds to that topic.
- 2.2.3 Additionally, many types of equipment have to undergo a thorough inspection by a qualified person before first use, before being returned to service following any repair, and before it is used after any incident which can reasonably be suspected to have caused damage (as applicable).
- 2.2.4 If any equipment or tool (including a worker's personal tool) is found to be unsafe during an inspection, the equipment or tool should be removed from service and have a yellow 'Caution – Do Not Use' tag placed on it until it is repaired or replaced. Additionally, the worker should notify their supervisor to schedule repair or removal of the tool.

2.3 Corrective Actions and Follow-Up

- 2.3.1 Corrective actions should be taken immediately, whenever possible, for all findings noted during any inspection.
- 2.3.2 All findings from inspections must be tracked to closure, if not corrected immediately.
- 2.3.3 Each corrective action must receive appropriate follow-up to ensure that action has been taken to correct the issue noted during the inspection.
- 2.3.4 Inspection findings shall be communicated to affected workers. This can be communicated via safety and/or all-employee meetings, creation of an EHS bulletin board to post pertinent postings and announcements, distribution of memos directly to all employees or another method of communication.

Goldwind USA Site Safety Plan & Procedure	Page 136
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

2.4 Inspection Recordkeeping

- 2.4.1 Inspection checklists must be used for all regulatory required inspections. All inspection checklists and/or forms must be filed in the site's EHS Filing System.

3.0 Training

- 3.1 All persons assigned responsibility in the health, safety and housekeeping inspection program should be provided 'Hazard Recognition & Reporting' training as applicable to their responsibilities in the program.
- 3.2 The training should focus on how to conduct an inspection of their immediate work area. This inspection should include ensuring waste is disposed of properly, walkways are not obstructed, cords are coiled and out of the way, all guards are in place, etc.

4.0 Responsibilities

- 4.1 Goldwind USA **EHS Coordinator** shall:

- 4.1.1 Annually review this procedure and update as necessary.
- 4.1.2 Provide general Inspection and Housekeeping guidance.
- 4.1.3 Review incident patterns relating to this procedure.

- 4.2 **Site Manager** shall:

- 4.2.1 Ensure the implementation of this Inspection and Housekeeping program.
- 4.2.2 Use these procedure guidelines to minimize hazards when assigning work activities to site employees.
- 4.2.3 Verify employees are complying with this procedure.

Goldwind USA Site Safety Plan & Procedure	Page 137
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

OVERHEAD CRANE MONTHLY INSPECTION PROCEDURES

Instructions:

Inspect all items listed on this form and return the completed form for recordkeeping.

Any deficiencies found must be notated on the form and the crane must be repaired before next use.

Crane Location/Description:

_____ **Date:** _____

Inspection Completed by: _____

☒= Satisfactory
Not Apply

☐= Requires Service or Closer Inspection

N/A = Does

- ☐ Inspect hooks for missing parts, damage, deformations or cracks:
 - no more than 15% excess in throat opening
 - 10° twist from the plane of the unbent hook
 - hook safety latch intact and fully operational
- ☐ Check hoist chains and end connections for wear, twist or distortion
- ☐ Check the Running Rope and end connections for wear, broken strands or reduction in rope diameter:

Unserviceable if:

 - **Ten randomly distributed broken wires in one rope lay.**
 - **Five broken wires in one strand of one rope lay.**
 - **Reduction of 1/3 original diameter of outside individual wires.**
 - **Evidence of heat damage**
- ☐ Operation of all pendant control buttons function as labeled
- ☐ Pendant control restraint is in safe condition. Check for bare wires and loose connections
- ☐ Check block and hook for free movement while in lowered position
- ☐ Check the hoist limit switch by raising the hook without a load to the actuation point of the upper limit switch
- ☐ Test Crane Traveling Brakes. Crane should stop smoothly and should not bind or grab
- ☐ Listen for unusual sounds or vibrations while crane is traveling or braking
- ☐ Visually inspect bridge for anything out of the ordinary
- ☐ Make sure that all safety guards are in place

Note any deficiency:

Once you have finished using the crane, return the hook to at least seven (7) feet above the work surface and move to a safe position.

Goldwind USA Site Safety Plan & Procedure	Page 138
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

PORTABLE ELECTRIC TOOLS INSPECTION

Tool Name: _____ Identification Number: _____
 Location: _____ Date: _____
 Inspected by: _____

(Y) Yes (N) No (NA) Not Applicable

- ☐ Is the electric tool approved by a nationally recognized testing laboratory?
- ☐ Is the tool well maintained?
- ☐ (Perform a visual inspection for external defects prior to each use)
 - ☐ Any loose parts?
 - ☐ Any deformed and/or missing pins?
 - ☐ Any damage to cord, outer jacket, or insulation?
 - ☐ Any evidence of possible internal damage?
(Such as a pinched or crushed outer jacket or cord)
 - ☐ Is the cord properly gripped at the inlet to the tool?
 - ☐ Are any manufacturer-installed guards in place and operating properly?
- ☐ Has the defective or damaged item been tagged and removed from service (if a defect or evidence of damage that might expose an employee to injury has been found)?
- ☐ Are GFCIs used in outside, wet, or damp locations, and/or are double insulated or battery driven tools utilized?
- ☐ Is the tool properly stored?
- ☐ Is personal protective equipment appropriate for the tool being used?

Initial and 3 /6 Month Inspection

- ☐ Is equipment grounding conductor properly attached to its terminals?
- ☐ Is the equipment grounding continuous from exposed metal parts to the plug's grounding pin?
- ☐ For cord sets, is the equipment grounding conductor continuous from the plug to all receptacles?

Goldwind USA Site Safety Plan & Procedure	Page 139
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

HARNESS INSPECTION

Inspector: _____
 Manufacture: _____
 Model Number: _____

Inspection Date: __ / __ / __
 Harness Number: _____
 Serial Number: _____
 Date Into Service: _____

IF INSPECTION REVEALS ANY FAILURES, REMOVE UNIT FROM SERVICE
 IMMEDIATELY AND CONTACT HEALTH AND SAFETY

INSPECTION	PASS	FAIL	COMMENTS
BUCKLES & D-Rings			
Not broken			
No distortion			
No sharp edges			
No burrs			
No cracks			
No signs of wear			
Corrosion free			
Work freely			
BACK PAD			
Not torn			
WEBBING			
No cuts 1/8 th inch or greater			
Free of frayed fibers			
Free of broken fibers			
No tears			
Pulled Threads			
Broken stitches, 2 or more			
No abrasion			
Mold free			
No burns holes 1/16 th "or larger			
No discoloration			
Clean: oil free, no paint chemical damage			
LABELS & TAGS			
Legible/clearly marked			

I certify that I have inspected the above piece of equipment and find it to be in working order and without defects.

Signature: _____

Goldwind USA Site Safety Plan & Procedure	Page 140
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

LANYARD INSPECTION

Inspector: _____
 Manufacture: _____
 Model Number: _____

Inspection Date: __ / __ / __
 Lanyard Number: _____
 Serial Number: _____
 Date Into Service: _____

IF INSPECTION REVEALS ANY FAILURES, REMOVE UNIT FROM SERVICE
 IMMEDIATELY AND CONTACT HEALTH AND SAFETY

INSPECTION	PASS	FAIL	COMMENTS
WEBBING			
No cuts 1/8 th inch or greater			
Free of frayed fibers			
Free of broken fibers			
No tears			
Pulled Threads			
Broken stitches, 2 or more			
No abrasion			
Mold free			
No burns holes 1/16 th "or larger			
No discoloration			
Clean: oil free, no paint chemical damage			
DECELERATION/SHOCK ABSORBER			
Housing intact			
No signs of impact load or deployment			
LABELS & TAGS			
Clearly marked/legible			
CARABINEER/SNAP HOOKS			
Work freely			
Not broken			
No distortion			
No sharp edges			
No burrs			
No cracks			
No signs of wear			
Corrosion free			
Self locking, closing			

I certify that I have inspected the above piece of equipment and find it to be in working order and without defects.

Signature: _____

Goldwind USA Site Safety Plan & Procedure	Page 141
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

LADDER INSPECTION

Inspector: _____
 Manufacture: _____
 Ladder Type: _____

Inspection Date: ____ / ____ / ____
 Ladder Location: _____
 Ladder ID Number: _____
 Date Into Service: _____

IF INSPECTION REVEALS ANY FAILURES, REMOVE LADDER FROM SERVICE
 IMMEDIATELY UNTIL REPAIRED

INSPECTION	PASS	FAIL	COMMENTS
Manufacturer's safety stickers are present and legible. Ladder is clearly identified as to Type (I, IA, II) and load limit.			
Check for bends, splits, cracks, field modifications*, slippery materials, corrosion, or other defects:			
Check Side Rails			
Check Steps/ Rungs			
Check Top Step/Rung			
Check for defects, sharp edges, burrs or unauthorized modifications			
Check welds for cracks			
Check connecting hardware (nuts bolts for fit)			
Check locking spreaders for function			
Check non-slip rubber shoes for grip			
Check rope/pulley for proper function			
FIXED LADDERS			
Check ladder climbing safety system for proper function			
Check connection points of ladder climbing safety system			
Check ladder section connection joints for proper fit			
Check rungs for slippery surfaces			
Check ladder-tower connection brackets for torque			
Check ladder hatch at deck levels for proper function			

I certify that I have inspected the above ladder and find it to be in working order and without defects.

