

# ***Selection of Access Equipment.***

***Gerry Mulholland, Health and Safety Leader, Crown House Technologies.***

**G**erry introduced his presentation by giving showing a DVD, called “It will never happen to me”, produced by Laing O’Rourke, in which is portrayed the tragic effects a fatal fall from height had on the family and friends of the accident victim! One of the sad comments made by his young widow, Gerry said, was that her husband had died before he was able to send her either a Christmas Card, or a Birthday Card.



Gerry Mulholland, Crown House Technologies

Gerry followed this harrowing introduction with an overview of the Laing O’Rourke Group and its operational bases in Europe, Middle East and South-East Asia and Australasia! These world-wide hubs employed 27,500 people and the turnover was £3.4 billion in 2006/07! The Crown House Technologies(CHt) part of the Group has a history stretching back over 190 years and it is now one of the UK’s principal building services providers, delivering innovative, high quality lifecycle solutions for its customers. In 2008/2009 it was the largest Mechanical & Electrical contractor in the UK, with much of its work in Data Centres and Banks. Along the way, has achieved 18 consecutive RoSPA Gold Awards!

As part of their continuing commitment to improving safety, CHt undertook a review of their management of access to working positions up to 4.5 metres. Across the company, CHt had realised that selection of access equipment was not being done consistently and, in an effort to address this, they decided to use a systematic process to collect data and analyse it. The method chosen was modelled on the theory employed by ESCP-EAP European School of Management Consulting, whose ante-cedents were first used in the USA by Frank Gilbreth in 1921! It involves analysing the selected work operations into their various parts, or ‘elements’ and subjecting each one to careful scrutiny in a “time and motion” study. This also enabled the investigators to obtain comparative times for using alternative types of equipment and to determine the reasons why one method of working may be better than another.

A crucial pre-requisite, Gerry went on to say, was to establish a sound business case for proceeding with the investigation, based on other significant factors, as well! For instance, an objective analysis of CHt accident statistics for Work at Height accidents over 3½ years showed that falls from height was the main cause of accidents causing the largest proportion of major, lost time and >3 day days off work. The investigators also considered whether other causes of accidents, such as falling objects, handling and slips/trips, had any links to WaH. Gerry added that just under a fifth of all accidents were related to WaH equipment and only a small proportion of these were caused by MEWPs. When looking at the cost of Claims, he added, MEWPs resulted in 11% of the total, whereas Podiums attracted the greatest proportion at 41%!

The investigators also looked at the effect of Weekly Plant Costs and Claims, which looked at the figures for Podiums, Mobile Towers, Ladders & A-frames and MEWPs. This showed quite clearly that although MEWPs cost twice as much as Mobile Towers, the weekly cost per item of claims for repairs to them was the largest item and off-set the basic hire cost. This was because there are more components to damage and lose on towers that have to be paid for at the end of the hire period. The relative Repair costs were: -

1. Mobile Towers & Scaffolds
2. Podiums
3. MEWPs
4. A-frames & Stepladders

This background information was also very useful in framing the strategy for conducting the research in a very controlled way. The most important stage, however, was an initial series of workshops designed to involve the workforce in the project. Approximately 160 employees and operatives from the CHt supply chain were invited to a series of workshops at seven work centres across the company, to answer the specific question “What do you want to work from”. Managers were deliberately excluded from these workshops, to encourage a free flow of ideas. These sessions were supported by Select, the CHt plant hire partners, to demonstrate their equipment and discuss product improvements and development with the end users. The overwhelming majority of those who attended preferred small, vertical, static MEWPs for work up and through the ceiling grid at a platform height of 1.8 – 2.0 metres, ahead of mobile towers and podium steps.

Over the next four months a programme of site visits and WaH studies yield further information about safe working methods. Typical comments were: -

- “Using MEWPs, personnel work faster when remaining at height when moving from one section to another. Podium towers have to be cleared of personnel & tools, outriggers lifted, brakes released, moved, brakes re-applied and outriggers dropped”
- “MEWPs cost a lot and reduce profits. But are safe and easy to use. MOST IMPORTANTLY – the safety rail adapts to fit through standards size ceiling grids for work above the frame or finished ceiling.”

- “Podiums – H&S rules about safety gates are easily breached”
- Steps are useful, but dangerous because they can topple”
- “Scaffold tower – returning them in need of costly maintenance is a common problem.”

