4.3.4 Report any damaged, defective or malfunctioning respirator to the construction Manager or the site HSE representative immediately.

4.3.5 If the respirator malfunctions while in use, go to a safe area and do not remain in a hazardous atmosphere.

4.3.6 Inspect the respirator and perform the applicable pressure fit tests each time before using the respirator.

4.3.7 Do not disassemble or alter a respirator other than to change cartridges or to clean it.

4.3.8 Do not share or give your respirator to another employee to use.

4.3.9 Remain clean-shaven so that a face piece-to-face seal can be obtained.

4.3.10 Attend the training.

4.4 Tools/Materials

4.4.1 Issue approved respirators ONLY to certified employees.

4.4.2 Be trained to understand the importance of respirator part compatibility and the problems associated with incorrect issuance.

4.4.3 *Maintain adequate supply of required respirators, in all sizes.*

4.4.4 Keep current selection guide on hand for yourself and for certified employees.

5. Procedures

5.1 Job Safety Analysis (JSA)

5.1.1 Each site (projects, service) department will identify and evaluate all workplace respiratory hazards by means of a JSA (DMS# 0008-7897).

5.1.2 The JSA will include a reasonable estimate of employee exposures to the hazards and the identity of each hazard's chemical state and physical form.

5.1.3 The information obtained from the JSA will be used to select and assign respirators to employees.

5.2 Selection of Respirators

5.2.1 The construction manager and site HSE representative, with the assistance of the Trainer, will select respirators by determining whether there is either a potential for employees to be exposed above a Permissible Exposure Limit (PEL) or there is a specific reason that an employee needs such protection.

5.2.2 If the exposure cannot be reduced below the PEL, the construction Manager and site HSE representative, with the assistance of the Trainer, will select a respirator based upon the following: chemical toxicity, maximum expected concentration, oxygen deficiency, chemical warning properties, sorbent limitations, face piece fit, mobility requirements, and type of use (routine, escape, or emergency entry).

5.2.3 The construction manager and site HSE representative, with the assistance of the Trainer, are responsible for selecting the appropriate respirator filters and/or cartridges based on a review of material safety data sheets (MSDSs) and/or other relevant air contaminant data.

5.2.4 Only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) shall be used.

5.2.5 Only filters and/or chemical cartridges matched to expected atmospheric contaminants known to be present at Vestas - American Wind Technology, Inc. facilities will be used.

5.2.6 Air-purifying respirators shall not be used in oxygen deficient atmospheres. Only atmosphere supplying respirators (SCBA, or air-supplied) are to be used under these conditions.

5.2.7 Respirators will not be assigned to individuals who cannot obtain a proper fit or when facial hair prevents obtaining a good face seal.

5.2.8 Consideration must be given to the limitations of the protective device and the work environment in which it will be used.

TABLE 1: RESPIRATOR SELECTION CRITERIA

Type of Exposure:	**Selection Procedure:**
Particulate exposure	Respirators will be selected on the basis of potential oil mist exposure (N, R or P), severity of the inhalation hazard (95%, 99% or 100% efficient), air particulate concentration, and the availability of 21% oxygen.
Vapor and gas exposure	Respirators will be selected on the basis of chemical composition, physical state (vapor or gas), air contaminant concentration, and the availability of 21% oxygen.
Atmospheric oxygen at or below 19.5% or air contaminants Immediately Dangerous to Life or Health (IDLH)	Supplied-air respirators will be selected. Only Grade D breathing air will be used for supplied-air respirators. Only oil-less breathing air compressor or oil-compressor systems provided with carbon monoxide (10 ppm) or high-temperature alarms periodically tested for the presence of carbon monoxide will be used.

5.2.9 The construction Manager and site HSE representative, with the assistance of the Trainer, will rely on the current NIOSH-assigned protection factors (APFs) when selecting respirators.

5.3 Medical Surveillance

5.3.1 *Every employee who is required to wear a respirator, or who requests an air-purifying* respirator, shall be medically evaluated before being fit-tested.

- The construction Manager or the site HSE will ensure each employee has a medical evaluation, using the OSHA respirator medical evaluation questionnaire. A physician or licensed health care professional will make this evaluation.
- Follow-up appointments may be required.

5.3.2 The construction manager or the site HSE representative will provide physician or other licensed health care professional with the following information:

- The type and weight of the respirator each employee will use,
- The duration and frequency of use,
- The expected physical work effort,
- Any other protective clothing and equipment worn,
- Temperature and humidity extremes at the workplace, and
- Air contaminants and concentration levels that each employee may encounter.

5.3.3 The physician or other licensed health care professional clinic may discuss the results of the evaluation with the employee and provide a written determination to the Safety Manager. This determination will not contain confidential medical information, but will include:

- An opinion regarding the employee's ability to tolerate a respirator,
- Any limitations on respirator use,
- Any need for follow-up evaluations, and
- A statement that the employee has been informed of the determination.

5.3.4 If the physician or other licensed health care professional recommends alternative respiratory protection, such as a powered air-purifying respirator, the construction manager or the site HSE representative will comply with the recommendation.

5.3.5 Employees will receive follow-up medical evaluations under the following conditions:

- The employee reports medical signs or symptoms related to respirator use,
- A reevaluation is recommended by a site construction manager, the site HSE representative or the licensed health care provider,
- A fit-test or other program information indicates a need for reevaluation, or
- When changes in the workplace increase respiratory stress on an employee.

5.4 Fit-Testing

5.4.1 All employees using a tight-fitting face piece respirator must pass an appropriate qualitative fit-test (QLFT) or quantitative fit-test (QNFT).

- The Trainer will determine which test is appropriate for each type of respirator.
- Qualitative fit testing shall be performed with the use of irritant smoke or Bitrex and testing procedures shall conform to the protocols found in OSHA 1910.134, Appendix A.
- A qualitative fit-test will be used only to fit-test negative pressure air-purifying respirators that achieve a fit factor of 100 or less.

5.4.2 Employees must be fit-tested before they use a respirator for the first time, whenever they use a different respirator face piece, and after any changes in their physical condition that could affect respirator fit.

5.4.3 Fit-tests will be administered using the employee's assigned respirator or from a selection of respirators set up for fit-testing purposes (for an initial fit-test).

5.4.4 All employees must be fit-tested annually and the results of the tests must be documented.

5.5 Respirator Use

5.5.1 Employees who have beards or other conditions that interfere with the face-to-face piece seal or valve function cannot wear tight-fitting respirator face pieces.

5.5.2 PPE or clothing that interferes with the face-to-face piece seal or valve function is not permitted.

5.5.3 Corrective lenses (contacts) with temple bars or straps that interfere with the face-to-face piece seal cannot be used with any respirator.

5.5.4 Employees shall be instructed on how to perform a positive pressure and negative pressure seal check whenever they don the device.

5.6 Monitoring Respirator Effectiveness

5.6.1 The construction manager or the site HSE representative and/or designated trained representative will monitor and reevaluate the effectiveness of the employees' respirators after any significant changes in work conditions or exposure levels.

5.6.2 Employees must leave the areas in which they wear respirators to wash their faces and their respirator face pieces:

- If they detect face piece leaks or changes in breathing resistance,
- To change respirators, filters, cartridges, or canister elements.

5.6.3 Respirators will not be used to enter IDLH atmospheres. If an IDLH atmosphere is known or suspected, employees will report the condition to their supervisor, but will not enter the area or confined space where the IDLH atmosphere exists.

5.7 Respirator Maintenance and Care

5.7.1 Respirators must be washed, cleaned, sanitized and inspected according to the manufacturer's instructions:

- Before any new respirator is used,
- After each use, and
- When respirators are used for fit testing.

Warm water with a mild detergent is used for cleaning air-purifying respirators. All parts should be allowed to dry thoroughly before reassembling.

5.7.2 Employees must inspect their respirators before they use them and after they clean them. Inspection includes:

- A check of respirator function,
- Tightness of connections,
- Condition of the elastomeric face piece,
- Head straps,
- Valves,
- Connecting tubes, and
- Cartridges, filters or canisters.

5.7.3 Only trained employees can replace worn or deteriorated respirator parts. All repair work, adjustments, and replaced parts must comply with the respirator manufacturer's instructions.

5.7.4 Air-purifying respirators are to be stored by the user in a bag or box in such a way that the device is kept clean and dry away from contamination and sunlight.

5.7.5 Replacement parts, such as filters, cartridges, and valve assemblies, shall be kept in a central location in each department.

5.7.6 Respirators used in emergency situations shall be inspected at least monthly, in accordance with the manufacturer's recommendations, and checked for proper function before and after each use.

5.8 Identity of Filters, Cartridges and Canisters

5.8.1 All filters, cartridges and canisters must be maintained as received from the manufacturer or supplier and be labeled and color-coded with the NIOSH approval label.

5.8.2 The label on a cartridge, filter or canister cannot be removed and must remain legible.

5.8.3 Defective filters, cartridges, and canisters cannot be used and must be removed from service.

5.9 Training

5.9.1 Before any employee wears a respirator for the first time, they must receive and understand training that covers:

- What the hazard is and why a respirator is necessary,
- How improper fit, use or maintenance can compromise the protective effects of the respirator,
- The respirator's capabilities and limitations,
- How to use the respirator in emergency situations, including situations in which the respirator malfunctions,
- How to inspect, put on, check the seals, and remove the respirator,
- Proper maintenance and storage procedures, and
- How to recognize medical signs and symptoms that may limit or prevent effective use of the respirator.

5.9.2 A person designated by the Trainer and/or designated representative will provide training, which will be fully documented, certifying that the employee understands the concepts presented and has demonstrated how to use and wear the respirator.

5.9.3 The training must give each user an opportunity to handle the respirator; to have it fitted properly; to test the face piece-to-face seal; to wear it in normal air for a trial period; and to wear it in a test atmosphere.

5.9.4 Retraining must be performed at least annually or as deemed necessary by the construction manager, site HSE representative, Trainer and/or designated representative.

5.9.5 Employees who ask to voluntarily use respirators and are permitted to wear them for this purpose must first read the information contained in OSHA 1910.134, Appendix D, Mandatory Information for Employees Using Respirators When Not Required Under the Standard:

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substances does not exceed the limits set by OSHA standards. If Vestas – AWT provides respirators for employee voluntary use, or if employees provide their own respirators, employees must take certain precautions to be sure that the respirator itself does not present a hazard.

Employees shall do the following:

- Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
- Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute of Occupational Safety and Health of the U.S. Department of Health and Human Services certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell the employee what the respirator is designed for and how much it will protect them.
- Do not wear respirator into atmospheres containing contaminants which respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect the employee against gases, vapors, or very small solid particles of fumes or smoke.
- Employees shall keep track of their respirators so that one employee doesn't mistakenly use another employee's respirator.

5.10 Program Evaluation

5.10.1 The construction manager, site HSE representative and/or designated trained representative will evaluate this program annually or as often as necessary to ensure that it remains effective.

5.10.2 The construction manager, site HSE representative and/or designated trained representative will consult employees about respirator fit, selection, proper use and maintenance, and will make periodic workplace observations to confirm that respirators are being used and maintained correctly.

5.11 Recordkeeping

The construction manager, site HSE representative, Trainer and/or their designated representatives will maintain records of non-confidential medical evaluation determinations, fit-testing (DMS 0008-7962), training documentation, and annual inspection audits and make them available to employees and OSHA.

Vestas®

Occupational Noise Exposure Program

Contents

1. Basis

Approximately 16 million workers are exposed to excessive on-the-job noise levels on an annual basis. In addition to causing hearing loss by destroying the inner ear, noise can put stress on other parts of the body causing fatigue and unnecessary psychological stress. This preventable added burden to the body can result in increased injury rates. This poses a serious problem for exposed workers and their employer. The OSHA Occupational Noise Exposure Standard establishes uniform requirements to make sure that the noise hazards associated with all U.S. workplaces are evaluated, and that the hazards associated with high noise are transmitted to all affected workers so that mitigation measures can be instituted.

2. General

Vestas-American Wind Technology will ensure that the noise hazards within our facility are evaluated, and that information concerning the hazards is transmitted to all employees. This standard practice instruction is intended to address comprehensively the issues of: evaluating the potential hazards of noise, communicating information concerning these hazards, and establishing appropriate protective measures for all employees.

3. Responsibility

The Company Safety Manager and/or Safety Representative is responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program. The Safety Manager and/or Safety Representative will develop written detailed instructions covering each of the basic elements in this program, and is the sole person authorized to amend these instructions. Vestas-American Wind Technology has expressly authorized the Safety Manager and/or Safety Representative to halt any operation of the company where there is danger of serious personal injury. This policy includes respiratory hazards.

4. Definitions

Definitions commonly found in the OSHA Occupational Noise Exposure Standard or that relate to the contents of the standard practice instruction.

Word	Definition
Action level	An 8 hour time weighted average of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of fifty percent.
Audiogram	A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.
Audiologist	A professional, specializing in the study and rehabilitation of hearing, which is certified by the American Speech-Language-Hearing Association or licensed by a state board of examiners.

Baseline audiogram	The audiogram against which future audiograms are compared.
Criterion sound level	A sound level of 90 decibels.
Decibel (dB)	Unit of measurement of sound level.
Hertz (Hz)	Unit of measurement of frequency, numerically equal to cycles per second.
Medical pathology	A disorder or disease. For purposes of this instruction, a condition or disease affecting the ear, which should be treated by a physician specialist.
Noise dose	The ratio, expressed as a percentage, of (1) the time integral, over a stated time or event, of the 0.6 power of the measured SLOW exponential time-averaged, squared A-weighted sound pressure and (2) the product of the criterion duration (8 hours) and the 0.6 power of the squared sound pressure corresponding to the criterion sound level (90 dB).
Noise dosimeter	An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.
Otolaryngologist	A physician specializing in diagnosis and treatment of disorders of the ear, nose, and throat.
Representative exposure	Measurements of an employee's noise dose or 8 hour time weighted average sound level that the employers deem to be representative of the exposures of other employees in the workplace.
Sound level	Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit: decibels (dB). For use with this instruction, SLOW time response, in accordance with ANSI S1.4-1971 (R1976), is required.
Sound level meter	An instrument for the measurement of sound level.
Time weighted average sound level	That sound level, which if constant over an 8 hour exposure, would result in the same noise dose as is measured.

5. Regulatory References

OSHA - 29 CFR 1910.95

6. Written Program

Development and maintenance of a written noise exposure program. This standard practice instruction will be reviewed on annual basis and updated as changes in company occur, or as changes are noted to 29 CFR 1910.95 which require revision of this document. Effective implementation of this program requires support from all levels of management within

Vestas-American Wind Technology. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

7. Audiometric Testing Program

Vestas-American Wind Technology will maintain an audiometric testing program in accordance with the following guidelines.

- Vestas-American Wind Technology will establish and maintain an audiometric testing program free of charge for employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels.
- Audio metric tests will be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.
- All audiograms obtained pursuant to this standard practice instruction will meet the requirements of 29 CFR 1910.95, Appendix C: Audiometric Measuring Instruments.
- Vestas-American Wind Technology will provide protection against the effects of noise exposure when the sound levels within our facility exceed those shown in Table 2.1, when measured on the A scale of a standard sound level meter at slow response.

Table 7.1 - PERMISSIBLE NOISE EXPOSURES

Duration per day, hour's	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
0 1/2	110
1/4 or less	115

- When noise levels are determined by octave band analysis, the equivalent A-weighted sound level will be determined by using the appropriate table from 29 CFR 1910.95, appendix 1, equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on the graph shown as Figure G-9, 29 CFR 1910.95 (included as an appendix to this instruction) and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from

the actual A-weighted sound level of the noise, will be used to determine exposure limits from Table 1-1 of this instruction.

- When employees are subjected to sound exceeding those listed in Table 1-1, Vestas-American Wind Technology will administer or have administered by qualified personnel, audiometric examinations, obtain valid audiograms, and ensure proper controls are reviewed and implemented where feasible. If such controls fail to reduce sound levels within the levels of Table 1.1, personal protective equipment will be provided and used to reduce sound levels within the levels of the table.
- If the variations in noise level involve intervals of 1 second or less, it will be considered to be continuous. When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect will be considered, rather than the individual effect of each.
- Exposure to impulsive or impact noise will not exceed 140 dB peak sound pressure level.

8. Hearing Conservation Program

Vestas-American Wind Technology is dedicated to providing a safe and healthful working environment. We believe that safety in all operations and activities is of primary importance. Ultimately however, it is the employee's responsibility to seek assistance when required, and to carry out the job in a safe manner. Vestas-American Wind Technology- will administer a continuing, effective hearing conservation program, as described in the following paragraphs, whenever employee noise exposures equal or exceed an 8 hour time weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures will be computed without regard to any attenuation provided by the use of personal protective equipment.

8.1 An 8-hour time weighted average of 85 decibels or a dose of fifty percent will also be referred to as the action level.

8.2 Monitoring. When information indicates that any employee's exposure may equal or exceed an 8-hour time weighted average of 85 decibels, Vestas-American Wind Technology will implement this monitoring program.

8.2.1 The company will conduct sampling on an "as-needed" basis and will be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.

8.2.2 Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring generally inappropriate, Vestas-American Wind Technology will use representative personal sampling to comply with the monitoring requirements of this instruction unless it can be shown that area sampling produces equivalent results.

8.2.3 All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels will be integrated into the noise measurements.

- Instruments used to measure employee noise exposure will have been calibrated to ensure measurement accuracy.

8.2.4 Monitoring will be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that:

- Additional employees may be exposed at or above the action level.
- The attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet the requirements of paragraph (j) of 29 CFR 1910.95.

8.2.5 *Employee notification.* Vestas-American Wind Technology will notify each employee exposed at or above an 8-hour time weighted average of 85 decibels of the results of the monitoring.

8.2.6 Observation of monitoring. Vestas-American Wind Technology will provide affected employees or their representatives with an opportunity to observe any noise measurements conducted.

8.2.7 Baseline audiogram. Within 6 months of an employee's first exposure at or above the action level, Vestas-American Wind Technology will establish a valid baseline audiogram against which subsequent audiograms can be compared. The company will obtain a valid baseline audiogram within 1 year of an employee's first exposure at or above the action level. Where baseline audiograms are obtained more than 6 months after the employee's first exposure at or above the action level, employees will wear hearing protectors for any period exceeding six months after first exposure until the baseline audiogram is obtained.

- Testing to establish a baseline audiogram will be preceded by at least 14 hours without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.
- Vestas-American Wind Technology will notify employees of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.

8.2.8 Annual audiogram. At least annually after obtaining the baseline audiogram, Vestas-American Wind Technology will obtain a new audiogram for each employee exposed at or above an 8-hour time weighted average of 85 decibels.

8.2.9 Evaluation of audiogram. Each employee's annual audiogram will be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred. An individual trained to technician level may do this comparison. If the annual audiogram shows that an employee has suffered a standard threshold shift, a retest will be accomplished within 30 days and the results considered as the annual audiogram.

8.2.10 Problem audiograms. Vestas-American Wind Technology will ensure that an audiologist, otolaryngologist, or physician review problem audiograms and determine whether there is a need for further evaluation. The reviewer will be provided the following information:

- The baseline audiogram and most recent audiogram of the employee to be evaluated.
- Measurements of background sound pressure levels in the audiometric test room, (if the testing was not conducted at the reviewers facility).
- Records of audiometer calibrations, (if the testing was not conducted at the reviewers facility).

8.2.11 Follow-up procedures. If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift has occurred, the employee will be informed of this fact in writing, within 21 days of the determination.

8.2.12 Standard threshold shift. A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F, 29 CFR 1910.95: Calculation and Application of Age Correction to Audiograms. Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, Vestas-American Wind Technology will ensure that the following steps are taken when a standard threshold shift occurs:

- Employees exposed or potentially exposed to high noise will be fitted with hearing protectors, trained in their use and care, and required to use them. For known high noise job assignments employees will be fitted and trained prior to job assignment.
- Employees already using hearing protectors will be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
- Employees will be referred for a clinical audiological evaluation or an ontological examination, as appropriate, if additional testing is necessary or if it is suspected that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
- Employees will be informed of the need for an ontological examination if a medical pathology of the ear that is unrelated to the use of hearing protectors is suspected.
- If subsequent audiometric testing of an employee whose exposure to noise is less than an 8 hour TWA of 90 decibels indicates that a standard threshold shift is not persistent, Vestas-American Wind Technology:
  - Will inform the employee of the new audiometric interpretation.

- May discontinue the required use of hearing protectors for that employee.

8.2.13 Revised baseline. An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist, otolaryngologist or physician who is evaluating the audiogram determine that:

- The standard threshold shift revealed by the audiogram is persistent.
- The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

8.2.14 Audiometric test requirements. Audiometric tests conducted on employees of Vestas-American Wind Technology will be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz. Tests at each frequency will be taken separately for each ear.

- Audiometric tests will be conducted with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used in accordance with, American National Standard Specification for Audiometers, S3.6-1969.
- Pulsed-tone and self-recording audiometers, if used, will meet the requirements specified in Appendix C, 29 CFR 1910.95: Audiometric Measuring Instruments.
- Audiometric examinations will be administered in a room meeting the requirements listed in Appendix D, 29 CFR 1910.95: Audiometric Test Rooms.
- Audiometer calibration. The functional operation of the audiometer will be checked before each day's use by testing a person with known, stable hearing thresholds, and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds. Deviations of 10 decibels or greater require an acoustic calibration.
- Audiometer calibration will be checked acoustically at least annually in accordance with Appendix E: Acoustic Calibration of Audiometers. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 decibels or greater require an exhaustive calibration.
- An exhaustive calibration will be performed at least every two years in accordance with sections 4.1.2; 4.1.3; 4.1.4.3; 4.2; 4.4.1; 4.4.2; 4.4.3; and 4.5 of the American National Standard Specification for Audiometers, S3.6-1969. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration.

8.3 Hearing protectors. Vestas-American Wind Technology will make hearing protectors available to all employees exposed to an 8-hour time weighted average of 85 decibels or greater at no cost to the employees. Hearing protectors will be replaced at no cost as necessary.

8.3.1 Vestas-American Wind Technology will ensure that hearing protectors are worn:

- By any employee who is required by previous testing to wear personal protective equipment.
- By any employee who is exposed to an 8-hour time weighted average of 85 decibels or greater, and who: has not yet had a baseline audiogram established, or has experienced a standard threshold shift.

8.3.2 Employees will be given the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided.

8.3.3 Vestas-American Wind Technology will provide training in the use and care of all hearing protectors provided to employees.

8.3.4 Vestas-American Wind Technology will ensure proper initial fitting and supervise the correct use of all hearing protectors.

8.4 Hearing protector attenuation. Vestas-American Wind Technology will evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. One of the evaluation methods described in Appendix B: Methods for Estimating the Adequacy of Hearing Protection Attenuation will be used.

8.4.1 Selected hearing protectors will attenuate employee exposure at least to an 8-hour time weighted average of 90 decibels.

8.4.2 For employees who have experienced a standard threshold shift, selected hearing protectors must attenuate their exposure to an 8-hour time weighted average of 85 decibels or below.

8.4.3 The adequacy of hearing protector attenuation will be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. More effective hearing protectors will be provided where necessary.

9. Training Program

Vestas-American Wind Technology will institute a training program for all employees who are exposed to noise at or above an 8-hour time weighted average of 85 decibels, and will ensure employee participation in such program.

9.1 The training program will be repeated annually for each employee included in the hearing conservation program. Information provided in the training program will be updated to be consistent with changes in protective equipment and work processes. Each employee will be informed of the following:

- The effects of noise on hearing.
- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care.
- The purpose of audiometric testing, and an explanation of the test procedures.

9.2 Access to information and training materials. Vestas-American Wind Technology will make available to affected employees or their representatives copies of this standard practice instruction and 29 CFR 1910.95, and will also post a copy in the workplace.

9.2.1 Vestas-American Wind Technology will provide to affected employees any informational materials pertaining to 29 CFR 1910.95 that are supplied by OSHA.

10. Recordkeeping

Exposure measurements. Vestas-American Wind Technology will maintain an accurate record of all employee exposure measurements.

10.1 Audiometric tests. Vestas-American Wind Technology will retain all employee audiometric test records. This record will include as a minimum:

- Name and job classification of the employee.
- Date of the audiogram.
- The examiner's name.
- Date of the last acoustic or exhaustive calibration of the audiometer.
- Employee's most recent noise exposure assessment.
- Vestas-American Wind Technology will maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.

10.2 Record retention. Vestas-American Wind Technology will retain audiometric and related records for at least the following periods.

10.2.1 Noise exposure measurement records will be retained for two years.

10.2.2 Audiometric test records will be retained for the duration of the affected employee's employment.

10.3 Access to records. All records cited in this standard practice instruction will be provided upon request to employees, former employees, representatives designated by the individual employee, and representatives of OSHA. The provisions of 29 CFR 1910.20 apply to access to records under this section.

10.2 Transfer of records. If Vestas-American Wind Technology ceases to do business, the records will be transferred to the successor employer and maintained by the successor employer. Should the company cease to function entirely the records will be provided to the respective employees, or as required by current law.

11. Appendices

11.1 Appendix A, 29 CFR 1910.95 Noise Exposure Computation

Computation of Employee Noise Exposure

- When the sound level, L, is constant over the entire work shift, the noise dose, D, in percent, is given by: D = 100 C/T where C is the total length of the work day, in hours, and T is the reference duration corresponding to the measured sound level, L, as given in Table G-16a below or by the formula shown as a footnote to that table.
- When the work shift noise exposure is composed of two or more periods of noise at different levels, the total noise dose over the workday is given by:

$$D = 100\ (C1/T1+C2/T2 + \ldots + Cn/Tn),$$

- Where Cn indicates the total time of exposure at a specific noise level, and Tn indicates the reference duration for that level as given by Table G-16a. The eight hour time weighted average sound level (TWA), in decibels, may be computed from the dose, in percent, by means of the formula: TWA = 16.61 $\log_{10}$ (D/100)+90. For an eight-hour work shift with the noise level constant over the entire shift, the TWA is equal to the measured sound level.

Table G-16a

A-weighted sound level, L (decibel)	Reference duration, T (hour)	A-weighted sound level, L (decibel)	Reference duration, T (hour)
80	32.0	106	0.87
81	27.9	107	0.76
82	24.3	108	0.66
83	21.1	109	0.57
84	18.4	110	0.5
85	16.0	111	0.44
86	13.9	112	0.38
87	12.1	113	0.33
88	10.6	114	0.29
89	9.2	115	0.25
90	8.0	116	0.22
91	7.0	117	0.19
91	6.1	118	0.16
93	5.3	119	0.14
94	4.6	120	0.125
95	4.0	121	0.11
96	3.5	122	0.095
97	3.0	123	0.082
98	2.6	124	0.072
99	2.3	125	0.063
100	2.0	126	0.054
101	1.7	127	0.047
102	1.5	128	0.041
103	1.3	129	0.036
104	1.1	130	0.031
105	1.0		

In the above table, the reference duration, T, is computed by

$$T = \frac{8}{2^{(L-90)/5}}$$

where L is the measured A-weighted sound level.

Conversion Between "Dose" and "8-Hour Time-Weighted Average" Sound Level

- *Compliance will be determined by the amount of exposure to noise in the workplace.* The amount of such exposure will usually be measured with an audiodosimeter, which gives readout in terms of "dose." Dosimeter readings can be converted to an "8 hour time weighted average sound level." (TWA).
- In order to convert the reading of a dosimeter into TWA, see Table A-1, below. This table applies to dosimeters that are set by the manufacturer to calculate dose or percent exposure according to the relationships in Table G-16a. So, for example, a dose of 91 percent over an eight-hour day results in a TWA of 89.3 dB, and, a dose of 50 percent corresponds to a TWA of 85 dB.
- If the dose as read on the dosimeter is less than or greater than the values found in Table A-1, the TWA may be calculated by using the formula: TWA = 16.61 $\log_{10}$ (D/100)+90 where TWA = 8 hour time weighted average sound level and D = accumulated dose in percent exposure.

Table A-1

Conversion From "Percent Noise Exposure" or "Dose" to "8-Hour Time-Weighted Average Sound Level" (TWA)

Dose or percent noise exposure	11.2 TWA
10	73.4
15	76.3
20	78.4
25	80.0
30	81.3
35	82.4
40	83.4
45	84.2
50	85.0
55	85.7
60	86.3
65	86.9
70	87.4
75	87.9
80	88.4
81	88.5
82	88.6
83	88.7
84	88.7
85	88.8
86	88.9
87	89.0
88	89.1
89	89.2
90	89.2
91	89.3
92	89.4
93	89.5
94	89.6
95	89.6
96	89.7
97	89.8
98	89.9
99	89.9
100	90.0
101	90.1
102	90.1

Dose or percent noise exposure	11.2 TWA
103	90.2
104	90.3
105	90.4
106	90.4
107	90.5
108	90.6
109	90.6
110	90.7
111	90.8
112	90.8
113	90.9
114	90.9
115	91.1
116	91.1
117	91.1
118	91.2
119	91.3
120	91.3
125	91.6
130	91.9
135	92.2
140	92.4
145	92.7
150	92.9
155	93.2
160	93.4
165	93.6
170	93.8
175	94.0
180	94.2
185	94.4
190	94.6
195	94.8
200	95.0
210	95.4
220	95.7
230	96.0

Dose or percent noise exposure	11.2 TWA
240	96.3
250	96.6
260	96.9
270	97.2
280	97.4
290	97.7
300	97.9
310	98.2
320	98.4
330	98.6
340	98.8
350	99.0
360	99.2
370	99.4
380	99.6
390	99.8
400	100.0
410	100.2
420	100.4
430	100.4
440	100.7
450	100.8
460	101.0
470	101.2
480	101.3
490	101.5
500	101.6
510	101.8
520	101.9

Dose or percent noise exposure	11.2 TWA
530	102.0
540	102.2
550	102.3
560	102.4
570	102.6
580	102.7
590	102.8
600	102.9
610	103.0
620	103.2
630	103.3
640	103.4
650	103.5
660	103.6
670	103.7
680	103.8
690	103.9
700	104.0
710	104.1
720	104.2
730	104.3
740	104.4
750	104.5
760	104.6
770	104.7
780	104.8
790	104.9
800	105.0

11.2 Appendix B, 29 CFR 1910.95 Estimating the Adequacy of Hearing Protector Attenuation

For employees who have experienced a significant threshold shift, hearing protection provided would have an attenuation that is sufficient to reduce employee exposure to a TWA of 85 dB. The following method will be used to estimate the adequacy of hearing protector attenuation.

The Noise Reduction Rating (NRR) developed by the Environmental Protection Agency (EPA) will be used. Only approved hearing protection equipment showing employees of Vestas-American Wind Technology will use the NRR on the hearing protector package. The NRR will be related to an individual employee's noise environment in order to assess the adequacy of the attenuation of a given hearing protector. When using the NRR to assess hearing protector adequacy, one of the following methods will be used:

- **Dosimeter (C-weighted):**
  - Obtain the employee's C-weighted dose for the entire work shift, and convert to TWA.
  - Subtract the NRR from the C-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.
- **Dosimeter (not capable of C-weighted measurements):**
  - Convert the A-weighted dose to TWA.
  - Subtract 7 dB from the NRR.
  - Subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.
- **Sound level meter (set to the A-weighting network):**
  - Obtain the employee's A-weighted TWA.
  - Subtract 7 dB from the NRR, and subtract the remainder from the A-weighted TWA to obtain the estimated A-weighted TWA under the ear protector.
- **Sound level meter (set to the C-weighting network):**
  - Obtain a representative sample of the C-weighted sound levels in the employee's environment.
  - Subtract the NRR from the C-weighted average sound level to obtain the estimated A-weighted TWA under the ear protector.
- **When using area monitoring procedures and a sound level meter set to the A-weighing network:**
  - Obtain a representative sound level for the area in question.

- *Subtract 7 dB from the NRR and subtract the remainder from the A-weighted* sound level for that area.

- **When using area monitoring procedures and a sound level meter set to the C-weighting network:**
  - Obtain a representative sound level for the area in question.
  - Subtract the NRR from the C-weighted sound level for that area.
    - Age Correction Values in Decibels for Males and Females.

Table F-1

Age Correction Values in Decibels for Males
Audiometric test frequency (Hz)

Years	1000	2000	3000	4000	6000
20 or younger	5	3	4	5	8
21	5	3	4	5	8
22	5	3	4	5	8
23	5	3	4	6	9
24	5	3	5	6	9
25	5	3	5	7	10
26	5	4	5	7	10
27	5	4	6	7	11
28	6	4	6	8	11
29	6	4	6	8	12
30	6	4	6	9	12
31	6	4	7	9	13
32	6	5	7	10	14
33	6	5	7	10	14
34	6	5	8	11	15
35	7	5	8	11	15
36	7	5	9	12	16
37	7	6	9	12	17
38	7	6	9	13	17
39	7	6	10	14	18
40	7	6	10	14	19
41	7	6	10	14	20
42	8	7	11	16	20
43	8	7	12	16	21
44	8	7	12	17	22
45	8	7	13	18	23

46	8	8	13	19	24
47	8	8	14	19	24
48	9	8	14	20	25
49	9	9	15	21	26
50	9	9	16	22	27
51	9	9	16	23	28
52	9	10	17	24	29
53	9	10	18	25	30
54	10	10	18	26	31
55	10	11	19	27	32
56	10	11	20	28	34
57	10	11	21	29	35
58	10	12	22	31	36
59	11	12	22	32	37
60 or older	11	13	23	33	38

Table F-2

Age Correction Values in Decibels for Females
Audiometric test frequency (Hz)

Years	1000	2000	3000	4000	6000
20 or younger	7	4	3	3	6
21	7	4	4	3	6
22	7	4	4	4	6
23	7	5	4	4	7
24	7	5	4	4	7
25	8	5	4	4	7
26	8	5	5	4	8
27	8	5	5	5	8
28	8	5	5	5	8
29	8	5	5	5	9
30	8	6	5	5	9
31	8	6	6	5	9
32	9	6	6	6	10
33	9	6	6	6	10
34	9	6	6	6	10
35	9	6	7	7	11
36	9	7	7	7	11
37	9	7	7	7	12

38	10	7	7	7	12
39	10	7	8	8	12
40	10	7	8	8	13
41	10	8	8	8	13
42	10	8	9	9	13
43	11	8	9	9	14
44	11	8	9	9	14
45	11	8	10	10	15
46	11	9	10	10	15
47	11	9	10	11	16
48	12	9	11	11	16
49	12	9	11	11	16
50	12	10	11	12	17
51	12	10	12	12	17
52	12	10	12	13	18
53	13	10	13	13	18
54	13	11	13	14	19
55	13	11	14	14	19
56	13	11	14	15	20
57	13	11	15	15	20
58	14	12	15	16	21
59	14	12	16	16	21
60 or older	14	12	16	17	22

Example to determine Age Correction Values in Decibels for Males and Females:

Audiometric test frequency (Hz)

Employee's age	1000	2000	3000	4000	6000
Age 32	6	5	7	10	14
Age 27	5	4	6	7	11
Difference	1	1	1	3	3

The difference represents the amount of hearing loss that may be attributed to aging in the time period between the baseline audiogram and the most recent audiogram. In this example, the difference at 4000 Hz is 3 dB. This value is subtracted from the hearing level at 4000 Hz, which in the most recent audiogram is 25, yielding 22 after adjustments. Then the hearing threshold in the baseline audiogram at 4000 Hz (5) is subtracted from the adjusted annual audiogram-hearing threshold at 4000 Hz (22). Thus the age-corrected threshold shift would be 17 dB (as opposed to a threshold shift of 20 dB without age correction).

12. Document History

Rev. no.:	Date:	Description of changes
R0	unknown	New document (old AWT number: 31031 R2)
R1	*unknown*	*unknown*
R2	15-Oct-2002	unknown
R3	01-Jan-2010	Content and template updates

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Equipment Defect Record

This form can be used to report defects in any equipment, including Personal Fall Arrest System (PFAS) and emergency descent equipment.

Site: | City, State/Prov.:

Inspector Name: | Signature:

DATE OF THIS INSPECTION: | Date of Next Inspection:

ITEM DESCRIPTION (Include Make/Model #s):

Serial # or Identifying Mark(s):

DEFECT FOUND: ☐ During Scheduled Inspection ☐ During Daily Pre Use Check ☐ *During Use

DESCRIBE DEFECT(s):

CAUSE OF DEFECT *(Probable Cause, or If Defect is the result of an Incident, reference incident report and date):*

REMEDIAL ACTION(s) *(Check any/all that apply):*

DEFECTIVE CONDITION:

☐ CAN BE REPAIRED

☐ Returned to MANUFACTURER for Repair on (date):

☐ Sent to:

for Repair on (date): | Phone:

☐ **CANNOT** BE REPAIRED*

☐ Item *DESTROYED to prevent accidental misuse OR,

☐ Replacement Ordered (date): | PO #:

From:

**** Some Safety Items, once subjected to impact forces, must be immediately removed from service and destroyed.***

Attach original to the appropriate inspection form and file in Site Safety Records for that equipment.
If item is removed from service, note and date on Site Safety Equipment Register.
PPE Issue Record form shall be used to register replacement equipment.