Signature: _____

Goldwind USA Site Safety Plan & Procedure	Page 142
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

JOB SAFETY ANALYSIS

GUSA EHS-13

1.0 Purpose & Scope

This procedure outlines the Goldwind USA Job Safety Analysis program. It outlines the system used to identify and analyze job tasks performed at Goldwind USA sites or customer sites and communicates and trains employees to safely perform those tasks.

2.0 Definitions

- 2.1 **Hazard** – Anything that can cause harm to an employee (e.g. chemicals, electricity, work at heights).
- 2.2 **Job Safety Analysis** – An assessment of a particular job task to determine the employee hazards that exist;
- 2.3 **Risk** – The likelihood (high or low) or chance that an employee will be harmed by a hazard.
- 2.4 **Site Manager-** For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.

3.0 Procedure

3.1 Job Safety Analysis and Risk Assessment Requirements

- 3.1.1 A Job Safety Analysis (JSA) must be performed for each job task performed that has an associated hazard or risk. The JSA consists of a careful examination of what possible hazards for a particular job task could cause harm to employees and the likelihood that the harm will actually occur. It must also identify the safety precautions necessary to eliminate the hazard, along with the personal protective equipment (PPE) required to be worn when performing the task. Specific regulatory requirements, best management practices and what is reasonably practicable should also be taken into consideration during the review.
- 3.1.2 The JSA will be completed on the corresponding form. The Job Safety Analysis form is presented as **Appendix A**.
- 3.1.3 Employees who actually perform the job task being evaluated must be included in the assessment. These individuals know the work process, are adequately trained to perform the identified task

Goldwind USA Site Safety Plan & Procedure	Page 143
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

and are most familiar with and sensitive to the actual and potential hazards that might require precautionary measures.

- 3.1.4 Once prepared on the appropriate form, the JSA will be filed with Goldwind USA corporate headquarters.
- 3.1.5 To view or download, click on 'Job Safety Analysis' or "Risk Assessments" and then select the type of activity you are looking for.
- 3.1.6 Completion of the JSA's will be based on a prioritization due to employee risk. Those assessments with the largest risk will be addressed first. Where there is uncertainty, a 'risk rating' may be attributed to each identified hazard to assist with prioritization.

3.2 Job Safety Analysis Process

- 3.2.1 The JSA process will include the following:
 - 3.2.1.1 Visual observation of job task
 - 3.2.1.2 Involvement of affected employees
 - 3.2.1.3 Job task/operation review (i.e. describe what is done in each basic step)
- 3.2.2 Significant findings from these assessments should be documented and include a description of the process or activity assessed, identification of the significant risks, identification of the employees at risk, date of the assessment and any additional reviews and names of the team working on the assessment. All of this information can be included on the corresponding form.
- 3.2.3 A suitable and sufficient risk assessment is one that:
 - 3.2.3.1 Correctly and accurately identifies a hazard,
 - 3.2.3.2 Identifies how an employee would be affected,
 - 3.2.3.3 Determines the likelihood of injury or harm arising,
 - 3.2.3.4 Quantifies the severity of the consequences,
 - 3.2.3.5 Takes into account any existing control measures,
 - 3.2.3.6 Evaluates applicable regulations,
 - 3.2.3.7 Will remain valid for a reasonable period of time,

Goldwind USA Site Safety Plan & Procedure	Page 144
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

3.2.3.8 Provides sufficient information to lead to appropriate control measures, taking into account the latest scientific developments and advances, and

3.2.3.9 Enables the employer to prioritize corrective actions that are necessary in order to control the risk.

3.3 Hazard Identification

The following information will be evaluated to determine hazards:

- 3.3.1 Nature of the tasks to be performed,
- 3.3.2 Potential chemical hazards (e.g. inhalation, ingestion and skin contact) and protection mechanisms,
- 3.3.3 Potential for ergonomic stressors (e.g. repetitive motion, lifting, awkward position) and protection mechanisms,
- 3.3.4 Required control measures (e.g. machine guarding, ventilation, isolation, work rotation, lifting devices and tool designs) to perform the job safely,
- 3.3.5 Operational references and procedures (e.g. equipment shut-down, lockout/tagout procedures, manufacturers' instructions, Material Safety Data Sheets),
- 3.3.6 Required personal protective equipment and its availability,
- 3.3.7 Previous chemical monitoring data or prior assessments,
- 3.3.8 Accident and injury records for prior years, and
- 3.3.9 Additional safety hazards such as fall, electrical or fire and explosion.

3.5 Job Safety Analysis Implementation

- 3.5.1 The Site Manager will review the JSA and implement it, if required.
- 3.5.2 Completed JSA's will be posted in operating areas and integrated with equipment operating procedures or posted directly on the equipment.
- 3.5.3 During the implementation of the JSA, additional health and safety issues may be documented that require immediate attention (e.g. missing guard) or control measures (e.g. ventilation) outside the direct scope of the JSA. These findings will be tracked to closure.

Goldwind USA Site Safety Plan & Procedure	Page 145
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

3.6 Job Safety Analysis Management

- 3.6.1 Goldwind USA will make completed JSA's available for employee review. The Site Manager will review and approve completed JSA's their site operation.
- 3.6.2 Individuals who have not been trained may create JSA's while working with a trained individual.

3.7 Job Safety Analysis Updates

- 3.7.1 JSA's will be modified and updated with the following:
 - 3.7.2.1 Changes to existing equipment or processes or control measures,
 - 3.7.2.2 New equipment or processes at the site
 - 3.7.2.3 Identified injury or illness trends and accidents or near miss accidents,
 - 3.7.2.4 Applicable changes in OSHA regulations, or
 - 3.7.2.5 Realization that the JSA is inadequate.

4.0 Training

- 4.1 Those personnel involved in developing JSA's will be trained to effectively perform this task. Assessors should have an understanding of the workplace, an ability to make sound judgments and knowledge of the best practicable means to reduce those risks identified.
- 4.2 The Site Manager will receive training to allow him to make significant modifications required to JSA's for the site, develop new ones or implement those created by others.
- 4.3 Employees performing job tasks described by a JSA must be trained on that completed JSA or Risk Assessment.
- 4.4 New and reassigned employees will be trained on appropriate JSA's, as above, prior to the start of their job activity.
- 4.5 Employees using the JSA's will be re-trained on the proper usage, location and function of these assessments when the assessment changes or if the employee demonstrates a lack of understanding, to ensure the safe performance of job tasks.

Goldwind USA Site Safety Plan & Procedure	Page 146
Date of Implementation/ Latest Revision: 11-1-10	Approved by: B. Lacoste

5.0 Auditing

Goldwind USA EHS manager will conduct an annual audit of the Job Safety Analysis program.

6.0 Responsibilities

6.1 Goldwind USA EHS Manager shall assist with the development of JSA's, and JSA training.

6.2 Goldwind USA Site Manager shall:

6.3 Ensure that this Job Safety Analysis is implemented at their site.

6.4 Ensure that the required assessments are performed in a prioritized manner for their facility,

6.5 Ensure that JSA forms are completed, communicated and posted,

7.0 References

GUSA EHS-2 Accident Reporting and Investigation Procedure

GUSA EHS-16 Personal Protective Equipment Procedure

8.0 Appendices

Appendix A Job Safety Analysis Creation Form

Goldwind USA Site Safety Plan & Procedure	Page 147
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

LOCK OUT TAG OUT & ELECTRICAL SAFETY RELATED WORK PRACTICES

GUSA EHS-14

1.0 Purpose and Scope

- 1.1 **Purpose** - This procedure outlines the Goldwind USA's Lockout/Tagout (LOTO) Wind Turbine Generator (WTG) program, whose purpose is to establish total energy isolation as the preferred method of energy control when workers are engaged in the service or maintenance of WTG with hazardous energy that could cause injury to personnel. This procedure is intended to establish minimum performance requirements for the control of hazardous energy.
- 1.2 **Scope** - This procedure applies to all services operations Goldwind USA site locations and at customer sites. It is also a requirement for all contractors and vendors as outlined herein.

Below is a listing of typical activities in which energy control procedures apply:

- erecting
- inspecting
- cleaning
- installing
- commissioning
- dismantling
- constructing
- setting up
- servicing
- repairing
- testing
- maintaining
- adjusting
- lubricating

2.0 Definitions

- 2.1 **Adjacent Equipment/ Process** - Adjacent machine [energy sources](#) are the primary and stored energy sources of a machine, equipment, process and circuit that, while not related to the primary machine, their nearness may present a hazard to persons working on the primary machine. To ensure safety, hazardous energy from adjacent equipment/processes should be identified.
- 2.2 **Affected Employee** – An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed. This individual is not authorized to perform LOTO.
- 2.3 **Alternative Methods:** Methods developed for work other than servicing and/or maintenance of equipment. The methods guide personnel, utilizing the safest procedures for tasks not requiring LOTO. Methods are developed based on risk assessment of the machine, equipment, process and circuit.