The WaH Studies were set up at two locations: -

1. Haywood Hospital, Stoke-on-Trent
2. Forth Valley Hospital, Scotland

The constant factors were

- Types of work – Mechanical & Electrical, First and Second Fix
- Working Height
- Materials and type of environment
- Establishment of ‘ideal conditions’ for: -
  - Equipment in good order with no breakdowns or maintenance issues
  - No distractions from other tradesmen or programme issues

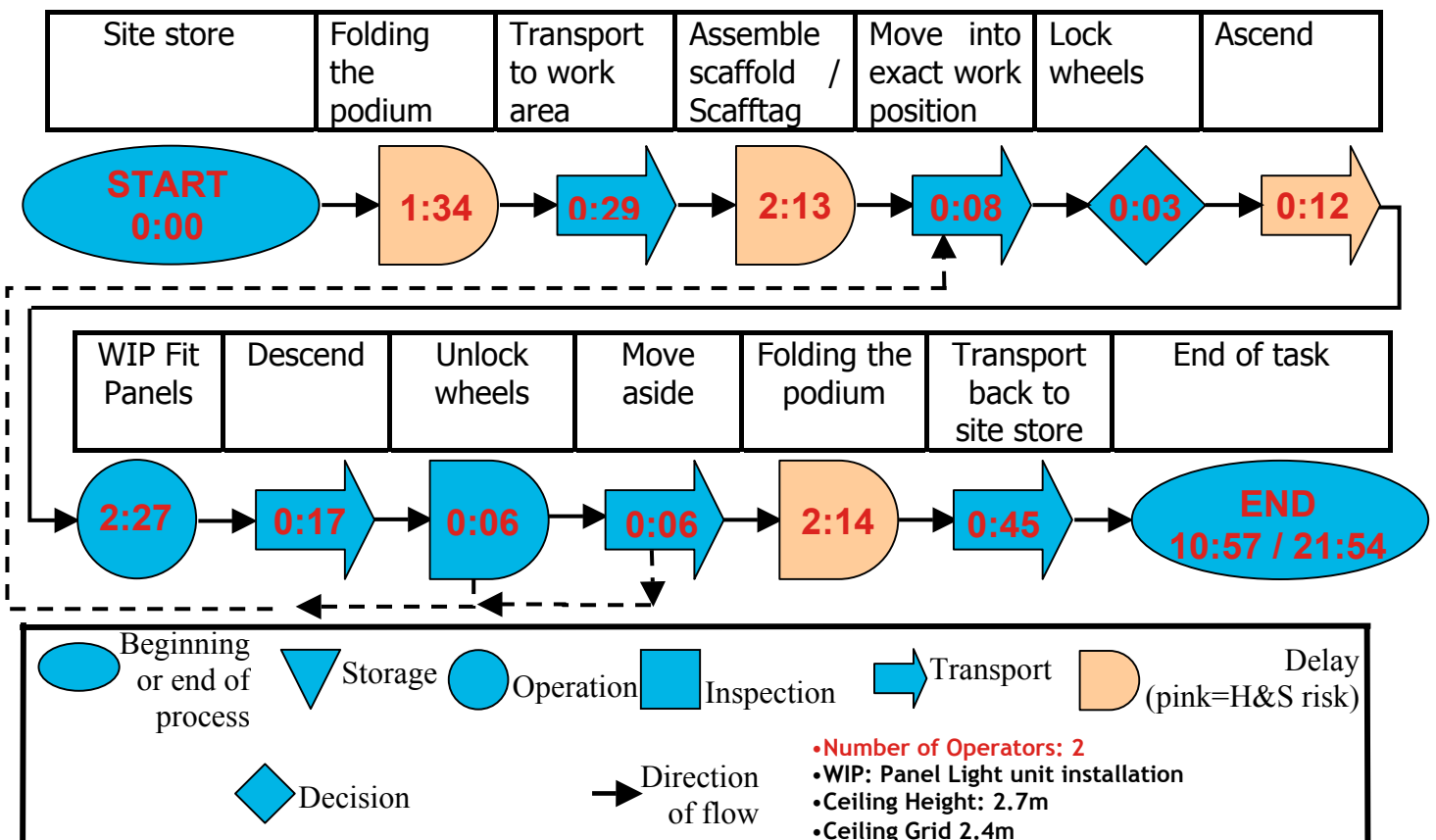
The Variables were: -

- Choice of Access Equipment

The Assumptions made were: -

- The work type is typical to CHt sites throughout UK
- The WaH Study is transferrable across each CHt regional business.

