

Mick Upton

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BDO Sydney Australia

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Report to the Coroner's Inquiry – Sydney Australia 2001

Summary

In February 2001, I was contacted by the legal team representing Mr. Vivian Lees the promoter of the Big Day Out (BDO) concert event in Australia. The lawyers informed me that there had been a fatal accident at the Sydney BDO in January 2001 and I was asked to submit a review report of the actions taken by the front of stage pit team at BDO. My review should also cover European front of stage safety systems in general use.

I was provided with videotape evidence from six camera positions shot by Channel V, the company filming the concert in order for me to form an opinion of the actions of the pit team. On viewing the tapes it appeared that the headline act (Limp Bizkit), had claimed that the promoter had failed to implement their request for a centre thrust barrier system to be installed for the concert. It was also obvious from comments made from the stage that Limp Bizkit had been very critical of the actions of the front of stage pit team at the time of the accident.

Following the submission of my report I was invited to attend the coroner's inquest in Sydney to expand on it and answer questions on European front of stage safety systems. A coroners inquiry system in Australia operates in much the same way as it does in the UK. That is to say that the aim of the inquiry is to establish the cause of death not to decide blame. I accepted the invitation to attend on condition that I could state my opinions freely regardless of whom I might offend. The lawyers representing both the promoter and the pit team agreed to this in April 2001.

I spent a total of four days answering questions from lawyers at the inquiry. With regard to the specific issue of the installation of a centre thrust barrier, Mr. Lees had stated previously that the system was not called for in the artiste contract and that there were not enough barriers available in Australia to construct such a system. Questions to me regarding the barrier therefore focused on my opinion of the effect that the parallel system

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that had been installed might have had on crowd density and the actions of the front of stage pit team.

In my opinion the video evidence indicated that the standing crowd density did not exceed 0.5m², a level that would be acceptable throughout Europe. With regard to the actions of the pit team, it was my opinion that they had done an excellent job and possibly saved many lives by their response to high-energy (moshing) cultural activity.

Following publication of my evidence to the inquiry by the press, I was criticised by one American web site for failing to blame the promoter for the accident. In my defense, I could only repeat that I was *not* there to point the finger of blame. I subsequently received a personal apology from the operator of the American web site in a telephone call but no apology was published on his web site.

The paper provided here is an edited version of a much longer document provided to the lawyers.

Review of the actions of the front of stage pit team at

The Big Day Out Concert, Sydney 21.1.01.

&

European front of stage barrier systems

BY

MICK UPTON

Introduction

This review considers the crisis management response by security staff during a fatal incident at the Sydney Royal Agricultural Show Ground on the night of 26.1.01 during a concert performance by Limp Bizkit and front of stage barrier systems in common use in Europe. The review has been conducted at the request of Mr. Vivian Lees, the terms of reference are set out in a letter signed by Mr. Lees, dated 7th April 2001, as follows:

To comment as to the conduct of security staff, this is interpreted to mean the crisis management response by front of stage security staff immediately prior to and during the fatal incident.

To review front of stage barrier configurations in current use in the UK and Europe at rock festivals and to provide any comments or suggestions that I may have to offer.

It is emphasized that any comments or suggestions that are made in this review are personal opinion of operating standards. This review does not seek to establish how or what triggered the incident at Sydney. That is entirely a matter for the appropriate Australian authorities.

The opinions expressed in this review regarding the circumstances at the Big Day Out concert are based on video footage of the incident of the front of stage and communication with Mr. Lees (Event producer) and Mr. Jeff Grey (Security Director), and information provided by Charlesworth Josem Partners PTY Ltd.

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The video footage provided to me is from six (6) different angles of the incident. It is therefore possible to form firm conclusions regarding the actions of the security team and the effectiveness of the design of the barrier system.

Glossary of terms used in this report

The following terms used throughout this review are explained for the benefit of the reader who might not be entirely familiar with the language used in concert promotion and rock cultural behaviour.

Body surfing: When people are lifted above a crowd they appear to be swimming as they roll their bodies and flail their arms and legs. Generally the surfer is attempting to reach the front of stage area.

Front of stage pit: A sterile area in front of the stage to allow security staff to protect the stage and mount a crisis management response to a crowd incident.

Kilo Newton (Kn): Pressure rating – approximately 240lbs

Mixer: A temporary structure constructed in front of a stage within the public area for the purposes of monitoring and controlling sound and lighting systems.

Moshing: The act of body slamming into people within an area in front of the stage. Moshing is an extension of punk rock's "slam dancing" period.

