

OSHA, Construction and Industry Working Ever Closer Together on Fall Protection

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Fall Protection and other safety practices at height became standard long before either ASSE or OSHA in certain industries and before OSHA expanded the concept into all areas of US industry which did not fall under another agency safety regulations. Here is a brief background to development of fall protection:

1860 Lineman's belts and straps for climbing telegraph poles and high work as a work tool primarily and enable two handed work creating a stable tripod with the belt and two legs gaffed on the pole.

1911 Fall Protection Status: ASSE is formed: Leather buckled belts and manila lanyards and ropes were available for safety belt applications.

1925 Rose Rope Grab for window cleaners – downtown incidents close to the newspaper reporters and photographers highlighted high work dangers.

1943 Program for testing initiated due to worker injuries with ropes and belts; Clarence Rose and MSA worked on a committee for many years to achieve funding.

1945 Forged hardware became available from surplus military supplies such as airplane belts and parachute gear snaphooks and D-rings.

1956 Test Report on forces on cadavers and anesthetized heavy dogs by ASSE which NSC financed after many years of no funding of the ASSE proposed testing.

1964 Boeing Harness report published showed the superiority of harnesses over belts for fall protection based on distribution of forces over shoulders and thighs rather than waist for prolonged suspension.

1971 OSHA belts and lanyards required, also safety nets: rules drafted by Floyd Van Atta.

1972 Rope 3/4" manila downgraded by 10% which meant 5400 lbs became rated by the Cordage Institute at 4800 lbs and this invalidated the use of the Rose Rope Grab unless 3/4" nylon was used which was higher priced than the 1/2" dia. nylon rope. 12 mm. rope grabs from Europe and 1/2" twisted nylon ropes with fall arrestors became more common for window cleaning.

1975 ANSI A10.14 Safety Belts and Lanyards was published, sponsored by the National Safety Council. Also the first non-mining applications of self-retracting lanyards were developed particularly for tank car worker protection on horizontal cables overhead.

1976 NBS report for OSHA on belt and shock-absorbing lanyard testing of forces.

1978 The first engineered horizontal lifeline system was introduced for industry use.

1982 After the oil embargo, OSHA suspended the proposed regulations for fall protection and safety in the exploration industry to appease oil interests.

1985 Frank Bird, leading US safety consultant, went on record that his clients saw no problem regarding fall hazards requiring special attention.

1986 First report on belt and harness suspension hazards by USAF for OSHA.

1989 OSHA 1910.66 Appendix C was published relating to Building Exterior Scaffolds, recognized Competent, Qualified Persons and Horizontal Lifelines.

1990 OSHA proposed a 1910 regulation upgrade to fall protection systems.

1991 ANSI A10.14 second edition was published with NSC as secretariat

1992 ANSI Z359.1 Personal Fall Arrest System standard was published with ASSE as secretariat.

1994 OSHA recognized Fall Protection Systems in its 1926 SubPart M. Proposed rule was 1993 (58 FR165-1657).

1994 Congress rolled back the proposed increase in roof fall protection regulation and tons of residential roof brackets had to be scrapped.

1998 Harnesses required for construction use by OSHA following publication in 1994 of the OSHA SubPart M construction regulations, effective 1995.

2004 ANSI A10.32 Construction Fall Protection Systems was published with ASSE as secretariat; (A10.14 was sunset retired by ANSI in 2001).

2010 Proposed regulations for 1910 General Industry Fall Protection (update of the 1990 proposal). Hearings in January 2011 as OSHA tries to pull the regulations closer together with construction requirements.

US Bureau of Labor Statistics showed that fall fatalities peaked around 2007, as the recession deepened with mortgage availability scarce and construction work slowed through the present time. Total deaths were approximately 800 deaths per year at the peak. Fall deaths in construction were approximately one third of all construction deaths and remain so.

Before OSHA there was state regulation primarily through New York and California regulations. In 1969 the Construction Safety Act applied to all federal government construction work contracts. In 1971 the 29CFR construction safety regulations grew out of the federal requirements ref 1910.11-.12. Federal Construction Safety incorporated by Section 6(a) rulemaking as 29 CFR 1915 later renumbered as CFR

1926 The States retained the right to create or continue the state safety regulation under 29CFR1902-1908.

Original fall protection equipment applied to tools mariners used to keep them from being thrown into the sea while attending to sails. They free-climbed to the rigging on Jacob's Ladders and then secured

with a belt around the waist; this became the option to maintain balance or be a work tool using the lanyard rope. River pilots access to and from ships has also been by Jacobs Ladders as was troop access, similarly by cargo nets to landing craft in Normandy and Vietnam. .. Chimney building also called for tie-off equipment to maintain balance. Fall protection was a secondary consideration.