Although the studies were apparently ‘stage-managed’, it ensured that time was not wasted on undesirable practices. The diagram below illustrates how the study measurements were recorded for one of the studies into the use of podiums at Haywood Hospital: -



The fine analysis into such small sub-operations of each task makes it easier to compare differences in working methods and to ensure that the data for identical tasks is transferable to all locations. It also increases the probability that improved methods of working may be more consistently implemented in more locations.

At the end of the studies, it was concluded that: -

### **Overall**

- MEWPs are safer, more productive and more economical to use
- MEWPs automation avoids accidents caused by human error
- General opinion on-site is that MEWPs “get the job done”
- MEWPs have fewer maintenance problems
- MEWPs are less likely to be abused by the workforce (possibly due to fewer working parts), therefore they require fewer inspections by site managers for their constant safe-use

### **Health**

- MEWPs are easier to manoeuvre – less manual handling
- MEWPs are more ergonomic and avoid unnecessary strain injury
- Access to the working platform is less complicated
- MEWPs achieve a better working height because of a more finely variable adjustment to suit the size of the user and the work position
- No repetitive climbing leading to either short- and long-term fatigue

### **Safety**

- MEWPs demonstrate lower H&S risks of all the access plant studied for WaH, against a background of: -
  - Falls from height as the primary cause of serious injury
  - 5% of all accidents have resulted in personal injury payouts
  - 25% of all WaH accidents resulted in personal injury payouts

### **Cost Effectiveness**

- Weekly total hire claims cost more than the weekly cost of a MEWP
- MEWPs occupy only 14% of the cost of repair to access equipment
- MEWPs are 3 times more productive than other access equipment

The most tangible outcome of this project was the publication of guidelines for more consistent selection of access for access equipment for the CHt workrange. This was done by means of the chart on the next page (simplified for clarity), using a simple “traffic lights” colour code. This information then had to be circulated to the appropriate parts of the company, specially new projects and estimating teams, shared with HSE, Trade Bodies, Hire Association and the Construction Industry.

## Guidance for the Selection of Access Equipment up to 4.6m Working Height.

Hierarchy of Control < 4.6m Working Height	Key		Work Activity						
	G	Preferred Option	Light duty M&E Works	Medium/Heavy duty M&E Work	Cable Pullers	Lagging	Ductwork	Communications	Fire Protection
	A	Subject to Justification via Site specific Control Measure							
	R	Site Based Permit Control ONLY							
Permanent Scaffold		Tube&fitting/ System Build	G	G	G	G	G	G	G
MEWP		Large 2 man S/P	G	G	G	G	G	G	G
		1 man S/P	G	G	G	G	G	G	G
		Pop Up	G	G	G	G	G	G	G
Mobile Scaffold		Std. Tower	G	G	G	G	G	G	G
		Narrow Gauge tower	G	G	A	G	G	G	G
Podium steps			R	R	R	R	R	R	R
Platform steps			A	R	R	A	A	A	A
Stepladder/ A - Frame Combination Ladder			A	R	R	A	R	A	A
Ladders			R	R	R	R	R	R	R



The 'Skyjack' self-propelled MEWP



The 'Pop Up Plus'

Gerry concluded by saying that there had been much interest from other organisations since the findings had been published. In September 2009 he had been asked to deliver a paper to the EuroPlatform Conference in Milan. In addition to an article in the Safety and Health Practitioner, the International Powered Access Federation (IPAF) had printed a report in its 2010 Yearbook. Interestingly, when the HSE featured the research on their Website, they approached it from a very different standpoint as a “Worker engagement case study”, in their campaign to promote a high profile element of their Health and Safety Strategy Document! He added that CHt were also sharing the results with the Heating and Ventilation Contractors’ Association (HVCA) and the electrical contractors’ Association (ECA), both of whom had provide positive feedback.

But probably the most intriguing follow up came from the USA in a novel “Coals-to-Newcastle” episode as Turner Construction showed an interest in the Gilbreth techniques that originated in their own country smany decades ago. The US connection hasn’t stopped there, Gerry added, as Harvard University is also showing some interest!

Nearer to home, Gerry reported in answer to questions that CHt were in discussion with IPAF about the development of an initial training course for a separate category of “Pusharound Verticals”. CHt were also doing in-house courses and a Manufacturer training standard was being considered. He added that other issues that had to be addressed were: -

- the provision of sufficient charging points
- erotection of doors and plasterboard walls in corridors
- considering site logistics in terms of corridor areas and widths, as well as floor spaces
- ensuring that floor loadings are not exceeded and that indentations/uneven areas in the flfloors are addressed to prevent overturning of equipment

As the questions drew to a halt, the Secretary asked the audience to show their appreciation in the usual way.