New Developments in Fall Protection Planning

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ELLIS FALL SAFETY SOLUTIONS
A DSC Company

ASSE PDC
Orlando
June 2007
Known: Every job involving fall hazards should be planned

- What is the work and work methods?
- What are the fall hazards? Eliminate or control?
- What are alternative solutions to the hazards?
- Fall Protection Plan: Implement solution choices
- Adequate Training of crew
- Availability of Engineer
- Monitoring of work

1910.132 General Industry regulations
What’s New 10 15 07?

- **Z359.0 through Z359.4** all new except for Z359.1 (Note: Snaphook gates now 3600 lbs)

- **Z359.2** is minimum requirements for a Comprehensive Managed Fall Protection Program and has the elements of:
  - fall protection planning
  - minimum training
  - hierarchy of controls

Available July 2007 from ASSE
What’s **Missing from Z359.2** regarding Fall Protection Planning

- Contract wording safety requirements
- Controlling employer duties
- Premises liability duties
- Non-employees e.g. delivery persons, inspectors, flatbed drivers’ tarping, HVAC, electrical, roof invitees
- Duty to provide Anchorage points for the above including window cleaners
Non-employee FP and Rescue eg truckers, contractors, invitees of all kinds (OSHA Act 5(a)(2))

Special attention to Roofs, Skylights and Holes (A1264.1 and A10.18)

ANSI Z10 Safety Program

Y-lanyards need one S/A per lanyard

Scaffold and Guardrail anchorages must be approved anchors by QP
Program Administrators must be trained to get the attention of top management by presenting the business case.

Program Administrators must be able to get funding for neutralizing new or existing fall hazards.

Program Administrators must be able to have QP and CP on the Design Team for new structures at the earliest opportunity.
J. Nigel Ellis comments (3 of 3)

- **Program Administrators**: Preventing Disasters by focusing on economic key factors with a knack for getting prompt management acceptance.

- **Program Administrators** must be capable of presenting the Economics of Safety to meet the IRR requirements to top management.
Disaster Trail

Practices

Holes

Ladder
Z359.2 Elements of Fall Protection Planning

- Hazard assessment by CP and QP
- Work methods acceptable FP solutions
- Review contractor FP Plan for details
- Discussion with operations
- Discuss acceptable contractor solutions
- CP appoints CR who appoints AR
- Training of foremen CP
- Training of AP
- Observation of work
- Re-training of those re: residual hazards
Hazard Assessment Example: Skylights

Fall Hazard Recognized!

Solutions
Skylight Disasters do happen

West Coast
Who will sell this prevention to management? $400/ea installed

1% protected since 1971 per Plastico (mfr)

East Coast
Fall Hazards Recognized Solutions
Fall Solutions

Tanktrucks/Tankcars

Tarping

Hoarfrost

Flatbed loading
Apply to trailer fleets

Eliminate the Fall Hazard
#1 Choice

Apply to tanktruck fleets
Roof Hatch Solutions

Horizontal Grab Bars
Corps of Engineers
Z359.2 Managed Fall Protection Program (1-32) 10/15/07

- Old:
  - Did not exist

- New Administrative Std:
  - Training requirements
  - Qualification of Trainers
  - Fall Hazard Survey Report
  - Fall Prot’n Hierarchy
  - Written FP procedures
  - Program Evaluation/Remediation
  - Design Requirements
  - Anchorages
### Z359 abbreviations in the standards & for this presentation

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Z359.2 Managed Fall Protection Program (2)

- **Old:**
  - Did not exist

- **New Administrative Std:**
  - Policy Statement by employer

- **Program Administrator:**
  - Directs employer’s fall protection program

- **Qualified Person:**
  - Structural analysis, stds testing, clearances, methods, selection, be a Competent Person
  - Certified Anchorages responsibility

- **Competent Person:**
  - Supervision, implementation, monitoring
  - Non-certified anchorages supervised
  - Knows regs, stds, eqpt systems, surveys
  - Can stop work if fall hazard identified
Z359.2 Managed Fall Protection Program (3)

Old:
- Did not exist

New Administrative Std:
- **Competent Persons** duties cont’d:
- Training Authorized Persons (AP) completed
- AP Retrain superv’n if cond’ns change
- Check clearance requirements
- Review procedures
- Implement rescue procedures
- Periodically inspect equipment
Z359.2 Managed Fall Protection Program (4)

- **Old:**
  - Competent Rescuer duties: 
    - Anticipate rescue, develop procedures
    - Training Authorized Rescuers (AR) completed
    - AR Retrain superv’n if cond’ns change
    - Knowledge of FP and rescue regs/STDs
    - Periodically inspect rescue equip’t

