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			Initial Issue Date	09/01/2016
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## OBJECTIVE:

The objective of this fall protection program is to communicate the hazards associated with falls in the workplace, and to provide regulatory compliant training on both control of fall hazards, and fall protection systems & equipment used for this purpose prior to commencing work. The identification, elimination, control and mitigation of hazards upfront holds the utmost important in the reduction of risk where fall hazards exist and when work with such systems and equipment is necessary.

## Scope

Fall protection measures must be taken when a worker is exposed to the hazard of a free fall from one level to another level. When a fall hazard exists, continuous fall protection is necessary; continuous protection means no exposure to a free fall hazard without protection including the fall exposure that arises when moving to or from a work position that requires the use of fall protection. Fall protection measures are required to protect workers from serious or fatal injury. Falls from heights are a leading cause of industrial and construction fatalities.

Managers are responsible for ensuring appropriate training is provided as outlined in this program and for providing the necessary resources to ensure the elements of the program can be met. Supervisors are responsible for complying with and enforcing the requirements outlined in this program. Employees are responsible for attending training, knowing, understanding, and following the policies of this program.

## DEFINITIONS

**Designated Area:** means a distinct portion of a walking-working surface delineated by a warning line in which employees may perform work without additional fall protection.

**Hole:** means a gap or open space in a floor, roof, horizontal walking-working surface, or similar surface that is at least 2 inches (5 cm) in its least dimension.


**Permanent Work Surface:** means that the work surface is intended to last indefinitely.

**Temporary Work Surface:** means that the work surface is not intended to last indefinitely i.e. scaffolding.

**Passive Fall Protection:** means a system that is non-dynamic, stationary, and does not move, adapt, or change when in or out of use. Passive systems don't require the use of personal protective equipment or active participation from the worker.

**Active Fall Protection:** means a dynamic system that requires the use of special equipment as well as worker participation. There are two types of active fall protection systems, fall restraint and fall arrest systems.

**Personal Fall Arrest System:** means personal protective equipment that will stop a worker's fall before the worker hits a surface below.

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**Travel Restraint System:** means a type of fall protection system, including guardrails or similar barriers that prevent a worker from traveling to the edge of a structure or to a work position from which the worker could fall.

**Fall Arresting Device:** means a part of a worker's personal protective equipment that stops the worker's fall and does not allow the worker to fall further.

**Fall Protection System:** means a personal fall arrest system, a travel restraint system, a safety net, or a designated area.

**Work Positioning System:** means a system used to support a worker so that the workers hands are free when he or she reaches the work position. A work positioning system is not a fall arrest system. It does not prevent the worker from falling if the primary support fails. In most cases, a work positioning system needs to be backed up with a fall arrest system.

## **ENGINEERING CONTROLS / GENERAL WORK PRACTICE**

Whenever there is any risk of falling regardless of height distance, we will evaluate the need for control measures. When working from permanent work surfaces, fall protection is required when the distance to the next lower level exceeds 4 ft.

Fall hazards requiring the use of protection are also considered to exist when working:

- Over dangerous equipment;
- over hazardous objects or hazardous substances;
- within 15' from the edge of a roof;
- on a scaffolding system exceeding 10' in height;
- from a suspended work platform;
- from an aerial lift or man basket;
- accessing a fixed ladder over 24 ft. long/high.

Passive fall protection measures, such as guardrails, that remove the exposure to falling must be considered over the use of personal protection systems. Personal fall protection systems consist of either a:


- Travel restraint system designed and set-up to limit movement of the user to a safe no-fall exposure zone; or
- Fall arrest system designed to and set-up to stop the free fall of a worker.

\*A travel restraint system is preferred over a fall arrest system whenever possible.

Fall arrest systems must be designed, set-up, and used considering free fall distance and stopping distance to adequately protect the user.

### Fall Arrest Requirements

- Fall arrest systems without a shock absorber cannot exceed a freefall distance of 4 ft. and are not

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recommended.

- Fall Arrest Systems with a shock absorber between the worker and an anchor point cannot exceed a freefall of 6 ft.
- Workers using fall arrest systems must use a full body harness.
- A personal fall arrest system must limit the maximum arresting force on a falling worker to 1,800 pounds.

#### Lanyards and Body Belts

A body belt may only be used as a positioning device system. A worker must limit the vertical distance of a fall by selecting the shortest-length lanyard that will still permit unimpeded performance of the worker's duties, by using only a single lanyard between the worker and the anchor point, and by securing the lanyard to an anchor point no lower than the worker's shoulder height. If a shoulder-height anchor point is not available, a worker must secure the lanyard to an anchor point that is as high as possible.

#### Fall Arrest Anchors

The Fall Protection Standards recognize two types of anchorages: certified anchorages are those designed or approved by a Qualified Person considering peak dynamic loading with a safety factor of 2; and non-certified anchorages are those of unquestionable strength, at least 5,000 lbs. chosen by a Competent Person.


#### Horizontal Lifelines

Horizontal lifelines are part of a personal fall arrest system (PFAS) that allows for a continuous tie-off point along the line of travel providing protection to a worker near a fall hazard such as a roof edge. Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.

#### Vertical Lifelines

When vertical lifelines are used in a fall arrest system, each worker will use a separate lifeline secured to an anchor point that is not used to support anything else, equipped with a rope grab. The lifeline must be weighted at the bottom and terminated to prevent the rope grab from falling off and must extend to within 4 ft. of ground level or another safe lower surface. If workers will utilize the same lifeline during ascent, only one worker at a time shall be permitted on the line, unless the line is specifically designed for more than one user.

Vertical lifelines will not be used if there are any knots or splices in the line. The line will be protected at all times from abrasion by sharp or rough edges and chemicals that could damage the line. Vertical lifelines must have a nominal breaking load of not less than 5,000 lbs. This breaking load will be specified by the manufacturer.

