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Within the Z359 Accredited Standards Committee, the Z359.6 subcommittee oversees ANSI/ASSE Z359.6-2009, Specifications and Design Requirements for Active Fall Protection Systems. In this interview, Thomas Kramer, P.E., CSP, provides an overview of the Z359.6 standard and explains how SH&E professionals can best incorporate it into their fall protection management programs.

Q: Please provide a brief description of your involvement with the ANSI/ASSE Z359 Accredited Standards Committee (ASC) for Fall Arrest/Protection.

A: I am chair of the Z359.6 and Z359.17 (Safety Requirements for Horizontal Lifelines for Personal Fall Arrest Systems) subcommittees and have served on the Z359 ASC since 2004.

Q: What should SH&E professionals look for when selecting an anchorage point?

A: First, they should look for more than just strength. The challenge with fall protection is that it is never just either the engineering or the safety discipline. Both are critical. Although the ratio of safety to engineering always changes, you always have both.

SH&E professionals should look for adequate strength and an appropriate location for clearances and swing fall. They should also ensure that equipment is appropriate for the anchorage. One areathat is often overlooked is free fall distance. This affects clearances and the maximum arresting force applied to the fallen worker. ANSI/ASSE Z359.2-2007, Minimum Requirements for a Comprehensive Managed Fall Protection Program, includes guidelines for developing procedures for the selection and use of anchorages. The standard also provides assistance to determine appropriate training for your organization.

Q: What best practices have you seen for incorporating anchorage point system management into an overall fall arrest/protection management program?

A: Anchorages can be broken into two different categories: 1) where new structures are used to serve as the anchorage; and 2) where the existing structure is used as an anchorage.

For new structures, we have created databases for each identified anchorage that describes the systems and gives locations and dates of installation. This allows the organization to track information for inspections and recertifications.

Existing structures can have many challenges. Whether it is a pipe rack at a petrochemical facility, roof structure in a hanger or manufacturing facility or something as simple as an eyebolt, how can a competent person know for sure that the point can support 5,000 lb? And remember, that load could be applied at some point in the future, perhaps after modifications have been made to the structure.

I recommend that the organization give a competent person the information s/he needs to be able to make decisions in the field when a qualified person is not available. For example, if your organization has prepared the fall hazard survey report as required in Z359.2, the location of tasks with fall hazards should be known. A qualified person can then preplan the location of anchorages so that in the future a competent person can use the anchorages when the qualified person is not available.

Q: Do you know of an incident that occurred because of incorrect selection of an anchorage point?

A: We were at a state project on top of an office building. Outside of the penthouse was a metal step with a rope tied around it. The rope had a lot of slack, so we followed it and discovered that it was being used as an anchorage for a window cleaning system. Regardless of whether it was used as the anchorage for the personal fall arrest system or as the tie-back for the suspended scaffold system, it was completely inappropriate with regard to factors such as strength, location and compatibility.

We also often see vent pipes or stacks used as anchorages. On concrete roofs, we have seen several cases where anchorages are attached to the topping concrete instead of to the structural slab. These situations are sometimes the scariest because the connection of the anchorage to the structure is typically hidden from view beneath the roof.

Q: When evaluating an anchorage point, is it necessary to take heavier workers into account, or should the person who selects the anchorage use the limits cited in the Z359 Fall Protection Code?

A: Absolutely for both questions. For the heavier worker, there will be a higher maximum arresting force, which leads to greater forces applied to the human body and the supporting structure. The person who selects the anchorage should determine whether any dangerous effects could occur to workers' health if they are suspended. A great session at the 2008 International Society for Fall Protection symposium addressed this topic. There are too many issues to discuss in this interview, but a simple reminder is that

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physical fitness and weight are important variables in determining how long the worker can safely suspend.

Q: How are certified versus uncertified anchorage points applied in the real world?

A: Z359 ASC has debated this issue for some time. Many believe that only qualified persons should identify anchorages, while others that argue anyone should be able to identify anchorages. The Z359.2 standard states that as a minimum, a competent person must identify anchorages. These are referred to as noncertified anchorages. I recommend that since competent persons typically do not have an engineering background, a qualified person must give guidance as to what an acceptable anchorage is. Furthermore, if the anchorage is part of a building structure, local building codes require the design of the anchorage to be completed by a professional engineer (P.E.).

Q: Must on-site testing take place to certify an anchorage point? If so, how is this done from a practical perspective?

A: On-site testing is not required but it may be necessary. Unfortunately, no documents currently give this guidance for testing. Z359 ASC hopes to include this guidance as part of a future revision of the Z359.6-2009 standard. Simply pulling on an anchorage to a predetermined force is inadequate. You must monitor applied load versus deflection prior to accepting it as an anchorage. If not, the load test could unintentionally damage the structure.

Q: As a best practice, do you believe organizations should inventory anchorage points in their respective facilities? Including an anchorage point in an inventory the same as certification?

A: To the first question, yes. An inventory records past inspection dates of anchorages and provides a basis for determining which anchorages must be evaluated in the future, whether it be inspecting or recertifying the system. It also provides a method for documenting which equipment or procedures are used for which anchorages.

Including an anchorage point in an inventory is not the same as certification. Just because an organization documents information about an anchorage does not make the anchorage safe to use.

Certification is a frequently misused term in fall protection. Some people believe that certification is a guarantee,

which it is not. In other cases, people certify to irrelevant requirements. For example, someone might say that a horizontal lifeline is certified to federal OSHA requirements, but that does not really mean too much in my opinion because the OSHA requirement is very general. In the Z359.6 standard, certification means that documentation exists and the system meets the standard.