- **New Administrative Std:**
Old:
Did not exist

New Administrative Std:
Authorized Rescuer duties:
- Perform and Assist in workplace rescue
- Training Authorized Rescuers (AR) completed
- AR Retrain superv’n if cond’ns change
- Knowledge experience of rescue equip’t
- Select rescue equipment for a rescue
- Review procedure for rescue pre-work
- Rescue equipment is properly protected
- Be knowledgeable of hazards during rescue
Z359.2 Managed Fall Protection Program (6)

- Old:
- Did not exist

- New Administrative Std:
- **Qualified Person Trainer** duties:
  - Working knowledge of regs/ stds/ equipment/ Engineering Principles
  - Meet minimum req. for QP
  - Training is customized to specific industry
Z359.2 Managed Fall Protection Program (7)

- Old:
  - Did not exist

- New Administrative Std:
  - Competent Person Trainer duties:
    - Working knowledge of regs/standards/equipment/systems
  - Be familiar with typical fall hazards in the industry
  - Training is appropriate to specific industry
  - Evaluate FP/Rescue skills of CP
Z359.2 Managed Fall Protection Program (8)

- Old: Did not exist
- New Administrative Std: Competent Rescuer Trainer duties
- Extensive experience & Advanced Training in rescue of persons from heights
- Working knowledge of regs/standards/equipment/FP & Rescue Systems
- Training is appropriate to conditions
- Evaluate FP/Rescue skills of CRE
- Administer written and skill-based exams
Z359.2 Managed Fall Protection Program (9)

- Old:
- Did not exist

- New Administrative Std:
  - **Training Standards**
  - Z490.1 Criteria/Practices Safety Training

- Develop Training Guide:
  - Outline/timeline, learning objectives
  - Pre-requisites, training aids
  - Student to instructor ratio
  - Methods of evaluation
  - Min. performance requirements of students

- Components and methods to meet all regs and acceptable engineering practices

- Training and evaluations documented
  - Electronic is OK: names, training deliverer, dates/times
  - Performance based on observation or exams
Z359.2 Managed Fall Protection Program (10)

Old:
1. Did not exist

New Administrative Std:
1. Program Administrator Training
   - FP/RT by CP Trainers
   - Must have working knowledge of regs/stds
   - Must know FP methods and systems

Training in skills:
- Develop and Maintain FP Program
- FH Surveys, approved equipment & systems
- Safety Committee selection
- Selection of CP and QP
- Writing FP Procedures/Eng’g Stds
- Accident Investigations or near miss incidents
Z359.2 Managed Fall Protection Program (11)

- Old: Did not exist
- New Administrative Std: Qualified Person Training:
  - Proper inspection, assembly use
  - Min. stds may include being Reg. P.E.
  - Training includes:
    - FH elim’n and control methods, feasibility
    - Applicable regs; develop FH surveys
    - Design of anchorages, HLL’s, clearances
    - Criteria for safe and unsafe systems
    - Develop procedures
    - Staying current as FP evolves (0.8 IACET CEU’s/year related to FP/Rescue)
Z359.2 Managed Fall Protection Program (12)

- **Old:**
  - Did not exist

- **New Administrative Std:**
  - **Competent Person Training:**
    - Proper inspection, assembly use
    - Min. stds may include being Reg. P.E.

- **Training includes:**
  - FH elim’n and control methods, feasibility
  - Applicable regs; develop FH surveys
  - Design of anchorages, HLL’s, clearances
  - Criteria for safe and unsafe systems
  - Develop procedures; watch for new fall hazards
  - Staying current as FP evolves (update training every two years minimum)
Z359.2 Managed Fall Protection Program (13)

- Old:
  - Did not exist

- New Administrative Std:
  - Competent Rescuer Education & Training: 3.3.5

- Physical demo by trainees all types equipment, selection, proper set-up, use locally where rescue may occur

- Compatibility, packaging methods, storage, use hazards associated with each system and component
Z359.2 Managed Fall Protection Program (14)

- Old: Did not exist
- New Administrative Std:
  - Competent Rescuer Education & Training: 3.3.5 continued:
- Training content:
  - FH elim’n & control methods, FP/rescue regs, assessment of FH to determine methods, inspection and records of rescue equ’pt, determine when system is unsafe, written fall protection rescue procedures, selection and use of non-certified anchorages
Z359.2 Managed Fall Protection Program (15)

- Old: Did not exist
- New Administrative Std:
  - Authorized Person Training 3.3.6:
  - Required training by a Competent Person trainer or Qualified Person trainer
  - Retraining when req. knowledge and skills are insufficient based on observation of CP/QP trainer
  - Physical demos, inspect, anchor, assemble, use
  - Working knowledge of FA/Rescue procedures and equipment by hands-on demo of skill
Old:
Did not exist

New Administrative Std:

**Authorized Person Training 3.3.6 cont’d:**

- **Min. training required:** FH recog’n, FH elim’n/control methods, applicable regs, responsibilities, use of written FH/rescue procedures, inspection