Vestas American Wind Technology 1881 SW Naito Pkwy Suite 100 Portland Oregon - www.vestas.com

Vestas PPE Inspection Record

Name: _____ ☐ Initial Issue

Dept/Title: _____ ☐ Quarterly

Date: _____ ☐ Annual

Site/Location: _____ ☐ Random

☑	Equipment	Present Condition	Stored Properly	Actions Required	Site Supervisor	Date Corrected
	*Fall Arrest Harness (CSA)					
	*Cable Grab w/ Carabiner					
	*Lanyard – double elastic leg and large mouth snap hooks (CSA)					
	Lanyard – 2', for positioning or ladder work					
	Lanyard – Retractable, seatbelt style					
	Gear Bag					
	Gloves, Cotton					
	Gloves, Leather					
	Gloves, Mechanic					
	Gloves, Latex or Nitrile					
	Glove Set, High Voltage					
	Hard Hat, white (CSA)					
	Hard Hat/Chin Strap					
	Hard Hat Liner					
	Petzl Helmet					
	Ball cap liner / Bump cap					
	LOTO – Lock, Tags, Hasp set					
	Respirator, Half Face					
	Respirator Cartridge – Organic Vapor					
	Respirator Cartridge – Particulate					
	Safety Glasses (clear)					
	Safety Glasses (tinted)					
	Safety Glasses (over the lenses)					
	Safety Goggles (clear)					
	Safety Glasses tether					
	Safety Glasses Anti-Fog wipes					
	High Visibility Vest					
	First Aid Kit – personal size					
	Work Uniform					
	Coverall					
	Safety Footwear Policy - review					

CERTIFICATION:

I have conducted a thorough inspection of PPE on the date and location specified above. I have indicated the status of each PPE item required by the tasks at this location and actions necessary to ensure each item is clean, in good repair and suitable for use.

I have also interviewed the employee using the PPE and he/she has demonstrated adequate knowledge and skills in the use of the PPE. They have also expressed their continued commitment to comply with Section 11, Personal Protective Equipment/Personal Use, Code of Safe Practices.

A copy of this inspection will be forwarded to HSE for retention.

Please use this space to express concerns and to make comments and suggestions to improve this procedure.
Use back side of sheet if necessary.

Employee Signature _____ Date _____

Supervisor (Print Name) _____ Signature _____ Date _____

Personal Protective Equipment (PPE) Issue Record

Vestas®

Name: _____ ☐ New Employee / 1st Issue

Dept/Title: _____ ☐ Replace - Lost / Stolen

Date: _____ ☐ Replace - Defective

Site/Location: _____ ☐ Additional Equipment Needed

	Equipment	Qty	Size	Comments
	*Fall Arrest Harness (CSA)			
	*Cable Grab w/ Carabiner			
	*Lanyard - double elastic leg and large mouth snap hooks (CSA)			
	Lanyard - 2', for positioning or ladder work			
	Lanyard - Retractable, seatbelt style			
	Gear Bag			
	Gloves, Cotton, Leather, Mechanic			
	Gloves, Latex or Nitrile			
	Glove Set, High Voltage			
	Hard Hat, white (CSA)			
	Hard Hat/Chin Strap			
	Petzl Helmet			
	Hard Hat Liner			
	Ball cap liner / Bump cap			
	LOTO - Locks, Tags, Hasp set			
	Respirator, Half Face			
	Respirator Cartridge - Organic Vapor			
	Respirator Cartridge - Particulate			
	Safety Glasses (clear) (tinted) circle one			
	Safety Glasses (over the lenses)			
	Safety Goggles (clear)			
	Safety Glasses tether			
	Safety Glasses Anti-Fog wipes			
	High Visibility Vest			
	First Aid Kit - personal size			
	Work Uniform			
	Coverall			

I have been issued the personal protective equipment checked above. I understand that this equipment is the property of Vestas Americas. I understand that I am responsible for this equipment and must return it at the termination of my employment, or this site visit. I understand that failure to comply with these requirements may result in progressive discipline up to and including termination.

Signature _____ Date _____

For new employees:

* Attach FALL ARREST SYSTEM INSPECTION RECORD for equipment accountability (model #, serial #, etc.), file in the Site Safety Records - Employee Orientation.
* If issued after start date, file in Site Safety Records - Inspections - Fall Arrest Systems.
**If replacing defective equipment, file with the Equipment Defect Record and note RFS (removed from service) date on the Site Equipment Register.

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Respirator Fit Test Record

Employee has had a medical review and has no limitations that would prevent the use of respiratory protection equipment:

Signature of employee tested _____ Date _____

A. Employee name (print): _____

Employee No: _____ Employee job title/description: _____

B. Employer name: _____

Location/address: _____

Telephone: _____ Fax: _____

C. Respirator selected:

Manufacturer: _____

Model: _____ NIOSH approval number: _____

D. Conditions: (which could affect respirator fit):

Clean shaven ☐ Facial scar ☐ PPE worn ☐

Comments/other: _____

E. Fit checks:

Negative pressure: ☐ Positive pressure: ☐

F. Fit testing:

Qualitative: Bitrex ☐ Irritant smoke ☐ Saccharine ☐

Quantitative: Fit factor _____ Passed ☐ Failed ☐

G. Employee acknowledgement of test results:

Employee signature: _____ Date: _____

Test conducted by: _____ Date: _____

DISCLAIMER: This respirator fit test(s) training was performed on and by the person listed. The results indicate the performance of the listed respiratory protective device under controlled conditions, as tested on the employee named. Fit testing, as performed, measures the ability of the respiratory protective device to provide protection to the individual tested. The manufacturer or test conductor express or imply no guarantee that this or any identical respiratory protective device will provide adequate protection under conditions other than were present when this test was performed. Improper use, maintenance, or application of this or any other respiratory protective device will reduce or eliminate protection.

Initials of person tested: _____

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Respirator Medical Evaluation

Health Care Professional Respirator Medical Evaluation Questionnaire

Note: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee:

Can you read (circle one)? Yes / No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1:

(Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____
2. Your name: _____
3. *Your age (to nearest year):* _____
4. Sex (circle one): Male/Female
5. Your height: _____ ft. _____ In.
6. Your weight: _____ lbs.
7. Your job title: _____
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____
9. The best time to phone you at this number: _____
10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes / No
11. Check the type of respirator you will use (you can check more than one category):
    a) _____ N, R, or P disposable respirator (filter-mask, non- cartridge type only).
    b) _____ Other type (for example, half- or full-face piece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
12. Have you worn a respirator (circle one): Yes / No –
    If "yes," what type(s): _____

Part A. Section 2:

(Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month: Yes / No
2. Have you ever had any of the following conditions?
   a) Seizures (fits): Yes / No
   b) Diabetes (sugar disease): Yes / No
   c) Allergic reactions that interfere with your breathing: Yes / No
   d) Claustrophobia (fear of closed-in places): Yes / No
   e) Trouble smelling odors: Yes / No
3. Have you ever had any of the following pulmonary or lung problems?
   a) Asbestosis: Yes / No
   b) Asthma: Yes / No
   c) Chronic bronchitis: Yes / No
   d) Emphysema: Yes / No
   e) Pneumonia: Yes / No
   f) Tuberculosis: Yes / No
   g) Silicosis: Yes / No
   h) Pneumothorax (collapsed lung): Yes / No
   i) Lung cancer: Yes / No
   j) Broken ribs: Yes / No
   k) Any chest injuries or surgeries: Yes / No
   l) Any other lung problem that you've been told about: Yes / No
4. Do you currently have any of the following symptoms of pulmonary or lung illness?
   a) Shortness of breath: Yes / No
   b) Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes / No
   c) Shortness of breath when walking with other people at an ordinary pace on level ground: Yes / No
   d) Have to stop for breath when walking at your own pace on level ground: Yes / No
   e) Shortness of breath when washing or dressing yourself: Yes / No
   f) Shortness of breath that interferes with your job: Yes / No
   g) Coughing that produces phlegm (thick sputum): Yes / No
   h) Coughing that wakes you early in the morning: Yes / No

i) Coughing that occurs mostly when you are lying down: Yes / No

j) Coughing up blood in the last month: Yes / No

k) Wheezing: Yes / No

l) Wheezing that interferes with your job: Yes / No

m) Chest pain when you breathe deeply: Yes / No

n) *Any other symptoms that you think may be related to lung problems: Yes / No*

5. Have you ever had any of the following cardiovascular or heart problems?

a) Heart attack: Yes / No

b) Stroke: Yes / No

c) Angina: Yes / No

d) Heart failure: Yes / No

e) Swelling in your legs or feet (not caused by walking): Yes / No

f) Heart arrhythmia (heart beating irregularly): Yes / No

g) High blood pressure: Yes / No

h) Any other heart problem that you've been told about: Yes / No

6. Have you ever had any of the following cardiovascular or heart symptoms?

a) Frequent pain or tightness in your chest: Yes / No

b) Pain or tightness in your chest during physical activity: Yes / No

c) Pain or tightness in your chest that interferes with your job: Yes / No

d) In the past two years, have you noticed your heart skipping or missing a beat: Yes / No

e) Heartburn or indigestion that is not related to eating: Yes/ No

f) Any other symptoms that you think may be related to heart or circulation problems: Yes / No

7. Do you currently take medication for any of the following problems?

a) Breathing or lung problems: Yes / No

b) Heart trouble: Yes / No

c) Blood pressure: Yes / No

d) Seizures (fits): Yes / No

8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)

a) Eye irritation: Yes / No

b) Skin allergies or rashes: Yes / No

c) Anxiety: Yes / No

d) General weakness or fatigue: Yes / No

e) Any other problem that interferes with your use of a respirator: Yes / No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes / No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-face respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you ever lost vision in either eye (temporarily or permanently): Yes / No
11. Do you currently have any of the following vision problems?
    a) Wear contact lenses: Yes / No
    b) Wear glasses: Yes / No
    c) Color blind: Yes / No
    d) Any other eye or vision problem: Yes / No
12. Have you ever had an injury to your ears, including a broken ear drum: Yes / No
13. Do you currently have any of the following hearing problems?
    a) Difficulty hearing: Yes / No
    b) Wear a hearing aid: Yes / No
    c) Any other hearing or ear problem: Yes / No
14. Have you ever had a back injury: Yes / No
15. Do you currently have any of the following musculoskeletal problems?
    a) Weakness in any of your arms, hands, legs, or feet: Yes / No
    b) Back pain: Yes / No
    c) Difficulty fully moving your arms and legs: Yes / No
    d) Pain or stiffness when you lean forward or backward at the waist: Yes / No
    e) Difficulty fully moving your head up or down: Yes / No
    f) Difficulty fully moving your head side to side: Yes / No
    g) Difficulty bending at your knees: Yes / No
    h) Difficulty squatting to the ground: Yes / No
    i) Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes / No
    j) Any other muscle or skeletal problem that interferes with using a respirator: Yes / No

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Respirator Medical Evaluation

Part B

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

16. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes / No
    If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes / No

17. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes / No

    If "yes," name the chemicals if you know them: _____

    _____

18. Have you ever worked with any of the materials, or under any of the conditions, listed below:

    a) Asbestos: Yes / No

    b) Silica (e.g., in sandblasting): Yes / No

    c) Tungsten/cobalt (e.g., grinding or welding this material): Yes / No

    d) Beryllium: Yes / No

    e) Aluminum: Yes / No

    f) Coal (for example, mining): Yes / No

    g) Iron: Yes / No

    h) Tin: Yes / No

    i) Dusty environments: Yes / No

    j) Any other hazardous exposures: Yes / No

    If "yes," describe these exposures: _____

    _____

    _____

19. List any second jobs or side businesses you have:

    _____

20. List your previous occupations:

    _____

21. List your current and previous hobbies:

    _____

22. Have you been in the military services? Yes / No

    If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes / No

23. Have you ever worked on a HAZMAT team? Yes / No

24. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes / No

    If "yes," name the medications if you know them:

    _____

    _____

25. Will you be using any of the following items with your respirator(s)?

    a) HEPA Filters: Yes / No

    b) Canisters (for example, gas masks): Yes / No

    c) Cartridges: Yes / No

26. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

    a) Escape only (no rescue): Yes / No

    b) Emergency rescue only: Yes / No

    c) Less than 5 hours per week: Yes / No

    d) Less than 2 hours per day: Yes / No

    e) 2 to 4 hours per day: Yes / No

    f) Over 4 hours per day: Yes / No

27. During the period you are using the respirator(s), is your work effort:

    a) Light (less than 200 kcal per hour): Yes / No

    If "yes," how long does this period last during the average shift::____ hrs. ____ mins.

    Examples of a light work effort are **sitting** while writing, typing, drafting, or performing light assembly work; or **standing** while operating a drill press (1-3 lbs.) or controlling machines.

    b) Moderate (200 to 350 kcal per hour): Yes / No

    If "yes," how long does this period last during the average shift:: _____ hrs. _____ mins.

    Examples of moderate work effort are **sitting** while nailing or filing; **driving** a truck or bus in urban traffic; **standing** while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; **walking** on a level surface about 2 mph or down a 5-degree grade about 3 mph; or **pushing** a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

    c) Heavy (above 350 kcal per hour): Yes / No

    If "yes," how long does this period last during the average shift: _____ hrs. _____ mins.

    Examples of heavy work are **lifting** a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; **shoveling**; **standing** while bricklaying or chipping castings; **walking** up an 8-degree grade about 2 mph; **climbing** stairs with a heavy load (about 50 lbs.).

28. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes / No

    If "yes," describe this protective clothing and/or equipment:

    _____

29. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes / No

30. Will you be working under humid conditions: Yes / No

31. Describe the work you'll be doing while you're using your respirator(s):

    _____

    _____

32. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

    _____

    _____

33. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

    Name of the first toxic substance: _____

    Estimated maximum exposure level per shift: _____

    Duration of exposure per shift: _____

    Name of the second toxic substance: _____

    Estimated maximum exposure level per shift: _____

    Duration of exposure per shift: _____

    Name of the third toxic substance: _____

    Estimated maximum exposure level per shift: _____

    Duration of exposure per shift: _____

    The name of any other toxic substances that you'll be exposed to while using your respirator: __

    _____

34. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security):

    _____

    _____

Vestas®

PPE Hazard Assessment Certification Form

Name of workplace: _____ **Assessment conducted by:** _____
Workplace address: _____ **Date of assessment:** _____
Work area(s): _____ **PPE Selected By:** _____
Job/Task(s): _____ **Effective Date:** _____

EYES/FACE ☐ **Negligible Hazard** **Can hazard be eliminated without the use of PPE? Yes ☐ No ☐**		
Work-related exposure to: ☐ Airborne dust ☐ Flying particles ☐ Hazardous liquids/chemicals ☐ Intense light ☐ Blood splashes ☐ Other: ____	PPE required to manage hazard: ☐ Safety glasses ☐ Safety goggles ☐ Face Shield ☐ Shading/Filter (#____) ☐ Welding shield ☐ Other: ____	Comments:
HEAD ☐ **Negligible Hazard** **Can hazard be eliminated without the use of PPE? Yes ☐ No ☐**		
Work-related exposure to: ☐ Beams ☐ Pipes ☐ Falling objects ☐ Machine parts ☐ Other: ____	PPE required to manage hazard: ☐ Protective Helmet ☐ Type 1 (top protection) ☐ Type 2 (lateral protection) ☐ Other: ____	Comments:
HANDS/ARMS ☐ **Negligible Hazard** **Can hazard be eliminated without the use of PPE? Yes ☐ No ☐**		
Work-related exposure to: ☐ Hazardous liquids/chemicals ☐ Scrapes, bruise, or cut ☐ Injuries from tools ☐ Extreme heat/cold ☐ Blood (OPIM) ☐ Other: ____	PPE required to manage hazard: ☐ Gloves ☐ Chemical resistance ☐ Liquid/leak resistance ☐ Temperature resistance ☐ Cut resistance ☐ Gauntlet or long necked ☐ Work Gloves ☐ Chemical Protective sleeves ☐ Long sleeves ☐ Other: ____	Comments:
FEET/LEGS ☐ **Negligible Hazard** **Can hazard be eliminated without the use of PPE? Yes ☐ No ☐**		
Work-related exposure to: ☐ Hazardous liquids/chemicals ☐ Heavy falling/rolling objects ☐ Heavy equipment ☐ Exposed electrical wiring or components ☐ Slippery surfaces ☐ Explosive atmospheres ☐ Tools ☐ Other: ____	PPE required to manage hazard: ☐ Closed shoes (e.g. no opened toes or sandals) ☐ Long pants ☐ Safety shoes or boots ☐ Toe protection ☐ Metatarsal protection ☐ Electrical protection ☐ Heat/cold protection ☐ Anti-slip soles ☐ Chemical resistance ☐ Leggings or chaps ☐ Foot-Leg guards ☐ Other: ____	Comments:
BODY/SKIN ☐ **Negligible Hazard** **Can hazard be eliminated without the use of PPE? Yes ☐ No ☐**		
Work-related exposure to: ☐ Hazardous liquids/chemicals ☐ Sharp or rough edges ☐ Extreme heat/cold ☐ Other: ____	PPE required to manage hazard: ☐ Lab Coat ☐ Raingear ☐ Coveralls, Body suit ☐ Apron ☐ Welding leathers ☐ Abrasion/cut resistance ☐ Other: ____	Comments:
BODY/WHOLE ☐ **Negligible Hazard** **Can hazard be eliminated without the use of PPE? Yes ☐ No ☐**		
Work-related exposure to: ☐ Working from heights of 6 feet or more ☐ Working around electrical ☐ Other: ____	PPE required to manage hazard: ☐ Fall Arrest/Restraint: Type: ____ ☐ Arc Flash Fire Resistive clothing Class ____ ☐ Other: ____	Comments:
LUNGS/EARS ☐ **Negligible Hazard** **Can hazard be eliminated without the use of PPE? Yes ☐ No ☐**		
Work-related exposure to: ☐ Irritating dust or particulate ☐ Irritating or toxic gas/vapor ☐ Loud work environment ☐ Noisy machines/tools ☐ Other: ____	PPE required to manage hazard: ☐ Respirator (Cartridge type: ____) ☐ Particulate Mask ☐ Hearing Protection ☐ Other: ____	Comments:

Hazard Assessment Certification for PPE

This tool is used to perform a hazard assessment for the purpose of identifying the type of PPE required within an area, for a task or for a group of tasks. It is to serve as written certification that a hazard assessment has been done as required by CFR1919.132(d)(2). Document your hazard assessment for PPE. Make sure that the blank fields at the beginning of the checklist are filled out.

Instructions:

1. Do a walk through survey of each work area and job/task. Read through the list of work activities in the first column, putting a check next to the activities performed in that work area or job.
2. Read through the list of hazards in the second column, putting a check next to the hazards to which employees may be exposed while performing the work activities or while present in the work area. (For e.g., work activity: climbing turbine ladders; work-related exposure: working from heights of 6 feet or more.)
3. Decide how you are going to control the hazards. Try considering engineering, workplace, and/or administrative controls to eliminate or reduce the hazards before resorting to using PPE. If the hazard cannot be eliminated without using PPE, indicate which type(s) of PPE will be required to protect your employee from the hazard.
4. Make sure that you complete the following fields on the form to certify that a hazard assessment was done:
    - Name of your workplace
    - Address of the workplace where you are doing the hazard assessment
    - Name of person certifying that a workplace hazard assessment was done
    - Date the hazard assessment was done
5. Route completed form to HSE office.
6. If assessor identifies PPE requirements in excess of associated Work Instructions, forward a copy to Tech Support for WI update.

Personal Fall Arrest System Inspection Record

Vestas®

Site: _____ Location: _____

This PFAS assigned to (Print Name): _____

Signature: _____ Date of this Inspection: _____

INSPECTION CHECKLIST *(" ✓" if no defect, or reference item number/letter and describe defect on defect record):*

I.a. CABLE GRAB OR SLEEVE

☐ The manufacturer's information for this piece of equipment, including inspection guidelines, is available for review.

MAKE: _____ MODEL: _____ SERIAL #: _____

BODY:

a. Free of paint, dirt, grease, etc. ☐
b. Markings are clearly readable ☐
c. Engraved arrows clearly visible ☐
d. Articulating surfaces are clean ☐
e. Safety pin sits firmly - is not bent ☐

HANDLE AND CABLE SHOE:

f. No bends, cracks, or deformities ☐
g. Operates freely and smoothly ☐
h. Springs secure and able to pull handle down ☐

ROLLERS AND UPPER ROLLER EXTENSION:

i. Rollers spin freely ☐
j. Roller track does not chafe ☐
k. Spring rotates upper roller extension to climbing position ☐
l. Fasteners secure and tight ☐

LOCKING LEVER:

m. Operates smoothly ☐
n. Springs back into locked position when released ☐

SLEEVE BODY:

o. Normal wear on cable slot surface ☐

I.b. AVANTI SLIDER

☐ The manufacturer's information for this piece of equipment, including inspection guidelines, is available for review.

MAKE: _____ MODEL: _____ SERIAL #: _____

SHOCK ABSORBER SERIAL NUMBER: _____ SHOCK ABSORBER EXPIRATION DATE: _____

SLIDER:

a. Free of paint, dirt, grease, etc. ☐
b. Markings are clearly readable ☐
c. No cracks or deformities ☐
d. Springs are intact and working ☐

SHOCK ABSORBER:

e. Free of paint, dirt, grease, etc. ☐
f. No tears, abrasions, mold, or burns ☐
g. No chemical, heat, or UV damage ☐
h. Energy absorber cover is secure, not torn or damaged ☐

II. HARNESS *(Full body harness, front, back, & side "D" rings - Expected Service Lifetime Per Mfr 2-3 years in service/use):*

☐ The manufacturer's information for this piece of equipment, including inspection guidelines, is available for review.

MAKE: _____ MODEL #: _____ SERIAL #: _____ MFR. DATE: _____

a. Webbing free of cuts, frays, or broken fibers ☐
b. No tears, abrasions, mold, or burns ☐
c. No chemical, heat, or UV damage ☐
d. No pulled or cut stitches *(May indicate impact loading)* ☐
e. Hardware not cracked, corroded, damaged, or distorted ☐
f. Buckles work freely ☐

III. ANCHORAGE CONNECTOR or CARABINER *(Steel, one-handed operation, self-locking/self-closing gates):*

Identifying Marks: _____ Steel or Aluminum (circle one)

a. *No bends, cracks, dents, deformities* ☐
b. *Rivets are not bent, loose or missing* ☐
c. Gate closes & locks automatically after releasing ☐

IV. ENERGY ABSORBENT LANYARD(s) *(With self-locking snap hooks):*

☐ The manufacturer's information for this piece of equipment, including inspection guidelines, is available for review.

MAKE: _____ MODEL #: _____ SERIAL #: _____ MFR. DATE:

a. Webbing free of cuts, frays, or broken fibers ☐
b. No knots, excessive dirt or paint buildup ☐
c. No tears, abrasions, mold, or burns ☐
d. No chemical, heat, or UV damage ☐
e. No pulled or cut stitches *(May indicate impact loading)* ☐
f. Measured length is same (+/-6") as marked on label ☐
g. Energy absorber cover is secure, not torn or damaged ☐
h. Connecting hooks work properly ☐
i. Snap hook gates move freely, lock upon closing ☐
j. Adjusters (if present) work properly ☐

Additional Comments *(Use Safety Equipment Defect Record to promptly address any noted defects)* **:**

_____

_____

_____

Every PFAS should be thoroughly inspected during initial assignment and then quarterly thereafter. When complete, file in Site Safety Records. Use this form to complete and update the Site Safety Equipment Register and Inspection schedule.

Personal Fall Arrest Equipment Register

Vestas®

Site Name/Location ______________________________

Site Supervisor ______________________________

Equipment Description	Manufacturer	Model #	Serial #	Year New	Assigned to:	Insp Date	RFS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Required - Verification (signature) that this list accurately reflects all of the personal fall arrest equipment for this site:

Print or Type Name ______________________ *Signature* ______________________ *Date* ______________

Vestas American Wind Technology 1881 SW Naito Pkwy Suite 100 Portland Oregon · www.vestas.com

Vestas® Tower Climbing Practical Test

(Print Full Name) _____ Date of Test (MM-DD-YR) _____

☐ Prospective Employee ☐ Site Guest ☐ Other: _____

Site/Location: _____ Trainer/Sup'r Name: _____

Turbine Model and ID #: _____ ☐ I have reviewed the **Turbine Safety Instruction** for this wind turbine

The Practical Test for Climbing a Wind Turbine Generator is comprised of a series of stages:

- Stage 1: Review of the potential hazards involved in this test, and site Emergency Response Procedures;
- Stage 2: Review basics of personal protective gear, proper use, fit, and limitations;
- Stage 3: Review of the actual climbing procedure;
- Stage 4: Practical Test – Trainer demonstration followed by trainee duplication – Ascent and descent.

Check or Initial as Training Points are reviewed:

Stage 1: HAZARD AWARENESS	**Trained**	**Stage 2: PPE USE, FIT, LIMITATIONS**	**Trained**
Heights		Climbing Harness Fit	
Wind Speeds		Head Protection, Gloves, Glasses, Boots	
Fatigue		Cable Glider/Avanti Slider to Cable Operation	
Radio or Phone Contacts		Anchorage Device Operation	
Location of ER Equipment			
Stop/Start Turbine (General Awareness)			
PPE for Hazard Abatement			

Stage 3: REVIEW OF CLIMBING PROCEDURE	**Trained**
Cable Glider/Avanti Slider Operation	
Platforms, Transitions, Tie-Offs (signs or yellow)	

Stage 4: PRACTICAL TEST - TOWER ASCENT/DESCENT (Note: The trainer can elect to discontinue this test AT ANY TIME). After each step, trainer will decide if test should continue, or comment why test should terminate. Prior to any climb test, notify Site Operations.

Trainer Attaches Cable Glider or Avanti slider, Climbs 15 feet and Returns – Trainee Duplicates	
Trainer Climbs to First Platform, Transitions to Platform - Trainee Duplicates	
Trainer Climbs to Top Platform, Ties Off, Transitions to Platform, Detaches From Cable Glider – Trainee Duplicates	
Trainer Evaluates Trainee Condition – *Is Trainee Coherent, Fatigued, Dizzy, Anxious*	
Trainer Climbs Ladder to Nacelle – Trainee Duplicates	
Trainer ascends to nacelle roof and ties off at two locations – Trainee Duplicates. Trainer Points Out Nacelle Components Including Tie-Off Points.	
Trainer transitions to last anchor point and Observes, Trainee transition to first/second anchor point. Trainer enters Hub-Trainee Duplicates	
Trainer Reviews Descent Procedures - Trainee Ties Off, Transitions to Ladder, Attaches Cable Glider/Avanti Slider, De-taches From Tie-Off , Climbs to First Platform, Waits – Trainer Observes Then Follows	
Trainee Transitions Past Platform, Descends to Tower Base, Detaches From Cable - Trainer Observes Then Follows	
Trainer and Trainee Remove Climbing Harnesses, Notify Operations, and Re-Start Turbine	
After Return To Site Office Trainer Will Verify That All Equipment Issued For the Purpose of This Test has been Returned	

TRAINER EVALUATION OF TOWER CLIMBING TRAINING/PRACTICAL TEST: ☐ PASSED ☐ FAILED (See Comments)

☐ RETEST DATE: _____ _____
Trainer Signature

Comments: _____

I understand that the opportunity for employment with Vestas Americas at this site as a Wind Turbine Technician is dependent on the successful completion of this test.

_____ _____
Signature Date (MM-DD-YR)

Vestas®

Daily Company Vehicle Inspection Form

DMS 0009-2996 R00
Date:2010-01-01
Page 1 of 1

Daily Vehicle Checklist

Week of:	Complete each item by initialing in box.					
Vehicle #:	Mon.	Tues.	Wed.	Thur.	Fri.	Sat/Sun
Engine Oil and Coolant Levels						
Windshield & Mirrors						
Doors and Windows						
Tires - Wear and Pressure (spare)						
Inspection and License Plate Stickers						
Insurance Card and Registration						
Steering Mechanism						
Check Ground under Vehicle for Fluid Leaks						
First Aid Kit						
Fire Extinguisher						
Warning Reflectors and Flares						
Jack, Lug-wrench and Spare Tire						
Communication Device						
Check for Cleanliness & Damages (Interior & exterior)						
Fuel Level, Gauges, and Dash Warning Lights						
Windshield & Mirrors						
Horn						
Head lights, Tail Lights, Turn Signals, Flashers, Warning Lights						
Defrosters, Heaters and Air Conditioner (when applicable)						
Seat Belts						

Notes:

Signature of Operator:

Vestas® **Crane Safety Program**

Contents

1. Purpose

Vestas-American Wind Technology will ensure that all cranes used within our facilities are evaluated. This standard practice instruction is intended to address comprehensively the issues of: evaluating the associated potential hazards, communicating information concerning these hazards, and establishing appropriate procedures and protective measures for employees.

Vestas-American Wind Technology will establish crane safety operational procedures through the use of this document.

2. Basis

Serious injury or death can be the result of improper use, or use of cranes having defective or poorly maintained components. The Occupational Safety and Health Administration (OSHA) estimates that most of these types of accidents can be prevented if proper safety precautions at job sites are initiated. This poses a serious problem for exposed workers and the employer. The OSHA Crane safety standards establish uniform requirements to ensure that the hazards associated with the use of cranes in U.S. workplaces are evaluated, safety procedures implemented, and that the proper hazard information is transmitted to all affected workers.

3. Responsibility

The Safety Manager and/or Safety Representative is the person authorized to amend these instructions. The Safety Manager and/or Safety Representative is authorized to halt any operation of the company where there is danger of serious personal injury.

4. References

- OSHA - 29 CFR 1910.179 - Overhead and Gantry Cranes
- OSHA - 29 CFR 1926.550 - Cranes and Derricks
- OSHA - 29 CFR 1903.1 (The General Duty Clause)
- CMAA - Spec. No. 70 and 74 Crane Operator's Manual
- ANSI - ANSI/ASME
    - B-30 series Cranes, Derricks, Hoists,
    - B- 30.2 Overhead And Gantry Cranes (Top Running Hoist)
    - B- 30.10 Hooks
    - B- 30.11 Monorail and Underhung Cranes
    - B- 30.16 Overhead Hoists (Underhung)
    - B- 30.17 Overhead & Gantry Cranes (Underhung Hoists)
    - B- 30.18 Stacker Cranes
    - B- 30.21 Manually Lever Operated Hoists

5. Scope

This standard practice instruction applies to cranes used in conjunction with other material handling equipment for the movement of material.

6. Written Program

Vestas-American Wind Technology will review and evaluate this standard practice instruction on an annual basis, or when changes occur to regulatory standards that prompt revision of this document, or when facility operational changes occur that require a revision of this document. Effective implementation of this program requires support from all levels of management within the company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals and objectives.

7. Initial Training

7.1 General

Training shall be conducted prior to job assignment. The employer shall provide training to ensure that the purpose, function, and proper use of cranes is understood by employees and that the knowledge and skills required for the safe application and usage is acquired by employees. This standard practice instruction shall be provided to, and read by, all employees receiving training. The training shall include, at a minimum, the following:

7.1.1 Preoperational inspection requirements of the crane to be used.

7.1.2 Specific operational requirements of the crane to be used.

7.1.3 Principles of crane operations.

7.1.4 Recognition of applicable hazards associated with the work to be completed.

7.1.5 Load determination and balancing requirements.

7.1.6 Procedures for removal of a crane from service.

7.1.7 All other employees whose work operations are or may be in an area where cranes may be utilized shall be instructed in an awareness level concerning hazards associated with cranes.

7.1.8 Physical and mental requirements of operators. Crane operators will be screened for physical and mental impairments that could result in an improper use. Operators will meet, at a minimum, the following requirements before being certified to operate cranes:

- Be drug and alcohol free during any lifting event.
- Be thoroughly trained in all facets of the required lift.
- Have a mature and safe attitude at all times.
- Have good depth perception (essential for load spotting).
- Have good hearing and vision (corrected or uncorrected).
- Have no history of unsafe acts in the workplace.
- Have the ability to react quickly in an emergency.
- Take no medication that will interfere with the operation.
- Understand the requirements for all phases of the lift.

7.2 Crane trainers

7.2.1 Please contact the HSE Department for a list of employees or position titles that will receive training and, as required, serve as crane trainers.

7.3 Retraining

7.3.1 Retraining shall be provided for all authorized and affected employees whenever (and prior to) there being a change in their job assignments, a change in the type of crane used, equipment being lifted, lifting procedures, or when a known hazard is added to the lifting environment.

7.3.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever this employer has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of crane procedures.

7.3.3 The retraining shall reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

8. Safe Operating Practices for Crane Operators

Whenever any crane is used, the following safe practices (at a minimum) shall be observed:

8.1.1 Always check warning devices and signals before use.

8.1.2 Always document and maintain inspection records.

8.1.3 Always ensure cranes shall not be loaded in excess of their rated capacities.

8.1.4 Always ensure the new location supports the weight.

8.1.5 Always keep employees clear of loads about to be lifted and suspended loads.

8.1.6 Always keep suspended loads clear of all obstructions.

8.1.7 Always lockout before maintenance or repairing cranes.

8.1.8 Always position the hook directly over the load before lifting.

8.1.9 Always test brakes by a short lift to ensure control.

8.1.10 Before being lifted, loads will be checked for proper balance.

8.1.11 Follow the manufacturer's recommendations.

8.1.12 Frequently inspect cranes exposed to adverse conditions.

8.1.13 Hands must not be placed between the suspension means and the load during lifting.

8.1.14 Know where you're going to set the load down!

8.1.15 Know your travel path in advance of the lift!

8.1.16 Loads will, in all cases, be properly balanced to prevent slippage.

8.1.17 Move loads only after being signaled by the designated, qualified signaler.

8.1.18 Never allow riders on loads or hooks.

8.1.19 Never allow unauthorized persons to operate cranes.

8.1.20 Never attempt to operate a crane or hoist that is suspected to be unsafe.

8.1.21 Never carry loads over workers.

8.1.22 Never carry loads past workers (they must yield right of way).

8.1.23 Never use cranes that are damaged or defective in any way.

8.1.24 Operators must watch the signalers.

8.1.25 Shock loading is prohibited.

8.1.26 Signalers must keep line-of-sight with the operator.

8.1.27 Signalers must watch the load.

8.1.28 Test all hoist controls and brakes at the beginning of each shift.

9. Safe Operating Practices for Signalers

Whenever any crane is used, the following safe practices (at a minimum) shall be observed:

9.1.1 Ensure that only one person is the designated signaler.

9.1.2 Ensure the operator acknowledges every signal.

9.1.3 Follow the manufacturer's recommendations.

9.1.4 Know the new location will support the weight.

9.1.5 Maintain line-of-sight with the operator.

9.1.6 Operators must watch the signalers.

9.1.7 Plan in advance where the load is going!

9.1.8 Stop the operation any time comprehension is lost.

10. Leaving or Parking Hoists or Cranes

Whenever leaving or parking hoists or cranes, the following safe practices (at a minimum) shall be observed:

10.1.1 Follow the manufacturer's recommendations.

10.1.2 Make a visual check for any dangerous condition.

10.1.3 Place all controls in the "off" position.

10.1.4 Place main power switch in the "off" position.

10.1.5 Raise all hooks to - but not through - limit switches.

10.1.6 Report all cranes that are not in operation immediately.

10.1.7 Report any defects immediately.

10.1.8 Tagout defective equipment immediately.

11. Handling Sling Loads

The following general safe practices (at a minimum) shall be observed when handling sling loads:

11.1.1 Always keep hands and fingers clear of intentioned loads.

11.1.2 Always keep suspended loads clear of all obstructions.

11.1.3 Always keep suspended loads clear of employees.

11.1.4 Always pad or protect slings from sharp edges of the load.

11.1.5 Always think before you affect a load.

11.1.6 Determine the history of the care and usage of the sling.

11.1.7 Determine the number of sling legs (if used) and load requirements.

11.1.8 Ensure you know rated capacity of the sling.

11.1.9 Ensure you know the angle the sling makes with the horizontal line.

11.1.10 Ensure you know the size, weight, and center of gravity of the load.

11.1.11 Follow the manufacturer's recommendations.

11.1.12 Never load in excess of the rated capacity.

11.1.13 Never pull a sling from a suspended load under tension.

11.1.14 Never shorten with knots, bolts or other makeshift devices.

11.1.15 Never use a sling that is damaged in any way.

12. Estimating the Weight of Loads

Lifting will not be conducted until load weights have been determined. When estimating load weights, operators will stay within 10% of the crane's rated capacity (or manufacturer recommendation). Never attempt a load lift based solely on a guess! The following methods may be used to estimate the weight of loads.

