

Persistent Standing & Crowd Safety

Conclusions from the Crowd Dynamics research project



In 2009 Crowd Dynamics (CD), a consultancy specialising in safety and crowd behaviour, were commissioned by the Premier League to conduct a study into the safety issues surrounding fans standing in seated areas at football grounds.

CD concluded that standing in seating areas alone may be considered to carry a negligible statistical likelihood of a spontaneous progressive crowd collapse. One of the discussion points has been about what constitutes -'persistent'. CD highlighted that safety issues are not related to persistency in standing in seated areas by itself; in many respects the level of risk will be greater at moments of excitement especially when fans suddenly leap to their feet, rush forward, or jump up and down-.

CD also highlighted that the progressive crowd collapse is not possible if the crowd is all seated and at moments of excitement the seated crowd stands. The standing crowd, however, may jump in excitement and that carries a higher risk of a progressive crowd collapse.

Aggravating factors such as the rake of the terrace and whether the crowd is dynamic or stable will significantly affect the likelihood of a progressive crowd collapse. The impact of this can be significant and, as such, standing in seated areas must be regarded as a significant risk.

Although standing in seated areas with shallow rakes may be considered as a lower risk, if it is tolerated by safety management it may be more challenging to influence those in steeper areas to sit.

The force required to create a crowd collapse can be as little as one or more persons lunging forward.

Appropriately positioned barriers could have a marked effect on the impact should there be a progressive crowd collapse.

Where persistent standing is anticipated a considered approach should include:

DESIGN

- Consideration of avoiding areas where steep rake applies
- Assessment of front barrier heights
- Application of 'S' factors to maintain 'fire breaks' (empty rows of seats particularly to the front of upper tiers)
- Application of 'S' factors to maintain empty seats adjacent to radial gangways (standing spectators require more space than seated)
- Introduction of strategically placed barriers to seated areas
- Revision of seat and spacing dimensions

INFORMATION

- Use of positive communication to encourage sitting (sit down and enjoy the show)
- Development of NLP (Neuro Linguistic Programming) options in support of a communication strategy
- Consistency of message
- Good rapport between safety officials and spectators
- Accurate, timely and relevant intelligence

MANAGEMENT

- Crowd Safety Risk Assessment
- Management policies on persistent standing:
 - Clear ownership of persistent standing 'risk'
 - Monitoring of areas where persistent standing is anticipated
 - Focus on vulnerable areas/spectators in particular (although tolerating standing in other areas can lead to the impression that it is acceptable to stand)
 - Early interventions/attention to front rows (if standing, those behind will also tend to stand in order to see plus such interventions will be seen by those behind)
- Education of safety personnel regarding risks from progressive crowd collapse
- Education of spectators

Instigators of Crowd Collapse

The force required to knock a crowd over is not substantial. For example one person deliberately jumping into the back of the person in front can instigate a progressive crowd collapse.

The risks of progressive crowd collapse increases with gradient and decreases with seat height (tripping reduces as the seats brace the crowd).

- Removing rows to introduce space has limited effect (more people could fall into the space, increasing the risk of serious injury. Where the front barrier height will not prevent persons toppling forward in the event of a progressive collapse, consideration should be given to keeping the front two rows vacant.
- Wider seats help to reduce likelihood and impact
- Leaving vacant seats at the end of a row will help reduce incursion into gangways (the standing crowd requires more space)