- **Update training every two years**

- **Evaluated annually** by CP, QP, QP/CP trainer or **outside QP trainer or CP trainer**
Old:
- Did not exist

New Administrative Std:
- Authorized Rescuer Training

3.3.7:
- Be trained by competent rescuer trainer before exposure to FH or rescue application.
- Retrained or add’l trained when it becomes apparent that req. level of training is missing
- Demos through hands-on equip’t skills
Z359.2 Managed Fall Protection Program (18)

- **Old:**
  - Did not exist

- **New Administrative Std:**
  - **Authorized Rescuer Training 3.3.7 cont’d:**

- **Minimum information:**
  - FH recogn’n, FH elim’n/control methods. applicable regs, responsibilities, use of written procedures, inspection before use

- **Update training every two years**

- **Evaluated annually to ensure competency by CR or CRT**
Old:
Did not exist

New Administrative Std:

Training for CP/QP trainers, CRT 3.3.8:

Trainers shall have documented experience, knowledge, skills in adult education methods

Trainers shall have documented experience, knowledge, training and education equal to or greater than any category of person they are training

Recommended: QPT, CPT, CRT have 1.6 hours IACET approved CEU every year
Z359.2 Managed Fall Protection Program (20)

- Old:
  - Did not exist

- New Administrative Std:
  - **Fall Hazard Survey Report 4.2:**
  - Each FH exposure documented in advance – one or more solutions provided
  - Rec: Graphic sketches, exposure rating (H, M, L)
  - Conducted by QP or CP familiar with local work processes and env’t with input from actual work team
  - Establishes risk factors to rank hazards
    - Frequency, severity, exposure reasons, duration, obstructions, existing FP equip’t, env’t condns, other workers incl. Contractors, proximity, other hazards eg moving parts, electrical, incident history
  - QP/CP presents report to PA
  - **Revised when changes** that render obsolete eg new equip’t, task, tools, etc.
**Z359.2 Managed Fall Protection Program (20)**

- **Old:** Did not exist
- **New Administrative Std:**
  - **Fall Protection Procedures 4.3:**
  - Written by employer’s QP or CP only
  - 100% continuous FP
  - Min. training and qualifications of AP eg aerial lift operator v. tower climber fall arrest
  - FA: acceptable anchorages, clearances, set up for access, egress, max. free fall, max. users
  - WP and Travel Restraint: acceptable anchorages, set-up, egress, max. users, limitations
  - Install’n and dismantling procedures: all components, approved mfrs, standards/drawings, anchor strength, limitations, instr’ns, insp’n details, criteria for accept/reject, incident analysis for improvement
**Z359.2 Managed Fall Protection Program (21)**

- **Old:**
  - Did not exist

- **New Administrative Std:**

- **Elimination and Controlling FH 5:**

- **Hierarchy of Fall Protection:**
  - Elimination eg bring to ground
  - Passive prot’n: guardrail, nets etc
  - Restraint: prevent CoG reaching edge
  - Fall Arrest – stop a fall in FBH
  - Admin. Controls: prevent exposure eg training, warnings ref to Z535 stds
Z359.2 Managed Fall Protection Program (22)

- **Old:** Did not exist
- **New Administrative Std:** Elimination and Controlling FH 5:
- **General Req. for FPS:**
  - Certified as consistent with mfrs instr’ns
  - Based on (predictive) calculations by QP
  - Certified Anchorage – (preferred) QP
  - Non-certified Anchorage by CP – alt
  - MAF FA 1800 lbs no collisions
  - FR work surface up to 4 in 12 slope
  - Adequacy evaluated by QP or test force per stds
  - Design loads are minimum
  - HLL by QP only
Z359.2 Managed Fall Protection Program (23)

- Old:
  - Did not exist

- New Administrative Std:
  - Design Req. New Facility FPS 5.3:

- Planning and designing new buildings and structures: eliminate and control

- Maintenance req. planned by architects for protected access to all areas of building using FP hierarchy of controls

- FP issues considered during Design Phase – platforms, perm./temp. anchor points
Z359.2 Managed Fall Protection Program (24)

- Old: Did not exist
- New Administrative Std:
  - Anchorages for FA 5.4:
    - Certified – design, selection, install’n under superv’n of QP strength 2:1
    - Non-certified 5000 lbs superv’n of CP
    - Strengths multiplied by number of systems attached
  - Safe location: access, forces generated, load path, connections, swing falls, rescue deflection, impact with structural members
- Used solely for FA
Z359.2 Managed Fall Protection Program (25)