Goldwind USA Site Safety Plan & Procedure	Page 148
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

- 2.4 **Authorized Employee** – A person who uses a Lockout/Tagout system procedure on machinery or equipment to perform service or maintenance on that machinery or equipment. This person has completed the required training to be an Authorized Employee (see Section 4.0 Training).
- 2.5 **De-energized:** Physically isolated from all energy sources and not containing residual or stored energy. A zero energy state is verified as existing.
- 2.6 **Dissipate:** The process of removing stored energy from a machine, equipment, process or circuit. The energy source steadily declines to a zero value after the energy source has been shut off and locked.
- 2.7 **Energized:** Connected to an energy supply or containing residual or stored energy.
- 2.8 **Energy Isolating Device:** A mechanical device that physically prevents the transmission or release of energy, including, but not limited to: disconnect switches, circuit breakers, line valve, etc. A device that utilizes a positive means, such as a lock, to hold an energy isolating system in a safe position and prevent the equipment from being energized.
- 2.9 **Equipment Specific LOTO Procedure:** A written outline of steps to follow to Lockout/Tagout and re-energize specific equipment. This procedure should include: type and magnitude of energy, isolation location, mechanism for isolation, and method to verify isolation.
- 2.10 **Exclusive Personal Control:** A means by which a single person controls equipment that may impact his/her safety.
- 2.11 **Maintenance Locks** – Locks used in conjunction with a “Caution – DO NOT OPERATE” Tag to render equipment inoperable by locking the energy-isolating device in the “off “ or safe position. To be used for long-term shutdown situations, when equipment is not actively being serviced or maintained.
- 2.12 **General LOTO Lock:** A key lock that is not assigned to an individual employee as an Individual LOTO Lock. This lock has only one key and master keys are not available. This lock may be used to lock out individual energy-isolating devices or energy sources when **group or complex group LOTO** is used. This lock may be left on for durations of greater than one shift. This lock is unique within the facility and is to be used only for LOTO. The LOTO lock shall hold an energy-isolating device in the “off” or safe position and prevent the energizing of a machine or equipment
- 2.13 **Hazardous Energy Source:** Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal, gravity or other energy (including potential and/or kinetic) that could cause injury to personnel.

Goldwind USA Site Safety Plan & Procedure	Page 149
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

- 2.14 **Individual LOTO Lock:** A type of key lock that is used for no other purpose, having one key, and for which master keys are not available. Such locks are individually assigned to authorized individuals, or can be obtained from a central repository of LOTO devices, whereupon they become personal locks while in use by an individual. LOTO Locks are typically colored red. The LOTO lock shall hold an energy-isolating device in the “off” or safe position and prevent the energizing of a machine or equipment.
- 2.15 **Lead Authorized Employee** – The authorized employee who has primary responsibility for the implementation and coordination of group Lockout/Tagout activities.
- 2.16 **LOTO (Lockout/Tagout):** The placement of a lock and red tag on the energy-isolating device in accordance with an established procedure, to secure isolation points to prevent unexpected start-up or release of hazardous energy. The red tag and lock indicate that the energy-isolating device shall not be operated until removal of the lock and red tag, in accordance with an established procedure.
- 2.17 **Lockout Device:** A positive means, such as a lock, a wheel valve cover with lock adapter, or the like that secures an energy isolating device in the safe position and prevents the energizing of a machine, equipment, process and circuit
- 2.18 **Red, “DANGER-DO NOT OPERATE” Tag (Red Tag)** – A safety tag to be used only for personnel protection to Lockout/Tagout equipment where injury could result if the tagged equipment were operated. When Red Tags are used, the energy-isolating device (primary switch or valve of the system, or equipment) must be made inoperable by use of a LOTO lock, physical disconnection, or equivalent protection. A sample of the tag is given in **Appendix B**. Red tags are used with every LOTO Lock (General or Individual) to indicate that the energy source is locked out and an authorized employee is actively working on the machine, equipment, process or circuit. Tags must be weather resistant and securely attached.
- 2.19 **Risk Assessment:** A comprehensive evaluation of the probability and the degree of the injury or damage to health in a hazardous situation. The risk assessment is used to select appropriate safeguarding.
- 2.20 **Service and/or Maintenance:** Any activities to machine, equipment, process and circuit that represent repairs, preventive maintenance, modifications and installation. These activities require that the machine, equipment, process or circuit, or their components, be at a “zero energy state”. The personnel performing these activities must employ LOTO in accordance with established procedures. When LOTO of the machine, equipment, process and circuit cannot be performed, alternative methods such as risk assessment shall be employed.

Goldwind USA Site Safety Plan & Procedure	Page 150
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

2.21 **Site Manager:** For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.

2.22 **Tagout Device:** A prominent warning, such as a tag and its method of attachment, that secures an energy-isolating device in a safe position and prevents the energizing of a machine, equipment, process or circuit.

3.0 Procedure

3.1 Lockout/Tagout

3.1.1 Each worker or contractor shall implement an effective LOTO and de-energization prior to conducting any work on equipment with hazardous energy.

3.1.2 All LOTOs shall be verified to assure effective isolation of all hazardous energy sources.

3.1.3 Total energy isolation is the expected and preferred method of energy control. When energy isolation is not possible, an approved alternative action must be followed.

3.1.4 Red "DO NOT OPERATE" Tags and LOTO locks shall be used when working on any equipment requiring repair, servicing, or any other work where the employee may be endangered if the machine or system is inadvertently energized or stored energy is released.

3.1.4.1 All identified energy sources shall be disconnected, shut-off, or blanked-off and locked out and tagged out.

3.1.4.2 Red "DO NOT OPERATE" Tags shall be used with LOTO Locks (General or Individual), and shall be attached to the energy isolating (primary disconnecting) device for the machine or system (e.g., electrical disconnect) and to all related potential "back- feeds" or other non-normal sources of energy to the equipment to be protected.

3.1.5 Each Authorized Worker working on a system shall use their own Red "DANGER DO NOT OPERATE" Tag and Individual LOTO Lock. Red "DANGER DO NOT OPERATE" Tags shall be completely filled-out in legible writing by the Authorized Worker who affixes the tag.

3.1.5.1 Red Tags shall be attached with a material having the general design and characteristics equivalent to a one-piece, all environment tolerant nylon cable tie, which is non-reusable, attachable by hand, self-locking, and require a minimum unlocking strength of at least 22 kgs (50 lbs) for release.

Goldwind USA Site Safety Plan & Procedure	Page 151
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

- 3.1.6 LOTO locks shall be non-mastered, serialized, identified as LOTO locks, and assigned to a specific individual, either as issued or from a LOTO station.
 - 3.1.6.1 Each Authorized Employee shall receive personal LOTO locks and Red Tags, or have access to them in central location, i.e., a LOTO center.
 - 3.1.6.2 All LOTO Locks and Lockout devices must be capable of withstanding exposure to the associated work environment conditions.
- 3.1.7 Operation-specific information for this LOTO procedure is documented in **Appendix A**. This information shall include a record of lock assignments and be maintained by the operation EHS Coordinator.
- 3.1.8 LOTO locks and Red "DANGER-DO NOT OPERATE" Tags shall be removed only by the Authorized employee who affixed the tag and lock.
- 3.1.9 **Shift or Personnel Change** - The maximum permitted duration for LOTO is one shift or the duration of the task, whichever is shorter.
 - 3.1.9.1 If work continues into the next shift, the incoming Authorized Employee shall install his or her LOTO locks and Red "DANGER-DO NOT OPERATE" Tags in the presence of the outgoing Authorized employee, who shall remove his or her tags and locks prior to leaving the site.
 - 3.1.9.2 If an Authorized Employee fails to remove the LOTO locks and Red "DANGER-DO NOT OPERATE" Tags and leaves the facility or customer location, he/she shall be required to return and remove the LOTO locks and Red "DANGER-DO NOT OPERATE" Tags.
 - 3.1.9.3 In case the signer of the tag cannot be located, the Service Area Manager, or his/her designee may authorize the removal of the LOTO locks and Red "DANGER-DO NOT OPERATE" tags after all possible attempts have been made to locate the employee. The attempts made to locate the employee, and the fact that someone other than the Authorized Employee removed the lock must be documented.
- 3.1.10 All new equipment shall be capable of being locked and tagged-out.

Goldwind USA Site Safety Plan & Procedure	Page 152
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

3.1.11 The Goldwind USA service sites shall maintain a supply of LOTO devices, including (but not limited to):

- 3.1.11.1 Red “DANGER DO NOT OPERATE” Tags,
- 3.1.11.2 LOTO locks,
- 3.1.11.3 Multiple Lock Hasps,
- 3.1.11.4 Cable Ties, and
- 3.1.11.5 Group lock boxes.

3.1.12 All devices used for Lockout/Tagout must be of the appropriate design and strength to secure isolation points.

3.2 Equipment-Specific LOTO Procedures

3.2.1 Each WTG must have equipment-specific LOTO procedures for each piece of equipment requiring LOTO when workers or contractors are engaged in the service or maintenance of machines, equipment, processes or circuits with hazardous energy that could cause injury to personnel. The equipment-specific procedure shall include the steps for equipment shut down, de-activation of energy isolating device(s), lockout of such energy isolation devices, methods to dissipate stored energy, and verification steps for equipment de-energization and isolation.

3.2.2 For equipment that is routinely serviced, all energy disconnects shall be labeled.

3.2.3 Where feasible, Equipment-Specific LOTO procedures shall be posted at each piece of equipment to which they apply. In addition, a complete set of Equipment-Specific LOTO procedures shall be maintained at the region/area service center. An Equipment-Specific LOTO Procedure Template is provided as **Appendix D**. Equipment-Specific LOTO procedures shall be written in the local language and must contain:

- 3.2.3.1 Common name of equipment
- 3.2.3.2 Location of equipment
- 3.2.3.3 The magnitude of energy (i.e. amount of power, in Volts or the pressure rating in p.s.i.) supplied to the equipment.
- 3.2.3.4 The exact location of the power source to the equipment.
- 3.2.3.5 A description of how energy to the equipment is to be isolated (including the types of energy control devices to be used).