12.1.1 Check equipment nomenclature plates.

12.1.2 Check shipping papers.

12.1.3 Consult with the equipment manufacturer.

12.1.4 Estimate weight-using weights of similar loads.

12.1.5 Use a dynamometer.

12.1.6 Use industry standard tables or charts.

13. Personal Protective Equipment

Operators will use the required PPE in the conducting of lifting operations. Protective clothing and equipment considerations:

13.1.1 Ensure PPE is appropriate for the particular hazard(s).

13.1.2 Ensure PPE is kept clean, fully functional, and sanitary.

13.1.3 Maintain all PPE in good condition.

13.1.4 Properly store PPE when not in use.

14. Crane Inspections

Where not otherwise delineated, crane inspections will be conducted in accordance with this section.

14.1 Crane inspectors

Please contact the HSE Department for the following:

- List of employees or position titles that will receive training and, as required, serve as crane inspectors
- List of company qualified inspectors

14.2 Inspection intervals

14.2.1 Daily Inspections

Cranes will be inspected each day before being used; the crane will be inspected in accordance with OSHA, Consensus Standards, and Manufacturer recommendations.

14.2.2 Periodic Inspections

Supervisors will determine and schedule additional inspections periodically during crane use, where service conditions warrant. A thorough periodic inspection shall be made on a regular basis, to be determined on the basis of: frequency of crane use; severity of service conditions; nature of lifts being made; experience gained on the service life of cranes used in similar circumstances; and OSHA, Consensus Standards, and Manufacturer recommendations.

14.2.3 Scheduled Inspections

The Safety Manager and/or Safety Representative will coordinate inspection dates and times with all assigned crane inspectors. The inspections will be conducted on a Periodic basis. Such inspections shall in no event be at intervals greater than once every 12 months.

14.3 Inspection documentation

Crane inspections will be documented. Scheduled inspections will be documented as having been conducted.

14.3.1 Identify items that were inspected.

14.3.2 Show the status of the inspected items.

14.3.3 Provide the signature of the inspector.

14.3.4 Show the date.

14.3.5 File it and maintain it!

14.3.6 Review the manufacturer's specific inspection requirements!

14.4 Damaged/Unserviceable cranes

Cranes found to be damaged or unserviceable will be immediately removed from service.

15. Daily Checks

The following items (at a minimum) shall be checked prior to use of any crane:

15.1.1 Check for air or hydraulic fluid leakage.

15.1.2 Check for load capacity stenciling on both sides of unit.

15.1.3 Check for twisted, broken or kinked cables or chains.

15.1.4 Check the operation of the crane, controls, and movement.

15.1.5 Inspect for deformed, cracked, or stretched hooks.

15.1.6 Inspect for serviceable safety latches.

15.1.7 Observe correct drum spooling as the hook is raised.

15.1.8 Operate empty hook until it actuates the upper limit switch.

15.1.9 Operate hoist and trolley brakes; ensure no excessive coasting.

15.1.10 Visually inspect all units for integrity, leaks, etc.

15.1.11 Review the manufacturer's specific requirements!

16. Monthly Checks

The following items (at a minimum) shall be checked monthly:

16.1.1 Follow any additional recommendations of the manufacturer.

16.1.2 Inspect for twisted, broken or kinked cables or chains.

16.1.3 Inspect hooks for cracks, missing or broken parts.

16.1.4 Measure hooks for deformation or stretching.

16.1.5 Measure lifting chains for excessive stretch, twisting, etc.

16.1.6 Review the manufacturer's specific inspection requirements!

16.1.7 Visually inspect all critical items.

17. Periodic Checks

Review the manufacturer's specific inspection requirements! The following items (at a minimum) shall be checked at periodic inspections (1 to 12 month intervals):

- Interval dependent on the type of activity performed.
- Interval dependent on the severity of service.
- Interval dependent on the environmental conditions.

At a minimum, the inspection should cover:

Chain Or Cable	Reeving	Hook Condition
Electrification	Hoist Drives	Travel Drives
Brakes	Limit Switches	Couplings
Rails	Balance	Controls
Warning Devices	End Stops	Signage

18. Periodic CMAA Inspection Recommendations

Class	Description	Typical schedule

A	Standby or infrequent service	Annually
B	Light service - 2-5 lifts / hr.	Annually
C	Moderate service - 50% capacity, 5-10 lifts / hr.	Annually
D	Heavy service - 50% capacity, 10-20 lifts / hr.	Semiannually
E	Severe service - near capacity, 20+ lifts / hr.	Quarterly
F	Continuous severe service - near capacity and continuous service throughout day	Bi-monthly

Note: Different conditions may suggest different intervals.

19. New, Idle, and Altered, Used Cranes

The use status of cranes will drive specific requirements for periodic maintenance and servicing. The status of the crane will be determined based on manufacturer recommendations and consultation with specific regulatory standards. Prior to initial use or reintroduction into service, cranes will be tested and inspected completely using the criteria applicable to periodic inspections. A report will be generated and kept on file for future reference. The manufacturer's specific requirements will be reviewed!

20. Preventive Maintenance

Preventative maintenance procedures will be developed and used for specific cranes. Maintenance procedures will be determined on the basis of: frequency of crane use; severity of service conditions; nature of lifts being made; experience gained on the service life of cranes used in similar circumstances; and OSHA, Consensus Standards, and Manufacturer recommendations. Typical requirements include:

20.1.1 Adjusting the brakes.

20.1.2 Adjusting the operation of limit switches.

20.1.3 Checking and filling the gear cases to the proper levels.

20.1.4 Cleaning and lubricating the wire rope (cable) and load chain.

20.1.5 Cleaning or replacing pitted or burned electrical contacts.

20.1.6 Cleaning or replacing the air and fluid filters.

20.1.7 Inspecting the operation of all controls and warning systems.

20.1.8 Lubricating the bearings, gears, pinions, linkages, shafts, etc.

20.1.9 Replacing any contaminated oils.

20.2 Preoperational Tests - General

20.2.1 Check for obstructions in the travel path of the crane.

20.2.2 Check upper and lower limit switches.

20.2.3 Ensure all emergency disconnects are known before any test.

20.2.4 Ensure that the manufacturer's recommendations are followed.

20.2.5 If you have a checklist - follow it!

20.2.6 If you're not familiar with the crane's operation, get help.

20.2.7 Inspect all electrical controls for proper operation.

20.2.8 Never unwind the spool completely!

20.2.9 Observe for smooth operation of the components.

20.2.10 Test all controls to determine proper operation.

20.3 Preoperational Tests - Hooks

20.3.1 Replace if deformation or cracks are found.

20.3.2 Check for proper function of the safety latch.

20.3.3 Inspect for twists from the plane of the unbent hook.

20.3.4 Check for proper swivel.

20.3.5 Hook repair is generally not recommended.

20.3.6 Emergency hook repair must be performed only under competent supervision.

20.3.7 After any hook repairs, the hook must be load tested before being returned to normal service.

20.4 Preoperational Tests – Rope

Check for the following:

20.4.1 Broken or worn outside wires.

20.4.2 Corroded or broken wires at end of connections.

20.4.3 Corroded, cracked, bent, worn, or improperly applied end connections.

20.4.4 Reduction in rope diameter (replace if found).

20.4.5 Severe kinking, crushing, cutting or unstringing.

21. Lockout/Tagout Considerations

Lockout/Tagout will be conducted when maintenance or servicing is performed on any crane. Lockout requirements will be determined on the basis of OSHA, Consensus Standards, and Manufacturer recommendations. (Also refer to VAME LOTO Program (DMS 0008-7997).) Typical requirements include:

21.1.1 Review requirements for the individual crane.

21.1.2 Integrate lockout and maintenance requirements.

21.1.3 Ensure training is adequate for level of maintenance.

21.1.4 Ensure written programs are established and reviewed.

21.1.5 Carefully select lockout devices; ask the manufacturer for recommendations.

21.1.6 Do not necessarily assume devices are interchangeable between different types of cranes.

22. History of this Document

Rev. no.:	Date:	Description of changes
00	Unknown	New document
01	Unknown	Unknown
02	24-July-2003	Old AWT Number: 31026. Document number updated. Nature of other changes unknown.
03	01-Jan-2010	Template update.

Vestas

Crane Inspection Form

(To Be Used ONLY If Crane Owner Does Not Have An Inspection Form)

SITE: _____ LOCATION: _____ DATE: _____

EQUIPMENT MAKE/MODEL/ID #: _____

VESTAS INSPECTOR NAME: _____ SIGNATURE: _____

CRANE OWNER/INSPECTOR NAME: _____ SIGNATURE: _____

Mark each item "X" if inspected and NO DEFECTS found, or N/A if Not Applicable

	ITEM	DESCRIPTION / PURPOSE	
*	**OPERATOR**	Has current and valid crane operation certification.	
1	**MFR Operation & Maintenance Manuals**	Manufacturer's operating and maintenance manuals shall accompany all mobile hoisting equipment. These manuals set forth specific inspection, operation and maintenance criteria for each mobile crane and lifting capacity.	
2	**Guarding**	All exposed moving parts such as gears, chains, reciprocating or rotating parts are guarded or isolated.	
3	**Swing Clearance**	Materials for guarding rear swing area.	
4	**High-Voltage Warning**	HV warning signs displaying restrictions and requirements are installed at the operator's station & at strategic locations on the	
5	**Boom Stops**	Shock absorbing or hydraulic type boom stops are installed in a manner to resist boom overturning.	
6	**Jib Boom Stops**	Jib stops are restraints to resist overturning.	
7	**Boom Angle Indicator**	A boom angle indicator readable for the operator station is installed accurately to indicate boom angle.	
8	**Boom Hoist Disconnect, Automatic Boom Hoist Shutoff**	A boom hoist disconnect safety shutoff or hydraulic relief to auto stop the boom hoist when the boom reaches a predetermined high angle.	
9	**Two-Blocking Device**	Cranes with telescoping booms should be equipped with a two-blocking damage prevention feature that has been tested on-site in accordance with manufacturer's requirements. All cranes, hydraulic and fixed boom used to hoist personnel must be equipped with two-blocking devices on all hoistlines intended to be used in the operation. The anti-two blocking device has automatic capabilities for controlling functions that may cause a two-blocking condition.	
#	**Power Controlled Lowering**	Cranes for use to hoist personnel must be equipped for power controlled lowering operation on all hoistlines. Check clutch, chains, and sprockets for wear.	
#	**Leveling Indicating Device**	A device or procedure for leveling the crane must be provided.	
#	**Sheaves**	Almost every wire rope installation has one or more sheaves – ranging from traveling blocks with complicated reeving patterns to equalizing sheaves where only minimum rope movement is noticed. Sheave grooves shall be smooth and free from surface defects, cracks, or worn places that could cause rope damage. Flanges must not be broken, cracked, or chipped. The bottom of the sheave groove must form a close fitting saddle for the rope being used. Lower load blocks must be equipped with close fitting guards.	
#	**Main Hoist and Auxiliary Drums System**	Drum crushing is a rope condition sometimes observed which indicates deterioration of the rope. Spooling is that characteristic of a rope which affects how it wraps onto and off a drum. Spooling is affected by the care and skill with which the first layer of wraps is applied on the drum. **Inspect** (note where applicable, Manufacturer's criteria):	
		Minimum number of wraps to remain on the drum:	
		Condition of drum grooves:	
		Condition of flanges at the end of drum:	
		Rope end attachment:	
		Spooling characteristics of rope:	
		Rope condition:	
#	**Main Boom, Jib Boom, Boom Extension**	Boom jibs, or extensions, must not be cracked or corroded. Bolts and rivets must be tight. Certification that repaired boom members meet manufacturer's original design standard shall be documented. Non-certified repaired members shall not be used until recertified.	
#	**Load Hooks and Hook Blocks**	Hooks and blocks must be permanently labeled with rated capacity. Hooks and blocks are counterweighted to the weight of the overhaul line from highest hook position. Hooks must not have cracks or throat openings more than 15% of normal or twisted off center more than 10° from the longitudinal axis. All hooks used to hoist personnel must be equipped with effective positive safety catches, especially on hydraulic cranes.	
#	**Hydraulic Hoses, Fittings, and Tubing**	Flexible hoses must be sound and show no signs of leaking at the surface or the junction with the metal and couplings. Hoses must not show blistering or abnormal deformation to the outer covering and should have no leaks at threaded or clamped joints that cannot be eliminated by normal tightening or recommended procedures. There should be no evidence of excessive abrasion or scrubbing on the outer surfaces of hoses, rigid tubing, or hydraulic fittings.	
#	**Outriggers**	Outrigger number, locations, types and type of control are in accordance with manufacturer's specifications. Outriggers are designed and operated to relieve all weight from wheels or tracks within the boundaries of the outriggers. If not, the manufacturer's specifications and operating procedures must be clearly defined. Outriggers must be visible to the operator or a signal person during extension or setting.	
#	**Load Rating Chart**	A durable rating chart(s) with legible letters and figures must be attached to the crane in a location accessible to the operator while at the controls. The rating charts shall contain the following:	
		A full and complete range of manufacturer's crane loading ratings at all stated operating radii.	
		Optional equipment on the crane such as outriggers and extra counterweight which effect ratings.	
		A work area chart for which capacities are listed in the load rating chart, i.e. over side, over rear, over front.	
		Weights of auxiliary equipment, i.e. load block, jibs, boom extensions.	
		A clearly distinguishable list of ratings based on structural, hydraulic or other factors rather than stability.	
		A list of no-load work areas.	
		A description of hoistline reeving requirements on the chart or in operator's manual.	

#			
#	**Wire Rope**	Main hoist and auxiliary wire rope inspection should include examining for broken wires, excess wear, external damage from crushing, kinking, cutting or corrosion.	
#	**Cab**	Contains all crane function controls in addition to mechanical boom angle indicators, electric wipers, dash lights, warning lights and buzzers, fire extinguishers, seat belts, horn, and clear unbroken glass.	
#	**Braking Systems**	Truck cranes and self-propelled cranes mounted on rubber-tired chassis or frames must be equipped with a service brake system, secondary stopping emergency brake system and a parking brake system, unless the owner/operator ***can show written evidence*** that such systems were not required by the standards or regulations in force at the date of manufacture and are not available from the manufacturer. The braking systems must have been inspected and tested and found to be in conformance with applicable requirements.	
		Crawler cranes are provided with brakes or other locking devices that effectively hold the machine stationary on level grade during the working cycle. The braking system must be capable of stopping and holding the machine on the maximum grade recommended for travel. The brakes or locks are arranged to engage or remain engaged in the event of loss of operating pressure or power.	
#	**Turntable/Crane Body**	Make sure that the rotation point of a crane's gears and rollers are free of damage and wear, are properly adjusted, and the components are securely locked and free of cracks or damage. The swing locking mechanism must be functional (pawl, pin) and operated in the cab.	
#	**Counterweight**	The counterweight must be approved and installed according to manufacturer's specifications with attachment points secured.	

INSPECTION COMMENTS (* Attach a EQUIPMENT DEFECT FORM to promptly address any noted defects):

When completed, file in Site Safety Records or forward to H&S Office.

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Pre-Lift Job Briefing

Site		Location			
Date (D-MTH-YYYY)		Time		AM / PM (Circle one)	
Weather		Temp (F)			
Wind Speed (M/S)		Gusts From (M/S)		to	

Crane Inspection

Operator Name:		Spotter Name:	
☐ Cable	☐ Hydraulics	☐ Operator Certification Current / Available	Exp. Date:
☐ Boom Test	☐ Capacity and Chart	☐ Equipment Certification Current / Available	Exp. Date:
Designated Signal Person(s):			
☐ Signals by Hand	☐ Signals by Radio / Phone (2 back up radios / phones available)		☐ Signals Reviewed

Rigging

☐ Rigging and lifting devices inspected	☐ Hooks have safety latches
☐ Slings, Straps, Wire Rope Chokers, Spreader Bars, etc. inspected	☐ Load limits verified

Position

☐ Outriggers on Solid Footing	☐ Counterweight Swing Area Barricaded
☐ Escape Routes Identified / Discussed	☐ Pinch Points Identified / Discussed
☐ Boom, Lines & Loads minimum of 10 feet (3.1 meters) from Power lines or ☐ Power Lines De-energized	

Review of Planned Lift (If additional steps are planned – list on back of form - ☐ see back of form)

Task Steps	Assigned to / Affected
1. Conduct test lift with load	Lift Supervisor / Crane Operator
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Crew

☐ Crew members have been oriented to the site		☐ All required PPE is worn correctly	
☐ Crew members have received appropriate training		☐ Crew has reviewed lift plan	
Crew Member (Print)	**Crew Member Signature**	**Crew Member (Print)**	**Crew Member Signature**
1.		5.	
2.		6.	
3.		7.	
4.		8.	

De-brief the Lift (use the back of the form as necessary - ☐ see back of form)

What went well?	Changes / improvements for next time?

File completed form in the Site Safety Records.

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Critical Lift Checklist

DETAILS:

Date of Lift: _____ Time of Lift: _____

Supervisor: _____ Contract No.: _____

Superintendent: _____

Lift Description: _____

_____

Subcontractor: _____ Subcontractor Supervisor: _____

Location of Lift: _____

Major Hoisting Equipment to be Used: _____

_____

Describe Item to be Lifted: _____

_____

REASON FOR CRITICAL LIFT PERMIT (CHECK ALL THAT APPLY):

- ☐ - Load exceeds 80% of the equipment load chart.
- ☐ - Load exceeds 50% of load chart and failure could endanger existing facilities.
- ☐ - Personnel will be lifted in non-emergency situation.
- ☐ - Helicopter used to lift in an industrial setting.
- ☐ - Lift is within the limits of approach to electrical or high pressure gas lines.
- ☐ - Hazardous substances are involved.
- ☐ - Two booms or lifting arrangements required.
- ☐ - Special rigging required.
- ☐ - There is a load transfer required.
- ☐ - Load exceeds 4.5 tonne/5 tons.
- ☐ - Load exceeds 4.5 metres/15 feet from CG.
- ☐ - Wind speed exceeds 20 km/12 miles/hour (Eng'g may be required).
- ☐ - Temperatures are lower than -30° C/-22° F. (Eng'g may be required).
- ☐ - Owner or site supervisor identifies lift as a "Critical Lift".

TOTAL WEIGHT OF LIFT
(INCLUDE SPECIAL RIGGING, FRAMING, AND CONTAINERS, EVERYTHING BELOW THE HOOK):

a) Certified Scale Weight: _____ or

b) Calculated Weight: _____ or

c) Calculated by: _____

d) Weight from Original Equipment Vendor drawings: _____

e) Allowance for sludge, scale, internal or external attachments: _____

Critical Lift Checklist

f) Total weight c + d = _____

g) Size of item to be lifted: _____

h) Distance CG, Centre of Gravity, to end: _____

LIFT RELATIONSHIP:

- Operating Radius: _____
- Boom Length (max. oper.): _____
- Ratio of lift: allowable load: _____ : _____ or _____ % _____
- Clearance between boom and elec./HP gas lines: _____
- Location of underground services: _____
- Clearance to existing structures/facilities: _____

CONDITION OF HOISTING EQUIPMENT AND RIGGING:

Yes ☐ No ☐ - Has equipment been inspected for this lift?
Yes ☐ No ☐ - Are there deficient items in the equipment log that will affect this lift?
Yes ☐ No ☐ - Has the rigging been inspected and approved for this lift?

GUY ANCHORS AND GUYS:

Yes ☐ No ☐ - Are guy lines required?
Yes ☐ No ☐ - Are the guys and anchors in good condition?
Yes ☐ No ☐ - Are there adequate guys and anchors?
Yes ☐ No ☐ - Do foot blocks need to be anchored?

STABILITY OF GROUND AREA:

Yes ☐ No ☐ - Is ground suitable for allowable load?
Yes ☐ No ☐ - Will require mats or additional blocking?
Yes ☐ No ☐ - Are there underground services to protect?

OPERATOR:

Yes ☐ No ☐ - Is evidence of operator competency to operate this equipment under the required conditions available for review?

POWER LINES AND GAS LINES:

Yes ☐ No ☐ - Is there potential risk from electrical or gas lines?
Yes ☐ No ☐ - Have alternative lift positions been considered?
Yes ☐ No ☐ - Can the lines be de-energized?
Yes ☐ No ☐ - Has protection or warnings been put in place?

USE OF PERSONNEL LIFT (SEE STANDARD OPERATING PROCEDURE FALL PREVENTION):

Yes ☐ No ☐ - Have alternative means of access been considered?

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Critical Lift Checklist

Yes ☐ No ☐ - Is this an approved personnel lifting device?
Yes ☐ No ☐ - Is the mechanical/engineering inspection current?
Yes ☐ No ☐ - Has the pre-job inspection been done?
Yes ☐ No ☐ - Are workers competent in the use of fall protection?
Yes ☐ No ☐ - Is wind speed considered acceptable for the lift?
Yes ☐ No ☐ - Is a tag line required?

COMMUNICATION:

Yes ☐ No ☐ - Have the radios been checked and are free of cross talk?
Yes ☐ No ☐ - Have hand signals been reviewed?
Yes ☐ No ☐ - Is it clear who will have overall control of lift?
Name _____

WEATHER CONDITIONS:

Wind speed: _____ Temperature: _____ Visibility: _____

HAZARDOUS SUBSTANCES:

Yes ☐ No ☐ - *Are hazardous substances involved in the lift?*
Describe: _____
_____
_____

Yes ☐ No ☐ - Are MSDS sheets attached to the checklist?

Checklist completed by: _____

Checklist reviewed by: _____

Date: _____ Time: _____

Vestas

Powered Industrial Truck - Fork Lift Inspection

SITE: _____ LOCATION: _____ DATE: _____

INSPECTOR NAME: _____ SIGNATURE: _____

EQUIPMENT MAKE/MODEL/ID #: _____

HOUR METER READING: _____ DATE OF LAST SERVICE: _____

Put "X" in column as applies - select "OK", "RS" for "Requires Service", or "N/A" if Not Applicable. Comment if item needs attention.

	OK	RS	NA	COMMENTS:
Are all name plates, model number, type designation and load capacity markings on this truck clearly legible?				
1 **OVERHEAD GUARD:** Are there broken welds, missing bolts, or damaged areas?				
2 **HYDRAULIC CYLINDERS:** Is there leakage or damage on the lift, tilt, or cylinder attachment functions?				
3 **MAST ASSEMBLY:** Are there broken welds, cracked or bent areas, or worn or missing stops?				
4 **LIFT CHAINS AND ROLLERS:** Is there wear, damage, kinks, rust, or any other sign that lubrication is required?				
Is there squeaking?				
5 **FORKS:** Are they cracked or bent , worn, or mismatched?				
Is there excessive oil or water on the forks?				
6 **TIRES:** (Inspect for embedded particles, large cuts along the circumference, chunks of rubber missing, or bond separation) Are all tires in good repair?				
All lugs in place and secure?				
Is pneumatic tire pressure correct?				
7 **BATTERY:** Are the cell caps and terminal covers in place?				
Is the cable insulation intact?				
State of charge acceptable? (Per hydrometer reading)				
8 **HYDRAULIC FLUID:** Is level correct?				
Any noticeable leaks?				
9 **GAUGES:** Are they all properly working?				
Are readings all normal or acceptable?				
10 **STEERING:** Operates correctly? (No excessive free play)				
If power steering, is the pump working?				
11 **BRAKES:** (Brakes may require service if pedal goes all the way to the floor)				
Do brakes work in reverse?				
Does the deadman seat brake hold when operator rises from seat?				
Does the parking brake work? Truck remains stationary when the parking brake is engaged; holds against slight acceleration.				
12 **LIGHTS:** If equipped with lights, are they working properly?				
13 **HORN:** Horn, whistle, gong, or other device is audible over the normal workplace noise?				
14 **SAFETY SEAT (See BRAKES)**				
15 **LOAD HANDLING ATTACHMENTS:**				

Note: If the truck is equipped with other than factory installed front-end attachments, the truck shall be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.

Is there hesitation when hoisting or lowering the forks, when using the forward or backward tilt, or the lateral travel on the side shift?				

Is there excessive oil on the cylinders?				
Is the tank guard bracket properly positioned and locked down?				

16 **FUEL:**

Is hose frayed, pinched, kinked, bound or damaged in any way?				
Is the connector threaded on squarely and tightly?				

* Propane Odor - If you detect the presence of propane gas odor, turn off the tank valve and report the problem.

17 **ENGINE OIL:**

Is level correct?				

18 **ENGINE COOLANT:**

Is level correct?				

Note: Never remove the radiator cap to check the coolant level when the engine is running or while the engine is hot. Stand to the side and turn your face away. Always use a glove or rag to protect your hand.

19 **TRANSMISSION FLUID:**

Is level correct?				

20 **WINDSHIELD WIPERS:**

Do they work properly?				

21 **SEAT BELTS:**

Are there any, and do they work?				

22 **SAFETY DOOR: (found on stand up rider models)**

Is it in place?				

23 **SAFETY SWITCH: (found on stand up riding tow tractors)**

Is it working?				

24 **HAND GUARDS:** (found on stand up riding tow tractors, walking pallet trucks, walking transtackers)

Are they in place?				

25 **TOW HOOK:**

Does it engage and release smoothly?				
Does the safety catch work properly?				

26 **CONTROL LEVER:**

Does the lever operate properly?				

INSPECTION SUMMARY:

* Attach a SAFETY EQUIPMENT DEFECT FORM to promptly address any noted defects.

*All powered industrial trucks shall be visually inspected **daily before use**; user signature and hours recorded.*
After every 10 hours of use, a formal inspection is required, using this (or other comprehensive form).
At 120 hours, the truck must be professionally serviced.

When complete, file in Site Safety Records - Site Equipment Inspections.

POWERED INDUSTRIAL TRUCK RECORD

(Keep Record With Truck)

PRINT NAME	DATE (mm/dd/yr)	HOURS
	/ /	.
	/ /	.
	/ /	.
	/ /	.
	/ /	.
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PRINT NAME	DATE (mm/dd/yr)	HOURS
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All powered industrial trucks shall be visually inspected ***daily before use,*** *user name and hours recorded. After every 10 hours of use, a formal inspection is required.*

At 120 hours, the truck must be professionally serviced.

Accident Report - Cover Sheet

Vestas

INCIDENT DATE: _____ NOTIFICATION DATE: _____

NOTIFICATION TO (check all that apply - list names - and note method of notification):

VESTAS - Site Specific

- ☐ Site Supervisor: _____
- ☐ Regional Manager: _____
- ☐ Next of Kin: _____
- ☐ Other: _____

VESTAS - Corporate

- ☐ HR / Payroll: _____
- ☐ Service: _____
- ☐ Projects: _____
- ☐ Safety: _____
- ☐ Finance: _____
- ☐ Legal: _____
- ☐ Other: _____
- ☐ Other: _____

NON VESTAS

- ☐ Employer: _____
- ☐ Customer: _____
- ☐ *OHS, OSHA or DOL: _____

* Fatalities or Serious Injury reports to will be made by Safety Manager or Corporate Officer ONLY

- ☐ Worker's Comp or WCB: _____
- ☐ Other: _____

ATTACHMENTS (list any / all additional pages that will comprise this report):

- ☐ Additional pages
- ☐ Witness Statement(s)
- ☐ Post Incident Safety Meeting Attendance Sheet
- ☐ Physician Statement
- ☐ Substance Screening Results
- ☐ Photographs
- ☐ Police Reports
- ☐ Insurance Forms
- ☐ Other: _____

When completed, SCAN and EMAIL TO safety@vestas-awt.com, or FAX to (503) 8327-0249. Attach any additional sheets.
FILE ORIGINAL completed report in Site Safety Records.

Vehicle/Equipment Accident Report

Part One - Operator's Report

I. ACCIDENT INFORMATION - COMPLETE ALL FIELDS THAT APPLY:

DATE OF ACCIDENT: _____ TIME (Military): _____ ☐ ON SITE ☐ OFF SITE

TYPE OF ACCIDENT:

☐ FLEET VEHICLE UNIT NUMBER _____ ☐ RENTAL CO. _____

☐ EQUIPMENT DAMAGE

☐ PROPERTY DAMAGE AREA(S) DAMAGED _____

☐ INJURY - If personal injury resulted from this event, please ALSO complete the Personal Incident Report.

LOCATION OF ACCIDENT: INCLUDE STREET ADDRESS (IF POSSIBLE), CITY AND STATE

DESCRIPTION OF EVENT: (Include additional pages if necessary)

CONDITIONS (Check ALL that apply):

LIGHT CONDITIONS: ☐ DAWN ☐ DAY LIGHT ☐ DUSK ☐ DARK WEATHER: ☐ CLEAR ☐ SNOWING ☐ RAINING ☐ FOG ☐ HEAVY WINDS

ROAD SURFACE: ☐ DRY ☐ WET ☐ ICE ☐ SNOW HIGHWAY: ☐ DIVIDED ☐ UNDIVIDED ___ # OF LANES

SPEED AT TIME OF INCIDENT: _____ POSTED SPEED LIMIT: _____ NUMBER OF PERSONS INVOLVED: _____

REASON FOR DRIVING/OPERATING _____

II. VESTAS EMPLOYEE INFORMATION (Print FULL name): _____

HOME ADDRESS: _____ STATE _____ ZIP _____

DL or ID #: _____ DL STATE: _____ DL EXP. DATE: _____

PHONE NUMBER _____ DATE OF BIRTH _____

III. VEHICLE/EQUIPMENT (Year/Make/Model): _____

VIN/SERIAL #: _____

LICENSE PLATE NUMBER _____ LICENSING STATE/PROVINCE _____

IF RENTAL VEHICLE, LIST RENTAL LOCATION _____ PHONE NUMBER _____

IV. OTHER DRIVERS/VEHICLES/PARTIES INVOLVED

Print FULL NAME, Home Address, Phone Number. If additional parties involved, attach additional sheets as necessary.

DRIVER NAME: _____ OWNER (If different than driver):

ADDRESS: _____ NAME _____

_____ ADDRESS: _____

PHONE: _____ _____

DL ST & #: _____ PHONE: _____

INSURANCE AND VEHICLE INFORMATION

INSURANCE COMPANY _____ YR/MAKE/MODEL: _____

POLICY # _____ VIN# _____

V. POLICE INFORMATION INCIDENT REPORTED ☐ NO ☐ YES REPORT # _____

CITATION ISSUED? ☐ NO ☐ YES IF YES, STATE CHARGE OR ATTACH CITATION _____

OFFICER NAME: _____ BADGE #: _____

STATION ADDRESS: _____ CITY _____ STATE _____

VI. WITNESSES (Print FULL NAME, Home Address, Phone #. Attach additional sheets as necessary):

NAME: _____ NAME: _____

ADDRESS: _____ ADDRESS: _____

PHONE: _____ PHONE: _____

DL #: _____ ST: _____ DL #: _____ ST: _____

WITNESS STATEMENT COMPLETED/ATTACHED? ☐ No ☐ Yes WITNESS STATEMENT COMPLETED/ATTACHED? ☐ No ☐ Yes

VII. DIAGRAM (Provide hand drawn diagram of accident scene. Label vehicles, direction of travel, street names, traffic control elements, etc. Also, indicate NORTH with ARROW):

JOB TITLE: _____ COST CENTER _____ DEPT _____

Vestas Employee Signature Date Signed

Present COMPLETED report to Manager.

Attach pertinent documentation, including photos, police reports, repair estimates, equipment or vehicle records.

Vehicle/Equipment Accident Report

Part Two - Supervisor's Report

I. POST-ACCIDENT INFORMATION

DATE OF SUBSTANCE SCREEN: _____ TIME OF TEST: _____ RESULT: _____

DATE OF HIRE WITH COMPANY: _____ LEVEL OF EXPERIENCE PERFORMING TASK: _____

EMPLOYER'S PREMISES? ☐ Y ☐ N ON THE JOB SITE?: ☐ Y ☐ N OTHER: _____

DID AN EMPLOYEE GET INJURED? ☐ NO ☐ YES - IF YES, COMPLETE AN INCIDENT REPORT

ANY EYE WITNESSES TO THIS EVENT? ☐ NO ☐ YES - IF YES, COLLECT AND ATTACH WITNESS STATEMENTS FROM EACH

NATURE/EXTENT OF INJURY/ILLNESS (Be specific - use additional pages if necessary):

DESCRIBE HOW INCIDENT OCCURRED? (List all objects and substances involved - use additional pages if necessary):

ANY KNOWN PRIOR DEFECTS? ☐ NO ☐ YES - IF YES, LIST:

II. ROOT CAUSE ANALYSIS (Check all that apply):

UNSAFE ACTIONS - (UNSAFE ACTIONS REQUIRE RE-TRAINING AND/OR A WRITTEN WARNING *BEFORE EMPLOYEE RETURNS TO WORK):

☐ IMPROPER TECHNIQUE (SHORT CUT)	☐ OPERATING WITHOUT AUTHORITY	☐ HORSEPLAY
☐ SAFETY RULE VIOLATION	☐ FAILURE TO WARNING DEVICE	☐ PHYSICAL OR MENTAL INPAIRMENT
☐ IMPROPER PPE OR PPE NOT USED	☐ BY PASSING SAFETY DEVICE	☐ FAILURE TO USE PROPER EQUIPMENT
☐ FAILURE TO USE A SPOTTER	☐ WEATHER	☐ OTHER:

EXPLANATION OF ROOT CAUSE ANALYSIS: (Use additional pages if needed)

III. SUPERVISOR'S CORRECTIVE ACTION(S):

DATE	CORRECTIVE ACTION	COMPLETED BY (NAME):
	Mandatory - Post Incident Safety Meeting to review incident	

IV. SITE CODE DESIGNATION:

COST CENTER _____ OPERATIONS ☐ SERVICE ☐ OTHER ☐

CONSTRUCTION MGR / SITE MGR. NAME _____ SIGNATURE _____ DATE: _____

When completed, SCAN and EMAIL signed COPY TO:
Fleet Planner at japfl@vestas.com AND Safety Department at safety@vestas-awt.com.
Attach any additional sheets and attach any pictures of the incident to the email.
FILE ORIGINAL completed report in Site Safety Records.

Vestas

Vestas Americas Transportation Security Plan

Contents

1. Purpose:

Vestas is committed to the safety and security of our employees, the customers we serve and the general public. We all are aware of the reasons that we must remain vigilant to prevent or inhibit the use of our equipment, terminals, or the products we transport by terrorists. We urge all employees to help us implement this plan and to continuously improve our security efforts. Regulations of the United States Department of Transportation require that any employee of this company (including independent contractors) who is a designated "hazmat employee" be trained and familiar with our company's security plan.

2. Scope:

Vestas Americas – All locations

3. Definitions:

Word	Definition
Hazmat Employee	Any person who performs a task or function covered by the regulations of the United States Department of Transportation.

4. References:

Title 49 of the Code of Federal Regulations (United States)

5. General Requirements:

5.1 Personnel Security:

Vestas will implement the following provisions with regard to the employment of the contractors which transport Vestas goods and services. Additionally, the company may (at its discretion) implement some or all of these provisions relevant to the employment of non-driver employees who perform functions regulated by the U.S. Department of Transportation's "Hazardous Materials Regulations" within Title 49 of the Code of Federal Regulations.

5.1.1 Perform detailed background checks on all applicants for any driver or leased operator position.

5.1.2 To the extent possible, check for criminal convictions.

5.1.3 Contact previous employers and references.

5.1.4 Investigate gaps in employment.

5.1.5 To the extent possible, have at least 10 years consecutive employment/education records.

5.1.6 Maintain employee information in a confidential and secure manner, and in compliance with all relevant Federal and state regulations and statutes regarding confidentiality and individual privacy.

5.1.7 Verify that drivers are US citizens or that non-citizens have documentation appropriate to their immigration status.

5.1.8 Ensure drivers have current CDL with appropriate endorsements and another form of identification (i.e. company issued credential; current medical certificate).

5.1.9 Collect company identification card and any security materials when a driver/employee leaves the company. Update websites and lists. Cancel passwords to prohibit computer access by former employees.

5.2 Unauthorized Access:

5.2.1 Vestas management will designate who is in charge of security for the company and at each facility.

5.2.2 Vestas management will conduct security awareness training for all employees, including how to report suspicious incidents or events.

5.2.3 Vestas Site Managers will require all visitors and outside vendors to a terminal to sign in and be identified by a visitor's badge. Designated parking areas for visitor vehicles should be established.

5.2.4 Designated Vestas personnel will perform daily yard checks and equipment reconciliations.

5.2.5 Designated Vestas personnel will remove keys from vehicles not in use and have secure key storage.

5.2.6 All employees should control access to computers, especially those with product or routing information in keeping with Vestas confidentiality rules.

5.2.7 Vestas may develop specific actions for each security level alert that might be set by the Department of Homeland Security, (e.g. no preloading during condition Red)

5.2.8 Vestas may consider use of seals (for manways, product loading and unloading lines, etc.) for certain products or routes.

5.2.9 Vestas will distribute information related to changes in the nation's threat level.

5.2.10 Vestas Management will inspect facility grounds, maintenance areas, and buildings to identify points of possible unauthorized entry to the property. This will be an important consideration, particularly at facilities having more than one point for access and egress.