- **Old:**
  - Did not exist

- **New Administrative Std:**
  - **Anchorages for WP 5.4.3:**
  - **Certified** – design, selection, install’n under superv’n of QP: anchor strength 2:1 foreseeable force
  - **Non-certified 3000 lbs** superv’n of CP
  - Strengths multiplied by number of systems attached
  - If also for FA must meet FA req.
Z359.2 Managed Fall Protection Program (25)

- Old:
  - Did not exist

- New Administrative Std:
  - Anchorages for TR 5.4.4:
  - Certified – design, selection, install’n under superv’n of QP: anchor strength 2:1 foreseeable force
  - Non-certified 1000 lbs superv’n CP
  - Strengths multiplied by number of systems attached
  - If also used for FA: meet FA req.
Old:
- Did not exist

New Administrative Std:
- **Anchorages for HLL 5.4.5:**
  - Designed by QP with experience in HLL design and use
  - 2:1 strength factor
  - Max. number of persons on HLL used for determining max. force in line
  - Fall arrest forces in HLL anchorages magnify forces above 5,000 lbs usual anchor req.
Z359.2 Managed Fall Protection Program (27)

- Old:
- New Administrative Std:

**Anchorages for Rescue Systems 5.4.6:**
- 3,000 lbs for non-certified anchorages
- 5x applied load for certified anchorages
- Strengths multiplied by the # systems
- Re-rigging of anchor considered during movement unless mobile anchorage connector used
- Recognize two person load possibility and additional fall arrest forces
- If rescue might involve FA use FA anchors
Z359.2 Managed Fall Protection Program (28)

- Old: Did not exist
- New Administrative Std:
  - **Selection of Safe Anchorages 5.4.7/8**
  - Consider recertification at regular intervals by QP “field verification”
  - Appl. Building Codes to be considered
  - Compatible with anchorage connector, AC
  - Minimize free fall to avoid lower contact
  - Max. allowed swing fall is considered
  - Ease of access to connect to anchor
  - Rate eyebolt along intended axis for AC
Old: Did not exist

New Administrative Std:

**Inspections 5.5.2-5:**
- FP and FR equipment inspected 1 yr max. unless mfr says more frequently
- CP does inspection
- **AP inspects** before use at beginning of shift to verify no wear or damage that requires removal from service
- Inspect for labels illegibility, defects, cuts, excess heat/oil/wear/corrosion/kinking/tears/improper function etc
- **Removal:** Tag such equipment; CP to inspect
- Follow mfr instr’n for maintenance; include in FP maintenance procedures
## Z359.2 Managed Fall Protection Program (30)

- **Old:** Did not exist
- **New Administrative Std:**
  - **Rope Access 5.6:**
  - **Safety Analysis leads to Rope Access Permit**
  - **All ropes meet Cordage Institute std for Life Safety Ropes (CI-1801)**
  - **Descender devices: hazards considered including descent energy, fail-to-safe mech.**
  - **CP evaluates application and #AP**
  - **Two persons min. AP, one of which is CP**
  - **>2 lbs tools are controlled with a lanyard**
Z359.2 Managed Fall Protection Program (31)

- Old:
  - Did not exist
- New Administrative Std:
  - Rescue Procedures 6.1
  - Prompt rescue - <6 minutes
  - Written rescue procedures by CP and maintained for rescue and self-rescue
  - Prof’l Rescue Agency: contacted in advance, review work locations, determine degree of reliance, provide their own procedures
  - In-house Rescue Services: used where outside services cannot be relied upon
    - Include selected AR and CR persons
    - Rescue procedures, complete equ’pt instr’ns
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<td>Duty of the <strong>Program Administrator</strong></td>
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<td>Review written policy statement, proper assignment of duties/responsibilities</td>
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<td>Adequate training conforms to A490.1</td>
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<td><strong>FH Survey Reports</strong> to identify all FH</td>
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<td>Equip systems, anchorages meet req of Z359 stds, procedures, incident investigations</td>
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<td><strong>Every two years or when QP or CP finds deficiencies inc. near-misses</strong></td>
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Summary: Z359

New Positions Fall Protection

- Program Administrator
- Competent Person FP
- Qualified Person FP
- Competent Person Trainer
- Qualified Person Trainer
- Authorized Person
- Authorized Rescuer
- Competent Rescuer Trainer
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Search for more Fall Hazards continues

Hose inertia

Tank Scaffold ladder section rips off

Fall Protection Plans would work
New - Fall Protection Planning

- Fall Hazard Survey by CP identifies fall potential
- Fall Hazards identified up front for access, work and egress in writing
- Competent Person identifies proposed work methods and fall protection options (FP Plan)
- CP trains Authorized Persons site-specifically
- Qualified Person designs Horizontal Lifelines and Anchor Points
- CP appoints Competent Person Rescuer and AR
- Plan is audited annually by Program Administrator
Questions??

www.FallSafety.com
This Program up next week
Call 800 372 7775 for personal assistance