Mosh pit: The area that moshing takes place, not to be confused with the front of stage Pit, moshing can occur anywhere.

Pit team: Security staff stationed in the pit to prevent a stage invasion and to extract persons in distress from a crowd.

Primary barrier: A temporary structure, generally of demountable type, erected in front of a stage in order to create a sterile zone (the front of stage pit) that will enable a pit team to operate effectively.

Stage diving: The act of a fan or performer diving or jumping into the crowd from the stage.

Secondary barrier: A temporary barrier similar to a primary barrier, erected to control a crowd. There may be as many secondary barriers as the crowd manager feels necessary within a crowd.

The concept of a front of stage pit

The origins of a sterile zone, or pit, in front of a concert stage can be traced to sixties youth culture. The sixties decade brought about a change in rock 'n' roll style by introducing 'Beat Groups', typified by the Beatles and the Rolling Stones. Beat music introduced a change in cultural behaviour from dancing to spectator hero worship. The wish to touch, or hug, a 'pop star' became an uncontrollable urge for many young fans and accessible dance hall stages only served to encourage fans to invade the stage, often resulting in shows ending in chaos.

To overcome the problem of over enthusiastic fans, promoters moved their shows back into theatres where it was common to have an 'orchestra pit'. These pits had

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been introduced at the front of stage at music halls in the nineteenth century for the specific purpose of allowing an orchestra to accompany an artiste musically without intruding on the audience view of the stage. Orchestra pits were therefore constructed at a lower level than the stage itself, a concept that remains today in modern theatre design.

Initially when orchestra pits were adapted for a security purpose they were unmanned. This was due to the fact that they were often very deep and this in itself was considered at the time to be enough to deter stage invasions. Deep pits however soon presented an unacceptable hazard when determined fans attempted to climb over them and fell into the pit! Promoters overcame this problem by placing security staff in a line in front of the pit to act as an added deterrent. By the end of the sixties decade a concept of a front of stage pit protected by a strong security team was established for the sole purpose of preventing stage invasions.

During the mid seventies; rock, beat and pop concerts moved outdoor to play to bigger audiences. Early pop festivals at the Isle of Wight played to over a quarter of a million people. This number of people obviously had the potential to create problems at the front of the stage. Festival promoters theorised that by building the stage very high the audience would be forced to stand back in order to see, therefore pits were considered unnecessary. Unfortunately this theory was fundamentally flawed in that it failed to take into account the fact that natural laws might cause a spontaneous dynamic surge which could create an intolerable pressure load on those persons at the front. A major incident was only avoided by the fact that cultural behaviour of the period was peace and love. A great number of people were happy to simply sit on the ground and enjoy the music. Nevertheless, by the end of the seventies it was generally accepted that security teams should be stationed within a pit barrier for two reasons; first to protect the stage and performers, second to assist persons in distress within the crowd.

Contemporary concert audiences are very active in terms of producing a crowd energy release. In this respect modern youth culture is very different from that of previous decades and predicting the energy released by cultural behaviour and natural laws of dynamics are an undeveloped science. Spontaneous surges, moshing and crowd surfing can result in literally hundreds of people being extracted from the crowd for their own safety. The primary purpose of a modern pit at outdoor concert events is therefore not to prevent stage invasions; they are rescue zones that allow a trained pit team to carry out the vital function of extracting persons in distress from a dense crowd. Unfortunately however there is no common standard for pit team training in the UK or Europe at this time. Currently, team competence levels are based purely on team experience and the dedication of those individuals that choose to undertake the often-difficult role of ensuring public safety.

Actions of the pit team during the Sydney incident

It is understood from information provided that the Sydney pit team was comprised of eighty-four (84) persons. This number would be considered in Europe to be above the normal level for a primary pit system, which would average fifty (50) persons. The manning level is however subject to the width of the pit. In this case there was a dual stage concept in place and this could account for the higher number of staff.

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Identifying the chain of command within the pit team was easy due to the fact that supervisory staff was wearing white shirts, this distinguished them from team members who wore yellow.

After observing the actions of the team on video I reached the following conclusions:

The team was managed by supervisors that showed a keen sense of awareness of the seriousness of the situation in front of them. At least two (unsuccessful) attempts were made to halt the show by appealing directly to the artiste on stage and further appeals were made to the crowd to co-operate with their efforts to help people.