Equipment developed in the window-cleaning industry led the way followed by tree-trimming equipment. The principle was to climb free-hand and secure at the workstation. However when the falls still occurred during access. then the attempts to secure the climbing and transfer with 100% fall protection became normal in recent years.

Some industries maintain today the posture of climbing free-hand and when stationary ingtied off. That thinking has been surpassed in the modern day to provide fall protection above trigger heights which vary due to the source of the standard eg construction: steel erection 15- 30 ft, scaffolds 10 ft, elsewhere 6 ft,- and general industry: 4 ft.

Since the days of the telegraph 150 years ago, access to the top cross-members of poles for telephone, cable and electric cable services has been using the lineman's belt and strap. Locking snaphooks have become more accepted as some uncouplings of seemingly compatible hardware have been hard to explain.

Tank and sewer work through small openings gave rise to the harness using bulky straps. As lighter webbings became available, the harness was shown in demonstrations to hold the body more vertical after a fall arrest instead of folded at the waist with a body belt and better to survive waiting for rescue. Europe moved to the harness in 1979, with France mandating harness use over body belts based on their extensive research.

The first Z359.1 standard in 1992 required the use of full-body harnesses and did not address the use of belts for fall arrest

In 1998, after OSHA declared the deadline four years in advance, the USA changed from belts to harnesses in construction, and general industry followed suit, except for the warehouse industry, within a couple of years.

The Corps of Engineers introduced fall safety programs into federal contract work for decades through its standards, and the US Navy was the first federal agency to require engineered anchor points after the year 2003 for its ashore facilities.

Larger corporations have done well in their fall protection programs through equipment, training and observation of crews plus inspection. Inspection has become a major hurdle for those who travel with their equipment to know what is fit for use when equipment slowly degrades.

The Z359 committee in 2006 decided to develop standards faster for the benefit of all and component standards, Z359.0-18 were started with chair persons who wrote the initial draft based on their background knowledge. To date, 3/11, eight standards including Definitions have been published by ASSE.

The ANSI Z359 committee achieved a locking snaphook gate test of 3600 lbs in the 2007 Z359.1 standard over the previous 220 lb requirement which promoted unrecognized distortion of the gate of larger hooks known as Pelican Hooks. ANSI A10.32 intends to follow in its 2011 pending standard. Some users have presently stopped using large question-mark-shaped hooks in favor of large carabiners for difficult applications.

In 2009, evidence was submitted to the Z359 committee that the test weight of 220 lbs torso did not represent a 310 lbs worker. After a testing report was issued, it was concluded that instead of a 1.4 factor, a 1.1 factor would be used to represent a 310 lb worker including clothes and safety equipment. Thus testing of equipment was raised to 282 lbs test weight in 2009 standards and beyond.

USDOL-OSHA-DOC, Washington, DC

Introduction

As OSHA enters its 41st year it is time to take stock of the lasting efforts the agency and numerous industry members contributed to making construction a safer work environment. As Assistant Secretary for Occupational Safety and Health, Dr. David Michaels, said in January, this year:

Worker deaths in America are down — from perhaps 14,000 in 1970 to 4,400 in 2009 — in a workforce that has doubled in size. Injuries and illnesses are down — from 10.9 incidents per 100 workers in 1972 to less than 4 per 100 in 2009. Some of this decline was due to the shift of our economy from manufacturing to service industries. But, clearly, much of our progress is due to tougher government standards and greater awareness of workplace safety practices brought about by OSHA.

In particular consider the evolution of fall protection in construction. Falls to lower levels have been and continue to be the most frequent contributor to construction fatalities. The Bureau of Labor Statistics in its Census of Fatal Occupational Injuries reminds us how catastrophic construction falls have been. From 2003 -2009 falls to lower levels represent at least 30% of construction fatal events. Construction fatalities represented in the same time frame were at least 20% of all fatalities for private industry.

Several major agency undertakings have addressed fall protection in construction since its inception as have numerous emphasis programs. The final rule for fall protection in construction was published in 1994, but the effort did not stop there. Recently one undertaking continuing the effort is the rescission of OSHA's compliance directive for interim fall protection in residential construction. Another is the negotiated rulemaking that produced OSHA's final rule for cranes and derricks in construction. You know the former as STD 3.1 and the later as CDAC.

Formally, however, STD 03-11-002, December 16, 2010, rescinds and replaces STD 3.1 (STD 03-00-001, June 18, 1999), and 29 CFR 1926 Subpart CC is the Final Rule for Cranes and Derricks in Construction and revises former 29 CFR 1926.550. Both efforts included significant improvements for fall protection in construction. Both processes, the STD rescission and the CDAC rulemaking, involved considerable input from industry.

