

<b>Health and Safety Executive</b>		<b>Sector Information Minute</b>	
<b>Commercial and Consumer Services, Transportation and Utilities Sector (CACTUS)</b>		<b>SIM 05/2002/03</b>	
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Target Audience:

AFQ Inspectors with responsibility for broadcasting and entertainment  
Specialist Group Inspectors

### **USE OF SMALL MOBILE LIFTING DEVICES AT OUTDOOR EVENTS AS SUPPORTS FOR SPEAKER CLUSTERS, LIGHTS, ETC.**

This SIM provides advice following accidents where lifting devices have overturned during use at outdoor events.

#### **BACKGROUND**

1 The events industry has a frequent requirement to elevate small clusters of loud speakers in the middle of audience areas at outdoor events to enable even sound distribution. At many sites this is essential to minimise environmental noise nuisance to neighbouring properties.

2 As these clusters are sited within audience areas, there is considerable pressure from event organisers to make the supporting elements as streamlined as possible to avoid creating sight line obstructions. A consequence of this streamlining is that the supporting structures may be relatively lightweight or slender and if improperly or incorrectly used they would offer little resistance to overturning or buckling of the mast.

3 Loudspeaker clusters can weigh up to 500 kg and are required to be around 6m or more above ground level. Outdoors, the elevated loudspeakers are exposed to the wind and will attract wind loading, which can lead to instability of the supporting structure. Sometimes pairs of units are used to support lighting grids and similar equipment. See [appendix](#) for examples.

#### **INCIDENT HISTORY**

4 Incorrect selection of equipment to support speaker clusters has led to incidents, some of which have resulted in serious injuries when devices have overturned. There have been a number of near misses where devices have suffered from buckling or partial collapse but no injuries have resulted.

#### **ADVICE TO INSPECTORS**

5 While some event organisers may choose to use readily available lightweight lifting devices to support equipment, many of the commonly available devices are intended by the manufacturer for use only where attended and indoors. The masts on some of these devices are not intended to withstand any additional bending moments, which can be a consequence of restraining the base or adding ballast.

6 Devices intended exclusively for indoor use are not usually designed to take account of wind loading. Nor are they designed to take account of the additional bending forces, which can arise from out-of-plumb effects caused by erecting them on uneven ground without levelling. Indoor devices can only resist overturning in usually one principal direction - to the front. Overturning to the rear or sides is likely even with minimal external loads.

7 There are a number of proprietary systems available from specialist contractors and suppliers, for use outdoors, in which the design of the vertical truss section is such that the effects of wind loading are accommodated. In most of these systems there is a base of sufficient size, with sufficient ballast loaded on to the base to provide for an appropriate factor of safety against the overturning. There are some specialist structures that rely on base area rather than ballast.

8 Where inspectors come across such devices used outdoors to elevate speakers or similar equipment, they should satisfy themselves that the equipment is intended for outdoor use and erected strictly in accordance with the manufacturer's instructions. Reference should be made to the manufacturer's information (if available). The provisions of the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) will apply and appropriate documentation should be available for inspection. Regulation 4 (duty on employer to ensure that equipment possesses adequate stability) and reg.8 (duty to ensure that *inter alia* lifting operations are carried out in a safe manner) are particularly pertinent to the stability issues highlighted in this SIM.

9 Also relevant are the Provision and Use of Work Equipment Regulations 1998 (PUWER) reg.4 (duty to ensure that work equipment is suitable for the use to which it is put) and the Management of Health, Safety and Welfare Regulations 1999 (MHSWR) reg.3 (risk assessment). The risk assessment and any method statements should take account of foreseeable wind loading and any other relevant factors such as ground strength and slope. The use of guy ropes may be necessary. The competent person undertaking the planning could derate the equipment to take account of wind loads, ie use lifting equipment of greater capacity than the load to be lifted.

10 Where ballast has been provided, it is essential that it remains in place for the time that the towers are in use. Therefore suitable steps should be taken to prevent persons tampering with it. One means would be the provision of an exclusion area around the base of the tower. Such an area would also serve to minimise the risk of any tampering with the winch or brake mechanisms.

11 Enquires should be made about arrangements for monitoring wind speeds, to ensure that the manufacturer's conditions for use can be adhered to. Where such arrangements are not in place, it may be prudent to discuss the possibilities of providing an exclusion zone [in the order of 1.5 times the tower height] around the tower, in case the wind speed does exceed design operating speeds.

12 Where the user cannot show that the equipment is suitable or the correct certification is not available or that arrangements are not in place to monitor site conditions, inspectors should consider enforcement action in the usual manner. Consideration should also be made of the adequacy of the risk assessment.

13 Further advice on the design of lifting equipment used in the entertainment sector is given in British Standard BS 7905-1: 2001 *Lifting equipment for performance, broadcast and similar applications - Part 1: Specification for the design and manufacture of above stage equipment (excluding trusses and towers)* and in BS 7905-2: 2000 Part 2: *Specification for design and manufacture of aluminium and steel trusses and towers.*

## ENQUIRIES

14 Enquiries about this SIM should be directed to the Entertainment Section of the Food and Entertainment Sector at the Glasgow Office, e-mail Area21, FOD Entertainment Section.

15 Requests for technical advice and assistance should in the first instance be referred to the local specialist group.

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## APPENDIX (para 3)



1. Photograph showing a typical speaker cluster on a proprietary, purpose designed lifting tower.



2. Photograph showing a pair of lifting devices used to support a lighting grid.