5.2.11 Periodically, Vestas will test emergency response communications equipment and procedures.

5.3 En Route Security:

5.3.1 Contractors working of behalf of Vestas should not accept business from an unknown party before verifying company legitimacy.

5.3.2 Contractors working of behalf of Vestas should lock vehicles and facility doors at all times and take keys anytime driver is not with vehicle. Ensure windows are closed.

5.3.3 Contractors working of behalf of Vestas should perform "walk around" inspection of vehicle after every stop, including deliveries and breaks. Be sure to look under the trailer and in hose tubes where a device could be attached.

5.3.4 To the extent possible, reduce preloading. Contractors working on behalf of Vestas should designate an area for pre- loaded trailers. Put glad- hand locks or kingpin locks on spotted loaded trailers. Regularly check that area.

5.3.5 Contractors working on behalf of Vestas should develop "parking instructions" for any locations away from Vestas facilities. Look for lighted and fenced areas, visibility, and security.

5.3.6 Contractors working on behalf of Vestas should include security considerations in route selection and times for pick up and delivery. When possible, avoid bridges, tunnels and dense population areas.

5.3.7 Contractors working on behalf of Vestas should minimize driver "down-time" while en route.

5.3.8 Schedule and dispatch with as few required stops as possible.

5.3.9 Contractors working on behalf of Vestas will establish procedures to communicate emergency messages to all facilities and to drivers on the road. Options may include satellite communications systems, cell phones, two-way radios, or scheduled call-in times. Management will include communications procedures for drivers to report an unexpected occurrence with equipment, load, or route.

5.3.10 Contractors working on behalf of Vestas (and other knowledgeable employees) should not discuss any details about their load or pick- up points and destinations with unauthorized personnel, such as over the CB radio or at truck stops.

5.3.11 Contractors working on behalf of Vestas should not pick up hitchhikers or allow any unauthorized personnel in the truck cab.

5.3.12 Contractors working on behalf of Vestas should not stop to help disabled vehicles or motorists. Call local authorities and notify them of anyone needing assistance. Be suspicious of motorists trying to get the driver to pull over for an "alleged" traffic accident. Be especially suspicious of vehicles with three or more people in them.

5.3.13 Contractors working on behalf of Vestas should develop procedure for detecting "late loads." Investigate any late load more than an hour late for a delivery.

5.3.14 Contractors working on behalf of Vestas should not change delivery destination unless authorized by dispatch.

5.3.15 Contractors working on behalf of Vestas should develop a procedure for drivers when being asked to pull over by law enforcement or an unmarked vehicle.

5.3.16 Contractors working on behalf of Vestas may arrange with shippers to schedule teams for long trips with high hazard materials

5.3.17 Contractors working on behalf of Vestas should consult with shippers to ensure security of consignee delivery areas. Request well- lighted and marked delivery area and that customer personnel be available to answer safety or security questions.

5.3.18 All Vestas employees are to report any suspicious events to their supervisors and possibly to local law enforcement based on their observations.

6. History of this Document

Rev. no.:	Date:	Description of changes
00	28-August-08	First Edition
01	01-Jan-2010	Content and template updates

Vestas Americas Control of Hazardous Energy Program

Contents

1. Definitions

Affected Employee: An employee whose job requires operation or use of a machine or equipment on which service or maintenance is performed under lockout/tagout or whose job requires him/her to work in an area in which servicing or maintenance is performed.

Authorized Person: A trained person who can perform lockout in accordance with this program. An Authorized Person can hang his/her personal locks on equipment that has already been locked out by the Person In Charge/Qualified Person.

CONTROL OF HAZARDOUS ENERGY Procedure: The CONTROL OF HAZARDOUS ENERGY Procedure consists of the LOTO Form (Appendix B or DMS# 0013-8299) and a written instruction that describes the safe shutdown, lockout, verification, unlocking, and startup of the equipment.

Control Lock: A non-conductive red lock applied by the Person In Charge to the lockout device. The control lock is the first lock applied and the last lock removed. The purpose of the control lock is to signal to the authorized person that the equipment was locked out by a Person in Charge in accordance with this CONTROL OF HAZARDOUS ENERGY Program.

Danger Zone: The immediate vicinity of a piece of equipment or machinery in which a person could be in danger if said equipment or machinery was to become energized.

Energized: The state of being connected to an energy source or containing residual or stored energy.

Energy Control Coordinator: A LOTO Specialist who has been designated by the Site Manager / Construction Manager to be the person responsible for the administration of the CONTROL OF HAZARDOUS ENERGY Program at the site location.

Energy-Isolating Device: A mechanical device that physically prevents the transmission or release of energy. These include manually operated circuit breakers, disconnect switches, blind flanges, blocks, valves, chains, and similar devices used to block or isolate energy.

Escorted Visitor – Unqualified worker. Must receive a site visitor orientation, cannot perform electrical work and cannot enter into the arc flash or shock boundaries.

Lockout: The placement of a Lockout Device, Lock and associated tag on an Energy-Isolating Device, in accordance with energy control procedures, ensuring that the Energy-Isolating Device and equipment being controlled cannot be operated until the Lockout Device is removed.

Lockout, Group: Requires a written procedure that lists all lockout points. Use of Red control locks for equipment and keys to the control locks are secured within the lock box. All workers must place their personal blue lock on the lockbox prior to performing work.

Lockout Boundary: The safe limits of a given Lockout/Tagout as determined by the lockout points for the equipment and systems to be worked on. All the equipment within the Lockout Boundary is safe to work on.

Lockout Device: A locking mechanism that provides a positive means for rendering an Energy-Isolating Device inoperable. The device may be a padlock alone, or a padlock in combination with a

restraining bar, chain, hasp, or any device that positively prevents the Energy-Isolating Device from being actuated.

Lockout, Individual (Exclusive): Individual/Exclusive Control is only allowed for plug-in equipment with power cords. A lockout is not required as long as the plug is within arm's reach of the individual performing work on the equipment. Where the plug is not within arm's reach of the individual performing work, the plug will be locked out with a suitable device.

Individual/Exclusive Control is allowed on breakers with door-mounted handles, when opening the door defeats the lockout applied to the door handle. When working under this isolation inside of this cabinet, a lockout is not required. If work location moves outside of the cabinet or if it is necessary to leave the location for any reason prior to the work being completed, the door must be closed and the lockout applied.

LOTO: Lockout – Tagout

LOTO Form: The LOTO Form (DMS# 0013-8299) catalogs all lockout points, tagout points and is where the Person In Charge signs off that the lockout is completed. It is found in Appendix B.

LOTO Specialist: A Qualified Person who has received special training in this program, and who is qualified to determine the appropriate Lockout methods and Lockout Boundaries for tasks performed on Vestas wind turbines.

Person In Charge: A Qualified Person designated to be in charge of a particular lockout.

Qualified Person: An Individual who has been trained in the construction, operation and recognition and avoidance of hazards for the equipment to be locked out.

Tagout: The placement of only a tag on an Energy-Isolating Device, where it is not physically possible to place a lock. Restrictions apply.

Vestas Senior Manager: The Site Manager or Construction Manager. Their permission is required for certain activities.

Zero Energy State: The state in which all possible energy sources have been disconnected and/or otherwise rendered inoperable, including stored energy within the piece of equipment or machinery. This requires following the Test-Verify-Test procedure to ensure zero energy. For electrical systems, this is an Electrically Safe Work Condition.

2. Scope and Purpose

2.1 Scope

This program outlines the methods, responsibilities and required employee training for the Lockout/Tagout energy control program for VESTAS AMERICAS (VAME), hereinafter called the CONTROL OF HAZARDOUS ENERGY Program.

2.2 Purpose

The purpose of the CONTROL OF HAZARDOUS ENERGY Program is to ensure that all persons performing work on Vestas wind turbines are fully protected from unexpected energization, startup or the uncontrolled release of energy, which could cause injury to those persons and/or damage to equipment.

WARNING: The procedures covered by this publication must be carried out only by persons who are knowledgeable in the operation and maintenance of wind turbines and in the practice of CONTROL OF HAZARDOUS ENERGY procedures and who have been trained by Vestas as a Person in Charge and/or LOTO Specialist. These instructions are intended only for such persons. They are NOT intended to be a substitute for adequate training and experience in safety procedures for this type of equipment. Failure to obtain the proper training and certification and to observe the precautions described in this CONTROL OF HAZARDOUS ENERGY Program may result in serious injury or death.

2.2.1 This CONTROL OF HAZARDOUS ENERGY Program has been established to prevent the unexpected release of potentially hazardous energy (e.g. mechanical, electrical, hydraulic, thermal, chemical, pneumatic, etc.) during the construction, service, and repair of Vestas wind turbines.

2.2.2 This CONTROL OF HAZARDOUS ENERGY Program is written to meet or exceed the requirements in the following standards:

a) OSHA 29 CFR 1910.147, Control of Hazardous Energy
b) OSHA 29 CFR 1910.333, Selection and Use of Electrical Work Practices
c) OSHA 29 CFR 1910.269 Electric Power Generation, Transmission, and Distribution
d) NFPA 70E, Electrical Safety in the Workplace
e) CSA Z460, Control of Hazardous Energy – Lockout and Other Methods
f) CSA Z462, Workplace Electrical Safety

3. CONTROL OF HAZARDOUS ENERGY Program

3.1 Compliance

3.1.1 ANY PERSON WHO OPERATES A VALVE, SWITCH OR OTHER ENERGY ISOLATING DEVICE TO WHICH A LOCK OR "DO NOT OPERATE" TAG IS ATTACHED WILL BE SUBJECT TO DISCIPLINARY ACTION UP TO AND INCLUDING IMMEDIATE TERMINATION, AND MAY BE SUBJECT TO CRIMINAL PROSECUTION.

3.1.2 The CONTROL OF HAZARDOUS ENERGY Program applies to all personnel, including employees, customers, contractors, inspectors and visitors.

3.1.3 Personnel working where the unexpected energization, start-up, or release of stored energy could occur and cause injury are required to comply with the restrictions and limitations imposed on them during the use of this lockout/tagout procedure. Energy sources include, but are not limited to, electrical, mechanical, pneumatic, and hydraulic.

3.2 Basic Lockout Rules

3.2.1 Do not attempt to operate any switch, valve, or other energy-isolating device when it is locked out other than during the initial check for a zero energy condition.

3.2.2 Prior to performing work, the employee must determine all sources of energy that potentially supply the equipment to be worked on. All sources of energy must be isolated and locked out.

a) **Exception:** Certain work procedures will require the equipment to remain energized in whole or in part. In this case, specific written work instructions must include formal job safety analyses that address the increased risk.

b) **Exception:** Troubleshooting energized systems requires a complete Pre-Task Plan (DMS# 0008-7900). Additional safety measures shall be identified and implemented.

3.2.3 Anyone working on the equipment must work under his or her personal lock and tag. Under no condition is anyone ever authorized to apply another person's lock and tag.

3.2.4 Personnel who are not touching the locked out equipment, but are required to enter into a danger zone to perform an inspection or walk-through, shall add their locks to the equipment lockout as if they were performing work on the equipment.

3.2.5 It is not permissible to rely on communications only (verbal, visual, written or radio) to perform a lockout. All persons must apply their own lock prior to work. In cases where accessibility is hampered, a portable lockbox system may be prepared so that all personnel may apply their lock.

3.2.6 All lockout locks will be applied to a lockout hasp, which is applied to the locking device. Never put your lock through the last hole in the lockout hasp. Instead, insert another hasp and put your lock through the new hasp. It is acceptable to daisy chain lockout hasps.

3.3 Verification of Deenergization

3.3.1 All equipment that is locked out must be start-tested where possible. The employee performing the lockout must operate the controls to verify that the equipment cannot be restarted.

3.3.2 Accumulated or stored energy sources that could supply a system that is locked out must be identified and dissipated by an appropriate means.

3.3.3 If there is a possibility of the equipment accumulating energy over time after the application of the lockout, then the lockout must:

a) Include an energy-dissipating device capable of continuously dissipating the energy without the buildup of hazardous conditions. Examples: open vent valve, temporary personal protective grounds.

-OR-

b) Be capable of completely isolating the source of energy in all cases where work is performed. Examples: double block and bleed (pressurized hydraulics), substantial blocking mechanism (rotor lock) with maximum wind speed.

3.3.4 All energy sources that are locked out must be verified completely deenergized by an appropriate means.

a) Electrical systems will be tested using approved methods outlined in the Electrical Safety Program (DMS 0008-7990), in the section for Electrical LOTO.

3.4 Lockout Point Requirements

3.4.1 All lockout points must consist of positive energy isolation devices such as disconnect switches, circuit breakers, block valves, and blocking pins.

3.4.2 All isolating devices used as lockout points must be capable of accepting an approved lockout device that physically prevents the actuation of the isolating device.

3.4.3 There can be no interlocks, contactors, diodes, check valves, or automatically controlled devices between the isolation device and the test point.

3.4.4 All lockout points susceptible to electrical shock shall be locked out with approved non-conductive lockout devices.

3.4.5 Refer to the VAME Electrical Safety Program (DMS 0008-7990), Section 6, for additional electrical requirements for proper lockout points.

3.5 Locks

3.5.1 All lockout locks will be issued by the employer to the Authorized Person(s) who may be required to work on machinery or equipment.

3.5.2 Personal lockout locks will all be keyed differently, and the keys will be kept by the employee who owns the locks. Personal locks for VAME employees shall be blue in color.

3.5.3 Control locks will all be keyed differently, and the keys will be kept either by the Person In Charge or locked in a lockbox. Control locks shall be non-conductive and red in color.

3.5.4 Locks shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

3.5.5 *Each personal lock shall be keyed different from all other locks. No one other than the lock owner* shall have a key.

3.5.6 Each individual lock will be identifiable as a lockout lock as follows:

a) Personal locks shall always be accompanied with a tag stating "DANGER – DO NOT OPERATE". The tag shall include the company name, first and last name identifying the worker and a contact phone number permanently printed on the tag.

b) VAME employees' tags shall have the first and last name of the employee, a color picture of the employee, and a contact phone number permanently printed on the tag.

c) Control locks shall always be tagged with "DANGER – DO NOT OPERATE" and shall include the permanent marking "VESTAS CONTROL LOCK".

3.5.7 **Visitors, vendors, and contractors:**

a) Shall supply their own locks and tags.

b) Each lock must have a key that is unique to the worker using the locks.

c) Markings shall include the word "DANGER", their name, their company name, and a phone number.

d) Vestas sites shall maintain a small supply of uniquely keyed locks for visitors who forget to bring a set of their own. Visitor locks shall be managed by the site's Energy Control Coordinator.

3.6 Lockout Boundary

3.6.1 The Lockout Boundary encloses the entire zone where it is safe to work. It is defined by the lockout points selected for the lockout procedure.

3.6.2 In all cases, the Lockout Boundary shall include the area where work is required.

3.6.3 Determining the proper Lockout Boundary requires a careful examination of the tasks to be performed and the surrounding equipment. Some tasks introduce greater risk and therefore must have a more expansive Lockout Boundary.

3.6.4 A Lockout Boundary can be made to include several work areas in one lockout procedure.

3.6.5 When the work area expands to an area outside the Lockout Boundary, the work must stop until a *new lockout is established that includes the new work area.*

3.6.6 All personnel performing work under a lockout must clearly understand the extent of the particular Lockout Boundary.

3.6.7 The Hazardous Energy Control Checklist (HECC) in Appendix A shall be used to initially establish all lockout procedures. The HECC helps define all sources of energy and establish a sufficiently large Lockout Boundary.

3.6.8 The Lockout Boundary shall be specifically identified on all written lockout procedures.

3.6.9 A Lockout Boundary may not rely on any process interlock, contactor, diode, or emergency stop.

3.6.10 A Lockout Boundary may not rely on any check valve, automatic control valve, or pressure relief valve.

3.7 Lockout Methods

3.7.1 **All lockout procedures will follow one of the established methods in this section:**

a) Individual (Exclusive) control

b) Single point lockout

c) Complex lockout

d) Group lockout (Lockbox)

3.7.2 ***Individual (Exclusive) Control***

a) Individual Control is only allowed for plug-in equipment with power cords.

b) In this case, a lockout is not required as long as the plug is within arm's reach of the individual performing work on the equipment.

c) Examples include a laptop computer power supply, a vacuum cleaner, or a drop light.

3.7.3 **Single Point Lockout**

a) An individual need not document the required procedure for a particular machine or equipment **when all of the following elements exist**:

a) the machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees;

b) the machine or equipment has a single energy source which can be readily identified and isolated;

c) the isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;

d) the machine or equipment is isolated from that energy source and locked out during servicing or maintenance;

e) a single lockout device will achieve a lock-out condition;

f) the lockout device is under the exclusive control of the Qualified Person performing the servicing or maintenance;

g) the servicing or maintenance does not create hazards for other individuals; and

h) the employer, in utilizing this exception, has had no accidents involving the unexpected activation or re-energizing of the machine or equipment during servicing or maintenance.

3.7.4 **Complex Lockout**

a) This method shall be used as the default lockout method, whenever the individual control or single point lockout methods cannot be applied.

b) In all cases, a Complex Lockout will require a written lockout instruction that identifies every isolation point.

c) The lockout instruction shall be approved by a Lockout Specialist.

d) *The lockout instruction consists of a lockout form and a written instruction. The written instruction* shall include the sequence for the safe shutdown, lockout, verification, clearing of lockout, and startup of the system. The written instruction shall follow the latest work instruction format.

e) *The Person In Charge shall establish the lockout in accordance with the lockout instruction, using* control locks. The Person In Charge keeps possession of the control lock keys.

f) After the lockout is established, the completed lockout form is handed to any Authorized Person who wishes to lockout according to the form. The Authorized Person then hangs locks at every isolation point in accordance with the lockout form. If the Person In Charge is also working on the equipment, then his personal lock must be applied in addition to the control locks.

g) Certain frequently used lockout instructions may be kept in electronic format and printed for use as required.

h) Lockout instructions that have been prepared by someone offsite shall be reviewed by the Energy Control Coordinator before use at the site. The Energy Control Coordinator shall verify that the lockout instruction is completely sufficient for the equipment as installed at the site.

i) A complex lockout can be converted to a group lockout at any time. The Person In Charge is responsible for guiding all personnel through the transition.

j) After the complex Lockout has been broken down, the LOTO Form shall be returned to the ECC for record-keeping.

3.7.5 Group Lockout (Lockbox)

a) The Group Lockout or Lockbox method shall apply whenever the Individual Control or Single Point lockout method cannot be used. A Group Lockout requires the use of control locks and a lockbox.

b) In all cases, a Group Lockout will require a written LOTO Procedure that identifies every isolation point.

c) The LOTO Procedure shall be approved by a LOTO Specialist.

d) The LOTO Procedure consists of a LOTO Form and a written instruction.

e) The LOTO Form shall be initially developed using the Hazardous Energy Control Checklist (HECC) form in Appendix A. The LOTO Form will follow the format found in Appendix B (also refer to DMS# 0013-8299).

f) In addition to the LOTO Form, the LOTO Procedure shall include a written instruction that details the sequence for the safe shutdown, lockout, clearing of lockout, and startup of a system. The written instruction shall follow the latest work instruction format.

g) Certain frequently used LOTO Procedures may be kept in electronic format and printed for use as required.

h) LOTO Procedures that have been prepared by someone offsite shall be reviewed by the Energy Control Coordinator before use at the site. The Energy Control Coordinator shall verify that the LOTO Procedure is completely sufficient for the turbine models and mark versions at the site.

i) All lockboxes will be substantial in construction to prevent tampering and to withstand the rigors of transport without breaking.

j) The completed LOTO Form shall be securely attached to the lockbox in a weatherproof, clear plastic jacket, so that all personnel locking on the lockbox may clearly read the LOTO Form.

k) Establishing a Group Lockout:

Step	Action
1.	The Energy Control Coordinator appoints a Person In Charge for the coordination of the Group Lockout.
2.	The equipment is locked out by the Person In Charge using the control locks.
3.	The Person In Charge completes the LOTO Form, then inserts the LOTO Form into the clear plastic jacket and attached to the lockbox.
4.	The Person In Charge puts the keys to the control locks into the lockbox.
5.	The Person In Charge then locks the lockbox latch with his/her personal lock (no hasp is used).
6.	All employees performing work under the Group Lockout will review the LOTO Form and apply their personal lockout lock to the lockbox, using a hasp.

l) Breaking down a Group Lockout:

Step	Action
1.	All employees who performed work under the Group Lockout remove their personal locks.
2.	The Person In Charge verifies that work is complete, that the turbine or circuit is ready for re-energization, and that the Group Lockout can be broken down.
3.	The Person In Charge removes his/her personal lock from the lockbox and retrieves the keys to the control locks and the LOTO Procedure.
4.	The Person In Charge removes all Group Lockout control locks, and restores the equipment to service following the written instruction in the LOTO Procedure.

m) It is permissible to nest a group lockout within another group lockout.

n) Any person (employee, vendor, or contractor) can request to put his or her personal lock-out locks on each of the lockout points of the Group Lockout, instead of just one lock on the lockbox, provided their lock conforms to section 3.4.4 of this manual.

- The person shall be given an additional copy of the Group Lockout procedure.

- The Person In Charge will assist the person in locating all of the lockout points.
- The person must lockout every lockout point identified in the LOTO Form.

o) After the Group Lockout has been broken down, the LOTO Form shall be returned to the Energy Control Coordinator for record-keeping.

3.8 Tagout

WARNING: TAGS ARE NEVER TO BE REMOVED BY ANYONE EXCEPT THE AUTHORIZED PERSON THAT INITIATED THE LOCKOUT/TAGOUT PROCEDURE.

3.8.1 Where possible, a lockout shall be used instead of a tagout.

3.8.2 A tagout is acceptable as a substitute for a lockout if all of the following conditions apply:

a) There is no physical means of attaching a lock to the isolating device.

-AND-

b) The equipment cannot be properly isolated with a lock at some other upstream isolating device.

-AND-

c) The use of a tagout is specifically approved by the Vestas Senior Manager.

3.8.3 When the tagout method is used, it shall be supplemented by at least one additional safety measure that will provide a level of safety equivalent to that of a lockout program. The particular measure that is used must be documented in the work instruction.

3.8.4 All tagout points will be recorded as line items in the LOTO Form. In addition, the line item will be marked with "TAGOUT".

3.8.5 **Examples of additional required safety measures include:**

a) Removing an isolating circuit element.

b) Application of grounding devices.

c) Blocking a controlling switch.

d) Opening an extra disconnecting device.

e) Closing an additional in-line valve.

f) Removal of a valve handle after closing valve.

3.8.6 Tags, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal.

3.8.7 Tag attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable (like a nylon cable tie).

3.8.8 Tags shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

3.8.9 Tags shall include first and last name of the employee, a color picture of the employee (if available), and a contact phone number.

3.8.10 Tags shall be attached on or as close to the device to be unquestionably apparent that that device is not to be activated.

3.8.11 Where used without a lockbox, every person working on the equipment shall attach a personal tagout tag to the isolation device, just as they would attach their personal lockout lock.

3.8.12 Where possible, the tag attachment means shall impede the activation of the device.

3.9 Interlock Bypass

3.9.1 No interlock shall be bypassed without written authorization from the Energy Control Coordinator and the Site/Construction Manager.

3.9.2 No interlock shall be bypassed without establishing a method to provide equal or greater protection. This method can consist of prohibiting access, prohibiting operation, or allowing such access or operation while following a special procedure written for the tasks required. The written procedure will establish safe boundaries and constraints such that the level of protection provided is equivalent to that provided by the interlock

3.9.3 Interlock bypass authorization shall use the form in Appendix E. The form shall require the following entries:

a) Reason the interlock bypass is required.

b) A list and description of all disabled devices, their purpose, the impact of disabling the interlock to equipment, and the impact of disabling the interlock to personal safety.

c) Method used to provide equal or greater protection while the interlock is bypassed.

3.9.4 While an interlock is bypassed, the interlock bypass form shall be posted in a conspicuous location.

3.10 Extended Shutdown

3.10.1 A Group Lockout is the Standard method lockout for extended shutdown situations.

3.10.2 In circumstances where equipment is taken out of service for extended time periods (more than one shift change), the equipment shall remain locked out with the control locks. The Person-In-Charge shall maintain their personal lock attached to the lockbox. This requirement applies in any of the following circumstances:

a) The equipment is left in a state where it should not be operated or started.

b) Starting the equipment could present a danger to persons nearby.

c) Starting the equipment could cause damage to the environment (e.g. oil spill).

d) Starting the equipment could cause equipment damage.

3.10.3 When personnel are not working on the system, any established lockout procedure and lockbox shall be left at the turbine control panel down-tower. The lockbox may be brought back to the office to facilitate turnover to a new Person In Charge, or in case of a tower evacuation.

3.10.4 When a Person In Charge needs to turn over responsibility of a lockbox, the new Person In Charge must place their lock directly on the lockbox without a hasp before the old Person In Charge removes their lock.

3.10.5 At the beginning of each shift, prior to starting work, the Person In Charge on the oncoming shift shall confirm that the isolation of the equipment is still effective by physically examining each control lock and lockout device. Verification of deenergization is not required unless a lockout device has been compromised.

3.10.6 All personnel performing work on the equipment shall first report to the Person In Charge of the lockout each day on each shift. Upon request, the Person In Charge shall provide a new copy of the lockout procedure to the workers.

3.11 Subcontractors

3.11.1 Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this procedure, the on-site employer and the outside employer shall inform each other of their respective lockout and/or tagout procedures.

3.11.2 VAME Sustainability/HSE must review and approve all subcontractor lockout and/or tagout procedures.

3.11.3 The Energy Control Coordinator shall have ultimate authority for the CONTROL OF HAZARDOUS ENERGY Program used on site.

3.11.4 Whenever Subcontractor's personnel are engaged in activities covered by this procedure, both the Subcontractor, and Energy Control Coordinator, shall ensure that his/her employees understand and comply with the restrictions and prohibitions of this CONTROL OF HAZARDOUS ENERGY Program.

3.12 Customers

3.12.1 The Energy Control Coordinator shall establish a proper understanding with the customer to ensure that there is consistent administration between the VAME CONTROL OF HAZARDOUS ENERGY Program and the Customer's CONTROL OF HAZARDOUS ENERGY Program. A written Memorandum of Understanding shall document this agreement and shall be kept on file as a site-specific addendum to this CONTROL OF HAZARDOUS ENERGY Program.

3.12.2 Where the Customer's CONTROL OF HAZARDOUS ENERGY Program does not require a lock to be applied, but instead relies solely on a utility-style tagout system, VAME CONTROL OF HAZARDOUS ENERGY Program requirements for locks shall prevail for all personnel (customer personnel included) performing work under a Vestas LOTO Procedure. Additionally:

a) When locks are required at the substation, the Energy Control Coordinator shall minimize substation access requirements by setting up a Group Lockout.

b) Only Vestas approved Energy Control Procedures will be used within the turbine.

3.13 Non-Owner Lock Removal

3.13.1 In the event that an Authorized Person is not available to remove their lockout/tagout device, the Energy Control Coordinator may remove (by following this procedure) the lockout/tagout device for them.

3.13.2 If the Energy Control Coordinator is not available, the Site Manager/Construction Manager shall designate a senior technician qualified as LOTO Specialist to perform this function.

3.13.3 Permission must be obtained from the Vestas Senior Manger.

3.13.4 Permission must also be obtained from the customer, in accordance with the customer's CONTROL OF HAZARDOUS ENERGY Program.

3.13.5 When possible, it is preferable to cut the lockout hasp rather than the lock.

3.13.6 **Use this procedure for non-owner lock removal (a check list is found in APPENDIX D):**

Step	Action
1.	Verify that the Authorized Person who applied the locking device is not present at the facility.
2.	Make all reasonable efforts to contact the Authorized Person and inform them that their lockout or tagout device is being removed.
3.	Make all reasonable efforts to contact the Authorized Person's supervisor and inform them that their employee's lockout or tagout device is being removed.
4.	Contact the Vestas Senior Manager and obtain permission prior to removing Authorized Person lockout or tagout device.
5.	Contact the Customer's Site Manager or other designated representative and obtain permission prior to removing Authorized Person lockout or tagout device.
6.	Ensure the Authorized Person is informed, before resuming work at the facility, that the lockout or tagout device has been removed.

3.14 Roles and Responsibilities

3.14.1 The VAME HSE Director is ultimately responsible for the administration of the CONTROL OF HAZARDOUS ENERGY Program.

3.14.2 VAME HSE shall maintain this program and keep it up to date.

3.14.3 Vestas Business Academy (VBA) shall be responsible for establishing a training curriculum that teaches all levels of CONTROL OF HAZARDOUS ENERGY program:

a) Escorted Visitor – Unqualified Worker (Level 0)

b) Authorized Person (Level 1)

c) Qualified Person in Charge (Level 2)

d) LOTO Specialist (Level 3)

e) Energy Control Coordinator

3.14.4 In addition, VBA shall provide a curriculum for annual refresher training.

3.14.5 The Site Supervisor/Construction Manager shall be responsible for the correct execution of the CONTROL OF HAZARDOUS ENERGY Program at their site.

a) The Site Supervisor/Construction Manager shall appoint one or more LOTO Specialist(s) to be the Energy Control Coordinator at the site.

b) The Site Supervisor/Construction Manager shall initiate a near-miss safety investigation whenever a discrepancy in a lockout has been discovered after work has commenced.

3.14.6 The Energy Control Coordinator shall perform the following CONTROL OF HAZARDOUS ENERGY duties:

a) Maintain the sets of lockboxes and control locks for use at the site.

b) Perform a monthly audit of lockout practices, and maintain a record of these audits.

c) Assist Qualified Persons in establishing the correct lockout procedures as necessary.

d) Ensure that all Qualified Persons at their site undergo annual LOTO refresher training.

e) Ensure that all newly trained Qualified persons performs a LOTO procedure practical evaluation.

3.14.7 The Qualified Person shall perform the following CONTROL OF HAZARDOUS ENERGY duties:

a) Perform the safe shutdown of equipment in accordance with work instructions.

3.14.8 The Person In Charge is a Qualified Person that is in charge of a particular lockout.

a) A Person In Charge shall be designated for every complex or group lockout.

b) The Person In Charge shall perform the lockout and verification of deenergization.

c) At each lockout point, the Person In Charge will hang a control lock (or tag).

d) The Person In Charge will brief all personnel locking out on the lockout boundary.

e) When work progresses to a point outside the LOTO boundary, the Person In Charge shall be contacted.

f) At the conclusion of the work, the Person In Charge will verify that all locks have been removed. If any locks remain, the Person In Charge will contact those employees and determine the status of the work. When all work is complete and all personnel have removed their locks, the Person In Charge shall walk down the equipment to verify that the equipment is ready for reenergization. Then the Person In Charge shall remove the control locks, restore the equipment, and make it ready for operation.

3.14.9 The Authorized Person shall perform the following CONTROL OF HAZARDOUS ENERGY duties:

a) Request that equipment be locked out by a Person In Charge when needed. In no case shall any Authorized Person attempt to establish the lockout by themselves.

b) Review all LOTO procedures prior to hanging locks, and ensure (to the best of their ability) that the task to be performed can be done safely within the Lockout Boundary established by the LOTO procedure.

c) Question the Person In Charge about any perceived discrepancy or technical feature of the task or lockout.

d) Follow approved LOTO procedures and put personal locks on isolation devices that have already been locked out and verified deenergized by a Person In Charge.

e) Remove all personal locks when work is complete or at end of shift.

f) Inform the Person In Charge after removing personal locks.

g) Inform the Person In Charge if the equipment is left out of service.

3.14.10 The Escorted Visitor shall:

a) Apply his or her lock at locations as instructed by the escorting Qualified Person.

3.15 Training

3.15.1 **Escorted Visitor Unqualified Worker CONTROL OF HAZARDOUS ENERGY Training**

a) Escorted Visitor Unqualified Worker shall be trained on CONTROL OF HAZARDOUS ENERGY requirements as part of general site orientation.

3.15.2 **Authorized Person CONTROL OF HAZARDOUS ENERGY Training**

a) Authorized Person training shall be provided to all personnel who are required to perform work on equipment that has been locked out in a Vestas wind turbine.

b) Vestas Business Academy (VBA) will cover Authorized Person CONTROL OF HAZARDOUS ENERGY training as part of the Basic Safety course.

c) The Energy Control Coordinator will provide Authorized Person CONTROL OF HAZARDOUS ENERGY training at the site.

3.15.3 **Qualified Person CONTROL OF HAZARDOUS ENERGY Training**

a) Qualified Person training shall be provided to all Vestas Technicians.

b) As a prerequisite, all Qualified Persons must be Vestas Technicians qualified to the Level 2 Qualification.

c) VBA will provide Qualified Person training as part of its standard curriculum. The Energy Control Coordinator will provide Qualified Person CONTROL OF HAZARDOUS ENERGY training at the site. Contractors who can provide documentation and who can demonstrate competencies commensurate with this program can be considered a Qualified Person. HSE will ensure review documentation.

3.15.4 **LOTO Specialist Training**

a) LOTO Specialist training shall be provided to senior Vestas Technicians.

b) As a prerequisite, all LOTO Specialists must be Vestas Technicians certified to the Level 3 Electrical Qualification.

c) VBA will cover LOTO Specialist training as part of the Turbine Theory course.

3.15.5 Energy Control Coordinator Training

a) Energy Control Coordinator training shall be provided to selected senior Vestas Technicians.

b) As a prerequisite, Energy Control Coordinators must be Vestas Technicians certified to LOTO Specialist.

c) VBA will train all Energy Control Coordinators.

3.16 Energy Control Coordinator

3.16.1 Each site shall have at least one person designated and trained as Energy Control Coordinator.

3.16.2 The Energy Control Coordinator must be selected for his or her attention to detail and superior knowledge of the turbine platform(s) at his or her site and ability to train others.

3.16.3 The Energy Control Coordinator must be a Vestas Technician certified to Level 3 Electrical Qualification and LOTO Specialist.

3.16.4 The Energy Control Coordinator shall ensure that ESP/CONTROL OF HAZARDOUS ENERGY training is provided to all individuals so they understand the purpose and function of the energy control program, and that the knowledge and skills required for the safe application, usage and removal of the energy controls are acquired by all individuals.

3.16.5 The Energy Control Coordinator shall certify that all ESP/CONTROL OF HAZARDOUS ENERGY training has been accomplished and is being kept up to date. The certification shall contain the topic of the training, each employee's name, and the dates of training.

3.16.6 Refresher training shall be provided annually to ensure the effectiveness of this program.

3.17 Periodic Assessments

3.17.1 The Energy Control Coordinator shall coordinate periodic assessments for each lockout method. The assessment shall be performed by a Qualified Person other than the employee who performed the lockout.

3.17.2 The periodic assessment shall be recorded using the CONTROL OF HAZARDOUS ENERGY Periodic Assessment Form in Appendix F.

3.17.3 The periodic assessments shall be performed at least monthly. A record of these monthly assessments shall be kept on file at the site for periodic safety audits.

3.17.4 An assessment shall be made for each Authorized Person to verify the employee's knowledge and correct any deviations or inadequacies identified.

3.17.5 The periodic assessment shall include a review between the assessor and each Authorized Person of the employee's responsibilities under the energy control procedure being evaluated.

4. Appendix A: Hazardous Energy Control Checklist

Date: _____ WTG ID#: _____ Completed by (name and position): _____

1. Identify the task to be performed:

_____

_____

2. Identify all sources of energy:

Source	Description	Isolation Point(s)
☐ Grid		
☐ Generator		
☐ UPS		
☐ Battery		
☐ Electrical Backfeed		
☐ Wind		
☐ Mechanical Backfeed		
☐ Hydraulic Pressure		
☐ Other		

3. Identify all sources of potentially stored energy:

Source	Description	Relief Method
☐ Capacitors		
☐ Magnetically Induced Charge		
☐ Hydraulic Accumulators		
☐ Sprung Force		
☐ Weight/Gravity		
☐ Inertial Movement		
☐ Mechanical Binding		
☐ Hot/Cold Surfaces		
☐ Hot/Cold Liquids		
☐ Other		

4. What is the safe boundary established by these isolations?

_____

Is this boundary enough to perform the task safely? Yes ☐ No ☐

5. Did you review the applicable one-line schematics to look for all sources of energy? Yes ☐ No ☐

6. Is there a particular shutdown and isolation sequence required? Yes ☐ No ☐

Detailed Description:

_____

_____

7. List all isolation points on the LOTO Form (Appendix B).

5. Appendix B: LOTO Form

NOTE: Refer to DMS #0013-8299 for a functional electronic version of this form.