Goldwind USA Site Safety Plan & Procedure	Page 153
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

3.2.3.6 Date of last revision of Equipment Specific LOTO procedure.

3.2.3.7 Name of person who revised the procedures last

3.2.4 Equipment specific LOTO procedures are to be reviewed annually by an authorized employee. At that time, the procedure shall be revised as needed and a new revision date and reviewer name added to the document.

3.2.5 **Group Lockout/Tagout** - In cases where multiple persons, trades, or departments are required to work on the same equipment or system, a Lead Authorized Employee will be designated and will be assigned overall responsibility for coordinating the group Lockout/Tagout between all Authorized Employees.

3.2.5.1 **Multiple Hasp LOTO Device:** When more than one individual is working on a system under Lockout/Tagout, and the energy isolating device cannot accept more than one LOTO lock, a Multiple Hasp LOTO Device, or Group Lockbox must be used. If a Multiple Hasp Device is used, each Authorized Employee working on the equipment being locked/tagged out shall verify that each LOTO step has been performed, and then attach their individual lock and tag to the Multiple-Hasp Device.

3.2.5.2 **Use of a Group Lockbox:** When a Group Lockbox is used to accommodate the number of Authorized Employees involved, the following steps are required:

3.2.5.2.1 Using necessary numbers of LOTO locks/tags, the Lead Authorized Worker will ensure each source is isolated, locked and tagged, verified as de-energized, place the LOTO keys for the actual equipment isolation points in the Group Lockbox.

3.2.5.2.2 The Lead Authorized Worker will also place one of his/her LOTO locks on the Group Lockbox.

3.2.5.2.3 When feasible, each Authorized Worker working on the equipment or system being locked out will verify that all energy sources have been shut down, isolated, and locked/tagged (with Lead Authorized Employee's Locks/Tags).

3.2.5.2.4 Each Authorized Worker will then affix their own lock and tag to the Lockbox.

Goldwind USA Site Safety Plan & Procedure	Page 154
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

3.2.5.2.5 LOTO Locks and Red Tags shall remain on the Group Lockbox until each Authorized Worker has completed work on the associated equipment.

3.2.5.2.6 Upon completion of the work, each Authorized Worker working on the equipment/system is to remove their own LOTO Lock and Red Tag from the Lockbox.

3.2.5.2.7 After assuring that the equipment/system is restored to a condition ready for normal operation, the Lead Authorized Worker may then unlock the Lockbox and remove the keys for the actual equipment isolation point LOTO locks.

3.2.5.2.8 The Lead Authorized Worker may then remove all LOTO locks, energy control devices and tags from the equipment after a final check has been made to ensure that no employees are exposed in the area of the equipment.

3.2.6 **Temporary Removal of LOTO Locks & Red Tags** – The following steps must be followed by Authorized Worker in situations when LOTO devices must be temporarily removed from a machine or piece of equipment for testing or positioning of the machine/equipment:

3.2.6.1 Survey the work area to ensure that nonessential items have been removed and that all machine components are operationally intact,

3.2.6.2 Notify all workers who were working on the affected equipment that the removal of LOTO locks and Red "DANGER-DO NOT OPERATE" Tags and subsequent equipment testing will occur and check that all workers are removed from the area or safely positioned,

3.2.6.3 Verify that the controls are in an off or "safe" position.

3.2.6.4 Remove LOTO locks and Red "DANGER-DO NOT OPERATE" Tags,

3.2.6.5 Energize as needed and proceed with testing/positioning.

3.2.6.6 After testing / positioning is complete, de-energize the system again, verify system equipment de-energization and isolation, and re-apply LOTO locks and Red "DANGER-DO NOT OPERATE" Tags until the maintenance or repair task is completed.

3.3.6 Contractors or other Outside Personnel

Goldwind USA Site Safety Plan & Procedure	Page 155
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

3.3.6.1 Contractors shall review this program and applicable specific procedures, and shall comply with the safety requirements of the LOTO standard prior to starting any work that involves hazardous/stored energy.

3.3.6.1.1 Contractors using their own equipment on-site shall have in place for review and approval, a Lockout/Tagout program specific to that equipment, that meets or exceeds the requirements of the LOTO standard for equipment that has more than one energy source.

3.3.6.1.2 Contractors shall not use or perform maintenance on Goldwind USA equipment without specific Goldwind USA approval. If Goldwind USA equipment must be locked-out by a contractor, then Goldwind USA authorized personnel shall also verify that the equipment has been de-energized and perform a group lock-out on the equipment in coordination with the contractor.

3.4 Compliance with this Lockout/Tagout Program

3.4.1 All workers are required to comply with the restrictions and limitations imposed upon them during the use of Lockout/Tagout.

3.4.2 Authorized workers are required to perform Lockout/Tagout in accordance with this procedure and the equipment-specific Lockout/Tagout procedures.

3.4.3 All workers, upon observing a machine or piece of equipment which is locked-out to perform servicing or maintenance shall not attempt to start, energize, or use the machine or equipment until it is properly released from LOTO.

3.5 Recordkeeping Requirements

3.5.1 The Site Manager shall designate the location of LOTO records in **Appendix A**, including:

3.5.1.1 Equipment-specific LOTO procedures,

3.5.1.2 Group Lockbox Log (if applicable), and

3.5.1.3 Location of locks, tags, LOTO devices, attachment devices, etc.

4 Training

4.1 Authorized Workers shall receive Lockout/Tagout.

Goldwind USA Site Safety Plan & Procedure	Page 156
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

4.1.1 Training for Authorized Workers will be required upon initial assignment and every two years thereafter.

4.1.2 Retraining will also be conducted when:

4.1.2.1 Results of a periodic inspection of the LOTO program indicate that employee knowledge or use of this procedure are inadequate,

4.1.2.2 Whenever there is a change in an employee's job assignments,

4.1.2.3 Whenever there is a change in machines, equipment or processes that present a new hazard, or

4.1.2.4 When there is a change in the energy control procedures.

4.1.3 All Authorized Workers must also perform an annual "try-out" demonstration of LOTO (i.e. performing LOTO on a piece of facility equipment using the equipment-specific LOTO procedure for that equipment).

4.1.4 Affected Workers shall receive Lockout/Tagout Awareness training. These workers shall also be instructed as to the prohibition against operating equipment under Lockout/Tagout

4.1.5 Retraining for Affected Workers will be conducted when:

4.1.5.1 Results of a periodic inspection of the LOTO program indicate that employee knowledge or use of this procedure are inadequate,

4.1.5.2 Whenever there is a change in an employee's job assignments,

4.1.5.3 Whenever there is a change in machines, equipment or processes that present a new hazard, or

4.1.5.4 When there is a change in the energy control procedures.

4.2 All Workers shall receive General Awareness Level Lockout/Tagout (LOTO) training to properly recognize the function of safety tags and locks as they relate to Lockout/Tagout. These workers shall also be instructed as to the prohibition against operating equipment under Lockout/Tagout.

Goldwind USA Site Safety Plan & Procedure	Page 157
Date of Implementation/ Revision Date: 11-1-10	Approved by: B. Lacoste

5 Responsibilities

5.1 Goldwind USA shall:

- 5.1.1 Implement the LOTO procedure,
- 5.1.2 Ensure that equipment-specific LOTO procedures are in place and current for all equipment, as required, and
- 5.1.3 Ensure that the annual LOTO Try-out Demonstrations are conducted for workers at the service area.
- 5.1.4 Ensure all workers are trained in LOTO requirements per this procedure,
- 5.1.5 Ensure all workers are trained on their responsibilities as listed in this LOTO Procedure,
- 5.1.6 Conduct periodic visual inspection to assure workers are following proper LOTO procedures,
- 5.1.7 Ensure Risk Assessments are conducted when appropriate,
- 5.1.8 Document emergency removals as required and ensure authorized workers are notified of any LOTO release upon return to the work place.

6 Appendices

Appendix A	Operation-Specific Lockout/Tagout Information
Appendix B	Examples of Tags Used for LOTO
Appendix C	LOTO Periodic Demonstration Record
Appendix D	Equipment-Specific LOTO Procedure Template

Goldwind USA Site Safety Plan & Procedure	Page 159
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

Appendix B EXAMPLES OF TAGS USED FOR LOTO

LOTO Tag – Typical Details



Goldwind USA Site Safety Plan & Procedure	Page 161
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

EQUIPMENT-SPECIFIC LOCKOUT/TAGOUT PROCEDURE

WTG Name: _____ **Number:** _____
Equipment Manufacturer: Goldwind USA **Location of Equipment:** _____
Application: Control of Energy during Servicing/Maintenance Activities
Equipment-Specific LOTO Developed/Revised by: _____ **Rev. Date** _____
*** Energy Sources:** Electrical/Mechanical/ Hydraulic (Oil)/Gravity// Other Hazards (*Select/Circle*)

Yes	No	Procedural Steps (If there are any questions concerning this procedure see your Supervisor or the EHS Representative). Complete all steps and power sources that apply.
☐	☐	1. NOTIFICATION OF AFFECTED WORKERS: Affected workers who use or work near the equipment have been notified that it is being shut down. In addition to this lockout procedure, the Authorized Employee must be aware of any additional safety requirements when dealing with this type of equipment. If there are any questions see your Site Manager before proceeding.
☐	☐	2. ALL SOURCES OF ENERGY HAVE BEEN IDENTIFIED above*, SOURCES OF STORED ENERGY (including their location) are:
☐	☐	3. DEACTIVATION OF ENERGY SOURCES & APPLICATION OF ENERGY CONTROL DEVICES: The equipment is deactivated by switching "off" the power switch located at:
☐	☐	ELECTRICAL POWER (at _____ V) to the equipment is controlled at _____ using the following energy control devices _____
☐	☐	HYDRAULIC POWER to the equipment is controlled at _____ using the following energy control devices _____
☐	☐	GRAVITATIONAL ENERGY is controlled by _____ using the following energy control devices _____
☐	☐	4. VERIFICATION OF LOCKOUT/TAGOUT: Energy isolation is verified by attempting to activate _____
☐	☐	TRY-OUT step performed by: _____ (Initial)
☐	☐	5. SIGN-OFF: If you have completed all of the previous steps (energy isolation is verified), and checked Yes for each box, please sign your name, fill in the information below, and then proceed with the work. I verify that the above steps have been completed and that I am authorized and trained to perform Lockout Tag-out procedures.
		Signature Department Date
☐	☐	6. RE-ENERGIZATION OF EQUIPMENT: Once work is complete: all equipment parts are replaced; all personnel and tools are cleared; Inspection of work area complete.
☐	☐	Each person involved in the work removes their own locks and tags and the last person assures all other personnel are clear and removes the energy control devices.
☐	☐	Energy is reconnected to the machine/system by _____
☐	☐	Control devices are removed from _____
☐	☐	Affected Workers are notified that the equipment is ready for use.

