The Eternal Fall Protection Issue – Anchor Selection & Certification

An ever-present issue for anyone using fall protection systems is selecting and qualifying anchorages. A constant struggle, for employers and employees alike, is determining if the anchorage is acceptable, compliant, compatible and most importantly, functional. Employers are often caught in a difficult situation, not having the resources to qualify every single anchorage that workers are attaching to, increasing the opportunity for workers to utilize inadequate anchorages. This session will provide direction and tools for employers and employees who are selecting anchorages. A common sense discussion and approach to anchorage selection will be presented that considers compliance with applicable regulations, function and compatibility. At the conclusion of this session, attendees will know what steps need to be taken, according to their location and industry, to effectively address anchorage selection.

Every governing body requires that fall arrest systems be attached to an anchorage of suitable strength, usually measured in thousands of pounds. There are variations in regulators' strength requirements, but for the most part, state, federal, provincial and international regulators require a five thousand or thirty-six hundred pound load requirement on the structure that is supporting the fall arrest system. The reasons for this strength are obvious and rarely challenged, however, difficulty lies in providing corroborating evidence or "proving" it.

In a perfect world, every anchorage would be individually evaluated and proven for use. The truth is that there are not enough engineers, time and money available to prove the strength of every anchorage, even if we wanted to. There are only two ways to "prove" how strong an anchorage is. The first is through common engineering practices where a person with an understanding of physics and materials evaluates the structure and determines its strength. The second method is by proof testing, where the anchorage is "proven" by placing a load on the structure. Neither of these methods are very efficient. Therein lies the problem for every worker and employer who uses fall protection equipment – how do we prove the strength of the anchorage?

Imagine an industrial setting where a hose has broken and fallen onto the top of a piece of equipment, twenty feet in the air. A worker must step outside of a guardrail and be exposed to a fall off the equipment to retrieve it, triggering a requirement for fall protection. Imagine over the equipment is an I-beam that is part of the building structure. To be truly compliant and demonstrate the highest degree of due diligence, the work should not be done until there is a structural analysis or proof load of the beam, even if it is beyond reproach. The reality is that the worker would trust the beam, attach to it and get the job done. Is this acceptable since the anchorage's compliance has not been proven? There are two schools of thought: the first argues that the only way to qualify an anchorage is by engineering or testing, while the second asserts that some level of judgment is permissible when the anchorage is unquestionably strong.

Certified Anchorages. Anchorages that have been proven are often referred to as "certified." Certified anchorages have documentation of load calculations with an identifying document, drawing or proof-testing report verifying the strength of the anchorage, generally signed by an engineer or testing laboratory. The American National Standard addressing fall protection (Z359) defines "certified" as "an act or process resulting in documentation that determines and attests to criteria that meet the requirement of an American National Standard. Such act or process may be carried out by testing or

applying proven analytical methods, or both, under the supervision of a qualified person or entity." The standard also includes a definition for certified anchorage, described as "an anchorage for fall arrest, restraint, positioning or rescue that a qualified person certifies to be capable of supporting the potential fall forces that could be encountered during a fall or that meet the criteria for a certified anchorage as prescribed."

The practicality of certifying anchorages is the challenge. It can be argued that it is impossible, or at least incredibly unreasonable, to conduct a structural analysis or load test of every anchorage that workers may interact with, and provide documentation.

Non-Certified Anchorages. Anchorages that have not been individually "proven" are often referred to as non-certified, improvised, non-engineered or makeshift anchorages. These are anchorages that have been selected based upon judgment, but lack the evidence or proof that the certification process provides. The worker or employer applies sound judgment in the selection of the anchorage, follows anchorage connector instructions but does not conduct an analysis or load test. The vast majority of anchorages fall into this category. No one will argue that these non-certified anchorages are equal to certified anchorages since sound judgment is subjective and cannot be compared to proven analytical methods, but consideration must be given to what it takes to conduct the analysis.