Vestas Loto Procedure **Site:** [redacted]
Turbine Model: [redacted] **MK Version:** [redacted] **WTG ID:** [redacted]

Description of task being performed:

This LOTO Procedure establishes a complete lockout boundary around the following system and/or components:

I have verified that this LOTO Procedure is accurate and sufficient to provide a safe boundary for work on the task above:
Printed Name: Signature: Title: [redacted]

LOTO Established by:
PIC Signature:
PIC Name:
LOTO Established:

ISO SEQ	Lock box and device #	Isolation ID and Location	Energy Hazard (mag, class)	Method to verify deenergization or dissipate energy	Location to verify deenergization	Lock out Pos	Test-Verify-Test initials

LOTO Transferred to
PIC Signature
PIC Name:

LOTO Cleared:
LOTO Transferred from
PIC Signature
PIC Name:
LOTO Cleared:

RES SEQ	Lock box and device #	Isolation ID and Location	Energy Hazard (mag, class)	Restore Position	Work Comp Insp Initials (Tools and Mat removed)	Lock Removed Initials

LOTO Cleared by PIC Signature
PIC Name:
LOTO Cleared:

6. Appendix C: Non-Owner Lock Removal Form

Date: _____ **WTG ID#:** _____

Owner of Lock(s): _____ **Number of locks to be removed:** _____

Owner's Company: _____

Owner's phone number (must be a personal number): _____

Reason for removing lock(s): _____

_____

Reason why owner did not remove locks before leaving the site:

_____

The lock owner was called and:

- ☐ Left a voicemail
- ☐ Talked with the owner
- ☐ Permission granted to remove locks

The Customer's Manager was contacted and:

- ☐ Permission granted to remove locks
- ☐ Permission not granted
- ☐ Permission granted, Customer will remove lock

The lock owner's supervisor was called and:

- ☐ Left a voicemail
- ☐ Talked with the supervisor
- ☐ Permission granted to remove locks

The Vestas Senior Manager was contacted and

- ☐ Permission granted to remove locks
- ☐ Permission not granted
- ☐ Permission granted, Customer will remove lock

The owner's lock(s) may not be removed without contacting either the owner or the owner's supervisor in a live conversation, and gaining verbal permission from the owner or the owner's supervisor.

Where possible, cut the lockout hasp(s) instead of the locks.

Vestas Site/Construction Manager: _____ Date: _____

Print name and title: _____ Time: _____

Lock(s) removed by: _____ Date: _____

Print name and title: _____ Time: _____

Contact the owner at the beginning of the next shift prior to beginning work. Return the locks to the owner and explain to them why their locks were removed. Inform the owner that their locks must be removed each time they finish work or leave the site.

Lock owner: _____ Date: _____

Print name and title: _____ Time: _____

7. Appendix D: Interlock Bypass Form

Date: _____ **WTG ID#:** _____

Detailed description of interlock to be bypassed:

_____

_____

What is the purpose of the interlock?

_____

_____

What is the impact of bypassing this interlock on equipment operation?

_____

_____

What is the impact of bypassing this interlock on personnel safety?

_____

_____

How will the interlock be bypassed?

_____

_____

What method will be established that will provide equal or greater protection?

_____

_____

Reason for bypassing interlock:

_____

_____

The interlock may not be bypassed without the authorization of both the Energy Control Coordinator and the Vestas Senior Manager.

Energy Control Coordinator:

_____

Date/Time:

_____

Vestas Senior Manager:

_____

Date/Time:

_____

Interlock Bypass Established by:

Person In Charge:

_____

Date/Time:

_____

Interlock Bypass Removed by:

Person In Charge:

_____

Date/Time:

_____

8. Appendix E: CONTROL OF HAZARDOUS ENERGY

Periodic Assessment Form

Date: _____ **WTG ID#:** _____

Assessor: _____ **Person in Charge of lockout procedure:** _____

Evaluate the adequacy of the LOTO Procedure	YES	NO
1. Is the Hazardous Energy Control Checklist properly completed?		
2. Are all energy sources locked out?		
3. Were all sources of stored energy properly dissipated?		
4. Is the lockout boundary sufficient for the task being performed?		
5. If tagouts are used, was an additional method clearly identified and implemented?		
6. Is the LOTO method appropriate for the situation?		
Evaluate the correct application of the LOTO Procedure		
1. Is the LOTO Procedure properly completed?		
2. Do the lockout devices prevent the operation of the isolation devices?		
3. Are all locks properly identified?		
4. If a tagout is used, did all employees working under the lockout apply their personal tagout?		
5. Is the LOTO Procedure securely attached to the lockbox?		
6. Are all employees working under the lockout personally locked out?		
Evaluate the understanding of the employees working under the LOTO Procedure		
1. Are the employees performing the task as described on the LOTO Procedure?		
2. Do the employees understand the lockout boundary?		
Comments		

9. History of this Document

Rev. no.:	Date:	Description of changes
00	–	New document (Old AWT Number: 31030)
01	--	Record of changes not available (Old AWT Number: 31030 R2)
02	15-Oct-2002	Change to new document numbering convention; record of additional changes not available
03	22-Oct-2009	Complete LOTO Program revamp (for reference use only)
04	22-Dec-2009	Initial release of revamped 2009 document
05	07-May-2010	Addition of Warning to Section 2.1.
06	08-Sept-2010	Complete process revamp.
07	10-Sept-2010	Error correction (section 3.7.5 (c)).
08	10-Oct-2010	Error correction (section 3.7.5 (e)).

Vestas®

Trenching and Excavation Safety

Contents

1. Purpose

Vestas-American Wind Technology will establish procedures for "trenching and excavation" undertaken by its employees through the use of this document. Preventing future work-place injuries in our company is the principal purpose of this document. This document will provide a basis for ensuring that all procedures implemented, revised or modified meet our requirements for safety. This document will help identify hazards in our workplace and enable us to determine the best course of action to take to reduce or eliminate known hazards.

2. Basis

OSHA requires all employers to maintain a written program. The primary hazard to which employees may be exposed during excavation work is a cave-in, which occurs when the soil forming the side of the excavation can no longer resist the forces applied to it. This results from a reduction in the frictional and cohesive capacities of the soil to resist forces. Changing environmental conditions, such as freezing and thawing, or the addition or removal of water from the pores of the soil, can reduce the ability of a soil to resist forces. The addition of superimposed loads from spoil piles, or the placement of equipment or materials near the edge of the excavation, also creates forces that can exceed the ability of the soil to resist.

3. Responsibility

The Safety Manager and/or Safety Representative is responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program. The Safety Manager and/or Safety Representative is authorized to amend these instructions and is authorized to halt any operation in the area where there is danger of serious personal injury.

4. Definitions

Word:	Definition
Accepted Engineering Practices	Those requirements which are compatible with standards of practice required by a registered professional engineer.
Aluminum Hydraulic Shoring	A pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross braces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.
Bell-Bottom Pier Hole	A type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a bell shape.

Benching (Benching System)	A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
Cave-In	The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.
Competent Person	For the purposes of this document, one who is capable of identifying existing and predictable hazards in their surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
Cross Braces	The horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bare against either uprights or wales.
Excavation	Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
Faces or Sides	The vertical or inclined earth surfaces formed as a result of excavation work.
Failure	The breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.
Hazardous Atmosphere	An atmosphere which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause, death, illness, or injury.
Kick Out	The accidental release or failure of a cross brace.
Protective System	A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
Ramp	An inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.
Registered Professional Engineer	A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

Sheeting	The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.
Shield (Shield System)	A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with 1926.652. Shields used in trenches are usually referred to as "trench boxes" or "trench shields".
Shoring (Shoring System)	A structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.
Sides	See "Faces."
Sloping (Sloping System)	A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
Stable Rock	Natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.
Structural Ramp	A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.
Support System	A structure such as underpinning, bracing, or shoring which provides support to an adjacent structure, underground installation, or the sides of an excavation.
Tabulated Data	Tables and charts approved by a registered professional engineer and used to design and construct a protective system.
Trench (Trench Excavation)	A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.
Trench Box	See "Shield."
Trench Shield	See "Shield."

Uprights	The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."
Wales	Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

5. References

29 CFR 1926.650 - 653

6. General Requirements

Vestas-American Wind Technology will ensure that whenever an excavation operation is being undertaken, work practices and proper conditions are met prior to beginning, during and at the conclusion of such excavation operations. It should not be assumed that every acceptable safety precaution is contained herein or that unusual circumstances may not require further or additional procedures, equipment and practices. Employees will cease operations if there is a question regarding a hazard or if such is suspected or discovered.

7. Written Program

Vestas- American Wind Technology will review and evaluate this standard practice instruction:

- On an annual basis
- When regulatory changes occur that prompt revision of this document
- When facility operational changes occur that require a revision of this document
- When there is an accident or close-call that relates to this topic

Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals and objectives.

8. Surface Encumbrances and Underground Installations - Safety Guidelines

8.1.1 All surface encumbrances that are located so as to create a hazard to employees will be removed or supported, as necessary, to safeguard employees. The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, will be determined prior to opening an excavation. The following procedures are designed to provide employees of this company with a system for protection and safe conditions while working in a trenching or excavation environment. Employees at all levels within the work force design these guidelines for use.

8.1.2 Establish the locations of all underground and overhead utilities and services before beginning trenching or excavation operations.

- Contact utility and service companies to include municipally owned underground and overhead utilities and services, and advise them prior to the start of all actual excavation. No exceptions.
- When excavation operations approach the estimated location of underground installations, the exact location of the installations will be determined by safe and acceptable means (modern techniques and customary types of equipment). Where this determination is unclear, the owning utility will be contacted for assistance.
- While any excavation is open, underground installations will be protected, supported or removed as necessary to safeguard employees.

9. Protection from Hazards Associated with Water Accumulation

9.1.1 Employees will not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline systems.

9.1.2 Inspect all excavations after any rainfall or other hazard-producing occurrence to determine if any change to the soil's capacity to resist the force has occurred. A person that has the competence to do so will perform this assessment.

- Water should not be allowed to accumulate within the excavation.

9.1.3 Water will be controlled or prevented from accumulating by the use of water removal equipment; a competent person who can ensure proper operation will monitor the water removal equipment and operations.

9.1.4 If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches or dikes, suitable means will be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. A competent person will inspect excavations subject to runoff from heavy rains.

10. Protection from Superimposed Loads

Superimposed loads (crane, backhoe and other such equipment working close to the excavation edges) require extra sheet piling, shoring or other bracing be used to assure the ability of the soil to resist. The use of mobile equipment near the excavation requires proper vehicle barricades and/or stop blocks.

11. Accesses and Egress from Excavations

11.1 Structural ramps

A competent person will design structural ramps that are used solely by employees as a means of access or egress from excavations. Structural ramps used for access or egress of

equipment will be designed by a competent person qualified in structural design, and will be constructed in accordance with the design.

11.2 Means of egress from trench excavations (less than 20 ft deep)

A stairway, ladder, ramp or other safe means of egress will be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

11.3 Means of egress from trench excavations (20 ft or greater in depth)

Ladders will be equipped with ladder platforms at 20-foot intervals.

12. Trench Safety

12.1.1 Trenches more than five feet deep require shoring or will be laid back to its angle of repose (stabilized slope).

12.1.2 In hazardous soil conditions (loosely compacted or rocky), trenches under five feet need protection.

12.1.3 At any excavation site, there shall be a competently trained person who is capable of identifying existing and predictable hazards, and who shall have the authority to take prompt corrective action to eliminate them on the site. This individual shall be able to identify soil classifications and protective systems (shoring, bracing and piling) to be used in accordance with OSHA Trenching Standards found in 29 CFR 1926.652.

12.1.4 Trenches more than five (5) feet deep require shoring or will be laid back to a stable slope. In hazardous soil, trenches under five (5) feet will also be protected.

12.1.5 Portable trench boxes or sliding trench boxes used in place of shoring and sloping shall be designed, constructed and maintained to provide protection at least equal to the required sheeting and shoring. Shields shall be designed by a registered professional engineer and will meet the standards found in 29 CFR 1926.652.

12.1.6 Shields shall be installed so as to restrict lateral or other hazardous movement. Trench boxes and shields shall extend to the bottom of the trench and no less than eighteen (18) inches above the vertical top of the trench or excavation face. Exceptions are found in 29 CFR 1926.652. Excavation to a level not greater that 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield. No employee shall be allowed within the shield or trench box during the installation, removal or relocation. If trench boxes are stacked at any time, means shall be provided to prevent separation.

13. Exposure to Vehicular Traffic

Employees exposed to public vehicular traffic will be provided with, and will wear, warning vests or other suitable garments marked with or made of reflector like or high-visibility material.

14. Exposure to Falling Loads

14.1.1 No employee will be permitted underneath loads handled by lifting or digging equipment.

14.1.2 Employees will be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

14.1.3 Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with §1926.601, to provide adequate protection for the operator during loading and unloading operations.

15. Warning Systems for Mobile Equipment

When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system will be utilized, such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

16. Hazardous Atmospheres

16.1 Testing and controls

Confined space entry procedures will be adhered to in accordance with Vestas-American Wind Technology Confined Space Entry Program. (See Confined Spaces (DMS 0008-8012) and Confined Spaces Canada (DMS 0008-8017.) To prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements apply:

16.1.1 Oxygen deficiency

Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation will be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

16.1.2 Flammable atmospheres

Adequate precautions will be taken, such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

16.1.3 Testing

When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing will be conducted as often as necessary to ensure that the atmosphere remains safe.

16.2 Emergency rescue equipment

16.2.1 Availability

Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, will be readily available where hazardous atmospheric conditions exist

or may reasonably be expected to develop during work in an excavation. The equipment will be attended when in use.

16.2.2 Lifelines

Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, will wear a harness with a lifeline securely attached to it. The lifeline will be separate from any line used to handle materials, and will be individually attended at all times while the employee wearing the lifeline is in the excavation.

16.3 Personal Protective Equipment (PPE)

The following procedures are designed to provide employees of this company with a checklist system or procedure to follow for the selection of proper PPE for operations under this program.

16.3.1 Checklist

- ☐ Hard hat
- ☐ Long sleeve garment
- ☐ Trouser
- ☐ Safety-toed work boot
- ☐ Proper eye and face protection
- ☐ Work gloves - rubber or neoprene when working with or in chemicals
- ☐ NIOSH-approved respirator where or when the job hazard may require
- ☐ Hearing protection
- ☐ Rubber or neoprene boots when exposed to waste-water products (a sanitary washing facility will be provided for cleanup)

Note: The first line supervisor or senior supervisor on the site will be responsible for compliance for proper utilization of PPE.

17. Material Handling Equipment

All material handling equipment will be operated in accordance with established Vestas-American Wind Technology's written policies, manufactures procedures and applicable OSHA standards.

18. Stability of Adjacent Structures

18.1.1 Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning will be provided to ensure the stability of such structures for the protection of employees.

18.1.2 Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees will not be permitted except when:

- A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or
- The excavation is in stable rock; or

- A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or
- A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

18.1.3 Sidewalks, pavements and appurtenant structures will not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

19. Protection of Employees from Loose Rock or Soil

19.1.1 Adequate protection will be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection will consist of scaling to remove loose material, installation of protective barricades at intervals as necessary on the face to stop and contain falling material, or other means that provide equivalent protection.

19.1.2 Employees will be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection will be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

20. Site Inspections

Daily inspections of excavations, the adjacent areas, and protective systems will be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. These inspections are only required when employee exposure can be reasonably anticipated. An inspection will be:

- Conducted by the competent person prior to the start of work and as needed throughout the shift.
- Inspections will also be made after every rainstorm or other hazard-increasing occurrence.
- Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees will be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

21. Fall Protection

21.1.1 Where employees or equipment are required or permitted to cross over excavations, walkways or bridges with standard guardrails will be provided.

21.1.2 Adequate barrier physical protection will be provided at all remotely located excavations. All wells, pits, shafts, etc., will be barricaded or covered. Upon completion of exploration and other similar operations, temporary wells, pits, shafts, etc., will be backfilled.

22. Training Requirements

22.1 Initial training

Vestas-AWT shall provide training to ensure the purpose and function of the trenching and excavation program is understood by employees and the knowledge and skills required for safe trenching and excavation operations is acquired by all affected employees. The training shall include as a minimum, the following:

22.1.1 Training in the recognition of applicable hazards associated with trenching and excavation operations.

22.1.2 Each affected employee shall be instructed in the purpose and use of this standard practice instruction.

22.1.3 All other employees whose work operations are or may be in an area where trenching and excavation operation are conducted shall be instructed to an awareness level about the procedures and prohibitions relating to work in such areas.

22.2 Refresher training

22.2.1 Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in equipment or processes that present a new hazard, or when there is a change in these procedures. Note: Retraining (to include a procedural review) will also be provided whenever there is a "close-call" or these procedures fail.

22.2.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever the Company has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of these procedures.

22.2.3 The retraining shall reestablish employee proficiency and introduce new or revised operational methods and procedures, as necessary.

22.2.4 Certification

The Company shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

23. Protection of Employees in Excavations

23.1 General

23.1.1 Each employee in an excavation will be protected from cave-ins by an adequately designed protective system except when:

- Excavations are made entirely in stable rock; or
- Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

23.1.2 Protective systems will have the capacity to resist without failure all loads that are intended, or could reasonably be expected to be applied or transmitted to the system.

23.2 Design of Sloping and Benching Systems

The slopes and configurations of sloping and benching systems will be properly selected and constructed as follows:

- **Option 1 –**

  Allowable configurations and slopes. Excavations will be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

- **Option 2 -**

  Determination of slopes and configurations is made using 29CFR §1926.652, Appendices A and B: Maximum Allowable Slopes, and allowable configurations for sloping and benching systems.

- **Option 3 –**

  - Designs using other tabulated data. Designs of sloping or benching systems will be selected from and in accordance with tabulated data, such as approved tables and charts. The tabulated data will be in written form and will include:
    - Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;
    - Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;
    - Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

  Note: At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, will be maintained at the jobsite during construction of the protective system. After that time, the data may be stored off the jobsite, but a copy of the data will be made available to OSHA upon request.

- **Option 4 –**

  Design by a registered professional engineer. Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) will be approved by a registered professional engineer. Designs will be in written form and will include at least the following:

  - The magnitude of the slopes that were determined safe for the particular project;
  - The configurations that were determined to be safe for the particular project;
  - The identity of the registered professional engineer approving the design.

  Note: At least one copy of the design will be maintained at the jobsite while the slope is being constructed. After that time, the design need not be at the jobsite, but a copy will be made available to OSHA upon request.

24. Design of Support Systems, Shield Systems, and other Protective Systems

Designs of support systems, shield systems, and other protective systems will be selected and constructed in accordance with the following options:

- **Option 1 -**

Designs using Appendices A, C and D of 29CFR §1926.652. Designs for timber shoring in trenches will be determined in accordance with the conditions and requirements set forth in appendices A and C. Designs for aluminum hydraulic shoring will be in accordance with appendix D of 29CFR §1926.652, but if manufacturer's tabulated data cannot be utilized, designs will be in accordance with appendix D.

- **Option 2 -**

  Designs using Manufacturer's Tabulated Data. Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data will be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

  - Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer will only be allowed after the manufacturer issues specific written approval.
  - Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations will be in written form at the jobsite during construction of the protective system. After that time, this data may be stored off the jobsite, but a copy will be made available to OSHA upon request.

- **Option 3 -**

  Designs using other Tabulated Data. Designs of support systems, shield systems, or other protective systems will be selected from and be in accordance with tabulated data, such as tables and charts. The tabulated data will be in written form and include all of the following:

  - Identification of the parameters that affect the selection of a protective system drawn from such data;
  - Identification of the limits of use of the data;
  - Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

  Note: At least one copy of the tabulated data which identifies the registered professional engineer who approved the data will be maintained at the jobsite during construction of the protective system. After that time, the data may be stored off the jobsite, but a copy of the data will be made available to OSHA upon request.

- **Option 4 -**

  Design by a registered professional engineer. A registered professional engineer will approve support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3 above. Designs will be in written form and will include the following:

  - A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and
  - Identification of the registered professional engineer approving the design.

25. Materials and Equipment used for Protective Systems

25.1.1 Materials and equipment used for protective systems will be free from damage or defects that might impair their proper function.

25.1.2 Manufactured materials and equipment used for protective systems will be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

25.1.3 When material or equipment that is used for protective systems is damaged, a competent person will examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then the material or equipment will be removed from service, and will be evaluated and approved by a registered professional engineer before being returned to service.

26. Installations and Removal of Support Systems

26.1 General requirements

26.1.1 Members of support systems will be securely connected together to prevent sliding, falling, kick outs, or other predictable failure.

26.1.2 Support systems will be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

26.1.3 Individual members of support systems will not be subjected to loads exceeding those which those members were designed to withstand.

26.1.4 Before temporary removal of individual members begins, additional precautions will be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

26.1.5 Removal will begin at, and progress from, the bottom of the excavation. Members will be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

26.1.6 Backfilling will progress together with the removal of support systems from excavations.

26.2 Additional requirements for support systems for trench excavations

26.2.1 Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system will be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

26.2.2 Installation of a support system will be closely coordinated with the excavation of trenches.

27. Sloping and Benching Systems

Employees will not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

28. Shield Systems

28.1.1 Shield systems will not be subjected to loads exceeding those which the system was designed to withstand.

28.1.2 Shields will be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

28.1.3 Employees will be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

28.1.4 Employees will not be allowed in shields when shields are being installed, removed, or moved vertically.

28.1.5 Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield will be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

29. History of Document

Rev. no.:	Date:	Description of changes
00	Unknown	New document
01	Unknown	Unknown
02	15-Oct-2002	Old AWT Number: 31033. Document number updated. Nature of other changes unknown.
03	01-Jan-2010	Template update.

Contents

1. Purpose:

This procedure covers the rules specific to entering a confined space. It also describes controls associated with the protection of Vestas Americas personnel and sub-contractors from the potential hazards of accessing into confined spaces. This program is intended to:

- Prevent unauthorized and unintentional personnel entry into a confined space.
- Confirm safe entry into, and work within, "confined spaces" by authorized, properly trained and equipped personnel and emergency rescue services.
- Comply with the minimum requirements for work inside a Confined Space as specified in OSHA 29 CFR 1910.146.

2. Definitions:

Word:	Definition:
Confined Space	A space that has all three of the following criteria: • Large enough and so configured that an employee can physically enter and perform assigned work. • Limited or restricted means for entry or exit. • Not designed for continuous employee occupancy. Examples of confined spaces are tanks, vessels, silos, storage bins, hoppers, vaults, and pits. It can be any enclosed or partially enclosed space where there is a risk of death or serious injury due to the presence of hazardous substances or dangerous conditions (i.e. lack of oxygen, toxic or combustible gases).
Confined Space / Non-Permit Required	An enclosed space that meets the criteria of a confined space; however, does not contain or, with respect to atmospheric hazards, have the potential to contain, any hazard capable of causing death or serious physical harm.
Confined Space / Permit Required	An enclosed space that meets the criteria of a confined space and also has insufficient ventilation or contains hazards that could be harmful to health or safety. Characteristics of a permit-required confined space may contain one or more of the following: • Contains or has a known potential to contain a hazardous atmosphere; • Contains a material with the potential to engulf an entrant; • Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section; and/or • Contains any recognized serious safety or health hazard. Examples of permit-required confined spaces include, but are not limited to: storage tanks (i.e. black ink tanks, diesel tanks), vessels, pits, sewers, vaults, pipelines, and valve pits. A permit-required Confined Space may be reclassified as a non-permit required confined space if all hazards within the space are eliminated and documented. Control of atmospheric hazards through forced air ventilation alone does not constitute elimination of the hazard.
Entry	The action by which a person passes through an opening into a confined space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space. Entry can occur both during work and during preparation for work.
Attendant/Stand by Person	An individual stationed outside the confined space that is trained in accordance with this program and who monitors the entrants inside the permit required confined space.

Entrant	Any personnel who are trained in accordance with this program and are authorized to enter a permit-required confined space. The entrant must be able to demonstrate an understanding of the identified training requirements and proper use of personal protective equipment indicated on the entry permit.
Entry Supervisor	The person responsible for determining if acceptable entry conditions are present at a permit-required confined space where entry is planned, for authorizing entry, for overseeing entry operations, and for terminating entry as required by this program. The entry supervisor shall be named in writing on the entry permit.
Employee in Charge	The onsite manager, lead technician, or designated qualified employee who has working knowledge of all work activities being performed by all groups/personnel working on location.
Rescue Team	The rescue team consists of no less than 2 people that are available and trained to perform rescue from a confined space in case of an emergency.
Entry Permit	The written or printed document that defines the conditions of confined space entry, the anticipated hazards associated with space entry, the reasons for entering the confined space, and which provides a listing of authorized attendants and entrants, the date of entry into the confined space, and the expiration time of the entry permit.
Entry Log	The written or printed document on which any atmospheric conditions are recorded prior to entry into a "Permit-Required Space with only Atmospheric Hazards," and which provides a listing of authorized attendants and entrants, and the date of entry into the confined space.
Job Safety Analysis (JSA)	A process to be used daily for each major task being completed by technicians to ensure a proactive assessment and mitigation of risks.
Permit Issuing Authority	The Site Manager, lead technician or other trained/authorized employee who is assigned by the Corporate HS&E Group for issuing permits consistent with all associated practice and permit requirements. The Permit Issuing Authority is the lead Vestas representative in the day-to-day management of the permit-to-work process within their area of responsibility. The Permit Issuing Authority is directly responsible for confirming that all necessary and required precautions and/or procedures are followed prior to approving the permit. They are responsible for: • Issuing permits consistent with all associated practice and permit requirements. • Insuring that ALL of the workers fully understand the work and understand the project/work specific emergency action plan. • Insuring that there are no simultaneous operations that may endanger this or other work groups assigned to the same location.

Hazardous Atmosphere An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more of the following causes:

- A flammable gas, vapor or mist in excess of 0% of its lower explosive limit.
- An airborne combustible dust at a concentration that meets or exceeds its lower explosive limit.
- An atmospheric oxygen concentration below 19.5% or above 23.5%.
- Atmospheric concentrations containing a toxic substance above the OSHA or ACGIH recommended exposure levels (whichever is more stringent).
- Any other atmospheric condition that is Immediately Dangerous to Life or Health (IDLH).

3. General Requirements:

The work area shall be surveyed by the Site Manager/Lead Technician or a designate to identify any confined spaces and/or other hazards associated with the work. This survey must identify the classification of confined spaces and rationale for the classification.

All affected personnel shall be informed of the existence and hazards of confined spaces by the posting of warning signs or by other equally effective means (i.e. Confined Space Inventory).

Confined Spaces that can be casually or inadvertently entered shall be guarded to prevent unauthorized entry.

Permit Required Confined Spaces shall only be entered when all provisions of the Confined Space Entry Program are satisfied.

Only properly trained and equipped personnel shall be allowed to participate in work involving entry into Permit Required Confined Spaces.

No entry shall be made until a rescue plan is developed, communicated to all affected personnel, and implemented by training the persons involved in possible evacuation/rescue processes.

4. Personnel Requirements:

The Entry Supervisor and Site Manager/Permit Issuing Authority shall be responsible for implementing and enforcing the requirements of the Confined Space Entry program. After the conditions for Confined Space Entry have been verified, the Site Manager must approve the Permit before the any work begins.

An Entry Supervisor also may serve as an Attendant or as an Authorized Entrant, as long as that person is trained and equipped, as required by this program, for each role they fill.

The duties of Entry Supervisor may be passed from one individual to another during the course of an entry operation. However, the person to whom the responsibilities are passed must have participated in the Job Safety Analysis and be identified on the permits.

5. Rescue and Emergency Services

The following requirements apply to ALL Vestas Americas locations where personnel enter permit required confined spaces to perform rescue and emergency services:

- Each member of the team shall be provided with and trained to properly use the PPE and rescue equipment necessary for making rescues from confined spaces.
- Each member of the team shall be trained to perform their assigned rescue duties, and each member shall also receive the training required of authorized entrants.
- Each member of the team shall practice making Confined Space rescues using dummies, mannequins, or actual persons in representative spaces that simulate the types of confined spaces from which rescue is to be performed, with respect to configuration, opening size, and accessibility. This training must be completed at least once every 12 months and repeated annually.
- All members of the team shall hold current certification in first aid and CPR.
- To facilitate non-entry rescue, retrieval systems or methods shall be used, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements:
  - Each Authorized Entrant shall use a chest or full body harness with a retrieval line attached at the center of the entrant's back, near shoulder level, or above the entrant's head.

NOTE- OSHA Statistics
The work activity that most frequently results in fatalities is rescue. For every entrant who dies in a confined space, approximately 1.6 people attempting a rescue die. In most cases, the people who die are untrained and improperly equipped for rescue.

6. Position Responsibilities

6.1 Attendant

- Know the hazards that may be faced during entry, including information on how exposure may occur, signs and symptoms of exposure, and consequences of an exposure.
- Be aware of possible behavioral effects of hazard exposure to worker/entrants.
- Constantly maintain an accurate count of personnel in the permit required confined space.
- Remain outside the permit-required Confined Space and monitor the Authorized Entrants until relieved by another Attendant.
- Communicate with Authorized Entrants as necessary to monitor entrant status and to alert them of the need to evacuate the space.
- Monitor activities inside and outside the space to determine if it is safe to remain in the space.
- Summon rescue and other emergency services as soon as the Attendant determines that Authorized Entrants may need assistance to escape from permit-required Confined Space hazards.
- Warn all unauthorized persons to stay away from the permit-required confined space.
- Perform non-entry rescues as specified by the location's rescue procedure.

- Perform no other duties that might interfere with the Attendant's primary duty to monitor and protect the entrants.

6.2 Entrant(s) Authorized

- Know the hazards that may be faced during entry, including information on how exposure might occur, signs and symptoms of exposure, and consequences of exposure.
- Be properly trained in the tasks and procedures they are required to perform.
- Use equipment properly and in accordance with the manufacturer's specifications.
- Communicate with the attendant as necessary to monitor status of the space and alert them of the need to evacuate the space.
- Alert the attendant whenever an entrant recognizes any warning sign or symptom of distress.
- Verify that all persons involved in permit required exposure to a dangerous situation or detects a prohibited condition.
- Exit from the Confined Space as quickly as possible whenever any of the following occur:
  - An order is given to evacuate by the Attendant or the Entry Supervisor.
  - The entrant recognizes any warning sign of a dangerous situation or symptom of exposure.
  - The entrant detects a prohibited condition.
  - An evacuation alarm is activated.

6.3 Entry Supervisors

- Know the hazards that may be encountered during entry, including information on how exposure might occur, signs and symptoms of exposure, and consequences of exposure.
- Verify that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Ensure that confined space entrants are properly trained and competent in their assigned duties.
- Verify that rescue services/equipment is/are available and that the means for activating a rescue has been tested and are available.
- Terminate the entry and cancel the permit when the entry operations specified by the permit have been completed or when a condition not allowed under the entry permit arises in or near the confined space.

6.4 Rescue Team Member

- Know the hazards that may be encountered during entry, including information on how exposure might occur, signs and symptoms of exposure, and consequences of exposure.
- Be aware of possible behavioral effects of hazard exposure to worker/entrants.
- Be properly trained in the duties they are required to perform.
- Be available in case of an emergency situation
- Perform non-entry rescues as specified by the location's rescue procedure.

7. Training

Personnel shall be trained in the relevant aspects of their assigned duties regarding confined spaces when:

- First assigned a Confined Space Entry role.
- There is a change in the assigned Confined Space Entry role.
- There is a change in permit-required Confined Space operations that presents a hazard about which an employee has not previously been trained.
- The Site Manager or the Entry Supervisor identifies deviations from acceptable entry conditions or that a worker demonstrates a lack of training in the Confined Space Entry procedures.
- Training shall include, at a minimum:
  - Proficiency in the specific duties assigned.
  - The type of Confined Space to be entered.
  - Chemical or physical hazards involved.
  - Work practices and techniques.
  - Atmospheric testing procedures.
  - Personal Protective Equipment (PPE) required.
  - Rescue procedures.

All training shall be documented and training records should be maintained in LMS.

8. Non-Permit Confined Space Entry

Work in an enclosed space that meets the criteria of a confined space, however, does not contain or, with respect to atmospheric hazards, have the potential to contain, any hazard capable of causing death or serious physical harm.

Vestas has classified the following as non-permit required confined spaces:

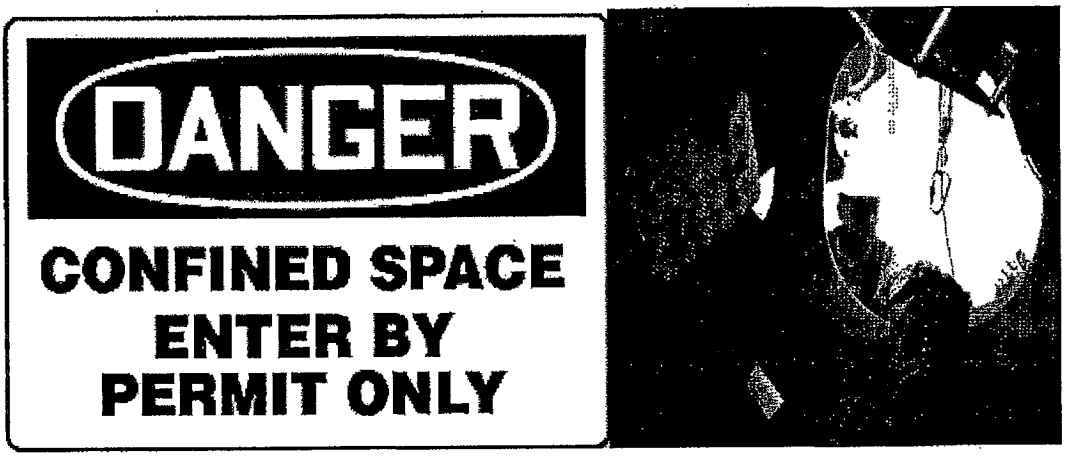
- Tower Sump/Cellar
- Tower
- Nacelle
- Hub

All applicable safety regulations shall be followed along with a work specific Job Hazard Analysis prior to work beginning.

9. Permit-Required Confined Space Classification

Vestas Americas has determined that accessing the space within a blade is consistent with that of a Permit Required Confined Space. When crossing into the threshold of the blade root the potential exists for engulfment and entrapment and the blades have a single point of entry therefore meeting the characteristics of a permit required confined space according to OSHA 1910.146.

- Blades



10. Permit-Required Confined Space Entry Permit

Work in the confined space identified above or any other permit-required confined space shall not be allowed until a Confined Space Entry permit and a JSA have been completed. The completed permit must be posted at or adjacent to the entrance of the permit-required Confined Space for the duration of the work.

Each completed entry permit shall be retained at the facility for at least one year to facilitate review of the permit-required Confined Space Entry program. Any problems encountered during an entry operation should be noted on the permit.

10.1 Permit

All of the following personnel must sign the permit:

- Site Manager/Lead Technician or authorized trained designee.
- Authorized Entrants
- Attendant/Standby person(s)

10.2 Duration of Permit

The permit duration is 12 hours or end of job, whichever occurs first, unless one of the following occurs which invalidates the permit

- Change of any permitted personnel.
- Conditions change in a manner not anticipated by the Confined Space Entry permit.
- Emergency conditions that cancel the permit.

11. Preparation for a permit required Confined Space Entry Permit

The Site Manager is responsible for confirming that a JSA has been completed and includes:

- Identification of communication protocols for all personnel named on the permit.
- Following all established electrical lockout/tag procedures for equipment isolation. Ensuring lockout and tag out of all necessary energy sources to confirm complete isolation of the confined space.

- Communicating rescue procedures to all personnel named on the permit.
- Identifying potential emergency conditions that may cancel the permit.
- Evaluating lighting conditions, temperature, the need for climbing, tie-off points, or other known hazards when preparing a Confined Space for entry.
- Providing, maintaining, and properly using appropriate PPE, such as coveralls, earplugs, goggles, gloves, and respirators, as required.
- Maintaining a first-aid kit outside the entry.
- Making available any fire extinguishers and other fire fighting equipment where needed
- Establishing a communication system (visual, hand signals, radio, voice, etc.) between workers and standby personnel.

Entrants and standby person(s) may only perform as rescuers if properly trained and equipped; however, the person must not enter the Confined Space during an emergency without first confirming that another trained standby person is present at the rotor hub.

Verify that a list of the rescue and other services that may be called/used in case of an emergency (and the means of communication with those services) has been attached to the permit.

12. Testing Confined Space Atmospheres

Permit required confined space atmospheres (blades) must be tested before entry is allowed. Tests shall be conducted in the following sequence and test results must be in accordance with the data below:

- The acceptable oxygen concentration range is from 19.5% – 23.5%. The normal oxygen level of 20.9% is desired. All other levels must be investigated and the contributing issue(s) addressed. Entry into a Confined Space with oxygen concentrations below 19.5% may be performed with additional personal protective equipment that requires entrants to wear a Self Contained Breathing Apparatus. **No one may ever enter a Confined Space with oxygen concentrations in excess of 23.5%.**
- The acceptable flammable gases or vapors concentration is 0% Lower Explosive Limit (LEL). **No one shall ever enter a Confined Space with flammable gas or vapor concentrations above 10% LEL.**

The Corporate HS&E Group should be contacted for guidance on how to achieve 0% LEL.