The fact that team discipline was maintained throughout the incident was evident by the fact that a second line was maintained in order to pass extracted persons out of the pit. This second line also prevented an attempt by one determined individual to climb onto the stage.

Team members, led by two supervisors, went into the crowd specifically to form a cordon so as to enable others to extract a casualty immediately in front of the primary barrier. By doing so they placed themselves at risk of injury from a pressure load created by cultural activity that included crowd surfing and moshing.

My overall conclusion with regard to the actions of the pit team is that they were well led, disciplined and they responded very well to a very serious situation. The extraction of the casualty was done as quickly as possible in the circumstances. While the loss of a life is obviously of deep regret, it is my firm opinion that the actions of the pit team actually saved lives on the night.

Barrier systems design

At European festivals it is generally the responsibility of the promoter to decide if a front of stage barrier system is to be installed. While it is also the responsibility of the promoter to decide on system design, the artiste's contract rider can often stipulate a particular system.

A design system is therefore generally a matter of agreement between the promoter and the artiste based on an analysis of crowd size, crowd profile, density, anticipated cultural behaviour, topography and natural laws of crowd dynamics. A well-informed local authority officer can however influence a barrier system decision. A good example of local authority input can be seen at the Wembley complex where the local licensing officer will have the final say in barrier system design. At the Limp Bizkit 2001 Wembley Arena concert the local authority officer would not allow the band to have a system of their choice.

The common denominator in the UK, and most European countries, for front of stage barrier systems is the fact that a barrier must be able to withstand an applied horizontal pressure load of 3kn per metre run at indoor events and 5kn per metre run at outdoor events. Pressure loads are generally measured at a height of 1.2m.

It is acknowledged here that a static *horizontal* pressure load of 1kn applied over a time period of 3/4minutes can cause serious injury or even death to a person. However, the rationale applied to barrier system loading specification is that a weak barrier system would collapse and therefore cause a high casualty rate. Whereas increasing the tolerance of a barrier allows vital minutes for the pit team to extract

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people in distress. In such circumstances the speed of reaction by the pit team and the time taken to halt the show are crucial factors.

It is important to emphasise at this point that in the case of the fatal accident at Sydney, the video appears to indicate that a *vertical* load might have been imposed on the victim due to a crowd collapse rather than dynamic load imposed against the pit barrier. Research indicates that in such circumstances death can occur in less than 3 minutes. If there are periods when the stage is in darkness, as there were in Sydney, it is possible that a fatality could occur in front of the pit without the knowledge of the team. A pit team relies totally on light from the stage to enable them to see the crowd, prolonged periods of darkness can therefore create high risk situations.

When using a single primary barrier system there are two options, a parallel system or a curved one. There is a valid opinion among practitioners that a curved barrier improves audience viewing and has the advantage of dissipating a pressure load if there were to be a dynamic crowd surge. A curved system is reliant on the fact that there are major emergency exit points stage left and right. Where it is not possible to install these exit points, a curved system has the potential to trap people in the corners during surge activity.

There is no data available that I am aware of at this time to support an argument that a parallel barrier system is less safe than a curved one. Where a parallel system is installed in a wide arena the crowd can extend both sides of the stage. Naturally crowd spread is governed by an ability of individuals to have a clear view of the stage and the location of emergency exits in that area becomes a key issue. The key factor in all crowd conditions is density control.

The video footage of BDO Sydney appears to show a sanding crowd density of 0.5, with ample room for crowd spread. Mosh pits are clearly visible within the crowd. A density factor of 0.3 only appeared to be evident for approximately 6/8 rows in front of the primary barrier. This density level is considered to be normal for rock concerts and therefore acceptable under UK current guidance.

Centre thrust systems

Following a fatal incident at the Donington Monsters of Rock event in 1988 in which two people died, the concept of a *Centre Thrust* barrier (often referred to in America as a T barrier) was developed. The purpose of the T barrier is to minimise the effect of lateral crowd surges. The concept is currently used by traditional rock acts such as AC/DC.

One advantage of this barrier system design is that it allows the pit team to operate approximately sixty (60) feet into a crowd. In my opinion the thrust should not be extended to reach the mixer or used when high-energy crowd moshing is anticipated as it splits the crowd into two halves.

A split crowd situation requires a pit team to work in two directions at the same time therefore a T system should only be installed where the event warrants it. An extended centre thrust can also encourage the artiste to use it to get closer to a crowd during a performance. This can cause a two-way pressure load within the crowd half way back from the stage that is extremely difficult to deal with. The temptation for the artiste to stage dive into the crowd from within the thrust might also cause a crowd collapse.