Frequency of use is one of the central issues. Many anchorages are for single tasks, never to be repeated. Maintenance workers who are troubleshooting issues may need to anchor to roof structure inside a facility, never to go to that specific area again. Though possible to conduct an analysis of the anchorage, it can be argued that it's unreasonable to invest this amount of time and resources to a one-time situation.

The hazard posed by testing is another issue that arises when dealing with certification of anchorages, generally while conducting proof loading. The exposure to fall hazards during the testing process is often greater than the exposure to conducting the work that instigated the testing.

Speed and allocation of time is another common issue. Pre-planning work is essential to be organized and efficient, and there are significant efforts to identify and certify anchorages as part of the design phase of construction or modifications. Architects, engineers, project managers and planners are becoming more familiar with the "Prevention through Design" philosophy, and more and more certified anchorages are planned. However, there must be recognition for the tasks where the employer and employee do not have the luxury of pre-planning. Breakdowns, accidents and many troubleshooting situations arise where speed is an issue and it is infeasible to allocate the time necessary to certify anchorages. A simple rescue situation is a good example where the risk of leaving a worker suspended in a harness outweighs the risk of having a co-worker select a non-certified anchorage.

The first recommendation to address anchorages is to fully understand the work. ANSI / ASSE Z359.2 – 2007, Minimum Requirements for a Comprehensive Managed Fall Protection Program is an excellent resource for any safety professional or manager addressing fall protection. Inside of this document is direction for an organization on how to conduct a fall hazard survey. The information gathered during this survey process will identify areas where fall hazards exist, the frequency of tasks, physical areas of exposure, workers path of travel and the duration of exposure for each task. By knowing these areas,

potential anchorage locations can be identified. The survey process will also reveal priority areas and enable an organization to develop a plan to address anchorage selection and certification.

At the conclusion of the survey, the data collected from each location can be addressed according to the following:

1. Certified Anchorages: It should be every organization's goal to provide certified anchorages. Fall hazards that are frequently accessed, high duration and occur often are obvious locations to provide certified anchorages. It can be difficult to justify the absence of a certified anchorage for fall hazards that are commonly encountered. Certified anchorages are the only way to definitively identify and assure the strength and performance of an anchorage.

2. Guiding Documents: Guidance documents and directions can be used by organizations to address anchorages. Guidance documents provide some level of assurances regarding the acceptability of the anchorages, but fall short of being certified. A good example of this is using a manufactured anchorage connector according to the directions supplied. For example, the directions that come with an anchorage connector designed for a wooden roof, with typical plywood sheeting and trusses underneath, is an example of a guidance document. The manufacturer provides guidance, based upon their testing and design, that states how to install the anchorage and into what type of surface. Although the individual anchorage has not been certified, there is some comfort in knowing that a product, designed for a specific purpose and installed according to instructions, is being used. Identifying the material and method of connection has minimalized the opportunities for errors. These pseudo-certified anchorages are a step in the right direction. In situations where the organization does not own or have the ability to certify the anchorage, guidance documents provide some level of assistance.

3. Non-Certified Anchorages: Although non-certified anchorages are the least desirable anchorage, they are a reality and will be for several years. OSHA accepts non-certified anchorages and lends some legitimacy to their use in the appendices to fall protection regulations. Fall protection training should provide guidance for the selection of non-certified anchorages, in greater detail than merely telling the organization to select something unquestionably strong. Experience has shown that once a worker understands the performance of an energy absorber and has a foundational knowledge on the performance of fall protection equipment, exercising judgment regarding anchorage selection is possible. The employer and employee alike should evaluate the specific work area and types of structure used for anchorages. Organizations must train the workers on specific anchorage structure when certification isn't possible.

Unfortunately, there isn't one solution to all anchorage issues. Organizations should take a measured approach to anchorages and develop a plan to reduce the likelihood of anchorage failure. The desired result is that fall protection and rescue systems are connected to anchorages that will support the load, will not fail, and are functional for the fall protection and rescue system. Identification and certification of existing anchorages should be a priority. In situations where certification cannot be achieved, training and education that takes advantage of guidance documents needs to occur, in order for employers to better assess non-certified anchorages.