Q: If an anchorage point is not in an organization's inventory but could withstand the forces listed in the Z359 Fall Protection Code, can the worker use the anchorage point without being certified?

A: Yes, this is referred to as a noncertified anchorage. A noncertified anchorage is required to have a higher load capacity than a certified anchorage and may be used under the supervision of a competent person rather than a qualified person. Noncertified anchorages should still be documented in the inventory.

Q: How often must an anchorage point be reexamined and recertified?

A: According to ANSI/ASSE Z359.2-2007, "anchorage systems shall be inspected by the authorized person prior to each use and by a qualified person or competent person at least annually." According to ANSI/ASSE Z359.6-2009, "active fall protection systems shall be thoroughly reviewed by an engineer at a frequency to be determined by the original design or other similarly qualified engineer but not to exceed 5 years."

Q: How is the Z359 ASC addressing anchorage points?

A: First, anchorage points are addressed in the Z359.2 standard under Section 5.4. This section provides the general types of anchorages with specific requirements for certified and noncertified anchorages.

Second, Z359.6 provides guidance to engineers designing fall protection systems. This standard is essentially a design guide for active fall protection systems.

Q: In your opinion, what is a qualified person's versus a competent person's role with respect to anchorage points?

A: In general, the qualified person designs the system while the competent person supervises and inspects use of the system when it comes to anchorage points.

Q: What role can OSHA play with regard to anchorage selection? How do you reconcile federal regulations with voluntary national consensus standards?

A: Federal and state OSHA is the law. However, many organizations understand the value of the ANSI standards. The value includes the most recent technology in this industry. Some OSHA regulations are between 15 and 40 years old while all of the ANSI/ASSE Z359 standards are less than 2½ years old.

Q: Do state laws affect anchorages? Do state-plan states use the same approach as OSHA?

A: Yes, state laws affect anchorages. A P.E. is required to be involved whenever the use of a structural member changes. So if a structural member currently supports the roof and it is proposed to support the roof and a fall arrest load, this constitutes a change of use and a P.E. is required to evaluate that change. Although exceptions exist, I personally believe that a qualified person who is a licensed P.E. should be the sole authority for certifying anchorage points.

For the most part, state-plan states use similar approaches to OSHA.

Q: What are your thoughts on anchorages in the construction industry? Depending on the work environment and personnel, there might not be an opportunity for anchorage point certification. How should this be addressed?

A: This is where the use of noncertified anchorages has the greatest benefit. In my opinion, a P.E. or qualified person must give the competent person guidance as to what an appropriate anchorage is.

For example, suppose you are in an emergency situation. You are working on the roof of a building and you fall. I am the engineer on site and I am asked whether a structural member can be used as an anchorage point for rescue. In this situation, I would feel comfortable answering the question, because it is an emergency situation and I know that if you are not rescued within 10 minutes, your life could be in danger. However, if I was asked to identify an anchorage by a client and people's lives were not in immediate danger, this would be a violation of engineering ethics. This due diligence is required by law.

Q: What is rope access and do anchorage point selection concepts used for traditional fall protection also hold true for rope access applications?

A: ANSI/ASSE Z359.0-2009, Definitions and Nomenclature Used for Fall Protection and Fall Arrest, defines rope access as "a technique using safety ropes, normally incorporating two separately secured systems, one as a means of access and the other as a secondary system, used with a harness in combination with other devices, for access to and from as well as suspension at the place of work."

Anchorage point selection concepts hold true for rope access applications.

Q: What is your opinion of temporary anchorage point equipment? Feedback from ASSE members has been positive, but proper installation and use through training continue to be an issue. What advice can you give on proper installation and use of temporary anchorage point equipment?

A: Many people do not use fall protection equipment outside the workplace, and the use of equipment is not intuitive. Consider these statistics. OSHA Subpart M was passed in 1994; from 1995 to 2007, fall fatalities from heights increased by 28%, while overall workplace fatalities decreased by 12%. Usually, when a new OSHA standard is released, fatalities are expected to decrease. However, in this case, when compared to overall workplace fatalities, they have increased significantly.

I think this is a sign of equipment not being intuitive or of people thinking that tying-off or wearing a harness equals protection. This is simply not the case.

Q: A P.E. or qualified person cannot always be on hand to approve anchorages. Can a company train a competent person to select anchorages, for example, in a construction environment?

A: Absolutely. A company or organization is required to train its competent persons with guidance from the P.E. or qualified person to identify appropriate anchorages. These anchorages are known as noncertified anchorages. Remember that anchorages are not only strength; the competent person must ensure that appropriate equipment is used and that procedures and training are in place.

Q: Can a contractor or subcontractor certify/select anchorage points in a facility, or do you believe the owner or general contractor should do this?

A: I believe in most cases it is the owner's responsibility. For example, if a window cleaning contractor cleans your windows, you would not expect them to install anchorages into your roof structure every time they do work. The roof would look like Swiss cheese after just a few years. In this case, it is the owner's responsibility to provide adequate anchorages for the contractor.

On the other hand, if a contractor for a single use needs to use an overhead anchorage, it might be more appropriate to have that contractor select the anchorage for that use. It boils down to how often the anchorage will be used. If it is to be used frequently, it makes financial sense for the owner to select the anchorage and to maintain all certification and inspection logs. This is partially addressed in the International Window Cleaning Association standard ANSI/IWCA I-14.1 (www.iwca.org/content.asp?contentid=31).

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