13. Entry to a Permit Required Confined Space

Personnel may only enter into a Permit Required Confined Space after preparation requirements are met and a permit is signed and issued. If at any time anyone (entrant, attendant, Entry Supervisor, or any other person) determines that the Confined Space Entry is unsafe or unanticipated hazards are present, the Permit Required Confined Space shall be immediately evacuated and safe conditions established prior to reentry.

Attendant on left and entrant on right

The designated standby person shall not leave the Confined Space hub access with any entrant inside unless they have been relieved by another trained standby person.

Unauthorized personnel shall not be allowed entry, and, if the confined space is left unattended, the entrance shall be barricaded. Access to the turbine is controlled by locks and therefore there is no need to post signage indicating that the blade is a permit required confined space.

14. Completion of Work and Restoration of Confined Space

When all work is complete and Permit Required Confined Space is ready to be returned to service, an entry supervisor will conduct a post-entry review. A site-specific checklist will be used for proper restoration. In addition to items listed on the permit, the following should be verified:

- Are all personnel out of the Permit Required Confined Space?
- Are all equipment and tools removed?
- Are all Lock Out/Tag Out equipment removed/disengaged?

After cancellation or expiration of the permit, an entry completion meeting (post-meeting) with everyone involved shall be held and documented. The canceled permit shall be reviewed to confirm that any hazards found or created have been documented to confirm that personnel participating in future entry operations are protected from previously unidentified hazards.

15. Confined Space Permit

A completed Confined Space Entry Permit (DMS 0008-8016) is required to enter a confined space. The permit must remain on-site for one year after the completion of the work to facilitate review.

16. History of this Document

Rev. no.:	Date:	Description of changes
00	18-Nov-2008	New Document
01	04-Mar-2009	Added reference to Confined Space Permit (HSE098

		[DMS 0008-8016]) to Section 18.17.
02	08-May-2009	Added new definitions.
	20-May-2009	Revisions to 18.11
	08-June-2009	Revisions to 18.5, 18.10, 18.11

Vestas®

Confined Space Policy and Program - Canadian Provinces

Contents

1. Purpose

This procedure covers the rules specific to entering a confined space. It also describes controls associated with the protection of Vestas Canadian Wind Technology personnel and sub-contractors from the potential hazards of accessing into confined spaces. This program is intended to:

- Prevent unauthorized and unintentional personnel entry into a confined space.
- Confirm safe entry into, and work within, "confined spaces" by authorized, properly trained and equipped personnel and emergency rescue services.
- Comply with the minimum requirements for work inside a Confined Space as specified in Canada Occupational Health and Safety Regulations (SOR/86-304)

2. Definitions

Word:	Definition:
Attendant/Stand by Person	An individual stationed outside the confined space that is trained in accordance with this program and who monitors the entrants inside the permit required confined space.
Confined Space	Except as otherwise determined by the Board, means an area, other than an underground working, that • is enclosed or partially enclosed, • is not designed or intended for continuous human occupancy, • has limited or restricted means for entry or exit that may complicate the provision of first aid, evacuation, rescue or other emergency response service, and • is large enough and so configured that a worker could enter to perform assigned work; • Examples of confined spaces are tanks, vessels, silos, storage bins, hoppers, vaults, and pits. It can be any enclosed or partially enclosed space where there is a risk of death or serious injury due to the presence of hazardous substances or dangerous conditions (i.e. lack of oxygen, toxic or combustible gases).
Confined Space / Non-Permit Required	An enclosed space that meets the criteria of a confined space; however, does not contain or, with respect to atmospheric hazards, have the potential to contain, any hazard capable of causing death or serious physical harm.

Confined Space / Permit Required

An enclosed space that meets the criteria of a confined space and also has insufficient ventilation or contains hazards that could be harmful to health or safety. Characteristics of a permit-required confined space may contain one or more of the following:

- Contains or has a known potential to contain a hazardous atmosphere;
- Contains a material with the potential to engulf an entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section; and/or
- Contains any recognized serious safety or health hazard.

Examples of permit-required confined spaces include, but are not limited to: storage tanks (i.e. black ink tanks, diesel tanks), vessels, pits, sewers, vaults, pipelines, and valve pits.

A permit-required Confined Space may be reclassified as a non-permit required confined space if all hazards within the space are eliminated and documented. Control of atmospheric hazards through forced air ventilation alone does not constitute elimination of the hazard.

Employee in Charge

The onsite manager, lead technician, or designated qualified employee who has working knowledge of all work activities being performed by all groups/personnel working on location.

Entrant

Any personnel who are trained in accordance with this program and are authorized to enter a permit-required confined space. The entrant must be able to demonstrate an understanding of the identified training requirements and proper use of personal protective equipment indicated on the entry permit.

Entry

The action by which a person passes through an opening into a confined space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space. Entry can occur both during work and during preparation for work.

Entry Permit

The written or printed document that defines the conditions of confined space entry, the anticipated hazards associated with space entry, the reasons for entering the confined space, and which provides a listing of authorized attendants and entrants, the date of entry into the confined space, and the expiration time of the entry permit. The permit also contains an entry log, on which any atmospheric conditions are recorded prior to entry into a "Permit-Required Space with only Atmospheric Hazards," and which provides a listing of authorized attendants and entrants, and the date of entry into the confined space.

Entry Supervisor	The person responsible for determining if acceptable entry conditions are present at a permit-required confined space where entry is planned, for authorizing entry, for overseeing entry operations, and for terminating entry as required by this program. The entry supervisor shall be named in writing on the entry permit.
Hazardous Atmosphere	An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more of the following causes: • A flammable gas, vapor or mist in excess of 0% of its lower explosive limit. • An airborne combustible dust at a concentration that meets or exceeds its lower explosive limit. • An atmospheric oxygen concentration below 19.5% or above 23.5%. • Atmospheric concentrations containing a toxic substance above the ACGIH recommended exposure levels • Any other atmospheric condition that is Immediately Dangerous to Life or Health (IDLH).
IDLH	An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
Job Safety Analysis (JSA)	A process to be used daily for each major task being completed by technicians to ensure a proactive assessment and mitigation of risks.
Permit Issuing Authority	The Site Manager, lead technician or other trained/authorized employee who is assigned by the Corporate HS&E Group for issuing permits consistent with all associated practice and permit requirements. The Permit Issuing Authority is the lead Vestas representative in the day-to-day management of the permit-to-work process within their area of responsibility. The Permit Issuing Authority is directly responsible for confirming that all necessary and required precautions and/or procedures are followed prior to approving the permit. They are responsible for: • Issuing permits consistent with all associated practice and permit requirements. • Insuring that ALL of the workers fully understand the work and understand the project/work specific emergency action plan. • Insuring that there are no simultaneous operations that may endanger this or other work groups assigned to the same location.
Rescue Team	The rescue team consists of no less than 2 people that are available and trained to perform rescue from a confined space in case of an emergency.
SCBA	Self-contained breathing apparatus

3. General Requirements

The work area shall be surveyed by the Site Manager/Lead Technician or a designate to identify any confined spaces and/or other hazards associated with the work. This survey must identify the classification of confined spaces and rationale for the classification.

All affected personnel shall be informed of the existence and hazards of confined spaces by the posting of warning signs or by other equally effective means (i.e. Confined Space Inventory).

Confined Spaces that can be casually or inadvertently entered shall be guarded to prevent unauthorized entry.

Permit Required Confined Spaces shall only be entered when all provisions of the Confined Space Entry Program are satisfied.

Only properly trained and equipped personnel shall be allowed to participate in work involving entry into Permit Required Confined Spaces.

No entry shall be made until a rescue plan is developed, communicated to all affected personnel, and implemented by training the persons involved in possible evacuation/rescue processes.

4. Personnel Requirements

The Entry Supervisor and Site Manager/Permit Issuing Authority shall be responsible for implementing and enforcing the requirements of the Confined Space Entry program. After the conditions for Confined Space Entry have been verified, the Site Manager must approve the Permit before the any work begins.

An Entry Supervisor also may serve as an Attendant or as an Authorized Entrant, as long as that person is trained and equipped, as required by this program, for each role they fill.

The duties of Entry Supervisor may be passed from one individual to another during the course of an entry operation. However, the person to whom the responsibilities are passed must have participated in the Job Safety Analysis and be identified on the permits.

5. Rescue and Emergency Services

The following requirements apply to ALL Vestas Canadian Wind Technology locations where personnel enter permit required confined spaces to perform rescue and emergency services:

- Each member of the team shall be provided with and trained to properly use the PPE and rescue equipment necessary for making rescues from confined spaces.
- Each member of the team shall be trained to perform their assigned rescue duties, and each member shall also receive the training required of authorized entrants.
- Each member of the team shall practice making Confined Space rescues using dummies, mannequins, or actual persons in representative spaces that simulate the types of confined spaces from which rescue is to be performed, with respect to configuration, opening size, and accessibility. This training must be completed at least once every 12 months and repeated annually.
- All members of the team shall hold current certification in first aid and CPR.
- To facilitate non-entry rescue, retrieval systems or methods shall be used, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements:

- Each Authorized Entrant shall use a chest or full body harness with a retrieval line attached at the center of the entrant's back, near shoulder level, or above the entrant's head.

NOTE: Statistics

The work activity that most frequently results in fatalities is rescue. For every entrant who dies in a confined space, approximately 1.6 people attempting a rescue die. In most cases, the people who die are untrained and improperly equipped for rescue.

6. Position Responsibilities

6.1 Attendant

- Know the hazards that may be faced during entry, including information on how exposure may occur, signs and symptoms of exposure, and consequences of an exposure.
- Be aware of possible behavioral effects of hazard exposure to worker/entrants.
- Constantly maintain an accurate count of personnel in the permit required confined space.
- Remain outside the permit-required Confined Space and monitor the Authorized Entrants until relieved by another Attendant.
- Communicate with Authorized Entrants as necessary to monitor entrant status and to alert them of the need to evacuate the space.
- Monitor activities inside and outside the space to determine if it is safe to remain in the space.
- Summon rescue and other emergency services as soon as the Attendant determines that Authorized Entrants may need assistance to escape from permit-required Confined Space hazards.
- Warn all unauthorized persons to stay away from the permit-required confined space.
- Perform non-entry rescues as specified by the location's rescue procedure.
- Perform no other duties that might interfere with the Attendant's primary duty to monitor and protect the entrants.

6.2 Entrant(s) Authorized

- Know the hazards that may be faced during entry, including information on how exposure might occur, signs and symptoms of exposure, and consequences of exposure.
- Be properly trained in the tasks and procedures they are required to perform.
- Use equipment properly and in accordance with the manufacturer's specifications.
- Communicate with the attendant as necessary to monitor status of the space and alert them of the need to evacuate the space.
- Alert the attendant whenever an entrant recognizes any warning sign or symptom of distress.
- Verify that all persons involved in permit required exposure to a dangerous situation or detects a prohibited condition.
- Exit from the Confined Space as quickly as possible whenever any of the following occur:

- An order is given to evacuate by the Attendant or the Entry Supervisor.
- The entrant recognizes any warning sign of a dangerous situation or symptom of exposure.
- The entrant detects a prohibited condition.
- An evacuation alarm is activated.

6.3 Entry Supervisors

- Know the hazards that may be encountered during entry, including information on how exposure might occur, signs and symptoms of exposure, and consequences of exposure.
- Verify that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Ensure that confined space entrants are properly trained and competent in their assigned duties.
- Verify that rescue services/equipment is/are available and that the means for activating a rescue has been tested and are available.
- Terminate the entry and cancel the permit when the entry operations specified by the permit have been completed or when a condition not allowed under the entry permit arises in or near the confined space.

6.4 Rescue Team Member

- Know the hazards that may be encountered during entry, including information on how exposure might occur, signs and symptoms of exposure, and consequences of exposure.
- Be aware of possible behavioral effects of hazard exposure to worker/entrants.
- Be properly trained in the duties they are required to perform.
- Be available in case of an emergency situation
- Perform non-entry rescues as specified by the location's rescue procedure.

7. Training

Personnel shall be trained annually in the relevant aspects of their assigned duties regarding confined spaces when:

- First assigned a Confined Space Entry role.
- There is a change in the assigned Confined Space Entry role.
- There is a change in permit-required Confined Space operations that presents a hazard about which an employee has not previously been trained.
- The Site Manager or the Entry Supervisor identifies deviations from acceptable entry conditions or that a worker demonstrates a lack of training in the Confined Space Entry procedures.
- Training shall include, at a minimum:
  1. Proficiency in the specific duties assigned.
  2. The type of Confined Space to be entered.
  3. Chemical or physical hazards involved.
  4. Work practices and techniques.

5. Atmospheric testing procedures.
6. Personal Protective Equipment (PPE) required.
7. Rescue procedures.

8. Non-Permit Confined Space Entry

Work in an enclosed space that meets the criteria of a confined space, however, does not contain or, with respect to atmospheric hazards, have the potential to contain, any hazard capable of causing death or serious physical harm.

Vestas has classified the following as non-permit required confined spaces:

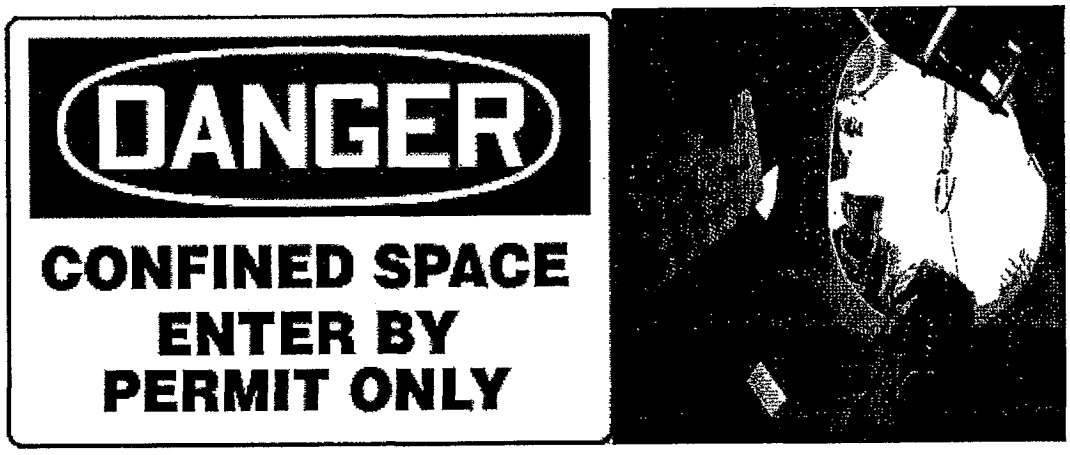
- Tower Sump/Cellar
- Tower
- Nacelle

All applicable safety regulations shall be followed along with a work specific Job Safety Analysis prior to work beginning.

9. Permit-Required Confined Space Classification

Vestas Canadian Wind Technology has determined that accessing the space within a blade & hub is consistent with that of a Permit Required Confined Space. When crossing into the threshold of the blade root the potential exists for engulfment and entrapment and the blades have a single point of entry. The hub has limited or restricted means for entry or exit that may complicate the provision of first aid, evacuation, rescue or other emergency response service - therefore they both meet the characteristics of a permit required confined space according to Canada Occupational Health and Safety Regulations (SOR/86-304)

- Blades & Hub



10. Permit-Required Confined Space Entry Permit

Work in the confined space identified above or any other permit-required confined space shall not be allowed until a Confined Space Entry permit and a JSA have been completed. The

completed permit must be posted at or adjacent to the entrance of the permit-required Confined Space for the duration of the work.

Each completed entry permit shall be retained at the facility for at least one year to facilitate review of the permit-required Confined Space Entry program. Any problems encountered during an entry operation should be noted on the permit.

10.1 Permit

All of the following personnel must sign the permit:

- Site Manager/Lead Technician or authorized trained designee.
- Authorized Entrants
- Attendant/Standby person(s)

10.2 Duration of Permit

The permit duration is 12 hours or end of job, whichever occurs first, unless one of the following occurs which invalidates the permit:

- Change of any permitted personnel.
- Conditions change in a manner not anticipated by the Confined Space Entry permit.
- Emergency conditions that cancel the permit.

11. Preparation for a Permit Required Confined Space Entry Permit

The Site Manager is responsible for confirming that a JSA has been completed and includes:

- Identification of communication protocols for all personnel named on the permit.
- Following all established electrical lockout/tag procedures for equipment isolation. Ensuring lockout and tag out of all necessary energy sources to confirm complete isolation of the confined space.
- Communicating rescue procedures to all personnel named on the permit.
- Identifying potential emergency conditions that may cancel the permit.
- Evaluating lighting conditions, temperature, the need for climbing, tie-off points, or other known hazards when preparing a Confined Space for entry.
- Providing, maintaining, and properly using appropriate PPE, such as coveralls, earplugs, goggles, gloves, and respirators, as required.
- Maintaining a first-aid kit outside the entry.
- Making available any fire extinguishers and other fire fighting equipment where needed
- Establishing a communication system (visual, hand signals, radio, voice, etc.) between workers and standby personnel.

Entrants and standby person(s) may only perform as rescuers if properly trained and equipped; however, the person must not enter the Confined Space during an emergency without first confirming that another trained standby person is present at the rotor hub.

Verify that a list of the rescue and other services that may be called/used in case of an emergency (and the means of communication with those services) has been attached to the permit.

12. Testing Confined Space Atmospheres

Permit required confined space atmospheres (blades) must be tested before entry is allowed. Tests shall be conducted in the following sequence and test results must be in accordance with the data below:

- The acceptable oxygen concentration range is from 19.5% — 23.5%. The normal oxygen level of 20.9% is desired. All other levels must be investigated and the contributing issue(s) addressed. Entry into a Confined Space with oxygen concentrations below 19.5% may be performed with additional personal protective equipment that requires entrants to wear a Self Contained Breathing Apparatus. **No one may ever enter a Confined Space with oxygen concentrations in excess of 23.5%.**
- The acceptable flammable gases or vapors concentration is 0% Lower Explosive Limit (LEL). No one shall ever enter a Confined Space with flammable gas or vapor concentrations above 10% LEL.

The Corporate HS&E Group should be contacted for guidance on how to achieve 0% LEL.

13. Entry to a Permit Required Confined Space

Personnel may only enter into a Permit Required Confined Space after preparation requirements are met and a permit is signed and issued. If at any time anyone (entrant, attendant, Entry Supervisor, or any other person) determines that the Confined Space Entry is unsafe or unanticipated hazards are present, the Permit Required Confined Space shall be immediately evacuated and safe conditions established prior to reentry.

Attendant on left and entrant on right

The designated standby person shall not leave the Confined Space hub access with any entrant inside unless they have been relieved by another trained standby person.

Unauthorized personnel shall not be allowed entry, and, if the confined space is left unattended, the entrance shall be barricaded. Access to the turbine is controlled by locks and therefore there is no need to post signage indicating that the blade is a permit required confined space.

14. Completion of Work and Restoration of Confined Space

When all work is complete and Permit Required Confined Space is ready to be returned to service, an entry supervisor will conduct a post-entry review. A site-specific checklist will be used for proper restoration. In addition to items listed on the permit, the following should be verified:

- Are all personnel out of the Permit Required Confined Space?
- Are all equipment and tools removed?
- Is all Lock Out/Tag Out equipment removed/disengaged?

After cancellation or expiration of the permit, an entry completion meeting (post-meeting) with everyone involved shall be held and documented. The canceled permit shall be reviewed to confirm that any hazards found or created have been documented to confirm that personnel participating in future entry operations are protected from previously unidentified hazards.

15. Confined Space Permit

A completed Confined Space Entry Permit (DMS 0008-8016) is required to enter a confined space. The permit must remain on-site for one year after the completion of the work to facilitate review.

16. Rescue Plan

16.1 Confined Space Entry Safe Work Procedure – Tower Basement

This procedure reflects the requirements and the safe procedure to enter and work in a Wind Turbine Tower Basement Confined Space. Every worker involved in basement work has to follow the exact procedure as described in the **Vestas Canadian Wind Technology Confined Space Entry Program.**

PRE-ENTRY CONSIDERATIONS

- Ensure that all the personnel involved in the work have the proper training as required by the **Vestas Americas Confined Space Entry Program, Lock-out/Tag-out procedures, and climbing procedures.**
- For "Lockout-Tag out" purposes follow the **Equipment Lockout Procedure.**
- Complete the **Job Safety Analysis**
- Determine and establish an emergency **rescue plan**.
- Establish the work zone physically, close all openings, hatches.

DURING ENTRY AND RE-ENTRY

- Follow the Confined Space Entry Procedure as described in the Vestas Americas Confined Space Entry Program.
- Have readily available and wear proper PPE to protect against identified and potential hazards.
- Safety harness must be worn at all times the entrance hatches are open. Once all hatches are closed the safety harness may be removed due to the increased hazard of catching it on protrusions. If any hatches are open workers must be tied off at all times with either the cable grab or shock absorbing lanyards.
- Radio or telephone available for emergency, 911 calls.
- Entry Permit completed by all workers involved in the work.
- Simple emergency plan involving attendant (Self or Entry rescue).
- One attendant in nacelle, competent worker
- Ensure safe work practices are followed.
- Stop work and exit the space if hazardous conditions arise, re-evaluate.
- Reissue permit after absence from area or if conditions change.
- Confirm that all persons & equipment are accounted for.

EMERGENCY AND RESCUE PROCEDURE

If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:

ALWAYS CALL EMERGENCY SERVICES FIRST IN CASE OF AN INJURED WORKER.

a) If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:
b) Determine if the worker is conscious.
c) Test the atmosphere before entering the confined space. If hazardous, an SCBA must be used by trained personnel only.
d) Perform first aid or CPR as necessary to stabilize victims and allow for their evacuation to the ground as quickly as possible.
e) Set up Tower Rescue Device
f) Raise worker to the waiting rescue workers on the main deck.
g) Secure the confined space for inspection and investigation.
h) Advise the Customer Power Plant Manager and the immediate Supervisor of the incident.
i) Record the details of the emergency as soon as possible after the emergency has ended. Be precise and detailed about the events before, during and after the emergency.
j) Accident reporting procedure:
   (i) Employees must report all minor or serious injuries without delay to their immediate Supervisors.
   (ii) Plant Manager in conjunction with the Vestas Site Supervisor must investigate all accidents; and members of the health and safety committee investigate all critical accidents.

(iii) Plant Manager must complete the accident/incident form.

AFTER EXIT

- Ensure safe work procedures are followed.
- Review operation- Comment on any unsatisfactory aspects.
- Acceptance of completed job.
- Sign off the Safe Work Permit.
- Perform the restoration as per the work instructions.
- Secure entry point of confined space; close the hatches on the way down.
- Sign off the Entry Permit
- Upon cancellation or completion of each Entry Permit, the Permit Issuer will return the completed documents to the Entry Supervisor.
- Retain all the original copies concerning the confined space entry in a station file for one year + current.

16.2 Confined Space Entry Safe Work Procedure - Hub

This procedure reflects the requirements and the safe procedure to enter and work in a Wind Turbine Hub Confined Space. Every worker involved in hub work has to follow the exact procedure as described in the **Vestas Canadian Wind Technology Confined Space Entry Program.**

PRE-ENTRY CONSIDERATIONS

- Ensure that all the personnel involved in the work have the proper training as required by the **Vestas Americas Confined Space Entry Program, Lock-out/Tag-out procedures, and climbing procedures.**
- For "Lockout-Tag out" purposes follow the **Equipment Lockout Procedure.**
- Complete the **Job Safety Analysis**
- Determine and establish an emergency **rescue plan.**
- Establish the work zone physically, close all openings, hatches.

DURING ENTRY AND RE-ENTRY

- Follow the Confined Space Entry Procedure as described in the Vestas Americas Confined Space Entry Program.
- Have readily available and wear proper PPE to protect against identified and potential hazards.
- Safety harness must be worn at all times the entrance hatches are open. Once all hatches are closed the safety harness may be removed due to the increased hazard of catching it on protrusions. If any hatches are open workers must be tied off at all times with either the cable grab or shock absorbing lanyards.
- Radio or telephone available for emergency, 911 calls.

- Entry Permit completed by all workers involved in the work.
- Simple emergency plan involving attendant (Self or Entry rescue).
- One attendant in nacelle, competent worker
- Ensure safe work practices are followed.
- Stop work and exit the space if hazardous conditions arise, re-evaluate.
- Reissue permit after absence from area or if conditions change.
- Confirm that all persons & equipment are accounted for.

EMERGENCY AND RESCUE PROCEDURE

If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:

ALWAYS CALL EMERGENCY SERVICES FIRST IN CASE OF AN INJURED WORKER.

a) If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:
b) Determine if the worker is conscious.
c) Test the atmosphere before entering the confined space. If hazardous, an SCBA must be used.
d) Perform first aid or CPR as necessary to stabilize victims and allow for their evacuation to the ground as quickly as possible.
e) Set up Tower Rescue Device
f) Lower worker to the waiting rescue workers on the ground
g) Secure the confined space for inspection and investigation.
h) Advise the Customer Power Plant Manager and the immediate Supervisor of the incident.
i) Record the details of the emergency as soon as possible after the emergency has ended. Be precise and detailed about the events before, during and after the emergency.
j) Accident reporting procedure:
   (iv) Employees must report all minor or serious injuries without delay to their immediate Supervisors.
   (v) Plant Manager in conjunction with the Vestas Site Supervisor must investigate all accidents; and members of the health and safety committee investigate all critical accidents.
   (vi) Plant Manager must complete the accident/incident form.

AFTER EXIT

- Ensure safe work procedures are followed.
- Review operation- Comment on any unsatisfactory aspects.
- Acceptance of completed job.
- Sign off the Safe Work Permit.
- Perform the restoration as per the work instructions
- Secure entry point of confined space; close the hatches on the way down.
- Sign off the Entry Permit

- Upon cancellation or completion of each Entry Permit, the Permit Issuer will return the completed documents to the Entry Supervisor.
- Retain all the original copies concerning the confined space entry in a station file for one year + current.

16.3 Confined Space Entry Safe Work Procedure - Nacelle

This procedure reflects the requirements and the safe procedure to enter and work in a Wind Turbine Nacelle Confined Space. Every worker involved in nacelle work has to follow the exact procedure as described in the **Vestas Canadian Wind Division Confined Space Entry Program.**

PRE-ENTRY CONSIDERATIONS

- Ensure that all the personnel involved in the work have the proper training as required by the **Vestas Americas Confined Space Entry Program, Lock-out/Tag-out procedures, and climbing procedures.**
- For "Lockout-Tag out" purposes follow the **Equipment Lockout Procedure.**
- Complete the **Job Safety Analysis**
- Determine and establish an emergency **rescue plan.**
- Establish the work zone physically, close all openings, hatches.

DURING ENTRY AND RE-ENTRY

- Follow the Confined Space Entry Procedure as described in the Vestas Americas Confined Space Entry Program.
- Have readily available and wear proper PPE to protect against identified and potential hazards.
- Safety harness must be worn at all times the entrance hatches are open. Once all hatches are closed the safety harness may be removed due to the increased hazard of catching it on protrusions. If any hatches are open workers must be tied off at all times with either the cable grab or shock absorbing lanyards.
- Radio or telephone available for emergency, 911 calls.
- Entry Permit completed by all workers involved in the work.
- Simple emergency plan (Self or Entry rescue).
- Ensure safe work practices are followed.
- Stop work and exit the space if hazardous conditions arise, re-evaluate.
- Reissue permit after absence from area or if conditions change.
- Confirm that all persons & equipment are accounted for.

EMERGENCY AND RESCUE PROCEDURE

If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:

ALWAYS CALL EMERGENCY SERVICES FIRST IN CASE OF AN INJURED WORKER.

a) If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:
b) Determine if the worker is conscious.
c) Test the atmosphere before entering the confined space. If hazardous, an SCBA must be used.
d) Perform first aid or CPR as necessary to stabilize victims and allow for their evacuation to the ground as quickly as possible.
e) Set up Tower Rescue Device
f) Lower worker to the waiting rescue workers on the ground
g) Secure the confined space for inspection and investigation.
h) Advise the Customer Power Plant Manager and the immediate Supervisor of the incident.
i) Record the details of the emergency as soon as possible after the emergency has ended. Be precise and detailed about the events before, during and after the emergency.
j) Accident reporting procedure:
   (vii) Employees must report all minor or serious injuries without delay to their immediate Supervisors.
   (viii) Plant Manager in conjunction with the Vestas Site Supervisor must investigate all accidents; and members of the health and safety committee investigate all critical accidents.
   (ix) Plant Manager must complete the accident/incident form.

AFTER EXIT

- Ensure safe work procedures are followed.
- Review operation- Comment on any unsatisfactory aspects.
- Acceptance of completed job.
- Sign off the Safe Work Permit.
- Perform the restoration as per the WORK INSTRUCTIONS.
- Secure entry point of confined space; close the hatches on the way down.
- Sign off the Entry Permit
- Upon cancellation or completion of each Entry Permit, the Permit Issuer will return the completed documents to the Entry Supervisor.
- Retain all the original copies concerning the confined space entry in a station file for one year + current.

16.4 Confined Space Entry Safe Work Procedure - Tower

This procedure reflects the requirements and the safe procedure to enter and work in a Wind Turbine Tower Confined Space. The tower base section is not considered part of the Tower Confined Space. Once past the first hatch, confined spaces procedures are in effect. Every worker involved in tower work has to follow the exact procedure as described in the **Vestas Canadian Wind Technology Confined Space Entry Program.**

PRE-ENTRY CONSIDERATIONS

- Ensure that all the personnel involved in the work have the proper training as required by the **Vestas Canadian Wind Technology Confined Space Entry Program, Lock-out/Tag-out procedures, and climbing procedures.**
- For "Lockout-Tag out" purposes follow the **Equipment Lockout Procedure.**
- Complete the **Job Safety Analysis**
- Determine and establish an emergency **rescue plan.**
- Establish the work zone physically, close all openings, hatches.

DURING ENTRY AND RE-ENTRY

- Follow the Confined Space Entry Procedure as described in the Vestas Americas Confined Space Entry Program.
- Have readily available and wear proper PPE to protect against identified and potential hazards.
- Safety harness must be worn at all times. If any hatches are open workers must be tied off at all times with either the cable grab or shock absorbing lanyards.
- Radio or telephone available for emergency, 911 calls.
- Entry Permit completed by all workers involved in the work.
- Simple emergency plan (Self or Entry rescue).
- Ensure safe work practices are followed.
- Stop work and exit the space if hazardous conditions arise, re-evaluate.
- Reissue permit after absence from area or if conditions change.
- Confirm that all persons & equipment are accounted for.

EMERGENCY AND RESCUE PROCEDURE

If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:

ALWAYS CALL EMERGENCY SERVICES FIRST IN CASE OF AN INJURED WORKER.

a) If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:
b) Determine if the worker is conscious.
c) Test the atmosphere before entering the confined space. If hazardous, an SCBA must be used.
d) Perform first aid or CPR as necessary to stabilize victims and allow for their evacuation to the ground as quickly as possible.
e) Set up Tower Rescue Device
f) Lower worker to the waiting rescue workers on the ground

g) Secure the confined space for inspection and investigation.
h) Advise the Customer Power Plant Manager and the immediate Supervisor of the incident.
i) Record the details of the emergency as soon as possible after the emergency has ended. Be precise and detailed about the events before, during and after the emergency.
j) Accident reporting procedure:
   (x) Employees must report all minor or serious injuries without delay to their immediate Supervisors.
   (xi) Plant Manager in conjunction with the Vestas Site Supervisor must investigate all accidents; and members of the health and safety committee investigate all critical accidents.
   (xii) Plant Manager must complete the accident/incident form.

AFTER EXIT

- Ensure safe work procedures are followed.
- Review operation- Comment on any unsatisfactory aspects.
- Acceptance of completed job.
- Sign off the Safe Work Permit.
- Perform the restoration as per the WORK INSTRUCTIONS.
- Secure entry point of confined space; close the hatches on the way down.
- Sign off the Entry Permit
- Upon cancellation or completion of each Entry Permit, the Permit Issuer will return the completed documents to the Entry Supervisor.
- Retain all the original copies concerning the confined space entry in a station file for one year + current.

16.5 Confined Space Entry Safe Work Procedure – Blades & Hub

ATMOSPHERIC HAZARDS

This procedure reflects the requirements and the safe way to enter Blade Confined Space. Every worker involved in this work has to follow the exact procedure as described in the **Vestas Canadian Wind Technology Confined Space Entry Program**

Due to the possibility of one of the following conditions occurring entry into the blades must be considered hazardous, with appropriate safeguards taken:

- **Toxic chemicals**
- **Toxic gasses and vapours**
- **Explosive vapours**
- **Toxic particulate in the air**
- **Oxygen deficient**

DEFINITIONS:

- **Acceptable atmospheric levels:** An acceptable atmospheric level is one at which the atmospheric concentration of any explosive or flammable gas or vapour is less than 10 % of its lower explosive limit, for any work.

- **Atmospheric hazard:** Any of the following situations qualifies as an atmospheric hazard:
  (a) The accumulation of flammable, combustible or explosive agents is over 10% of the LEL.
  (b) Oxygen content in the atmosphere that is less than 19.5 % or more than 23% by volume.
  (c) The accumulation of atmospheric contaminants, including gasses, vapours, fumes, or dust, that could:
    - result in acute health effects that poses an immediate threat to life, or
    - interfere with a person's ability to escape unaided from a confined space.

- **Bump Test:** A bump test is a method of testing an instrument's sensors with a concentration of gas high enough to make the instrument go into alarm. If the instrument fails to alarm or its reading does not coincide with the measure of gas as indicated on the test cylinder, a full calibration must then be performed to adjust the instrument's reading.

DO NOT ENTER A BLADE or HUB CONFINED SPACE UNLESS YOU:

1) **Use forced air ventilation to provide fresh air into the confined space.**
2) **Monitor the atmosphere with a previously bump tested air monitor.**
3) **Reach the normal atmosphere and eliminate or control the atmospheric hazard deficiency, then you can proceed with the pre-entry procedure. The space will remain hazardous which means that all the precautions must be taken to ensure the safety of the workers in the confined space. The emergency rescue plan will include 2 rescuers trained in the use of self contained breathing apparatus.**

Specific safety precautions for work in a potential hazardous environment: To be carried out by trained specialists only where self contained breathing apparatus or air supplied respirator is required. This is only permitted for rescue purposes by trained rescuers or for inspection purposes by trained and experienced workers.

PRE-ENTRY CONSIDERATIONS

- Ensure that all the personnel involved in the work have the proper training as required by the **Vestas Canadian Wind Technology Confined Space Entry Program, Lock-out/Tag-out procedures, and climbing procedures.**
- For "Lockout-Tag out" purposes follow the **Equipment Lockout Procedure.**
- Complete the **Job Safety Analysis**
- Complete the **Confined Space Entry Plan**
- Determine the emergency **rescue plan.**
- Establish the work zone physically, protect all openings, hatches.

NOTE: Removal of unconscious persons from confined spaces is difficult. The use of the tower rescue device should be considered and, where appropriate, be in the hub before entry to the

confined space is permitted. **No persons are to enter the space to carry out retrieval of an unconscious person unless they have been trained as rescuer and in the use of SCBA or air adduction equipment, have it available and are wearing it.**

In an emergency, the spontaneous reaction to immediately enter and attempt rescue of an unconscious person, from a confined space may lead to the deaths or serious injury of those attempting the rescue.

The person working in the confined space to enable him/her to quickly exit the area may wear a self-rescue system. **It is not to be used to rescue one person by another.**

DURING ENTRY AND RE-ENTRY

- Follow the Confined Space Entry Procedure as described in the Vestas Americas Confined Space Entry Program.
- Have readily available and wear proper PPE (see DMS 0008-6837 – PPE Plan) to protect against identified and potential hazards.
- Gas monitoring is mandatory before and during entry in a continuous mode.
- Periodic measurements must be recorded on the entry permits
- Ventilation mandatory.
- Safety harness with a retrieval line connected and in use is mandatory unless it may cause a greater hazard.
- Two attendants in nacelle, both competent rescuers.
- Establish a path of communication between entrant(s) and attendant.
- Radio or telephone available for emergency, 911 call.
- Entry Permit completed by all workers involved in the work.
- Emergency plan with two trained rescuers. (Entry and non-entry rescue).
- Two workers trained as a rescuer and in the use of SCBA, mandatory.
- Ensure safe work practices are followed.
- Stop work and exit the space if hazardous conditions arise, re-evaluate.
- Reissue permit after absence from area or if conditions change.
- Confirm that all persons & equipment are accounted for.

IF AN OXYGEN-DEFICIENT OR TOXIC ATMOSPHERE IS DISCOVERED

If a toxic atmosphere contains gas, vapour or dust in a concentration higher than that indicated on he Confined Space Entry Permit, or if an oxygen-deficient or an excess-oxygen atmosphere exists the following procedures must be implemented:

- Evacuate the confined space immediately.
- Bump test the air monitor and resample to ensure the accuracy of the data indicating that there is an oxygen deficiency, excess oxygen or toxic atmosphere.
- Notify the supervisor that an oxygen-deficient, excess-oxygen or toxic atmosphere has been discovered, and provide as many details as possible, including the exact location.
- If it's safe to do so, ventilate the confined space with a blower unit to elimi-

nate toxic pollutants.