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## **BIG OX ENERGY SITE SPECIFIC FALL HAZARDS**

### **DIGESTERS:**

When work is required on the rooftop of the digesters, a “designated area” will be used as the means of fall protection if the work is being conducted within the horizontal lifelines that run along both digesters parallel with the roof edges. Any action that requires leaving the designated area toward the roof edge outside the horizontal lifelines requires the use of a personal fall arrest system and tying off to the horizontal lifeline or other suitable anchorage point. When work atop the digesters requires opening of the roof hatches, all so-engaged workers must use a personal fall arrest system and be tied off to either the horizontal lifeline, the davit arm retrieval system or other suitable anchorage point.

### **G.E.M**

When work is required atop the GEM unit, the worker(s) will lower the connector(s) from the self-retracting lifelines (SRL) that are located above the GEM with affixed the pull-rope(s). The worker(s) must then attach the SRL connecting device to the dorsal ring on their full body harness, and then either access the top of the GEM by entering and elevating the scissor lift, or by the use of a correctly erected portable ladder. Only trained and authorized personnel are permitted to operate the scissor lift or access the top of the GEM.

### **MOBILE STAIR TOWERS**

Access to the top of tanker trucks in the receiving area must be accomplished by utilizing the mobile stair tower unit stationed there. All workers and truck drivers are required to be within the stair tower’s guardrail system while on the stair tower. If it is necessary to access an area of the tanker truck either off the tanker trucks’ fixed ladders or without the protection of the mobile stair tower unit’s guardrail system, the worker or driver must lower the connector from the SRL that is located in the receiving area with the pull-rope and attach it to the dorsal ring of a correctly fitted and worn full body harness in order to access portions of trucks or trailers above 4’ in height. The stair tower unit within the plant may be used to access areas above 4’ in height as necessary.

### **AERIAL LIFTS**


Only trained and authorized personnel are permitted to operate aerial lifts. A full body harness with lanyard attached to the anchorage point(s) within the basket is required upon entering an aerial lift basket and prior to its operation. Aerial lift are required to be inspected (see operator’s manual) for serviceability prior to each use, and will be taken out of service for repair if any deficiencies are discovered.

### **SCISSOR LIFTS**

Only trained and authorized personnel are permitted to operate scissor lifts. A PFAS is required for work within a scissor lift as it elevates vertically and is manufactured with a guardrail system. Travelling with the work-platform elevated is allowed only when it is operated on a flat, level surface and no obstructions, pits or holes that could cause the unit to tip over are located in the path of travel. Scissor lifts are required to be inspected (see operator’s manual) for serviceability prior to each use, and will be taken out of service for repair if any deficiencies are discovered.

### **LADDERS**

All workers will be trained in the use of ladders prior to commencement of work on them. Big Ox Energy employs portable ladders and there are multiple fixed ladders throughout the facility. Portable ladders will be inspected prior

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to each use and removed from service for repair or replacement upon discovery of any deficiency. Fixed ladders will be inspected for defects on a regular basis.

## **INSPECTION AND MAINTENANCE**

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All equipment used in fall protection systems must be visually inspected before each use to ensure equipment is in serviceable condition. When purchasing equipment and raw materials for use in fall protection systems, applicable ANSI & ASTM requirements will be met. The equipment will be stored in a cool dry place not subject to direct sunlight. The equipment will be protected from physical and chemical damage. The equipment must not be used for purposes other than fall protection. Fall protection equipment must be re-certified as specified by the manufacturer.

### Removal from Service

Fall arrest equipment subjected to impact from a free fall or by testing or found to be defective must be removed from service. Equipment should not be returned to service until a professional engineer or the manufacturer certifies that the equipment is safe to use

## **FALL PROTECTION PLAN**

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### Rescue Capability

Anytime a fall arrest system is used, planned rescue capability (people, equipment, and procedures) are readily available to remove/rescue a worker from a suspended position. Big Ox Energy will utilize portable ladders and/or aerial lifts or scissor lifts as remove/rescue equipment in the event of a fall involving a suspended worker immediately upon its occurrence to prevent suspension trauma and/or orthostatic intolerance. Any person involved in a fall incident will be medically evaluated as necessary.

## **INVESTIGATION**

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In the event of a fall, near miss or any other serious incident an investigation will be conducted within 24 hours. The investigation team can include:

- Workers involved
- Witnesses
- Big Ox Energy - Siouxland LLC Onsite Supervision
- Safety Manager

A copy of the investigation will be given to applicable Big Ox Energy home office contact as determined by the onsite manager for the purpose of identifying the reason for the incident and to provide corrective actions to prevent a similar incident.

## **TRAINING**

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Users of personal fall protection systems must be trained in selection, installation, and use of the equipment. The training will be documented and will include references to standards and requirements of applicable local codes, the user instructions provided by the equipment manufacturer, and procedures used to assemble, maintain, inspect, use, and disassemble the fall protection system.

Training records will show the following:

- Who was trained, when, dates of training
- Signature of person providing training & date employer determined training was deemed adequate.

All workers and contractors will be provided with training during orientation, and periodically during safety meetings. Workers will be provided with instruction in fall protection plans and safe use of fall protection systems prior to being allowed to work in an area where a fall protection system must be used. The training will also include hazard identification and elimination in regards to fall protection. The training shall enable each employee to recognize the hazards of falling & shall train each employee in procedures to minimize these hazards.

Retraining will occur when:

- There are visible deficiencies in training.
- If the worksite changes.
- The fall protection systems or equipment changes that render previous training obsolete.

## **OTHER REQUIREMENTS**

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Failure to comply with the components of this program will be dealt with as per Big Ox Energy - Siouxland LLC's Disciplinary Program.