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When the T system was first introduced there were a number of casualties due to trapping at the base of the T. Design has now improved but the system is now only used where a lateral surge is highly likely. It has been used in America to control cultural behaviour but the system was coupled with a drastic reduction of crowd capacity in front of the stage. An example of a T barrier and a reduced crowd capacity combination is the concert by Metalica at the Los Angeles Coliseum last year (2000) when crowd capacity on the pitch area in front of the stage was reduced by approximately 50%. This was possible due to the venue design, which incorporates a high level of seating together with field perimeter fencing.

Pen systems

In Denmark, the system in use at the 2000 Roskilde Festival was a complex design that incorporated crush barriers in front of the primary barrier. The crush barriers at Roskilde were permanent fixtures that had been in place for over thirty years. Prior to the 2000 incident it had always been theorized that the system prevented lateral and dynamic crowd surges. Unfortunately it was found that they also created trapping points and they were removed immediately after a fatal incident to be replaced by a new system.

The new system introduced was based on a theory that a high-energy release within a crowd mass is activated by approximately 2% of its capacity, therefore by splitting the front of stage crowd into manageable groups of 500 people energy can be controlled. Entry into the system is via two controlled queues. Pens are constructed with de-mountable sections rated at 5kn and ingress and egress is calculated as separate units, similar to a permanent building. The crowd is directed by marshals via an integral crowd barrier network through gates into a pen until that pen reaches a density of 0.5 at which point that pen is closed. Crowd migration is prevented within the system by using the same principle of marshals and crowd barriers. Gangways within the system are kept clear for emergency evacuation requirements and provision has been made for the extraction of people from the secondary pit. A separate pit team staffs the primary and each pen has a team of marshals to supervise it. Safety zones are maintained as a contingency plan to control density in the event that the crowd invades the pens.

It is intended that each pen will be cleared during a one-hour interval between acts. Diverse acts are presented on the main stage in order to encourage people to leave the pens after each act. Emergency evacuation has been calculated into the system. A senior crowd manager, based on the stage with an overall view, is in control of the system and he/she is authorised to stop the show immediately if necessary. It is a condition of the licence that neither the artiste nor their representatives have control of the system and they must stop the show immediately if they are instructed to do so.

It remains to be seen how effective this system will be. It is however an adaptation of a system piloted in Belgium where indications are that it did improve crowd safety. At this early stage of development there are two obvious problems, both financial. The system is very costly in terms of the amount of barrier needed plus the cost of installation. Secondly, there is increased staff cost due to the fact that two pit teams are needed plus security and marshals. Present estimates for Roskilde this year indicate that one hundred and seventy staff will be required to make the system fully effective.

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Furthermore these remarks demonstrate that whoever made them had very little comprehension of what was actually taking place in front of the stage.

The presence of persons in the pit that were not identifiable was confusing; it is possible that they were crew members or band security. If this was the case it might be reasoned that they should have taken action to halt the show and bring stage lights up to full potential rather than become actively involved in rescue attempts in semi-darkness. As it was, pit team members were forced to rely on the use of torches during the early stages of the incident and their pleas to halt the show were ignored.

With regard to front of stage barrier systems generally, this review has attempted to present an overview of systems common in Europe. It is not claimed that these are the only systems in use. The issue of system design is very much personal preference therefore it is possible that there are others in use that I am not aware of.

The introduction of a person at Roskilde to be solely responsible for the effectiveness of a crowd safety system and crisis management response is an interesting concept as it removes the promoter one step from responsibility. However, while the recognition of crowd management as a social science is long overdue in my opinion it should be remembered that it could only be effective if coupled with a comprehensive training program that will lead to a formal qualification. Current practice throughout Europe generally is that an individual or a security company with an established reputation for working with crowds is contracted to take on the role. Often a person will combine two roles, for example it is common for production managers to assume responsibility for safety but as they have other tasks to perform on the day I believe this to be a high-risk strategy.

I am currently negotiating with UK government approved training organisations, academic bodies and promoters to introduce a European standard of training that will include; basic steward/marshal, supervisor, pit management and crowd management planning and safety officer, this project is still in its infancy. There has been a favorable response from all sides to pilot programs that I have implemented however and it is possible that a full syllabus will be available for accreditation by next year.

This concludes my review of the issues outlined in the instruction letter. If there are issues that require clarification or expanded on please do not hesitate to get in touch with me.