IF AN EXPLOSIVE ATMOSPHERE IS DISCOVERED

Where gas or vapour in a confined space is, or may be, explosive or flammable, workers may enter the confined space for emergency purposes; if the concentration of the gas or vapour does not, or is not likely to, exceed 10% of its lower explosive limit (LEL) and that the oxygen concentration level is under 23%. Where gas or vapour in a confined space is, or may be, explosive or flammable, workers may enter the confined space only if:

If an explosive atmosphere is discovered (vapours, gases, dust), and its readings are over 10% the lower explosive limits, the following procedures must be implemented;

a) Evacuate the confined space and the surrounding area immediately.
b) Turn off all sources of ignition and ensure no smoking takes place in the area.
c) Bump test the air monitor to ensure accuracy of the readings.
d) Notify the supervisor immediately that an explosive condition has been discovered and provide as many details as possible, including the exact location.
e) If it's safe to do so, ventilate the confined space with a CSA-approved (explosion- proof) extractor to eliminate the explosion hazard.
f) Purge with an inert gas, if applicable.
g) Also purge with air.

NOTE: No one is to enter a confined space where an explosive atmosphere has been detected. A safe level for an explosive atmosphere is under "10% lower flammability limit."

EMERGENCY AND RESCUE PROCEDURES

If an emergency requires the retrieval of employees from the confined space, the following procedures must be followed (also refer to the Vestas Canadian Wind Technology Confined Space Entry Program).

ALWAYS CALL EMERGENCY SERVICE FIRST IN CASE OF AN INJURED WORKER.

If an emergency requires the retrieval of employees from the confined space, the following procedures must be followed:

a) If an emergency requires the rescue of employees from the confined space, the following procedures must be followed:
b) Determine if the worker is conscious.
c) Test the atmosphere before entering the confined space. If hazardous, an SCBA must be used.
d) Perform first aid or CPR as necessary to stabilize victims and allow for their evacuation to the ground as quickly as possible.
e) Set up Tower Rescue Device
f) Lower worker to the waiting rescue workers on the ground
g) Secure the confined space for inspection and investigation.

h) Advise the Customer Power Plant Manager and the immediate Supervisor of the incident.

i) Record the details of the emergency as soon as possible after the emergency has ended. Be precise and detailed about the events before, during and after the emergency.

AFTER EXIT

- Ensure safe work procedures are followed.
- Review operation- Comment on any unsatisfactory aspects.
- Acceptance of completed job.
- Sign off the Confined Space Entry Permit (DMS 0008-8016).
- Perform the restoration as per the work instructions
- Secure entry point of confined space; close the hatches on the way down.
- Sign off the Entry Permit
- Upon cancellation or completion of each Entry Permit, the Permit Issuer will return the completed documents to the Entry Supervisor.
- Retain all the original copies concerning the confined space entry in a station file for one year + current.

17. References

Confined Spaces has a set of national regulations. However, individual provinces and territories may have introduced minor changes while integrating Confined Spaces with their occupational health and safety regulatory regime. Here are provincial Regulations for any special Confined Spaces requirements:

- **British Columbia**
  British Columbia Occupational Health & Safety Regulation, 296/97, Part 9.8

  http://www2.worksafebc.com/Topics/ConfinedSpaces/RegulationAndGuidelines.asp

- **Alberta**
  Alberta Occupational Health & Safety Code 2006, Part 5 46(1)

  http://www.employment.alberta.ca/documents/WHS/WHS-LEG_ohsc_2009.pdf

- **Saskatchewan**
  Saskatchewan Occupational Health and Safety Regulations, Part XVIII 272(3)

  http://www.qp.gov.sk.ca/documents/English/Regulations/Regulations/O1-1R1.pdf

- **Manitoba**
  Manitoba Workplace Safety and Health Regulation 217/2006, Part 15

  http://safemanitoba.com/uploads/regulations/part1.pdf

- **Ontario**
  Ontario Regulation 632/05 Section 8 & 9

  http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_050632_e.htm

- **Québec**
  Québec OH&S Regulation, LRQ, c.S-2.1, Section XXI

http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=//S_2_1/S2_1R6.htm

- **New Brunswick**
  New Brunswick Regulation 91-191 Part 17 263(6)

  http://www.gnb.ca/0062/regs/91-191.htm

- **Nova Scotia**
  Nova Scotia Regulation 4/2004 Part 12 130 3(b) & 5(a)

  http://www.gov.ns.ca/just/regulations/regs/ohsgensf.htm

- **Newfoundland and Labrador**
  Newfoundland & Labrador Consolidated Regulation 1165/96 25(10)

  http://www.assembly.nl.ca/Legislation/sr/Regulations/rc961165.htm

- **Prince Edward Island**
  Prince Edward Island OH&S Act Regulations Part 13

  http://www.gov.pe.ca/photos/original/wcb_ohs_regs.pdf

- **Nation-wide (Canada)**
  Canada Occupational Health and Safety Regulations (SOR/86-304) Section 11.11

  http://laws.justice.gc.ca/en/showdoc/cr/SOR-86-304/20070524

18. History of this Document

Rev. no.:	Date:	Description of changes
00	11-August-2009	New document
01	01-Jan-2010	Template updated

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Confined Space Entry Permit

GENERAL INFORMATION

Wind Facility:	
WTG:	
Work to be done:	
Date and time:	

PERMIT SPACE HAZARDS

(Fill in fields if necessary/applicable)			
ATMOSPHERIC	**YES**	**NO**	**POTENTIAL**
Oxygen Deficiency	☐	☐	☐
Oxygen Enrichment	☐	☐	☐
Explosive (Gas/Vapor)	☐	☐	☐
Hydrogen Sulfide	☐	☐	☐
Explosive Dust	☐	☐	☐
Other toxic gases/vapors	☐	☐	☐
CONFIGURATION (entrapment)	☐	☐	☐
MECHANICAL	☐	☐	☐
ELECTRICAL	☐	☐	☐
SUBSTANCE HAZARD TO SKIN/EYES	☐	☐	☐
HEAT STRESS	☐	☐	☐
COLD STRESS	☐	☐	☐
HYDRAULIC	☐	☐	☐
PNEUMATIC	☐	☐	☐
WEATHER (electrical storms)	☐	☐	☐
OTHER POTENTIAL HAZARDS (Describe hazard -e.g. radiation, noise, phobias, mental or physical condition of entrant, vibration, cold, hot, humid etc.)			

PERSONNEL

Company Name	
Entrant(s) (Refer to Log)	**NAME & SIGNATURE**
Attendant(s) (Hub & Blades)	
Entry Supervisor	

EQUIPMENT VERIFICATION

Equipment on-site and verified in good order by :

COMMUNICATION PROCEDURES USED BY ENTRANT(S) & ATTENDANT(S) – *CHECK ALL THAT APPLY*

Visual	☐	**Rope**	☐
Voice	☐	**Radio**	☐
Other (specify)			

CONTROLS/ EQUIPMENT – *CHECK ALL THAT APPLY*

ISOLATION ☐	
Lockout/Tagout	☐
Service Key	☐
Remote Stop	☐
CONTINUOUS ATMOSPHERIC TESTING ☐	
VENTILATION ☐	
Natural	☐
Continuous Forced Air	☐
Local Exhaust	☐
ENTRY EQUIPMENT ☐	
Ladders	☐
First Aid Kit	☐
Other (specify type)	
PERSONAL PROTECTIVE EQUIPMENT (PPE) ☐	
Respirator	☐
SCBA/ESCBA	☐
SAR	☐
Air Purifying	☐
Protective Clothing (specify – i.e. gloves, coveralls etc.)	☐
Eye and Face Protection	☐
Hearing Protection	☐
RESCUE & RETRIEVAL EQUIPMENT ☐	
Full Body Harness	☐
Cable Grab	☐
Lanyards	☐
Tower Rescue Kit	☐
INTRINSICALLY SAFE ELECTRICAL EQUIPMENT & GFCI ☐	
EXPLOSION PROOF FLUORESCENT LIGHTS ☐	
COMMUNICATION EQUIPMENT ☐	
Radio	☐
Phone	☐
Other (specify type)	
FIRE EXTINGUISHERS ☐	

MSDS REVIEW ☐

Hazards Identified ☐
New Materials Reviewed ☐

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ATMOSPHERIC TESTING RECORD

CONDITION	ACCEPTABLE LEVEL	PRE-ENTRY READINGS				Time Interval Readings			
		Reading	Time	Reading	Time	30 min.	1 hr.	1.5 hrs.	2 hrs.
Oxygen	19.5% - 23.5%								
Explosive (Gas/Vapor)	<10% LEL								
Explosive Dust	<LEL (5 ft. visibility)								
Carbon Monoxide	25 ppm								
Hydrogen Sulfide	10 ppm								
Other Hazards (e.g. Heat Stress – specify type)									
Other Hazards (e.g. Heat Stress – specify type)									
Name(s) or Initials of Tester:									
Testing Equipment Used:		Serial #:			Type:				

Last Factory Calibration Date:	
Last Instance of Cal Gas Used:	

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Confined Space Entry Permit

ENTRY AUTHORIZATION

CONFINED SPACE LOCATION:	
Nature of work to be done:	
Permit applies from	**to**
Entry authorized by (example - PM or CM):	
Date/Time:	
Signature:	

POST ENTRY PERMIT AT ENTRANCE TO PERMIT SPACE.
(NOTE: IF CONDITIONS CHANGE, THIS PERMIT IS VOID.)
ATTACH THE CATEGORY ENTRY PROCEDURE TO THE PERMIT.

ENTRY CANCELLATION

ENTRY CANCELLED BY:	
Date/Time:	
Signature:	
REASON FOR CANCELLATION:	
Entry Operation Completed	☐
Prohibited Condition Arose (describe)	

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Confined Space Entry Permit

CONFINED SPACE CATEGORY RISK ASSESSMENT

The purpose of this risk assessment is to identify the hazards (potential and existing), and to determine the category of confined space that is to be entered. Each potential hazard below has a category (1 or 2) allocated to it. This cannot be changed. Add a checkmark to the clear box if the hazard is present, or leave it empty if the hazard is not present. Document additional hazards and categorize the space. This will then identify the safety precautions that must be taken.

Site:

Date:

HAZARD – Mark check box if hazard is present; leave blank if hazard is not present	1	2
1. No other hazards than being a confined space	☐	
2. Electrical shock	☐	
3. Temperature extreme	☐	
4. Risk of falling objects	☐	
5. Risk of falling while working	☐	
6. Slippery/wet surfaces when climbing	☐	
7. Rescue plan-include self or assisted rescue technique	☐	
8. Limited egress from the space	☐	
9. Burning liquid potential	☐	
10. Limited ventilation	☐	
11. Flammable/ explosive potential	☐	
12. Toxic gases & vapors potential	☐	
13. Rescue plan-include self or entry rescue techniques	☐	
14. Extremely limited egress	☐	
15. Rescue plan-include non-entry or entry rescue techniques	☐	
16. Atmospheric deficiency at pre-entry air sample		☐
17. Entry & egress extremely difficult		☐
18. Falling hazard into a constricted space		☐
19. Rescue plan-include non-entry or entry rescue techniques		☐
20. Other considerations (specify):	☐	☐

Also consider :

- Nature of the confined space
- The work to be done
- The range of methods by which the work can be safely done
- The actual method selected and rescue plan proposed
- Emergency and rescue procedure (self rescue, non-entry rescue, entry rescue)

Comments:

Nature of the work to be done (describe):
Work Instruction Reference #:

Contents

1. Introduction

This document provides an overview of ongoing operation and maintenance (O&M) requirements that are mandated by federal and state environmental regulations for the class of waste products known as **UNIVERSAL WASTES** that are produced by Vestas operations. Universal wastes include:

- **Batteries** such as nickel-cadmium (Ni-Cd) and small sealed lead-acid batteries, which are found in many common items including electronic equipment, mobile telephones, portable computers, and emergency backup lighting.

Note: Automotive lead-acid batteries are NOT considered universal wastes[1]

- **Agricultural pesticides** that have been recalled or banned from use, are obsolete, have become damaged, or are no longer needed.
  They often have been stored for long periods of time in sheds, cabinets, etc.
  These types of chemicals should not be encountered at Vestas service site locations.
- **Thermostats**, which can contain as much as 3 grams of liquid mercury and can be found in almost any building.
- **Lamps**, which typically contain mercury and sometimes lead.
  Examples of common types of lamps include fluorescent, high intensity discharge (HID), neon, mercury vapor, high-pressure sodium, and metal halide lamps..

The target users of this document are all Vestas service site personnel that have occasion to use or manage the types of products noted above.

This document specifically addresses how these products, when they become wastes, are to be managed and disposed of or recycled.

2. Process Description

The term **UNIVERSAL WASTE** depicts the fact that businesses, government, communities, and households "universally" produce these types of wastes. Vestas produces **UNIVERSAL WASTES** at virtually all its locations, ranging from used fluorescent light tubes from office lighting at the Vestas Americas corporate offices, to spent nickel-cadmium batteries from a flashlight in a service truck at a wind park service site.

Historically, **UNIVERSAL WASTES** were disposed into the trash and ultimately ended up in municipal waste landfills, even though the properties of these wastes, or chemicals contained in the waste, would typically be considered a hazardous waste. For example, the sulfuric acid electrolyte in a small lead-acid battery in an uninterruptible power supply (UPS) for a desktop computer has a pH less than 2.0 (which would make it a corrosive hazardous waste). Many fluorescent light tubes contain enough mercury to be considered a toxic hazardous waste.

In the mid-1990's the federal government adopted rules intended to (a) reduce the amount of these wastes that end up in our municipal landfills, and (b) encourage recycling and proper disposal of these universally produced hazardous wastes.

[1] Normal fleet supply vendor channels should be followed for returning and recycling used automotive lead-acid batteries. That is, it is expected that Vestas will only do business with vendors that will take-away/swap used automotive-type batteries for new batteries when they are purchased or delivered.

3. How Universal Wastes Are Regulated

This section summarizes key environmental requirements that apply to the handling and management of universal wastes at Vestas. These requirements are primarily imposed by federal regulations that have been adopted by the various states where we operate. Typically, the state environmental agency administers and enforces the state regulations.

3.1 Air Emissions

While some very minor air emissions could result from the improper management of universal wastes (e.g., crushing fluorescent light tubes that contain trace amounts of mercury), these wastes are not specifically controlled by air regulations.

3.2 Stormwater Discharges

State and local environmental agencies issue stormwater discharge permits based on the type of industrial activity conducted at a site-specific location. If the industrial activity is covered, a permit is required unless a demonstration is made that the potential for hazardous materials to come into contact with stormwater will not occur.

For facilities that have a stormwater NPDES permit, a written Stormwater Pollution Prevention Plan (SWPPP) is required to be prepared. The plan must describe physical and procedural steps that the permit holder has implemented to reduce or mitigate the chances of contaminating stormwater runoff. At least twice per year, permitted facilities are required to collect and analyze samples from various storm drain inlets for various pollutants to gauge the effectiveness of its pollution prevention practices. These results must be reported to the State each year.

At this time, no Vestas site operation has a stormwater NPDES permit.

As with any chemical product, extreme care must be exercised when handling all universal wastes to prevent the waste (or chemicals contained in the waste) from coming into contact with the ground or stormwater (such as draining the electrolyte from small lead-acid batteries, crushing light bulbs, or a leaking pesticide container).

3.3 Wastewater Discharges

Placing (e.g., draining) any universal waste (or chemicals contained in the waste) into the sanitary sewer (e.g., draining electrolyte or any pesticide into a sink) or septic tank system is not permissible.

3.4 Hazardous Wastes

As described in Section 4, the universal waste regulations require six (6) simple management steps:

- Do NOT throw universal wastes into the trash;
- Collect and store universal wastes in appropriate, non-leaking containers;
- Label or mark the container to identify what type of universal waste is inside in the container;
- Do NOT store accumulated universal wastes onsite for more than 1 year;
- Provide basic training to Vestas employees that produce, handle, or manage universal wastes; and
- Assure that universal wastes are shipped to and received by an authorized universal waste collection site or destination facility (e.g., a recycling facility for fluorescent light tubes).

Despite the fact that the Universal Waste rules impose certain requirements, these rules are significantly more relaxed when compared to the 'regular' hazardous waste regulations. Therefore it is imperative that we properly identify, accumulate, store, and transfer universal wastes from our operations to companies that will properly manage these materials.

4. Required Operating Practices

This section provides an overview of the environmental regulatory requirements that pertain to managing universal wastes including:

- Collection and storage requirements
- Inspections
- Training
- Reporting and recordkeeping

Vestas service personnel that produce universal wastes are responsible for assuring that all requirements identified in this document are fulfilled. Any deviation from, or exception to, these requirements must be reported to Vestas' Environmental Manager.

4.1 Waste Collection Requirements

This section provides an overview of the minimum requirements that Vestas personnel must follow for the collection of universal wastes prior to disposal or recycling. This includes universal wastes that are produced during field/mobile activities.

4.1.1 All Vestas Operations

- ► Universal wastes must NOT be disposed of by throwing into the trash, or discarded in any other way.
- ► Do NOT crush or break fluorescent light tubes. They must be accumulated, stored, and shipped intact in order to qualify for the universal waste program.
- ► Do NOT drain the electrolyte from any wet cell batteries unless specifically directed by the Vestas Environmental Department.

4.1.2 Mobile Operations

- ► Return all universal wastes to your base service site garage.
- ► Give the universal wastes to the person responsible for stores or to the Site HazMat Coordinator.

4.1.3 Service Centers and Other Fixed Facilities

- ► Universal wastes must be placed into non-leaking containers that are appropriate for the universal waste;
- ► Do NOT place different types of universal wastes into the same container (e.g., don't place an unwanted container of RoundUp herbicide in the same container as used Ni-Cad batteries);
- ► Make sure the accumulation container(s) is clearly labeled with the words "Universal Waste," the type of universal waste (e.g., pesticide, fluorescent light tube, etc.), and the date the container is initially used for accumulating universal wastes. (See Figure 1.)
- ► The accumulation container(s) must be kept closed, except when emptying or filling, to minimize the potential for spillage;

- Store the container(s) in an area with good ventilation. Harmful vapors can be released when opening a container to add or remove waste.
- The law allows a maximum of ONE YEAR onsite accumulation time for Universal Waste. It is Vestas' policy to remove these wastes in a timely manner, and more frequently than once per year if necessary to maintain small inventories at the service centers and other locations.
- Notify the Site Hazardous Material Coordinator or Vestas' Corporate Environmental Manager during APRIL and SEPTEMBER of each year with a Universal Waste inventory so that the company can make necessary arrangements for proper offsite management of these wastes.

4.2 Special Transfer and Storage Arrangements

As a general rule, a waste produced at a particular location must be handled and stored locally until such time as the company makes arrangements to ship the waste to an appropriate third-party vendor to dispose, recycle, or treat the material in accordance with the regulations. This holds true for Universal Wastes. That is, each location that produces Universal Wastes is expected to provide for the proper onsite storage and management of the waste until the waste is shipped offsite to the selected vendor.

Most Vestas locations produce very small quantities of Universal Waste that primarily consist of batteries and fluorescent light tubes. The regulations allow some flexibility for companies that operate at multiple locations to consolidate accumulated Universal Waste at one or more 'central' locations. Centralized collection facilitates a company's overall efforts to properly manage these materials by reducing the storage burden at its satellite locations and providing a more convenient pick-up option for vendors who ultimately manage these wastes.

The primary requirements that must be satisfied before Universal Wastes can be transferred from one location to another include:

- The shipping location must assure that all Universal Wastes are packaged and labeled in accordance with U.S. DOT shipping regulations;
- The shipping location must prepare an accurate inventory of Universal Wastes being transferred to the central location;
- The receiving location must accept the shipment;
- The total quantity of Universal Wastes stored at the receiving location cannot exceed 2,200 lbs after the shipment[2];

Unless specifically authorized by the Vestas Environmental Department, DO NOT transfer any quantity of Universal Wastes from your location to another Vestas facility. The Corporate Environmental Manager will work with you to either furnish proper storage containers and labels or assist you in making arrangements to transfer the waste materials to another Vestas location.

4.3 Stormwater

All Vestas service personnel are expected to make a conscious effort to assure that drips, leaks, and minor spillage of any chemical product or waste are immediately cleaned up with absorbent materials. (Absorbent materials must be collected and placed into a drum or other suitable container until the site HazMat Coordinator or Corporate Environmental Manager can determine if the material needs to be tested.)

[2] If more than 2,200 lbs of Universal Wastes is ever accumulated at the receiving location, Vestas must notify the state environmental agency. We will manage our operations to NOT exceed this threshold.

- All Universal Waste storage is to be conducted under cover or indoors.

4.4 Inspections

The containers used for accumulating Universal Wastes are required to be under an inspection program to assure that appropriate preventative maintenance is occurring and that no releases to the environment occur.

Written records for daily visual inspections are recommended, but not required, unless a spill or release is discovered. Written records for weekly and monthly inspections are required.

4.4.1 Visually Inspect or Verify Daily

It is *recommended* that Facility personnel check areas were Universal Waste containers are stored every day to make certain the containers are in good condition and no releases are occurring.

4.4.2 Visually Inspect or Verify Weekly

- That container(s) used for accumulating Universal Wastes are kept closed (i.e., lid or cover is secured);
- That container(s) are stored in a secure area and properly maintained so that they do not leak, rupture, or tip over when being opened, handled, or stored;
- That each storage container is marked with the words **Universal Waste** and the category of waste (e.g., pesticide, light tubes, etc.); and

4.5 Visually Inspect or Verify Monthly

- That no container(s) of Universal Waste have accumulated onsite for longer than **9 MONTHS** without notifying Vestas' Corporate Environmental Manager.
- Check to assure that an adequate inventory of spill response supplies is available at or near the area where the containers are located; and
- Emergency notification telephone numbers are posted at or near the waste storage area.

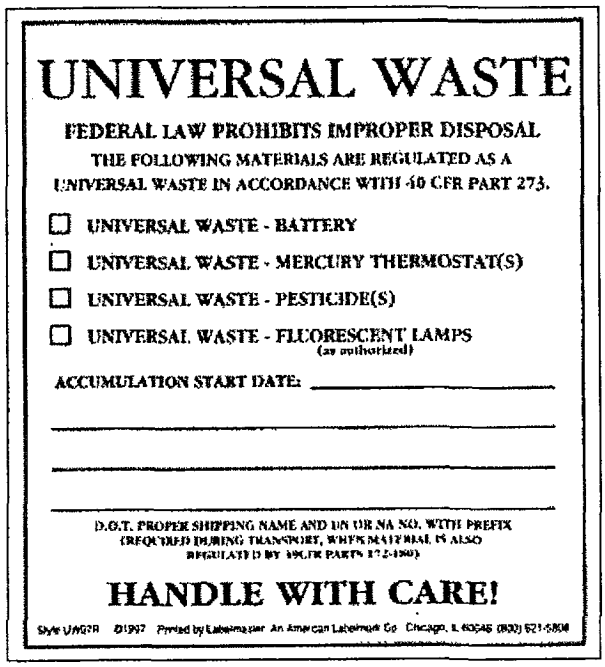
4.6 Reporting Requirements

- At a minimum, inspection records MUST include the date and time of the inspection, the name of the individual making the observations, a notation of the observations made, and the date and nature of any repairs or other remedial actions; and
- All spills must be immediately reported (within 15 minutes of discovery) to the site HazMat Coordinator or Corporate Environmental Manager.

4.7 Recordkeeping Requirements

The Site HazMat Coordinator, or designee, must maintain the following records and documents:

- An emergency response Contingency Plan, Spill Prevention Control and Countermeasures Plan, (SPCC) or other plan. (If you are uncertain-contact the Corporate Environmental Manager);
- Inspection logs kept for at least 3 years; and
- Training documents, including copies of training materials and personnel attendance log sheets.


UNIVERSAL WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

THE FOLLOWING MATERIALS ARE REGULATED AS A UNIVERSAL WASTE IN ACCORDANCE WITH 40 CFR PART 273.

☐ UNIVERSAL WASTE - BATTERY

☐ UNIVERSAL WASTE - MERCURY THERMOSTAT(S)

☐ UNIVERSAL WASTE - PESTICIDE(S)

☐ UNIVERSAL WASTE - FLUORESCENT LAMPS (as authorized)

ACCUMULATION START DATE: _____

D.O.T. PROPER SHIPPING NAME AND ID OR NA NO. WITH PREFIX (REQUIRED DURING TRANSPORT, WHEN MATERIAL IS ALSO REGULATED BY 49CFR PARTS 172-180)

HANDLE WITH CARE!

Style UW02R ©1997 Printed by Labelmaster An American Labelmark Co Chicago, IL 60646 (800) 621-5808

Figure 1 Universal Waste Label

5. History of this Document

Rev. no.:	Date:	Description of changes
00	2006-09-26	First edition - Reformatted & new number 27-Jul-2007
00	2010-01-01	Content and template updates

Contents

Top 10 DO's and DO NOT's for Managing Used/Spent Aerosol Containers	
Do	**Do Not**
► Contact the site HazMat Coordinator or the Corporate Environmental Manager if you have any questions not answered in this document. ► Make sure the Vestas Chemical Evaluation Committee has approved any new chemicals PRIOR to purchase. ► Check the Material Safety Data Sheet (MSDS) for chemical products to determine if potential chemical incompatibilities may occur if the material is stored in the same area with other hazardous materials. ► Make sure that proper separation or segregation is provided for hazardous materials that may be incompatible with each other. ► All flammable and combustible liquids stored inside a building MUST be stored inside an approved storage cabinet. ► All hazardous materials must be stored in an area or inside a device that is equipped with secondary containment. ► All Vestas site personnel MUST make a conscious effort to assure that drips, leaks, and minor spillage of hazardous materials are immediately cleaned up with absorbent materials.	► Do NOT exceed the allowable storage limits for storing flammable and combustible materials. ► Do NOT dispose or discard any chemical container until it has been completely emptied. ► Any precipitation that comes into contact with a hazardous material MUST NOT be allowed to discharge to any soil, storm drain inlet, ditch, swale, etc.

1. Introduction

This module provides an overview of ongoing operation and maintenance (O&M) requirements that are mandated by federal, state, and local hazardous material and fire code regulations for the following activities:

- General Storage of Hazardous Materials;
- Secondary Containment for Hazardous Material Storage; and
- Separation of Incompatible Materials.

These requirements are typically not mandated by environmental regulations, but rather they are required by the local hazardous material and fire codes. Mismanagement of hazardous materials can lead to releases to the environment, the production of hazardous wastes, or the production of wastewaters containing these substances.

The target users of this document are all Vestas personnel located at wind park service sites that have occasion to use or handle hazardous chemical products. This document specifically addresses how these products are to be stored and handled prior to their intended use.

This document does not cover all regulatory requirements applicable to the management of hazardous materials that may apply to Vestas.

2. Process Description

2.1 What is a Hazardous Material?

A number of U.S. federal agencies have attempted to define hazardous material, hazardous substance, etc., including the Department of Transportation (DOT), the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA). Each agency has developed different lists and differing definitions.

DOT's definitions pertain to the classification of hazardous materials for the proper selection of shipping containers, labeling, truck placarding, and emergency response procedures. OSHA's definition pertains to classifying hazardous materials for determining worker protection requirements and occupational exposure standards. EPA's definitions cover a wide spectrum of considerations ranging from protection of surface and groundwater to defining hazardous wastes, and emergency notification procedures in the event of spills into the environment. Unfortunately, a consolidated list of hazardous materials/substances does not exist, but ranges from over 400 substances regulated by OSHA to over 62,000 regulated by EPA. Generally, there are about 2,000 hazardous chemical substances contained in all of the products that are readily available in commerce.

For Vestas' purposes, a hazardous material is broadly defined to mean any chemical substance in its pure or diluted form that is capable of causing physical harm to living things, structures, or the environment, or could be considered any form of a health hazard. Any product or substance that has a hazardous ingredient listed on its Material Safety Data Sheet (MSDS) is considered a hazardous material. This includes such common products as typewriter correcting fluid to multi-component specialty paint systems.

2.2 General Chemical Categories

In order to ensure safe handling, packaging, and storage, new (and waste) chemicals must be stored by compatibility. Improper storage can cause fire, heat generation, container corrosion, poison gas evolution, and other dangerous conditions if incompatible chemicals mix. The classes and chemicals given below are intended to give the most common examples. Under most circumstances at Vestas, the MSDS for a product will contain chemical compatibility information that can be used to help determine how it should be handled and stored.

2.2.1 Flammable Gas

Flammable gases are gases under pressure, or compressed liquids that are gases at standard pressures and temperatures that will ignite in the presence of an ignition source.

Examples: propane, methane, acetylene, hydrogen.

2.2.2 Poison Gas

Poison gases are gases under pressure or compressed liquids that are gases at standard pressures and temperatures that are toxic.

Vestas should not have any reason to have this type of chemical onsite at any wind park.

Examples: methyl bromide, phosgene, tetraethyl pyrophosphate.

2.2.3 Flammable and Combustible Liquids

Flammable liquids are chemicals that have a flashpoint (FP) of 100°F[1] or less. In other words, it is a liquid that if warmed to 100°F it would give off enough vapor to ignite in the presence of an ignition source such as a flame. Combustible liquids are chemicals that have flashpoints greater than 100°F but less than 200°F.

Because of the discrepancy between defining flammable and ignitable from a practical standpoint, Vestas has chosen to call a flammable liquid a chemical with a flashpoint less than 140°F and a combustible liquid a chemical with a flashpoint greater than 140°F.

Class I Flammable Liquids (FP<100°F): alcohols, glycols, aldehydes, amides, esters, ethers, aromatic hydrocarbons, halogenated organics, ketones, and aliphatic saturated hydrocarbons.

Examples: Products containing isopropanol, acetaldehyde, ethyl acetate, xylenes, and hexanes. Automobile gasoline, methanol, and our natural gas odorant (Scentinel S-20) are all Class I Flammables.
Class II (100°F < FP < 140°F) and Class III (140°F < FP < 200°F) Combustible Liquids: aliphatic and aromatic amines, dithiocarbamates, carbamates, mercaptans, and other organic sulfides, nitriles, organic nitro compounds, and unsaturated aliphatic hydrocarbons.

Examples: Products containing ethanolamine, ethyl mercaptan, acetonitrile, ethyl nitrate, and butadiene.
No. 2 diesel fuel and kerosene are both considered Class II Combustibles (FP<130°F).

[1] Note that liquids with a flash point less than 140°F will also be considered an 'ignitable' hazardous waste when spent or no longer fit for use. These materials require special handling when produced. .

2.2.4 Flammable Solids

Flammable solids include chemicals that are moisture and/or water reactive. For example, chemicals in this class can react with water to give off a flammable gas that may ignite (i.e., sodium metal releasing hydrogen gas), or can react with water to release heat (i.e., metal powders).

Vestas should not have any reason to have this type of chemical onsite at any wind park.

Examples: sodium metal, hydrides (sodium hydride), calcium carbide, sodium hydrosulfite, sodium methacrylate and powdered metals.

2.2.5 Oxidizers

Oxidizers are chemicals that, for the purpose of this definition, will supply oxygen or it's analog to either initiate or enhance the combustion of other materials.

Inorganic Oxidizers: nitric acid, perchloric acid, ammonium nitrate, potassium nitrate, and other nitrates, bromates, iodates, permanganates, chlorates, and chlorine gas.

Basic Inorganic Oxidizers (stabilized with sodium hydroxide): sodium hypochlorate.

Organic Oxidizers: tetranitromethane, benzoyl peroxide, and other carbon/hydrogen-based oxidizers.

2.2.6 Corrosives

Corrosives are most easily defined as chemicals with a pH of above 11 or below 3, or it is corrosive to the skin. When determining if a corrosive material will be considered a hazardous waste, the pH must be below 2 or greater than 12.5.

Inorganic Acids: sulfuric acid, hydrochloric acid, hydrofluoric acid, phosphoric acid.

Organic Acids: acetic acid, propionic acid, and formic acid.

Bases (caustics): sodium hydroxide, potassium hydroxide

2.2.7 Cyanide and Sulfide Compounds

These are compounds that can release toxic cyanide or sulfide gasses if exposed to acidic conditions. Substances not commonly considered to be acids can have pH's low enough to cause a release of cyanide and sulfide gasses.

Vestas should not have any reason to have this type of chemical onsite at any wind park.

Examples: potassium cyanide, ferric sulfide.

Note: sulfate compounds do not generally pose this hazard.

2.2.8 Poisons

The poisons class is the class for chemicals that only show a hazard due to toxicity.

Group One Poisons: alcohols, glycols, aldehydes, amides, esters, ethers, aromatic hydrocarbons, halogenated organics, ketones, and aliphatic saturated hydrocarbons.

Examples: Products containing ethylene glycol, glutraldehyde, formamide, dichlorobenzene, quinone, acetophenone.

Group Two Poisons: aliphatic and aromatic amines, dithiocarbamates, carbamates, and other organic sulfides, nitriles, organic nitro compounds, and unsaturated aliphatic hydrocarbons.

Examples: Products containing aniline, dithane, aldicarb, cyanogen, and chloropicrin.

2.2.9 Pyrophorics

Pyrophorics are chemicals that will spontaneously ignite if exposed to the air. Vestas should not have any reason to have this type of chemical onsite at any wind park.

Example: silane gas, white phosphorous.

2.3 Hazardous Materials Used by Vestas

Fortunately, Vestas has done a good job minimizing the use of hazardous materials that present special handling and storage considerations. However, we do continue to use some chemical products that are hazardous and do require forethought in the manner that we handle, store, and use these products. Categories of hazardous materials that are in use or may be contained in products that we use include:

- Flammable Gases
- Class I and II Flammable Liquids
- Combustible Liquids
- Inorganic Oxidizers
- Corrosives
- Group One Poisons

2.4 Empty Containers

One of the frequent wastes that is produced are empty containers left after using a chemical product. For bulk materials such as oil, Vestas attempts to use suppliers that will take back empties (e.g., poly drums, etc.). However, a large number of chemical containers end up getting thrown away, scrapped, or recycled. In some cases the residues left in these seemingly empty containers may actually cause the container itself to be regulated as a hazardous waste.

From a regulatory perspective, a container is considered empty if:

- All material has been removed that can be removed using the practices commonly employed to remove materials from that type of container, e.g., pouring, pumping, tilting, and aspirating, ***and***
- No more than one inch of residue remains on the bottom of the container or inner liner.

Note: You must satisfy both conditions, above, for the container to be considered empty.

2.5 Potential Chemical Incompatibilities

One objective of this module is to improve all Vestas personnel's general understanding of the potential incompatibilities posed by various hazardous materials that may be used or stored at wind parks sites where Vestas is providing operations and maintenance services.

Based on the current types of hazardous materials used by Vestas, the general types of reactions that may occur if incompatibles are mixed together include:

- Evolution of heat that can cause splash hazards or lead to possible fire/explosive hazard conditions if either organic solvents are present in the material, or the heated mixture contacts combustible materials and a spark or ignition source is present.
- Evolution of innocuous and non-flammable gases that can cause excessive pressure buildup in vessels or containers causing unsafe storage conditions and potential splash hazards.
- Evolution of toxic gases that can quickly overcome personnel or can cause excessive pressure buildup in vessels or containers causing unsafe storage conditions and potential splash hazards.

- Evolution of flammable gases that can ignite or explode in the presence of a spark or ignition source or can cause excessive pressure buildup in vessels or containers causing unsafe storage conditions and potential splash hazards.

It is beyond the scope of this module to provide extensive information on the chemistry and the potential incompatibilities for all materials used by Vestas, particularly since the universe of materials varies with time. The MSDS for a particular chemical product is required to provide general chemical incompatibility and hazardous chemical reaction byproduct information.

The Corporate Environmental Manager has a more detailed set of tools and instruction on performing specific chemical incompatibility evaluations including computer software to assist in these evaluations. If you have any question on the potential incompatibility of one or more chemicals in a waste or a product, contact the Corporate Environmental Manager.

3. Generalized Process Diagram

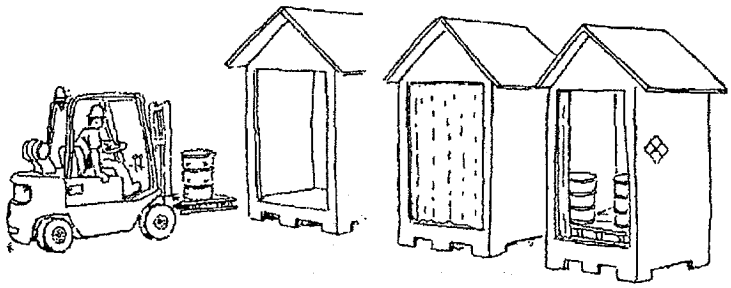


Figure 1: Proper Storage of Hazardous Materials is an Essential Environmental Practice at Vestas

4. How Hazardous Materials Are Regulated

This section summarizes key environmental requirements that apply to the onsite management of hazardous materials that are used by Vestas personnel while performing routine operation and maintenance activities. These requirements are primarily imposed by local, state, and federal regulations.