Goldwind USA Site Safety Plan & Procedure	Page 162
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

MEDICAL SERVICES

GUSA EHS-15

1. Purpose and Scope

1.1. This procedure outlines the Goldwind USA Medical services program

2. Procedure

2.1. Medical Services

2.1.1. Various medical services are necessary at Goldwind USA sites in order to ensure and maintain the health and safety of employees. These include the following:

2.1.1.1. Basic medical treatment including First Aid and CPR

2.1.1.2. Pre-employment, periodic, PPE required physicals and back to work fitness evaluations

2.1.1.3. Regulatory required medical surveillance Bloodborne pathogen, or other biological hazard employee training and medical services

2.2. Service Site must provide adequate medical equipment via first aid stations. These stations can be inventoried and managed either internally or by an outside vendor. The inventory method is documented in **Appendix A**.

2.3. Service Site must provide adequate off-site medical services via a selected clinic for job-related injuries and illnesses and physical examinations. In addition, rehabilitation will be provided for required transitional return to work cases.

2.4. The EHS Manager that have implemented the restricted work program, will pre-qualify all off-site medical services/companies prior to initial use and annually thereafter.

2.5. Off-site medical service activities will be coordinated to ensure the appropriate capabilities and qualifications of the desired services.

2.6. Medical services will be provided for all employees, on all work shifts.

3. Program Coordination

3.1. The EHS Manager will participate as required in the following activities

3.1.1. Regulatory required medical surveillance and exams,

3.1.2. Health and safety surveys,

3.1.3. Industrial hygiene and chemical exposure evaluations,

3.1.4. Accident investigations,

3.1.5. Ergonomic evaluations,

3.1.6. Personal protective equipment (PPE) evaluations,

3.1.7. Physical hazard (e.g., radiation and heat stress) evaluations, and/or

Goldwind USA Site Safety Plan & Procedure	Page 163
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

3.1.8. Emergency medical treatment.

- 3.2. The EHS Coordinator will inform the associated clinic that only necessary medical information will be communicated to the Site Manager.
- 3.3. When necessary, the EHS Manager will participate in the reporting and documentation (See OSHA 300) of employee injuries and illnesses. In all cases, however, EHS Procedure Accident Investigation & Reporting will be followed.

3.4. OSHA 300 Log Recordables and Non-Recordables

- 3.4.1. Any injury requiring treatment beyond first aid is considered to be recordable.
- 3.4.2. Tetanus shots and negative X-rays are considered first aid and would not be recordable.
- 3.4.3. Non Prescription Strength Over the Counter Medications do not make the injury recordable.
- 3.4.4. Wound closures using bandages, band-aids, gauze pads, steri-strips is non-recordable
- 3.4.5. Wound closures using a stitch or more and glues are recordable
- 3.4.6. Massage, as a modality is not considered recordable, PT or Chiropractic treatment is.

4. **Workers' Compensation**

- 4.1. Goldwind USA maintains insurance policies that specify that immediate notice of any accident or occurrence that may result in a liability under a policy must be given to the insurer. **Failure to do so may result in loss of coverage and/or right of recovery under a policy.**
- 4.2. Specifics on Goldwind USA's workers' compensation insurance policy can be obtained from the Human Resources department, who will act as the main interface with the insurance and claims management companies.
- 4.3. The EHS Manager/Coordinator or Human Resources department will promptly arrange to have the workers' compensation claim form completed and forwarded to the appropriate insurance company.
- 4.4. In the event of an injury to non-Goldwind USA personnel, it is the responsibility of that person or their supervisor to manage the workers' compensation form submission.

5. **Back-to-Work**

- 5.1. The site manager must notify the EHS Manager or HR Manager of any employee who returns to work from a workers' compensation case, a disability case or any of the following cases:
- 5.2. Hospitalized employees; regardless of length of stay, but work-related,
- 5.3. Absent employees due to a contagious disease (e.g., tuberculosis, hepatitis, meningitis, etc.), not a common cold or other typically non-serious contagious illness, regardless of length of time absent,
- 5.3.1. Absent employees due to a personal illness for two or more weeks,

Goldwind USA Site Safety Plan & Procedure	Page 164
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

- 5.3.2. Work-related employee exposures, or
- 5.3.3. Employees who are not in one of the above categories, but whose supervisor or manager are uncertain of their fitness to return to work without undue safety or health risk.
- 5.3.4. In contagious disease cases or when an employee has been absent due to illness for two or more weeks, a return to work examination may be appropriate. In all other cases identified above, the EHS Manager or the HR Manager will outline the necessary steps to be taken and resources required in order to return the employee to work.
- 5.3.5. Upon return to work from a personal injury case in which the employee was under the care of a personal physician, the employee's personal treating physician must provide return to work authorization prior to the employee returning to work. After the personal physician's return to work authorization, the certified clinic and/or company doctor must also provide return to work authorization.

6. Medical and Exposure Records

- 6.1. All medical records will remain confidential between the employee, or employee-designated representative, designated Goldwind USA representative(s), medical service personnel and government agencies, as necessary. These records will be maintained for the duration of employee employment plus thirty (30) years.
- 6.2. The EHS Manager or the HR Manager will ensure that the clinic, or other such facility, has the procedures necessary to maintain records as described above. The methodology of maintaining this documentation is given in **Appendix A**.
- 6.3. Medical records will be maintained at the Goldwind USA Company Headquarters, not the service site
- 6.4. Exposure records include workplace monitoring and measurements (e.g., radiation), material safety data sheets, and any record that identifies a toxic substance or harmful physical agent to which the employee may be exposed.
- 6.5. Related pertinent e-mail notes are also discoverable and may be considered a part of the employee's medical record.

7. Employee Access to Records

- 7.1. Individual medical records may be released under certain situations without written approval. These situations usually involve compliance with statute (standards and/or regulations), medical emergency, adversary proceedings, safety, etc. Review of these instances should be made with a designated Human Resources representative prior to release of any information.
- 7.2. When an employee asks to review their medical record for purposes of interpreting information therein, it is recommended that an appropriately trained medical professional be available for such review.
- 7.3. An employee has the right of access to their own exposure records as defined in the applicable regulations.

8. Training

- 8.1. All Goldwind USA employees are trained on the Medical Services Procedure.

Goldwind USA Site Safety Plan & Procedure	Page 165
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

9. Responsibilities

9.1. Site Manager shall:

- 9.1.1. Ensure implementation of the Goldwind USA Medical Services program at their site

9.2. EHS Manager and Human Resources shall:

- 9.2.1. Ensure adequate off-site medical services are available for all Goldwind USA employees,
- 9.2.2. Perform initial and annual clinic certifications,
- 9.2.3. Facilitate return to work in worker's compensation and disability cases by completing functional job analysis and serving as a liaison between the treatment team and Goldwind USA
- 9.2.4. Participate in the reporting and documentation of employee injuries and illnesses, when appropriate, and
- 9.2.5. Assist the site manager in documenting an employee's fitness for duty.

9.3. EHS Manager shall:

- 9.3.1. Ensure that adequate first aid supplies are maintained at the site,
- 9.3.2. Ensure that no medical records are maintained at the site, and
- 9.3.3. Complete and update annually the site-specific information in **Appendix A.**

Goldwind USA Site Safety Plan & Procedure	Page 166
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX A

SITE SPECIFIC MEDICAL SERVICES PROGRAM INFORMATION

Name of Site Manager:	
Name of EHS Manager:	
-Office Phone Number:	-Cell Number:
Name and Location of Clinic:	
-Phone Number:	
-Fax Number:	
-Contact Person:	
Name and Location of Preferred Emergency Room:	
-Phone Number:	
-Fax Number:	
-Contact Person:	
First Aid Stations Managed and Inventoried by: <i>(list outside vendor name, address and phone if used)</i>	
Location of Exposure Records and Responsible Person:	
Location of Medical Surveillance Records and Responsible Person:	
Information Completed By:	Date:
Phone Number:	

Goldwind USA Site Safety Plan & Procedure	Page 167
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

PERSONAL PROTECTIVE EQUIPMENT

GUSA EHS-16

1.0 Purpose & Scope

This procedure outlines the Goldwind USA Personal Protective Equipment (PPE) program. It includes guidance for specific types of PPE and situations where the proper use of PPE is required. The objective is to minimize and control the potential for injury through the proper selection and use of PPE. This procedure is applicable to all Goldwind USA services sites and customer sites. In addition to this procedure, the following procedures contain more PPE details about their specific topic:

- 1.1 Confined Space Entry
- 1.2 Electrical Safety
- 1.3 Fall Protection
- 1.4 Hot Work
- 1.5 Lockout/Tagout

2.0 Definitions

- 2.1 **Administrative Controls** – Use of a procedure or guidance to prevent employee exposure.
- 2.2 **Attenuation** – Reduction of noise level.
- 2.3 **“A” Weighting (or A Scale)** – Measurement of sound from 31.5 Hertz (Hz) to 16,000 Hz with less value or ‘weight’ given to low frequencies and extremely high frequencies. Most industrial noise is measured in dBA.
- 2.4 **Decibel (dB)** – A logarithmic unit of measurement expressing the relative intensity of sound on a scale from 0 (average least perceptible) to 130 (average pain level) or higher.
- 2.5 **Engineering Controls** – Use of equipment or a system (i.e. ventilation) to prevent employee exposure.
- 2.6 **Face Shield** – Secondary protection for eyes and face, which must be worn with primary protectors, such as safety spectacles or goggles, to

Goldwind USA Site Safety Plan & Procedure	Page 168
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

shield the wearer's face from chemical splash, impact, heat or optical radiation.