Mick Upton
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- Since his report was written the Roskilde system has proved to be very successful and the pen capacities have been increased from 500 to 1000 persons.
- The introduction of crowd safety training has been successfully introduced at Buckinghamshire New University (BNU), first in the form of the Foundation Degree and now with higher degree courses.
- In the UK it is now possible to gain a certificate in front of stage pit training from BNU

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At the 2001 conference of the International Live Music Conference (ILMC), an annual meeting of international concert promoters and other interested parties, a resolution was passed to form a safety group that has a mandate to review concert safety standards in Europe and report back at the 2002 conference. The first indication of change as a result was the 2002 festivals at Lowlands (Holland), Hultsfred (Sweden) and Roskilde (Denmark) which banned crowd surfing. In the U.K. promoter Stuart Galbraith (SFX), has stated that he would like to see a common policy on the issue and he intends to meet with other UK promoters with a view to following the European lead. A major difficulty with a ban however is implementing it within a crowd mass. Roskilde organisers believe that they can overcome this problem by splitting the crowd in front of the stage into smaller manageable groups of 500 persons.

Multi barrier systems

In the wake of the Roskilde tragedy last year (2000) there is now a popular support for multi barrier systems when a mass high-energy crowd activity is anticipated. A good example of a multi-barrier system is the triple system that was used by Midland Concert Promotions Ltd for a crowd attendance of 125,000 people at an Oasis concert held at Knebworth Park during August 1996.

A multi -barrier system should provide controlled access and egress into the first two areas. Each person entering the system at Knebworth was issued with a colour wristband relevant to the area they were directed into. Emergency evacuation was catered for by the provision of exits each side of the arena.

Promoter opinion

In order to present a balanced picture of the of the Concert/festival promoters attitude to the use of front of stage barrier systems, this review considered it relevant to examine European systems used during the year 2000 and 2001. This course of action was taken in view of public statements that have been made in Australia to the effect that T barrier systems are now standard at European events.

The organisers of major events held in six European countries were contacted during the research for this review. These countries were Belgium, Denmark, Holland, Republic of Ireland, Sweden and the U.K. The following criterion was established when selecting European events: they were outdoor concerts, crowd attendance was in the region of 50,000 persons and cultural behaviour was 'high energy'. It was found that none of the events contacted used a T barrier system for the main stage. In Holland, Sweden, UK and Ireland the most common design was a primary parallel 5kn system. It is perhaps worth noting that Limp Bizkit performed without serious incident at a UK concert in Leeds with a parallel system in 2000. Two further UK concerts were then researched during 2001. At the Ozzfest event at Milton Keynes Bowl in June 2001 it was found that the event operated a dual stage set-up with a parallel primary barrier system. At the Sterophonics event at Donington in July 2001 the promoter installed a single stage set-up incorporating a primary and secondary barrier system.

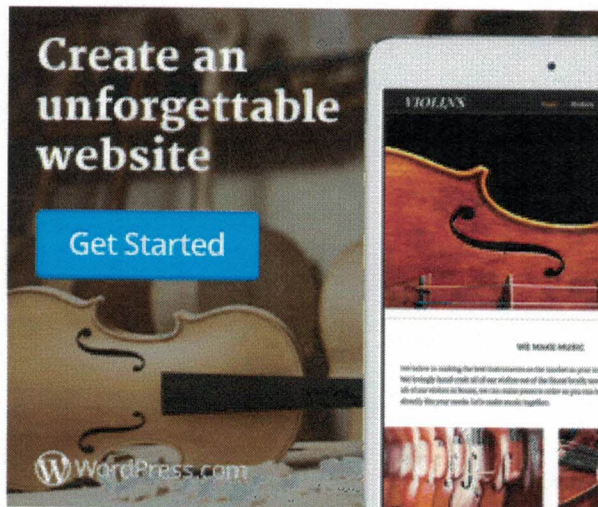
Summary

It has been stated here that in my opinion the actions of the pit team during the Big Day Out event were highly commendable. I therefore believe that comments made from the stage with regard to ineffective security are entirely unjustified.

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- In the UK there are now occupational standards of training for supervisors (Level 3) and managers (Level 4) on the National Occupational Standards
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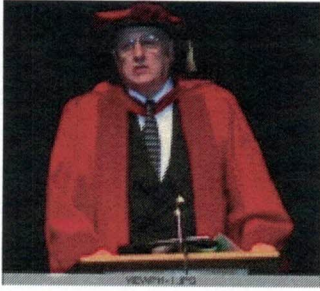
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