Rather than proceed from a historical event and work forward; this discussion starts with these two events and works backwards to their underpinnings and earlier OSHA construction fall protection advances.

Residential Fall Protection

- December 16, 2010, OSHA published STD 03-11-002
 - Rescinded STD 03-00-001 - known as STD 3.1A, December 18, 1999, the plain language version of STD 3.1 that provided the STD a definition of “residential construction”

- Original STD 3.1, December 8, 1995
 - Issues of feasibility and greater hazard
 - Limits of contemporary technology overcome by currently available advances
- STD 03-11-002 provides definition for “Residential construction” applicable to 29 CFR 1926.501(b)(13).
- Path to Decision to Rescind
 - 2009 – 2008 Advisory Committee on Construction Safety and Health (ACCSH)
 - Work Group on Residential Fall Protection
 - Framing contractors, Builders, National Associations, Truss Design/Manufacturing, Carpenters, Fall Protection Design/Manufacturers, OSHA State Plan Representatives, National Institutes of Occupational Safety and Health
 - Work Group Recommended rescission
 - Roofing Contractors Association advocated retaining some form for low slope roofing
 - 2008 – National Association of Home Builders – letter to Assistant Secretary – rescission
 - 2008 – ACCSH formal vote recommends to Agency – rescission
 - 2008 - Occupational Safety and Health State Plan Association (OSHSPA) – rescission
 - 1999 – Advanced Notice of Proposed Rulemaking – questions to the industry concerning residential construction
 - 1999 – STD 3.1A, the plain language revision of STD 3.1 plus a definition of residential construction within the STD
 - 1995 – STD tempered impact of Section 1926.501(b)(13) – dealt with industry concerns over infeasibility and greater hazard
 - 1994 – 29 CFR 1926 Subpart M – August 9, 1994, Section 1926.501(b)(13) imposed duty to have fall protection for those engaged in residential construction.
 - Traditional – guardrail, safety net, personal fall arrest systems unless demonstrated infeasibility/greater hazard – then Section 1926.502(k) fall protection plan
- STD 03-11-002’s enforcement date is June 16, 2011.
 - Employers engaged in residential construction who wish to use alternative fall protection measures must meet the requirements in 29 CFR 1926.501(b)(13) and 1926.502(K).
 - Fall protection plans used to comply with 29 CFR 1926.501(b)(13) and 1926.502(k) must be written and site specific.
 - This instruction interprets “residential construction” for purposes of 29 CFR 1926.501(b)(13) to include two elements: (1) a residence requirement; and (2) a wood frame construction requirement.
- Interpretation of “Residential Construction” for 1926.501(b)(13) – two part test
 - (1) “residential construction,” the end-use of the building in question must be as a home or dwelling; and
 - (2) “residential construction,” the building in question must be constructed using traditional wood frame construction materials and methods
 - ACCSH, ACCSH work group, association, contractor, builders input
 - Agency decided that end use was a necessary component of the interpretation in order to stay within the plain meaning of 1926.501(b)(13) Residential construction.

Cranes and Derricks in Construction – Fall Protection

- Federal Register / Vol. 75, No. 152 / Monday, August 9, 2010 / Rules and Regulations
 - 29 CFR 1926 Cranes and Derricks in Construction; Final Rule (1926 Subpart CC)
 - Effective date: November 8, 2010 – with phase ins e.g. operator certification, insulating links
 - 29 CFR 1926.1423 “Fall Protection”
 - Boom walkways
 - Steps, handholds, ladders, grabrails, guardrails and railings
 - Personal fall arrest and fall restraint systems
 - Non-assembly/disassembly
 - For assembly/disassembly
 - Anchorage criteria
 - Tower cranes
 - Anchoring to load line
 - Training
 - Crane and Derrick Negotiated Rulemaking Advisory Committee (CDAC)
 - 23 Members – employer users (10), government (1), insurance (1), labor (4), lessors/maintenance (1), manufacturers/suppliers (4), power line owners (1), trainer and operator testing (1)
 - Negotiated July 2003 to August 2004
 - Heard testimony from numerous presenters
 - Received input from ACCSH
 - ACCSH work group late 1990’s early 2000’s
 - ACCSH work group draft document – December 5, 2002
 - Negotiated Rulemaking Act – 5 U.S.C. § 562(2) “consensus” means unanimous concurrence among the interests represented on a negotiated rulemaking committee, established under this subchapter, unless such committee –
 - (A) agrees to define such term to mean a general but not unanimous concurrence; or
 - (B) agrees upon another specified definition;
 - Consensus – not more than two non-Federal dissents