- 2.7 **Goggles** – A wraparound protective device that fits the contours of the upper face, surrounding the eyes in order to protect them from impact, splash or vapor hazards. Primary protection for eyes; available in an 'eye cup' type, which covers only the eye sockets, and the 'cover' type, which protects the eyes and part of the face around the eyes. Some goggles are ventilated, which are usually more comfortable and cooler, but may allow the intrusion of smaller foreign bodies and liquids.
 - 2.8 **Hazard Assessment** – The gathering of information in the workplace in order to determine which hazards or potential hazards can be associated with a particular job, job classification or work area.
 - 2.9 **Impervious** – Incapable of being passed through or penetrated.
 - 2.10 **Material Safety Data Sheet (MSDS)** – Information, typically prepared by the manufacturer or distributor of chemicals, which provides physical and chemical characteristics and handling precautions for a material.
 - 2.11 **Primary Protector** – Protective device that may either be worn alone or with a secondary protector.
 - 2.12 **Safety Glasses** – Primary protectors used to shield eyes from a variety of hazards, including radiation and flying particles such as chips, spark and splinters.
 - 2.13 **Secondary Protector** – Protective device that must be worn with a primary protector.
 - 2.14 **Site Manager**- For purposes of identification, the Site Manager is the person designated by Goldwind USA to have operational control of a Goldwind USA operating site.
 - 2.15 **Welding Helmet** – Special type of face shield that protects the eyes and face from flying particles and UV radiation created by welding processes. Welding helmets are designed to accept filters of varying optical densities; the proper filter should be used for the type of welding being performed.
- 3.0 **Procedure**
- 3.1 **General PPE Requirements**
 - 3.1.1 In most circumstances, PPE should not be the sole method of hazard exposure control. PPE should be used when engineering and administrative controls are not feasible, or to provide additional protection.

Goldwind USA Site Safety Plan & Procedure	Page 169
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

3.1.2 All PPE must be inspected prior to use, cleaned regularly and maintained in usable condition. Any equipment that is damaged must be replaced immediately. Equipment that does not fit properly shall not be worn. It shall be replaced or re-fit.

3.1.2.1 Fall protection harnesses and lanyards must be inspected daily, before each use for any fraying, defects or worn parts.

3.1.2.2 The Goldwind USA site manager or designated EHS coordinator is responsible for procuring new PPE when required.

3.1.3 A Job Safety Analysis (JSA) for PPE requirements will be performed for job tasks. This assessment is addressed entirely in EHS Procedure-Job Safety Analysis.

3.1.3.1 When all job tasks cannot be completed immediately, a priority schedule will be established based on associated risk. The level of risk is determined per guidance in the JSA procedure.

3.1.6 The service area must have available the necessary quantity and sizes of PPE to meet job requirements. Additionally, the PPE that is in stock and currently in use must be of the appropriate type as identified by the individual hazard assessments.

3.2 PPE Distribution

3.2.1 Appropriate PPE will be distributed to each affected employee according to the findings of the PPE hazard assessment and job assignment JSA's .

3.2.2 Visitors will be provided with the appropriate PPE for their activities.

3.2.3 Contractors working at a Goldwind USA site are responsible for having or acquiring approved PPE that must be appropriate for the work they are performing.

3.2.4 Respirators and respirator cartridges, protective clothing and electrical safety gloves are examples of PPE that must be under controlled distribution. The person responsible for the distribution of the controlled PPE and the storage location are listed in the site-specific information, **Appendix A**.

3.2.5 Storage locations for uncontrolled PPE are also listed in the site-specific information, **Appendix A**.

Goldwind USA Site Safety Plan & Procedure	Page 170
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

3.2.6 PPE will be distributed to only those employees that are physically capable of and appropriately trained in properly using the equipment.

3.2.7 Where medical clearance for PPE use is required (i.e. respirator use), employee PPE evaluations will be coordinated with Medical Services and documented, as applicable.

3.3 PPE Enforcement and Verification

3.3.1 Employees are required to wear the proper PPE for their job task.

3.3.2 PPE requirements for particular areas must be communicated with signs placed in such areas. The lack of signage for any reason must not be construed as an excuse for not wearing appropriate PPE.

3.4 Body Protection

3.4.1 A wide variety of natural and synthetic materials are used in protective clothing. The major types of protective clothing and their functions are:

3.4.1 Waterproof and resistant to some chemicals

3.4.2 Synthetic rubber is resistant to oil, grease, organic solvents, and petroleum products

3.4.3 Plastics are resistant to oil, grease, many solvents, mild acids and alkalis

3.4.4 Natural rubber items are designed for electrical insulation

3.4.5 Cotton (or other natural material) clothing should be worn while welding or performing other 'hot work' where sparks or welding slag is a potential.

3.4.2 Certain types of clothing are inappropriate for particular uses.

3.4.2.1 Cotton clothes are not impervious and, therefore, must not be worn where such protection is required.

3.4.2.2 Polyester or other synthetic materials must not be worn while welding or performing other 'hot work' where sparks, welding slag or arc flash is a potential.

Goldwind USA Site Safety Plan & Procedure	Page 171
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

- 3.4.3 For chemical handling, including loading and unloading, employees shall wear protective clothing as dictated by the MSDS for that material.
- 3.4.4 For protection from cuts, bruises and abrasions, special protectors made of padded leather, fabric, plastic, hard fiber, or metal should be worn. These protectors are available for almost all parts of the body and are designed to allow freedom of movement.
- 3.4.5 Goldwind USA personnel involved in climbing and servicing WTG's shall company approved apparel. If specific or specialized protective wear is necessary, it will be provided at the expense of the company.

3.5 Eye and Face Protection

- 3.5.1 Eye protection must be worn for designated tasks as identified in the **JSA**, whenever there is risk of projection of particles into the eyes or chemicals use.
- 3.5.2 All safety glasses, goggles and face shields shall meet ANSI specific safety requirements and shall be imprinted by the manufacturer as such. Safety glasses must have plastic frames and impact resistant lenses.
- 3.5.3 Employees who wear prescription glasses shall wear safety glasses that incorporate their prescription into the lens or shall wear protection over their prescription glasses. Over protection shall be plastic, impact resistant. Normal prescription and non-prescription eyewear, even if made of plastic or tempered glass, do not necessarily conform to ANSI standard standards.
- 3.5.4 Eye and face protection will be provided at Goldwind USA expense.
- 3.5.5 In cases where potential electrical hazards exist, metal frame glasses or metal neck chains must not be worn.
- 3.5.6 Where conditions present a fogging hazard to eye and face protection, the EHS Coordinator or site manager may use their discretion in determining the type of protection to be worn to provide the best protection while avoiding fogging. In all cases, adequate care must be taken to provide full and complete protection.
- 3.5.8 Face shields do not provide adequate eye protection on their own and shall only be used over primary eye protection.

Goldwind USA Site Safety Plan & Procedure	Page 172
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

3.5.9 The wearing of contact lenses should be avoided in industrial environments, such as maintenance, construction, and wherever equipment, processes or other operations present recognized eye hazards such as flying objects, hazardous radiation (including weld flash), chemical vapors, liquids or glare. This contact lens guidance is due to the following risks:

3.5.9.1 Small foreign bodies, which normally are washed away by tears, sometimes become lodged beneath contact lenses, where they may cause injury to the cornea

3.5.9.2 Chemicals splashed into the eyes may be trapped under a contact lens and cause extensive corneal damage before the lens can be removed and the eye adequately irrigated

3.5.9.3 Removal of a contact lens for urgent irrigation after injury may be difficult due to eyelid spasms.

3.6 Foot Protection

3.6.1 Safety boots/shoes provide protection against the following hazards:

3.6.1.1 Rolling objects (e.g. barrels, rolls, heavy pipe, etc.)

3.6.1.2 Accidentally kicking sharp sheet metal

3.6.1.3 Impacts from falling objects.

3.6.2 Hard or steel toe, leather upper-ankle-protection safety shoes with rubber soles that meet OSHA specific safety requirements are required for all service site employees that work in the service center area or WTG areas.

3.6.2.1 Safety boots/shoes are provided to employees at Goldwind USA company expense.

3.6.3 Employees who's primary work on switchgear, transformers or other electrical power delivery component maintenance or installation must refer to the PPE guidance in the Electrical Safety procedure.