4.1 Air Emissions

Air emissions that may result from the generation and handling hazardous materials containing volatile organic compounds (VOCs) such as xylene, methyl ethyl ketone, and acetone, are regulated by state and federal air regulations. The primary use of VOC-containing products is for part cleaning or is contained in paint products such as aerosol cans. Though these chemicals are regulated by various agencies, Vestas' usage is small enough that we are not impacted by the regulations.

4.2 Stormwater Discharges

State and local environmental agencies issue stormwater discharge permits based on the type of industrial activity conducted at a site-specific location. If the industrial activity is covered, a permit is required unless a demonstration is made that the potential for hazardous materials to come into contact with stormwater will not occur.

For facilities that have a stormwater NPDES permit, a written Stormwater Pollution Prevention Plan (SWPPP) is required to be prepared. The plan must describe physical and procedural steps that the permit holder has implemented to reduce or mitigate the chances of contaminating stormwater runoff. At least twice per year, permitted facilities are required to collect and analyze samples from various storm drain inlets for various pollutants to gauge the effectiveness of its pollution prevention practices. These results must be reported to the State each year.

At this time, no Vestas site operation has a stormwater NPDES permit.

The words HAZARDOUS MATERIAL purely and simply mean that any and all measures must be taken by Vestas to assure that these substances are not exposed to stormwater.

4.3 Wastewater Discharges

Placing (e.g., draining) any hazardous material into a sanitary sewer (e.g., draining an acid or a paint solvent into a sink) or septic tank system is not permissible. Attempts to render a surplus or spent hazardous material non-hazardous such as neutralizing an acid are not to be considered by any Vestas employee as a means of disposing one of these materials into the sewer system.

4.4 Hazardous Wastes

Many hazardous materials can be regulated as a hazardous waste when they become spent, dirty, obsolete, or are intended to be discarded. Federal and state hazardous waste regulations are applicable to the identification, onsite management, and disposal of hazardous wastes.

4.5 Uniform Fire Code

The Uniform Fire Code[2] (UFC) generally prescribes how hazardous materials must be stored at Vestas facilities. Local fire jurisdictions may adopt the UFC, the International Fire Code (IFC)[3], or some variant. These regulations have requirements that address the following:

Note: This is not an exhaustive list.

- Installation of warning signs and labeling;
- Separation of incompatible materials;
- Allowable storage volumes of hazardous materials within certain areas of buildings based on the type of occupancy in that area;
- Requirements for provision of secondary containment; and
- Other requirements (e.g., fire extinguishers, sprinkled fire suppression, etc.)

In most areas, the local Fire Department is responsible for performing periodic inspections of Vestas facilities to evaluate whether we are in conformance with the Code. Depending on the local municipal code, the Fire Marshal may have authority to issue citations or assess fines.

[2] Published by the Western Fire Chiefs Association, Fallbrook, CA, 2003.

[3] Published by the International Code Council, Falls Church, VA, 2003

The 2003 edition of the UFC is just under 400 pages in length, thus it is beyond the scope of this module to provide extensive review of its requirements. The Corporate Environmental Manager has a copy of the UFC and is available to assist you in interpreting how these rules may affect your operation.

4.6 Warning Signs and Labeling

NO SMOKING signs must be posted in rooms or areas where hazardous materials are stored or dispensed and within 25 feet of outdoor storage, dispensing, or open-use areas.

Containers of hazardous materials must bear labels that identify the potential physical and health hazards associated with the material. If the labeling procedures used for our Worker-Right-To-Know program are followed, no additional labeling is required. The primary container must be labeled as well as any smaller containers that may be used for dispensing and day use (e.g., squirt bottles or other small containers).

When products are stored in an approved hazardous material storage cabinet (See Figure 2), a list of products stored in the cabinet must be posted on the outside of the cabinet. It is not necessary to post the inventory, but rather a list of products stored inside.

4.7 Separation of Incompatible Materials

Most of the hazardous materials that Vestas purchases are packaged in containers ranging in size from one pint to 55 gallons. Prior to purchase, and certainly prior to storing hazardous materials at your facility, the MSDS must be checked to determine if various products are compatible or incompatible with other products that may be stored/used in the same area.

Separation of incompatible materials must be provided when one or more incompatible materials are stored in containers that exceed one-half (1/2) gallon in size. Separation may be accomplished by:

- Segregating incompatible materials by a distance of at least 20 feet;
- Isolating incompatibles by a non-combustible partition or wall that extends at least 18 inches above the material stored; or
- Storing liquid and solid materials in approved hazardous material storage cabinets.

4.8 Allowable Storage Limits

This is one of the most complicated portions of the UFC/IFC. For Vestas's purposes, this is more appropriately characterized as exempt storage limits. That is, what are the maximum quantities that can be stored before special engineering or structural controls must be implemented to conform to the UFC/IFC. Further, it is the objective of Vestas to only have NOMINAL quantities of hazardous materials on-hand at any time to perform day-to-day activities. Ordering ANNUAL quantities of products shall not be done unless the Corporate Environmental Manager concurs on the purchase strategy.

For flammable and combustible hazardous materials (Refer to paragraph 2.2.3) the maximum amounts that can be stored in a control area[4] are:

- Class I-A Flammable (FP<73°F and boiling point <100°F) – **30 gallons**
- Class I-B Flammable (FP<73°F and boiling point >100°F) – **60 gallons**
- Class I-C Flammable (FP>73°F and <100°F) – **90 gallons**

[4] A control area is an area of a building or structure that is separated by not less than a one-hour fire resistive wall. The maximum number of control areas in a building cannot exceed four (4).

- Combined Class I Flammables – **120 gallons**
- Class II Combustible (FP>100°F and <140°F) – **120 gallons**

IF all flammable and combustible liquids are stored in approved storage cabinets (See Figure 2), these limits can be increased by a factor of 2 (i.e., the Class I-A limit could be increased to 60 gallons, and so on).

It Is The Policy Of Vestas That All Flammable And Combustible Liquids That Are Stored INDOORS Be Stored In Approved Storage Cabinets Regardless Of Amount Stored Or Used At Your Facility.
Contact the Site HazMat Coordinator or the Corporate Environmental Manager for assistance in selecting and obtaining appropriate storage cabinets.

4.9 Requirements for Secondary Containment

The UFC defines threshold limits for volumes of hazardous materials above which secondary containment for spill control must be provided.

It is The Policy of Vestas That All Hazardous Materials (Liquids and Solids) Be Stored In an Area or Device Equipped with Some Form of Secondary Containment.
This policy applies to hazardous materials stored indoors AND outdoors. Secondary containment can be provided by installing containment berms/curbs and chemical resistant coatings, storing hazardous materials in approved storage cabinets equipped with secondary containment (See Figure 2), or by using portable containment devices (See Figure 3 and 4), or other means approved by the Corporate Environmental Manager.

Hazardous materials that are in use at a workstation or other area where the material is being used, applied, or consumed do not need to have secondary containment, however, it is strongly encouraged.

5. Operating Requirements

This section provides an overview of the regulatory requirements that pertain to the ongoing storage and management of hazardous materials. The general categories include:

- Storage requirements
- Managing stormwater
- Inspections
- Reporting and recordkeeping

Vestas personnel that use hazardous materials are responsible for assuring that all requirements identified below are fulfilled. Any deviation from, or exception to, these requirements must be reported to Vestas' Corporate Environmental Manager.

5.1 Hazardous Material Storage

This section provides an overview of the requirements that apply to the storage of hazardous materials.

5.1.1 All Vestas Operations

- ► Flammable and combustible liquid storage amounts must not exceed those allowed in Section 4.8.
- ► Indoor storage of flammable and combustible liquids must be done in approved storage cabinets.

- ▶ All hazardous materials must be stored in an area or device that is equipped with secondary containment. See Section 4.9.
- ▶ Hazardous materials that are in use are encouraged to have secondary containment.

5.1.2 Mobile Operations

- ▶ If you know you will be transporting hazardous materials on fleet vehicles to a turbine unit or other location, it is strongly recommended that you place the materials into a tote or other container that will provide secondary containment while in transit.
- ▶ All fleet vehicles used for transporting hazardous materials must be equipped with a spill kit.

5.1.3 Hazardous Material Storage Area Operating Requirements

- ▶ Containers of hazardous materials must be stored in an area equipped with secondary containment.
- ▶ All storage areas must have appropriate warning signs, products must be properly labeled, and storage cabinets must have a list of products posted on the outside of the cabinet.
- ▶ Storage containers and containment areas must be visually inspected WEEKLY for evidence of corrosion, damage, leakage, or other deterioration.

5.2 Making Chemical Changes

Over time, the use of a particular hazardous material may be phased out and new products will become available to perform routine O&M tasks.

- ▶ Prior to the use of any new chemicals, it is essential that you submit the Material Safety Data Sheet (MSDS) and a Chemical Safety Evaluation Request (CSER) to Vestas' Chemical Evaluation Committee for review and approval.
- ▶ To the maximum extent possible, investigate the use of alternative chemicals that are less hazardous.

5.3 Stormwater

All Vestas personnel MUST make a conscious effort to assure that drips, leaks, and minor spillage of hazardous materials are immediately cleaned up with absorbent materials. (Absorbent materials must be collected and placed into a labeled drum or other suitable container until the site HazMat Coordinator or Corporate Environmental Manager can determine if the material needs to be tested.)

- ▶ Do not allow drips, leaks, etc., to enter into site storm drains, ditches, or swales, or percolate into the ground. Preventing the loss of even small amounts of hazardous chemicals into the stormwater system is a top priority for all Vestas personnel.
- ▶ Any precipitation that comes into contact with a hazardous material MUST NOT be allowed to discharge to any storm drain inlet, ditch, swale, etc.
- ▶ If your facility has an outdoor hazardous material storage area that is equipped with secondary containment, precipitation that accumulates within the containment area must first be visually inspected to make sure no leaks or spillage of hazardous materials has occurred into the containment area prior to discharging the accumulated water. If it is suspected or confirmed that leakage has occurred, the water must be collected or tested to confirm if it is suitable for discharge into the storm drainage system.

5.4 Inspections

Each hazardous material storage area must be inspected to assure that the container is in satisfactory condition and to make sure any secondary containment systems are functioning properly and are receiving appropriate preventative maintenance to assure that no unacceptable releases to the environment occur.

Written records for daily visual inspections are recommended, but not required, unless a spill or release is discovered. Written records for weekly and monthly inspections are required.

At a minimum, inspection records **MUST** include the date and time of the inspection, the name of the individual making the observations, a notation of the observations made, and the date and nature of any repairs or other remedial actions.

5.4.1 Visually Inspect or Verify Daily

It is recommended that Facility personnel check areas where hazardous materials are stored every day to make certain the containers are in good condition and no releases are occurring.

5.4.2 Visually Inspect or Verify Weekly

- That container(s) of hazardous materials are stored in a secure and properly maintained area equipped with secondary containment and that there is no evidence of leakage.

5.4.3 Visually Inspect or Verify Monthly

- Check to assure that the list of products stored in any hazardous material cabinet(s) is current;
- Check to assure that an adequate inventory of spill response supplies is available at or near the area where the containers are located; and
- Emergency notification telephone numbers are posted at or near hazardous material storage areas.

5.5 Reporting Requirements

- At a minimum, inspection records MUST include the date and time of the inspection, the name of the individual making the observations, a notation of the observations made, and the date and nature of any repairs or other remedial actions; and
- All spills must be immediately reported (within 15 minutes of discovery) to the site HazMat Coordinator or Corporate Environmental Manager.

5.6 Recordkeeping Requirements

The Site HazMat Coordinator, or designee, must maintain the following records and documents:

- An emergency response Contingency Plan, Spill Prevention Control and Countermeasures Plan, (SPCC) or other plan. (If you are uncertain contact the Corporate Environmental Manager);
- Inspection logs kept for at least 3 years; and
- Training documents, including copies of training materials and personnel attendance log sheets.

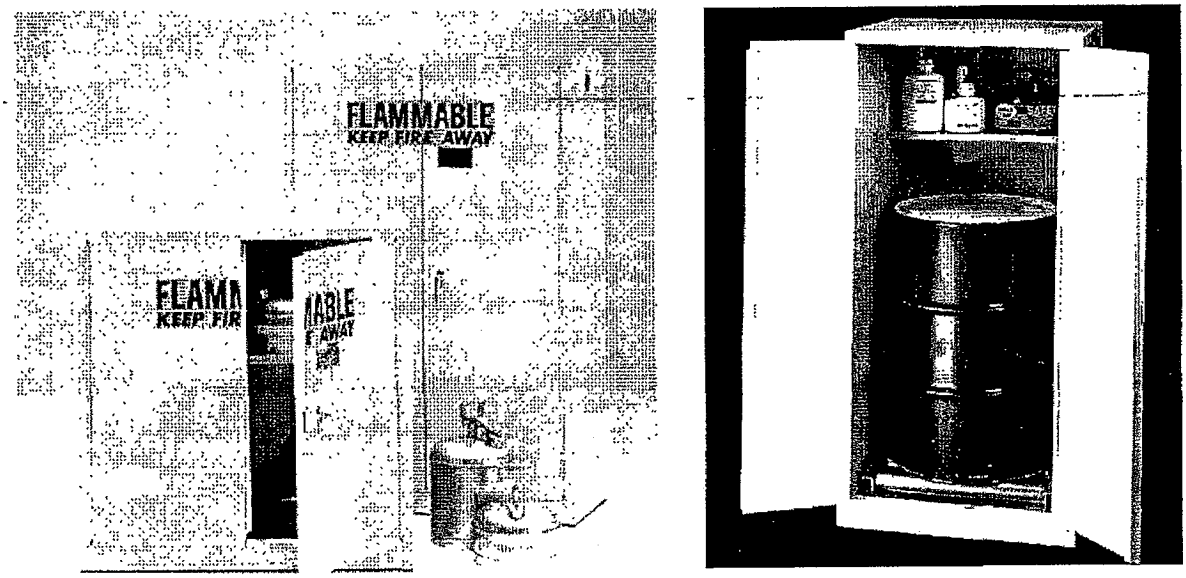


Figure 2: Example of Approved Flammable and Combustible Liquid Storage Cabinets

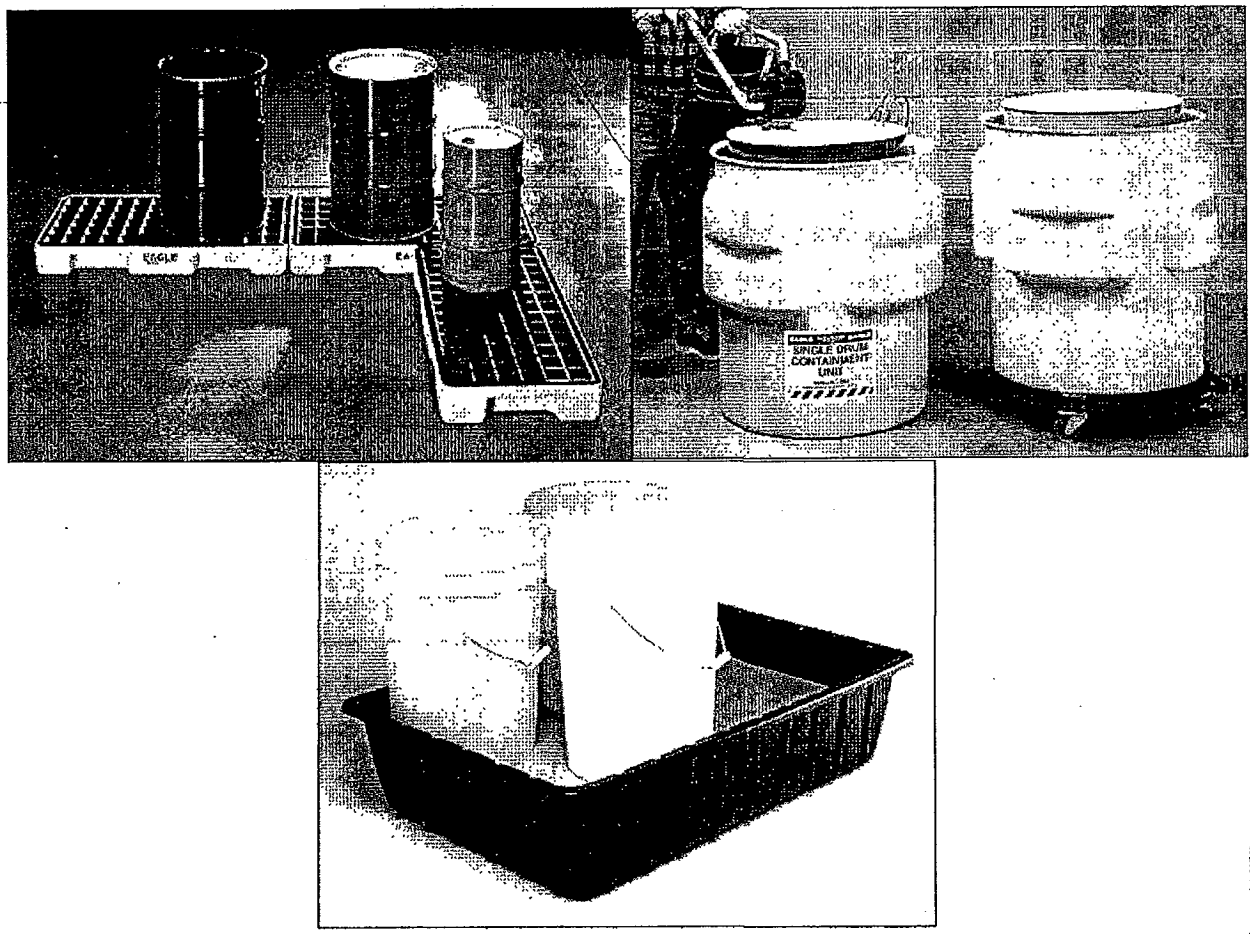
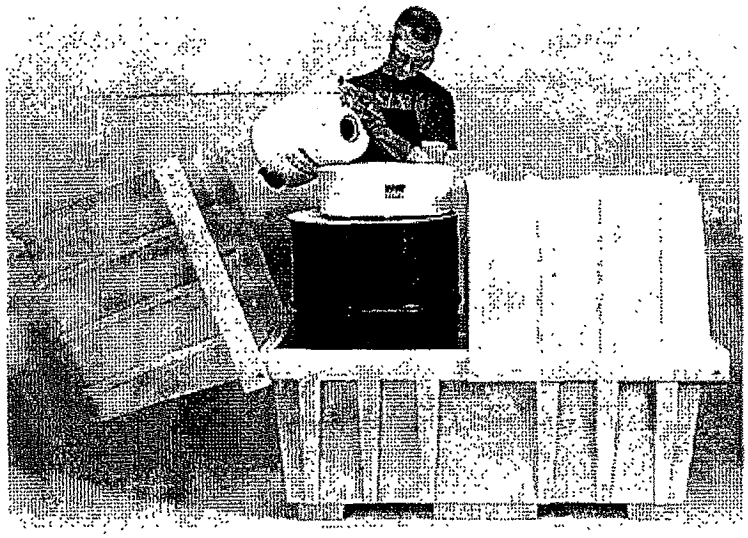


Figure 3: Example of Approved Portable Indoor or Covered Use Secondary Containment Device



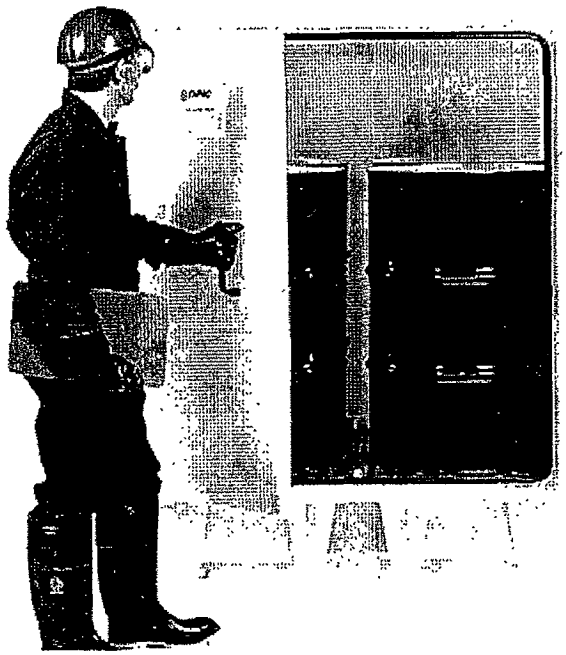


Figure 4: Example of Approved Outdoor Use Portable Secondary Containment Devices

6. History of This Document

Rev. no.:	Date:	Description of changes
00	2006-07-26	First edition – Reformatted & renumbered 25-Jul-2007
01	2010-01-01	Template updates

Vestas®

Aerosol Can Management

Contents

Top 10 DO's and DO NOT's for Managing Used/Spent Aerosol Containers	
Do	**Do Not**
► Contact the site HazMat Coordinator or the Corporate Environmental Manager if you have any questions not answered in this document. ► Work with the site HazMat Coordinator or Corporate Environmental Manager to find alternatives to aerosol-based products. ► You are responsible for puncturing and draining all aerosol cans that you produce. ► Place drained aerosol cans into a dumpster or scrap metal bin. ► Make sure the container used for accumulating liquids from puncturing and draining aerosol cans is clearly labeled with the words "Hazardous Waste." ► If you will be operating the can puncturing station, make sure the carbon filter is properly fitted, the anti-static strap is properly attached, and that you have on safety goggles with splash protection prior to puncturing any cans.	► Do NOT dispose of any unpunctured and undrained aerosol cans into the trash. ► Do NOT puncture and drain any aerosol container that contains a STRONG OXIDIZER. ► Do NOT puncture and drain any spent aerosol container that has not been previously approved by Vestas's Chemical Evaluation Committee. ► Do NOT accumulate spent aerosol containers at your site for longer than 90 days before puncturing and draining.

1. Introduction

This document provides an overview of ongoing operation and maintenance (O&M) requirements that are mandated by federal and state environmental regulations for the following waste products produced by Vestas operations:

- Used/Spent Aerosol Containers (e.g., touch-up paints, cleaners, lubricants, etc.).

The target users of this document are all Vestas site service personnel that have occasion to use products that are packaged in aerosol spray containers. This document specifically addresses how used aerosol containers are to be managed and disposed.

2. Process Description

It is the policy of Vestas to only allow aerosol-based products for essential uses where an alternative, non-aerosol product, cannot be safely or effectively substituted.

Over the years, Vestas has endeavored to reduce its use of products that are packaged in aerosol containers. Generally, aerosol products are not viewed as ENVIRONMENTALLY FRIENDLY, though product manufacturers have made strides to eliminate the use of propellants containing chlorofluorocarbons (CFCs).

Aerosol-based products such as spray cleaners, touch-up paints, primers, lubricants, insecticides, etc., normally contain highly flammable non-CFC propellants such as propane derivatives or isobutane. Regardless of the liquid product in the can, the propellant itself is highly flammable and potentially explosive. Most warning labels on the can will say something to the effect "Do not puncture or incinerate." Depending on the product, the contents may also have some hazardous properties. Paints, primers, and lubricants typically will contain solvents that have low flash points. Cleaners may be corrosive or also have a low flash point.

3. How Aerosol Cans are Regulated

This section summarizes key environmental requirements that apply to the handling and management of used/spent aerosol containers at Vestas. These requirements are primarily imposed by state or federal regulations.

3.1 Air Emissions

Vestas' use of aerosol spray products is considered to be an incidental use and are not specifically controlled by prevailing air regulations provided only consumer-type products are used (i.e., products you can readily purchase). Also, Vestas' Chemical Use Committee will review the proposed purchase of new aerosol products (when allowed) to confirm that no use restrictions are imposed by various state or federal air emission regulations.

3.2 Stormwater Discharges

State and local environmental agencies issue stormwater discharge permits based on the type of industrial activity conducted at a site-specific location. If the industrial activity is covered, a permit is required unless a demonstration is made that the potential for hazardous materials to come into contact with stormwater will not occur.

For facilities that have a stormwater NPDES permit, a written Stormwater Pollution Prevention Plan (SWPPP) is required to be prepared. The plan must describe physical and procedural steps that the

permit holder has implemented to reduce or mitigate the chances of contaminating stormwater runoff. At least twice per year, permitted facilities are required to collect and analyze samples from various storm drain inlets for various pollutants to gauge the effectiveness of its pollution prevention practices. These results must be reported to the State each year.

At this time, no Vestas site operation has a stormwater NPDES permit.

As with any chemical product, care must be exercised with aerosol products to prevent the product and propellant from coming into contact with stormwater (such as allowing overspray to contact the ground).

3.3 Wastewater Discharges

Placing (e.g., draining) or spraying the contents of aerosol products into the sanitary sewer (e.g., spraying into a sink) or septic tank system is not permissible.

3.4 Hazardous Wastes

Any used/spent aerosol container that still contains any liquid OR any propellant is considered a hazardous waste and CANNOT be disposed into the trash.

Some states in which Vestas operates have determined that used/discarded aerosol containers are a hazardous waste *unless* they have been *completely* emptied and the propellant has been fully aspirated. That is, if an aerosol container contains any liquid OR any propellant, it is considered a hazardous waste. The two most common situations that occur with aerosol products that result in the can/product being considered a hazardous waste are:

- The spray nozzle clogs before the entire product has been used. What remains is an unusable, but partially filled aerosol product whose contents are still under pressure.
- The propellant is exhausted before all of the can contents have been used. What remains is a partially filled liquid product that cannot be emptied.

The only *legitimate* method to discard use/spent aerosol containers into the trash for disposal or into a scrap metal bin for recycling is to deactivate the container by *puncturing and completely draining* it prior to discarding. Vestas has purchased approved aerosol can deactivation units and installed them at all wind park service sites (See Figure 1). DO NOT use any other method to puncture and drain aerosol containers. Properly deactivated aerosol containers may be discarded into the trash, or metal recycling bin (if available at your location).

4. Required Operating Practices

This section provides an overview of the environmental regulatory requirements that pertain to managing spent aerosol containers including:

- Collection and storage requirements
- Inspections
- Reporting and recordkeeping

Vestas facility personnel that use aerosol products are responsible for assuring that all requirements identified in this document are fulfilled. Any deviation from, or exception to, these requirements must be reported to Vestas's Corporate Environmental Manager.

4.1 Waste Collection Requirements

This section provides an overview of the minimum requirements that Vestas personnel must follow for the collection of used/spent aerosol containers prior to disposal or recycling. This includes aerosol containers that are produced during field/mobile activities. The waste collection requirements below apply unless spent containers are immediately deactivated using an approved device at your facility.

4.1.1 All Vestas Operations

- Used/spent aerosol containers MUST not be disposed of by throwing it in the trash, or placed in a metal recycling bin UNLESS the container has been properly punctured and drained first.

4.1.2 Mobile Operations

- Return all spent aerosol containers to your base Service Center.
- Deactivate the containers using the aerosol can deactivation unit.

4.1.3 Service Centers and Other Fixed Facilities

- If spent aerosol container(s) will not be immediately deactivated in the puncturing unit, place non-leaking spent aerosol containers into an appropriate container such as a 5-gallon closeable top safety container (see Figure 2);
- The employee that uses the aerosol container is ultimately responsible for depressurizing and proper disposal of the empty can.
- Make sure the accumulation container is clearly labeled with the words "Hazardous Waste;"
- The accumulation container must be kept closed, except when emptying or filling, to minimize the potential for spillage;
- If no depressurizing unit is available at your facility, contact Vestas' Corporate Environmental Manager.

4.2 Aerosol Can Puncturing Unit Requirements

- The puncturing unit must be equipped with the minimum features shown in Figure 1 (including a anti-static wire and goggles with splash protection);
- The carbon filter unit must be in good service. (Some carbon filters are packaged with an indicator that changes color when the carbon is spent, others are rated for puncturing a certain number of aerosol cans – check the filter before using the unit);
- See the facility HazMat Coordinator for replacement carbon filters.
- Make sure the liquid accumulation container is clearly labeled with the words "Hazardous Waste;"
- Prior to operating the puncturing device, make sure you are familiar with the operating instructions;
- BEFORE puncturing any container, CHECK the MSDS for the product to verify that the contents DO NOT contain a STRONG OXIDIZER. [See Table 1.]
- The release of strong oxidizers into the accumulation drum at the puncturing station could result in one or more of the following chemical reactions: evolution of heat, toxic gases, or flammable gases, and the potential for fire.
- If you are uncertain if the aerosol container contains a STRONG OXIDIZER, contact Vestas' Corporate Environmental Manager.

- Assuming that the contents of the can may be safely drained into the accumulation container, follow the manufacturer's instructions for puncturing and draining the aerosol can(s).
- Record the date, number of spent aerosol cans that were punctured and drained, and your name on the log sheet that is located at the puncturing station.

4.3 Making Chemical Changes

Because of the potential chemical incompatibilities of mixing the liquids in aerosol-based products in the accumulation container of the puncturing unit, it is important that all new aerosol products be reviewed and approved by Vestas' Chemical Evaluation Committee prior to purchasing.

If you have spent aerosol containers for products that have not been approved by the Chemical Evaluation Committee, contact the site HazMat Coordinator, or the Corporate Environmental Manager prior to puncturing unapproved containers.

*** **The use of aerosol products that contain lead or chlorinated solvents such as trichloroethylene (TCE), 1,1,1-trichloroethane (TCA), or methylene chloride is strictly forbidden.** ***

4.4 Stormwater

All Vestas Service Site operations personnel are expected to make a conscious effort to assure that drips, leaks, and minor spillage of any chemical product or waste are immediately cleaned up with absorbent materials.

Absorbent materials must be collected and placed into a drum or other suitable container until the site HazMat Coordinator or Corporate Environmental Manager can determine proper disposal methods.

- All aerosol can storage is to be conducted under cover or indoors.
- Storage and operation of the aerosol can puncturing unit is to be conducted under cover or indoors.

4.5 Inspections

The containers used for accumulating spent aerosol cans, and the puncturing unit/container are required to be under an inspection program to assure that appropriate preventative maintenance is occurring and that no releases to the environment occur.

Written records for daily visual inspections are recommended, but not required, unless a spill or release is discovered. Written records for **WEEKLY** and **MONTHLY** inspections are required.

4.5.1 Visually Inspect or Verify Daily

It is *recommended* that Facility personnel check areas where spent aerosol containers are stored every day to make certain the containers are in good condition and no releases are occurring.

4.5.2 Visually Inspect or Verify Weekly

- That container(s) used for accumulating spent aerosol containers are kept closed (i.e., lid or cover is secured);
- That container(s) are stored in a secure area and properly maintained so that they do not leak, rupture, or tip over when being opened, handled, or stored;
- That each storage container and the container used for draining the punctured cans are marked with the words "Hazardous Waste"; and

- That no spent aerosol cans have accumulated onsite for longer than 90 days without being punctured and drained.

4.5.3 Visually Inspect or Verify Monthly

- Check or estimate the liquid level in the container used for collecting drained liquids. If the container is approximately 75% full, contact the site HazMat Coordinator or the Corporate Environmental Manager to make arrangements for disposal of the waste liquids.
- Check the carbon filter on the puncturing station to make sure the carbon is not exhausted.
- Check to assure that an adequate inventory of spill response supplies is available at or near the area where the containers are located; and
- Emergency notification telephone numbers are posted at or near the can puncturing station.

4.6 Reporting Requirements

- At a minimum, inspection records **MUST** include the date and time of the inspection, the name of the individual making the observations, a notation of the observations made, and the date and nature of any repairs or other remedial actions; and
- All spills must be immediately reported (within 15 minutes of discovery) to the site HazMat Coordinator or Corporate Environmental Manager.

4.7 Recordkeeping Requirements

The Site HazMat Coordinator, or designee, must maintain the following records and documents:

- An emergency response Contingency Plan, Spill Prevention Control and Countermeasures Plan, (SPCC) or other plan. (If you are uncertain contact the Corporate Environmental Manager);
- Inspection logs kept for at least 3 years; and
- Training documents, including copies of training materials and personnel attendance log sheets.

Table 1: List of Strong Oxidizers

(CHECK MSDS to make sure these are NOT in aerosol products that are to be punctured)
Items in ***BOLD ITALICS*** are fairly common ingredients in a number of products, especially cleaning and disinfecting supplies.

Ammonium chlorate
Ammonium dichromate
Ammonium nitridoosmate
Ammonium perchlorate
Ammonium periodate
Ammonium permanganate
Ammonium persulfate
Ammonium tetrachromate
Ammonium tetraperoxychromate
Ammonium trichromate
Antimony perchlorate

Barium bromate
Barium chlorate
Barium iodate
Barium nitrate
Barium perchlorate
Barium permanganate
Barium peroxide
Bromic acid
Bromine
Bromine monofluoride
Bromine pentafluoride
Bromine trifluoride
t-Butyl hypochlorite

Cadmium chlorate
Cadmium nitrate
Calcium bromate
Calcium chlorate
Calcium chlorite
Calcium hypochlorite
Calcium iodate
Calcium nitrate
Calcium perchromate
Calcium permanganate
Calcium peroxide
Chloric acid
Chlorine
Chlorine dioxide
Chlorine fluoroxide
Chlorine monofluoride
Chlorine monoxide
Chlorine pentafluoride
Chlorine trifluoride
Chlorine trioxide
Chromic acid
Chromyl chloride
Cobaltous nitrate
Copper nitrate

Dichloroamine
Dichloroisocyanuric acid

Ethylene chromic oxide

Fluorine
Fluorine monoxide

Guanidine nitrate

Hydrogen peroxide

Iodine pentoxide

Lead chlorite
Lead nitrate
Lithium hypochlorite
Lithium peroxide

Magnesium chlorate
Magnesium nitrate
Magnesium perchlorate
Magnesium peroxide
Manganese nitrate
Mercuric nitrate
Mercurous nitrate

Nickel nitrate
Nitrogen dioxide

Osmium amine nitrate
Osmium amine perchlorate
Oxygen difluoride
Perchloryl fluoride
Phosphorus oxybromide
Phosphorus oxychloride
Potassium bromate
Potassium dichloroisocyanurate
Potassium dichromate
Potassium nitrate
Potassium perchlorate
Potassium permanganate
Potassium peroxide

Silver nitrate
Sodium bromate
Sodium carbonate peroxide
Sodium chlorate
Sodium chlorite
Sodium dichloroisocyanurate
Sodium dichromate
Sodium hypochlorite
Sodium nitrate
Sodium nitrite
Sodium perchlorate
Sodium permanganate
Sodium peroxide
Strontium nitrate
Strontium peroxide
Sulfur trioxide
Sulfuric acid

Trichloroisocyanuric acid

Uranyl nitrate
Urea nitrate

Zinc ammonium nitrate
Zinc nitrate
Zinc permanganate
Zinc peroxide
Zirconium picramate

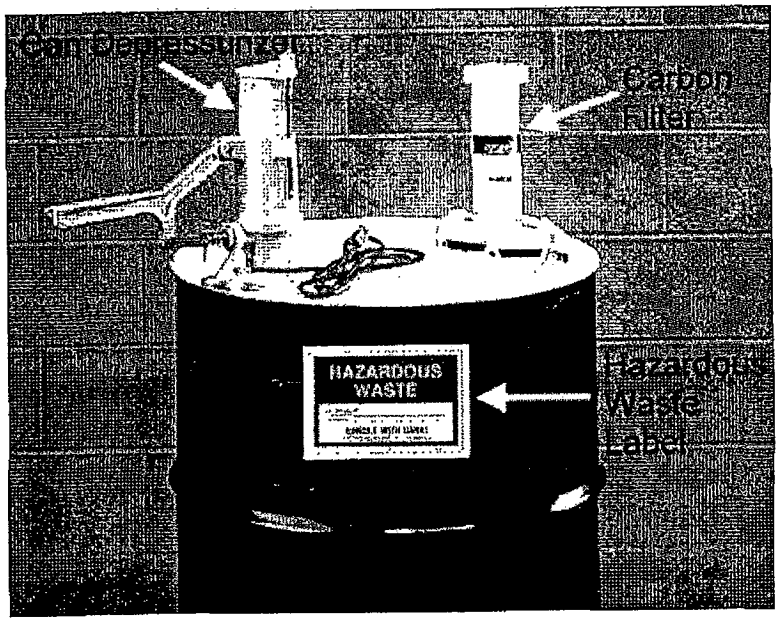


Figure 1 Proper Configuration for Aerosol Can Puncturing Unit

Figure 2 Recommended Spent Aerosol Can Accumulation Container

Summary: Application of Champaign Wind LLC, Vol III, Part 37 electronically filed by Mr. Michael J. Settineri on behalf of Champaign Wind LLC