

Due to the great demand we offer again:

Fall Protection for Engineers

3-day Seminar - 13th to 15th of April 2011 - BG BAU, Haan / Germany

Introduction

Accidental falls remain the leading cause of injuries and fatalities in different industries. The hazard of falling accompanies almost all jobs on construction sites, shipping or mining. During erection of electricity transmission towers and telecommunication towers, the hazard of falling cannot be removed. When constructing typical buildings the fall hazard can and is primarily controlled by the use of guardrails/barriers, but this method is not suitable for towers, oil rigs, wind-mills and a majority of various jobs. For example in aircraft hangars, maintenance personnel have to work at heights or walk on the wings of airplanes. Like it or not, we have to resort to personal fall arrest systems (PFAS) and often have to deal with anchor devices – especially complex horizontal lifelines (HLL).



(Photo: Sperian Protection)

The design of PFASs requires knowledge of the dynamics of accelerating and decelerating falling masses. Engineers need an ability to calculate the maximum arrest force (MAF) acting on the FAS user, the total dynamic FAS extension (Total Fall Distance, TFD) and the required clearances. The design of anchor devices should ensure that the strength of their components is capable of withstanding the maximum arrest load (MAL) that is generated in an HLL. Mathematical modeling of flexible horizontal lifelines when the line's sag is represented by a catenary equation is needlessly difficult. Parabolic models are almost as accurate and much simpler; however, even this approximation cannot be tackled without iteratively solving the equations.

The MAF should not hurt the fall victim. Its level is limited in EU standards to 6 kN (8 kN in Canada and the USA). Notwithstanding the limits, the real injury threshold for a human body subjected to transitory deceleration depends on the direction and the point of application of the MAF on the fall casualty's body. The new MAF limits for the "X" and "Y" directions are lower than the official 6 (8) kN.

Protection against falls from heights is considered by many to be the most complex part of the entire Personal Protective Equipment (PPE) field. In addition to the above described mathematical skills, the FAS designer is faced with an enormous task of selecting components which are available in a lot of models, makes, types and classes from a large number of suppliers. The differences between various models of equipment that all meet the same standard can be subtle, but can also significantly affect the peak impact forces and required clearances. Designers cannot rely on minimum requirements published in standards to accurately describe and compare how equipment certified to these standards will behave. Elimination of the force of gravity is not a viable option, and all joking aside, accidental falls will continue to happen. While we should always seek ways of preventing falls, the removal of the fall hazard is, on very many jobs, either impossible or not economically feasible. We must therefore strive to arrest falls by designing systems that minimize the chance of injuring the worker. This is a noble goal, but very difficult or impossible to achieve with certainty. It is incumbent on design professionals to know and follow best practices that are known to minimize the risks.

The Seminar's Objective

The Fall Protection for Engineers seminar reveals the current state-of-the-art techniques and understandings in design of personal fall protection systems (PFPS). Our design philosophy places special emphasis on the following features that should be part of all Fall Protection Systems:

1. We should initially respond to all fall hazards with an attempt to remove the hazard of falling, either by changing the process or by employing equipment, systems or techniques that prevent workers from being in or reaching locations where falls can occur,
2. When it is not feasible to prevent falls, Fall Arrest Systems must be used to reduce fall accident frequency and severity, by meeting as many of the following objectives as possible:
 - The systems must comply with or exceed existing regulations and standards,
 - The Residual Risks in FAS should be minimized,
 - The Fall Protection Engineer should employ all modern tools available to FSA designers and be knowledgeable in the state-of-the-art technology
 - The systems must be user-friendly,
 - They cannot be overly expensive to acquire,
 - They cannot adversely affect productivity,
 - Their overall benefit should result in cost savings for the employers.

The Speakers

The BG BAU and partners have, in the spirit of international cooperation, invited two experts from Canada to share with their European colleagues, the Canadian experience in design of fall protection systems. Both Andrew C. Sulowski, P.Eng., and Greg Small, P.Eng. share between them over 55 years of continuous work in fall protection engineering all over the world. They are retained as consultants to fall protection manufacturers and suppliers of engineered systems, to assist with complex problems and develop innovative solutions.

Another speaker is Wolfgang Schäper. He is a world-renowned expert in personal fall protection. He is convenor and member in several working groups of CEN/TC 160 and other German Committees. As a Technical Auditor for "PPE against falls from a height/descender devices" of the notified body "Zentrum für Sicherheitstechnik Haan" he gained a lot of practical experiences.

Seminar Material Supplied to All Participants

The seminar materials supplied to all participants include several manuals, books, and videos. The sheer volume of the provided references necessitates that we also provide carry-on luggage to make it easier to get these resources home. Participants will also receive a copy and one-year-license to use High Engineering Corp's (Microsoft Excel) spreadsheets to simplify the highly complex calculation of Fall Arrest System forces and clearances (especially in the HLLs).



The knowledge and information offered by all speakers is unique and cannot be obtained from any other source. Today's global economy and optimal protection of our workforce compels us to know and use state-of-the art engineering techniques for fall protection. We are confident that participants will concur that their investment will pay for itself very quickly. Participants will develop a new and very scarce level of expertise to offer their current or future employers.