3.7 Hand Protection

3.7.1 Appropriate hand protection shall be worn when an employee's hands are exposed to hazards, such as severe cuts, abrasions or lacerations, punctures, chemical burns or thermal burns.

Goldwind USA Site Safety Plan & Procedure	Page 173
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

3.7.2 When selecting hand protection, employees must take into consideration the task to be performed, duration of use, and the actual or potential hazards to which they may be exposed.

3.7.2.1 Any chemical's MSDS must always be followed for specific hand protection requirements.

3.7.3 Work gloves should be worn whenever possible, except when wearing the gloves is either impractical or would create a greater hazard, such as in the vicinity of moving parts.

3.7.3.1 Gloves shall be used when climbing the WTG, working in the WTG, nacelle, or hub to help in gripping the ladder, and to protect hands from sharp objects.

3.7.4 For material handling, employees shall wear, at minimum, general-purpose gloves.

3.7.4.1 Cloth gloves afford adequate protection when handling pipe.

3.7.4.2 Leather or leather-palm gloves should always be worn when handling wire rope.

3.7.5 Rubber gloves are necessary in certain situations involving electrical work. Due to the special nature of work involving the potential for electric shock, EHS Procedure – Electrical Safety must be referenced for additional requirements.

3.7.6 Cut resistant (i.e. Kevlar, leather, etc.) gloves and wrist protection shall be worn by employees while handling particularly sharp materials.

3.7.7 Vibration absorbing or reducing gloves shall be worn whenever possible to reduce employee exposure to vibrating or repetitive hand tools. This includes, but is not limited to use of a continuous grinding using a hand held grinder and repetitive hammering.

3.7.8 Gloves should be worn when the hands would otherwise be wet from any substance causing a slippery grip.

3.8 Head Protection

3.8.1 Employees shall be provided with and shall wear head protection (hard hat) whenever they are engaged in jobs in which there is a reasonable probability of head injury.

3.8.2 Hard hats with chinstraps are required in WTG areas, working in the WTG, and on construction project sites.

Goldwind USA Site Safety Plan & Procedure	Page 174
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

- 3.8.3 Hardhats shall conform to OSHA and ANSI specific standards
- 3.8.4 2.5 – 3 centimeters (1 – 1.25 inches) is required to be maintained between the top of the head and the underside of the hardhat shell. The suspension is the ‘shock absorber’ between the head and the shell and is integral to the hat’s overall effectiveness. Hardhat suspension systems should be replaced when they signs of wear.
- 3.8.5 Objects shall not be carried inside the helmet, as proper clearance is needed for the protective system to be effective.
- 3.8.6 Hardhats shall be replaced when the hard hat displays physical damage (cut, cracked, dented, etc.) that would compromise the integrity of the hardhat protection.
- 3.8.7 The shell of the hard hat should be cleaned regularly. Stains or dirt may hide hairline cracks or a defect that requires the hardhat to be replaced.
- 3.8.8 Hardhats should be stored where they will not become deformed by excessive heat or be damaged by objects tossed onto them. Shells of hard hats must never be painted. Solvents in the paint may cause thermal plastic to become brittle. Numbers or symbols can be applied with reflective tape.
- 3.8.9 Hardhats should be inspected before they are worn. If there are any holes, cracks, fraying of suspension materials or other signs of damage or alteration, they should be replaced.
- 3.8.10 Hardhats must be worn as the manufacturer intended, front to back, not backwards or sideways. They should be adjusted as necessary to comfortably fit the wearer.
- 3.8.11 Individuals with long hair must protect their hair from contact with moving parts, particularly rapid spinning machinery

3.9 Hearing Protection

- 3.5.4 Employees shall wear approved hearing protection when exposed to noise levels greater than 85 dBA, where mandatory hearing protection signs are displayed or whenever the employee has any doubts as to whether or not hearing protection is required.
- 3.5.5 Hearing protection will be provided to employees at Goldwind USA company expense.

Goldwind USA Site Safety Plan & Procedure	Page 175
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

3.5.6 The type of hearing protection to be used depends on the preference of the prospective user. Ear protectors fall into two main groups:

3.5.6.1 Ear Plugs (Insert Type) – Available in a variety of materials. Plugs must fit properly and remain correctly seated to provide the rated attenuation. Employees should wash their hands prior to handling or inserting earplugs.

3.5.6.2 Ear Muffs – Proper fit is important. Seal must not be compromised by hair or glasses frames.

3.5.7 Disposable hearing protection is designed for one use only and should be disposed of after use. Re-useable earplugs should be cleaned prior to reuse.

4.0 Training

4.1 All employees required to wear PPE will participate in initial PPE training, which will cover the following topics, at minimum:

- When PPE is necessary,
- What PPE is necessary,
- How to properly put on, take off, adjust and wear PPE,
- The limitations of the PPE, and
- The proper care, maintenance, useful life and disposal of the PPE.

4.2 Personnel utilized to evaluate and select PPE will be provided with the training necessary to perform their duties. Qualified vendors may be used to provide various PPE options and guidance on proper use of the equipment they provide.

5.0 Auditing

5.1 The Goldwind USA designated EHS coordinator will conduct an annual audit of the facility's PPE program.

5.2 Program updates will be made consistent with the assessment findings, employee feedback, injuries and illnesses and regulatory requirements.

6.0 Responsibilities

6.1 Site Manager shall:

6.1.1 Ensure that this Personal Protective Equipment program is implemented at their site,

6.1.2 Verify that the required use of PPE is enforced,

Goldwind USA Site Safety Plan & Procedure	Page 176
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

6.2 EHS Coordinator shall:

- 6.2.1 Implement the PPE program,
- 6.2.2 Verify that the actual quantity of PPE available covers the PPE required to perform all job tasks, as identified in the JSA and PPE hazard assessment,
- 6.2.3 Verify that the PPE in stock and currently in use is of the appropriate type and size as identified by the individual hazard assessments,
- 6.2.4 Ensure that the PPE that requires controlled access is managed by a properly trained person,
- 6.2.5 Ensure that areas that have PPE requirements are properly identified with signs,
- 6.2.6 Ensure that all employees required to wear PPE participate in PPE training, and
- 6.2.7 Complete, and update on an annual basis, the site-specific information in **Appendix A**.

6.3 All Employees shall:

Use PPE when required by regulation or this procedure, inspect PPE prior to use, maintain PPE in a safe and clean working condition and replace PPE if necessary.

7.0 References

GUSA EHS-13 Job Safety Analysis Procedure
GUSA EHS-3 Confined Space Entry Procedure
GUSA EHS-14 LOTO & Electrical Safety Procedure
GUSA EHS-7 Fall Protection Procedure
GUSA EHS-11 Hot Work Procedure

8.0 Appendices

Appendix A Working directive guidelines for PPE use in WTGs

Goldwind USA Site Safety Plan & Procedure	Page 177
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

APPENDIX A

Goldwind USA

SITE SPECIFIC PERSONAL PROTECTIVE EQUIPMENT INFORMATION

Name and Location of Site: _____

Name of Site Manager: _____

Name of EHS Coordinator: _____

List the person responsible for the distribution of the following PPE and the storage location:

Responsible Person: _____

Storage Location: _____

Controlled PPE: (specify type, color sizes etc)

Fall protection equipment (see procedure, Fall protection):

Electrical Safety Gloves: _____

Respirator cartridges: _____

Uncontrolled PPE: (specify type, color, sizes etc)

Head Protection (Hard Hats): _____

Hand Protection (Gloves): _____

Body Protection (Tyvek Suits, Aprons): _____

Cold Weather Body Protection: _____

Special Foot Protection: _____

Eye/Face Protection: _____

Hearing Protection: _____

Information Completed By: _____ Date: _____

Goldwind USA Site Safety Plan & Procedure	Page 178
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

TOWER RESCUE AND EMERGENCY RESPONSE

GUSA EHS-17

1.0 Purpose and Scope

1.1 Potential emergency events may present the need for the expeditious evacuation of towers under a variety of emergency situations. It should be recognized that local emergency responders can not be exclusively relied upon to facilitate a rescue given the unique nature of the work environment as well as the remote settings of Wind Tower Generators (WTG) operational sites. Given these two concerns, local emergency responders should be called in to assist in an emergency evacuation, however designated personnel shall be prepared to serve as the primary rescue team. All WTG personnel shall be trained in the use of the Goldwind USA recommended Tower Evacuation System (TES). Only trained personnel shall be authorized to operate the WTG Rescue System. Goldwind USA is required to designate qualified personnel to serve as the Incident Commander during a rescue operation. The Incident Commander will coordinate rescue operations with local emergency providers as needed.

1.2 *An important aspect for tower rescue is the treatment of suspension trauma. Suspension trauma can occur when an individual is left hanging from their harness for any given amount of time when blood circulation is cut off or restricted to the legs. Suspension trauma can leave de-oxygenated blood pooled in the legs and if this blood is reintroduced to the body too quickly, oxygenated blood levels can be drastically reduced in the body core and brain resulting in shock that can be fatal. It is of great importance that medical personnel are told that anyone being lowered is likely to have suspension trauma and needs to be treated as such. General treatment of suspension trauma includes:*

- 1.2.1** *Positioning the victim in an upright seated position for 5-10 minutes*
- 1.2.2** *Next, lower the upper body to an inclined position with the back at no more than a 60% incline to horizontal for another 10-15 minutes.*
- 1.2.3** *After this lower the victim into a flat horizontal position for transport to a emergency care facility for evaluation.*

Failure to this procedure can result in inducing shock to the victim that can result in death.