Fall Protection Rulemakings

- Federal Register / Vol. 66, No. 12 / Thursday, January 18, 2001 / Rules and Regulations
 - 29 CFR 1926 Safety Standards for Steel Erection; Final Rule (1926 Subpart R)
 - 29 CFR 1926.760 “Fall Protection”
 - General requirements
 - Connectors
 - Controlled Decking Zone (CDZ)
 - Criteria for fall protection
 - Custody of fall protection
 - Steel Erection Negotiated Rulemaking Advisory Committee (SENRAAC)

- 20 Members from labor, industry, public interests and government agencies
 - Negotiated 18 months starting in mid June 1994 – 11 full committee meetings
 - Numerous workgroup meetings
 - Submissions from / participation by interested parties including
 - Steel Joist Institute (SJI)
 - American Institute for Steel Construction (AISC)
 - Steel Erectors Association of America (SEAA)
 - American Iron and Steel Institute (AISI)
 - Metal Building Manufacturers Association (MBMA)
 - Steel Deck Institute (SDI)
 - National Association of Miscellaneous, Ornamental and Architectural Products Contractors (NAMOA)
 - Institute of the Ironworking Industry (III)
 - Ironworkers Employers Association of Washington, D.C. and Western Pennsylvania (IWEA)
 - Allied Building Metal Industries
 - Consensus – unanimity
- Federal Register / Vol. 61, No. 170 / Friday, August 30, 1996 / Rules and Regulations
 - 29 CFR 1926 Safety For Scaffolds Used in the Construction Industry; Final Rule (1926 Subpart L)
 - 29 CFR 1926.451(g) “Fall Protection”
 - 29 CFR 1926.451(g)(1) - 10 foot trigger height retained from proposed rule
 - Comments to the rulemaking record
 - Realized that American National Standards Institute’s A10.8-1988 had 10 foot trigger recommendation
 - Consensus – not used. Notice and Comment Rulemaking – OSH Act Section 6 (b)
 - Agency decision based on own work and public/industry comments / testimony
 - Federal Register / Vol. 59, No. 152 / Tuesday, August 9, 1994 / Rules and Regulations
 - 29 CFR 1926 Safety Standards for Fall Protection in the Construction Industry; Final Rule (1926 Subpart M)
 - 29 CFR 1926.501 “Duty to have fall protection”
 - Consensus – not used. Notice and Comment Rulemaking – OSH Act Section 6 (b)
 - Agency decision based on own work and public comments / testimony

Data – Bureau of Labor Statistics

Bureau of Labor Statistics - Census of Fatal Occupational Injuries				
Original Data Value				
Generated February 28, 2011				
Series Id:	FIU50X 00000081N00	FIU50X 236XXX81N00	FIU50X 237XXX81N00	FIU50X 238XXX81N00
Area:	All U.S.	All U.S.	All U.S.	All U.S.
Case Type:	Fatalities by detailed private industry	Fatalities by detailed private industry	Fatalities by detailed private industry	Fatalities by detailed private industry
Category:	Ownership-- Private industry	Ownership-- Private industry	Ownership-- Private industry	Ownership-- Private industry
Industry:	All workers	Construction of Buildings	Heavy and Civil Engineering Construction	Specialty Trade Contractors
Years:	2003 to 2009	2003 to 2009	2003 to 2009	2003 to 2009
Year	Annual	Annual	Annual	Annual
2003	5043	227	247	629
2004	5229	225	220	759
2005	5214	227	244	677
2006	5320	219	224	724
2007	5112	249	219	690
2008	4670	206	190	567
2009*	3890	150	167	477
2009* - Preliminary				

Bureau of Labor Statistics - Census of Fatal Occupational Injuries

Original Data Value

Generated February 28, 2011

Series Id:	FIUEGX 236XXX81N00	FIUEGX 237XXX81N00	FIUEGX 238XXX81N00
Area:	All U.S.	All U.S.	All U.S.
Case Type:	Fatalities by detailed private industry	Fatalities by detailed private industry	Fatalities by detailed private industry
Category:	Event or exposure-- Fall to lower level	Event or exposure-- Fall to lower level	Event or exposure-- Fall to lower level
Industry:	Construction of Buildings	Heavy and Civil Engineering Construction	Specialty Trade Contractors
Years:	2003 to 2009	2003 to 2009	2003 to 2009
Year	Annual	Annual	Annual
2003	95	22	230
2004	106	17	309
2005	126	10	232
2006	97	20	286
2007	105	29	284
2008	83	19	221
2009*	71	11	184

2009* - Preliminary