Goldwind USA Site Safety Plan & Procedure	Page 179
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

2.0 Primary Tower Evacuation Procedure

2.1 The primary means of evacuation from the WTG is to descend the tower ladder way as per normal safe climbing procedures.

2.2 The secondary means of evacuation covered in this procedure are to be used only in the event that the primary means is infeasible. Infeasibility would include a fire down tower that blocks the ladder way or a medical evacuation of a unresponsive victim or a victim that could not climb the ladder without assistance due to the severity of their injuries

3.0 Secondary Tower Evacuation Procedures

3.1 The recommended secondary means of evacuation from the WTG is explained in the following matrix:

Situation	Evacuation Method
#1 Fire at the base of the tower	Controlled descent, outside of tower, from Hub via TES
#2 Fire in Nacelle, worker in Hub	Controlled descent, outside of tower, from Hub via TES
#3 Injured victim, responsive or unresponsive, requiring assistance in evacuation from either Nacelle, Tower Decks, or Ladder	Assisted controlled descent, inside tower, via TES through tower hoist access way or ladder way
#4 Injured victim, responsive or unresponsive, requiring assistance in evacuation from Hub assembly or top of Nacelle	Extrication from hub, possibly including use of a Yates Spec Pak stretcher, Assisted controlled descent, inside tower, via TES through tower hoist access way or ladder way
#5 Fall victim, responsive, suspended off Nacelle	TES lowered to victim from top of nacelle Victim attaches TES to Back D-Ring Victim hoisted back up to Nacelle
#6 Fall victim, unresponsive, suspended off Nacelle	Rescuer utilizes a rescue hitch attached to the suspended victim's lanyard near the attachment point. Utilizing the TES the victim is hoisted approximately 6 inches to provide slack in the lanyard attachment hook-anchor connection. The victim's lanyard is then disconnected from the

Goldwind USA Site Safety Plan & Procedure	Page 180
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

	anchor point allowing the rescuers to lower the victim to the ground by means of the TES
--	--

3.2 Additional equipment utilized in support of this procedure

- 3.2.1 Full Body Harness
- 3.2.2 Approved anchor points
- 3.2.3 First aid equipment
- 3.2.4 Fire Extinguishers
- 3.2.5 Radio communication devices

Authorized users shall be properly trained and in healthy condition as not to pose a danger to themselves or others while performing the rescue.

4.0 Maintenance and Care of TES Components

- 4.1 All rescue equipment shall be inspected as instructed below on a monthly basis, after use for training purposes and after any rescue use. Any item failing inspection or subjected to shock loading or impact loading shall be removed from service immediately.

5.0 Emergency Notification and Communications

- 5.1 When a situation occurs that warrants the evacuation or assisted evacuation through use of tower rescue the reporting party (RP) should immediately notify emergency responders:

- 5.1.1 Type of emergency (fire, medical)
- 5.1.2 Location of emergency- Turbine # and location in turbine.
- 5.1.3 Status of victim (if applicable) - Conscious, unconscious, bleeding, in shock, etc.
- 5.1.4 Need of EMS- Urgent (needed up-tower) or Non-urgent (needed at base for patient delivery).

After the call has been made to local emergency response provider (LERP) a designated person should meet the LERP at the predetermined point on site for escort to the emergency location.

6.0 Tower Fire Emergency Evacuation Procedure

The primary means of egress shall always be the ladder.

- 6.1 When a situation occurs that warrants evacuation from a tower due to fire, time will be of the essence and calm action must be taken to escape without

Goldwind USA Site Safety Plan & Procedure	Page 181
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

injury. If escape by ladder descent is not possible the follow procedures will be utilized:

6.2 Self-evacuation from the Hub or Nacelle

- 6.2.1** Proceed as per normal safe climbing methods, 100% tie off, to the top of the nacelle with the TES. Attach the anchor end of the TES to a suitable anchor point such as a turbine plate anchor. These anchors must not be in a location where they will be exposed to fire during the evacuation
- 6.2.2** Connect the attachment end TES to the Front-Chest D-Ring of the harness.
- 6.2.3** Deploy the evacuation rope, ensuring that it clears all obstructions, straight to the ground.
- 6.2.4** Disengage your standard fall protection lanyard from the rail anchor
- 6.2.5** Descend the rope. There shall be no more than one (1) person attached to each TES at any time or failure may occur and serious injury or death may occur by the resulting fall.

Upon descending to ground level proceed to the pre-determined safe meeting location.

6.3 Assisted Hub Extraction and Rescue Procedure

- 6.3.1** Should an emergency require implementation of this rescue plan, determine the nature and extent of the injuries to the victim.
- 6.3.2** Next, notify LERP of the need for assistance. Once notification is made deploy the TES.
- 6.3.3** If the victim is non-responsive or injured such that he cannot self evacuate, the rescuers must lower him, attached to the Yates Spec Pac or Rescue Sked.
- 6.3.4** Once victim is on the ground and descent device is removed, LERP should take custody of the victim for stabilizing and transport to appropriate medical facility.

6.4 Suspended Worker Tower Rescue Procedure

- 6.4.1** Should a situation occur where a suspended victim requires rescuing, an immediate emergency notification shall be made as previously detailed.
- 6.4.2** The reporting party shall then deploy the TES.
- 6.4.3** If the victim is responsive and can engage the TES to their back D-ring, the victim is to be hoisted to a secure position.
- 6.4.4** If the victim is non-responsive or injured such that they cannot aid in the rescue, the rescuers must proceed with the procedure detailed below in **7.2.4**. A minimum of two rescuers will be required for this procedure.

Goldwind USA Site Safety Plan & Procedure	Page 182
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

6.5 Rescue of Unresponsive or Injured Suspended Victim off Nacelle

- 6.5.1** Proceed as per normal safe climbing methods, 100% tie off, with the TES to a position above the suspended victim.
- 6.5.2** Connect the anchor attachment end to an appropriate anchor point.
- 6.5.3** Affix a rescue rig connection to the anchor connection end of the victim's lanyard.
- 6.5.4** Connect the attachment end of the TES to the rescue rig.
- 6.5.5** Hoist the victim approximately six (6) inches by means of the TES to point at which enough tension has been removed between his lanyard hook and the anchor point.
- 6.5.6** Disengage the victim's lanyard.
- 6.5.7** Lower the victim to the ground with the TES and follow the first aid protocol as detailed in the Purpose and Scope section of this procedure

7.0 Training

- 7.1** Site Managers are required to ensure that every employee receives appropriate safety training and orientation on this procedure. This training shall be conducted upon hiring and refresher training shall be conducted at a minimum of every six months.

8.0 Responsibilities

8.1 Goldwind USA EHS Coordinator shall:

- 8.1.1** Annually review this procedure and update as necessary.
- 8.1.2** Provide general Fall Protection guidance.
- 8.1.3** Review incident patterns relating to this procedure.

8.2 Site Manager shall:

- 8.2.1** Ensure the implementation of this Fall Protection program.
- 8.2.2** Use these procedure guidelines to minimize fall hazards when assigning work activities to site employees.
- 8.2.3** Re-enforce to all workers the required use of 100% fall protection when working at elevations.
- 8.2.4** Verify employees are complying with this procedure.

Goldwind USA Site Safety Plan & Procedure	Page 183
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

WTG TOWER CLIMBER EVALUATION

GUSA EHS-18

Instructions: As a prerequisite to climbing a Goldwind USA WTG, all climbing candidates are required to successfully complete the following climber evaluation.

As a pre-condition of approval, the climbing candidate must acknowledge that he/she is in good health and physically fit to climb the tower ladder. Pre-existing medical conditions that may preclude climbing may include but not be limited to:

- Heart disease
- Respiratory ailments including but not be limited to emphysema, chronic obstructive pulmonary disorder (COPD), asthma
- Orthopaedic injuries including but not limited to rotator cuff, elbow, hand, knee and or ankle injuries or conditions
- Acrophobia (fear of heights)
- Claustrophobia (fear of enclosed spaces)

These are examples of medical conditions that may be aggravated by the stress of climbing a ladder that ranges to 100 meters in height. The prospective climber must attest that he/she has been made aware of the rigors and potential risks associated with climbing the wind tower and that they are physically fit to do so.

Climber Candidate	Trainer	Date
-------------------	---------	------

Location

Climbing Candidate Evaluation:

1.	The candidate has been instructed on the proper inspection, adjustment and fit of the harness and lanyard(s)	(Trainer Initials)
2.	The candidate has been instructed on the proper method for climbing the ladder and the proper use of the ladder climbing system	
3.	The candidate has been instructed on the designated attachment/ anchor points located within the tower, nacelle and nacelle roof	
4.	The candidate has been instructed on the emergency situations that may require the rapid evacuation of the tower, the methods of evacuation and the use for the tower evacuation system.	
5.	The candidate has been instructed on the 100% tie-off requirements at elevated positions within the WTG	
6.	The candidate has demonstrated an comprehensive understanding of these instructions for climbing the WTG	
7.	Evaluator Notes:	

Goldwind USA Site Safety Plan & Procedure	Page 184
Date of Implementation/ Last Revision: 11-1-10	Approved by: B. Lacoste

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

11/16/2015 4:01:53 PM

in

Case No(s). 15-1921-EL-BGA

Summary: Amended Application of 6011 Greenwich Windpark, LLC to Amend its Certificate of Environmental Compatibility electronically filed by Teresa Orahod on behalf of Sally Bloomfield