Survey of Firework Trends from UK Display Companies

Tom Smith and Avril diPalma
Davas Ltd, 8 Aragon Place, Kimbolton, Huntingdon, Cambs, UK PE28 0JD

Abstract: *As part of Davas's involvement with the UK firework display industry, a survey of UK professional firework display companies was carried out to identify areas of current concern and to attempt to identify trends. The results of this survey are presented here.*

Keywords: *Survey, 2007, fireworks, UK*

Introduction

Although it has been suggested many times before, the firework industry is probably under greater threat now than it has been for many years.

As part of the authors' involvement with the UK's Explosive Industry Group (EIG)[1] and the British Pyrotechnists Association (BPA)[2] a survey of the UK display firework companies was carried out to identify areas of current concern, and in attempt to identify future trends. It is intended that the survey be carried out on a regular basis, adopted as necessary to reflect changes in regulation and practice, in order to try and map these trends.

The UK Industry

The UK professional firework display industry is quite diverse, ranging from operations that perform only a handful of displays each year to those that operate all year round staging many hundreds of displays. Recent work by Davas Ltd with the UK Government[3] has quantified the professional display industry as shown in Table 1.

The UK display industry, like many around the world, perceives the threat to their businesses as deriving from many sources, be they legislative or related to practice or supply.

Table 1. *UK Firework display industry statistics.*

No. of display companies	180
No. of manufacturers	1
No. of importers	26
Total number of displays	*ca*. 10000
Total value of displays (£)	*ca*. 20 million
No of companies surveyed	98

Determination of questions

The questions posed to the companies are presented in Tables 2A–H. The topics to be examined and the indicative responses were determined to reflect issues arising from meetings of the EIG and BPA.

Scope of survey

98 UK display companies were surveyed by email and respondents asked to provide a rating of each indicative response by rating each answer 1–10 (10 being the greatest). Nil responses were acceptable, and respondents were also asked to provide further information or further indicative responses, and also to suggest topics for future surveys.

It is proposed that in future it may be useful to extend the survey worldwide and also to other sectors of the firework industry – for instance those that specialise in supply of fireworks to the public. In addition, it would be interesting to compare the responses from industry and from enforcing authorities.

Survey period

The survey was carried out in the period 1 June 2007 to 20 June 2007

Results and Discussion

The results are presented in the following tables (Table 2A–H). Each table quantifies the answers received in 2 ways – respectively

- The maximum value given by any respondent to the question and answer
- The average value given by all respondents to the question and answer

		Maximum	Average
A – International legislation	(a) The EU Pyrotechnic Directive ( )	10	6.9
– Which of the following will have the greatest effect in the short/medium term?	(b) Changes to the UN classification regime ( )	10	9.0
	(c) Regulations on the use of pyrotechnics ( )	8	5.9
	(d) Environmental legislation ( )	8	5.4
	(e) Transport Security ( )	7	5.0
	(f) Other – please specify below		

		Maximum	Average
B – Products (fireworks)	(a) Single shot – comets ( )	10	7.8
– Please indicate which product types you think will find increased application in the short/medium term?	(b) Single shot – other items ( )	10	7.4
	(c) Mines ( )	8	6.5
	d) Multishot devices ("cakes") – traditional ( )	8	6.0
	(e) Multishot devices ("cakes") – novel designs ( )	8	7.6
	(f) Spherical burst shells ( )	7	4.6
	(g) Non-spherical burst shells ( )	8	4.6
	(h) Static or dynamic "set pieces" ( )	8	5.5
	(i) Lancework devices ( )	10	5.4
	(j) Low noise effects ( )	10	8.3
	(k) Daylight effects ( )	8	4.5
	(l) Pyrotechnic effects used as fireworks ( )	10	5.4
	(m) Other – please specify below		

		Maximum	Average
C – New developments	(a) Nano compositions ( )	6	4.4
– Which of the following developments will have the greatest impact on fireworks in the short/medium term?	(b) Use of novel oxidisers ( )	8	6.2
	(c) Blackpowder alternatives ( )	10	6.1
	(d) Flashpowder alternatives ( )	10	8.1
	(e) Biodegradable components ( )	9	7.0
	(f) Use of novel colorants ( )	9	6.1
	(g) Other – please specify below		

The major issues, with average scores over 7.5, therefore are:

- Changes to the UN classification of fireworks
- Increased use of single shot comets
- Increased use of novel design "cakes"
- Increased use of low noise effects
- Alternatives to flashpowder
- Environmental aspects of the use of plastic sub-components
- Environmental aspects of the use of metal sub-components
- Issues concerning the supply of igniter cord or equivalent
- Issues arising from the use of low quality igniters

None of these is surprising, but we hope they will serve as a useful benchmark for future studies. In addition it is useful to attempt to quantify concerns rather than rely on anecdotal evidence.

Other topics

Other topics of concern, and areas for future

		Maximum	Average
D – Environmental concerns	(a) General debris (mess) arising from the use of fireworks or pyrotechnics ( )	8	5.3
– Please rate the following as to which poses the greatest environmental concern in the short/medium term?	(b) Use of plastic sub-components ( )	10	7.6
	(c) Use of metal sub-components ( )	10	8.1
	(d) Noise arising from use of fireworks or pyrotechnics ( )	10	6.8
	(e) Toxic combustion by-products from firing displays – environmental issues ( )	9	6.0
	(f) Use of heavy metal salts ( )	8	5.9
	(g) Use of perchlorates ( )	8	5.3
	(h) Toxic combustion by-products from firing displays – health issues ( )	8	4.5
	(i) General effect on flora/fauna ( )	7	3.8
	(j) Other – please specify below		

		Maximum	Average
E – Restriction of products	(a) Electric igniters ( )	10	4.5
– Please rate the difficulty in obtaining the following items and which could, therefore, restrict your operation in the short/ medium term?	(b) General fuse – such as pipe match ( )	10	3.6
	(c) Igniter cord or equivalent ( )	10	7.9
	(d) Pyrotechnic delays ( )	10	4.3
	(e) Any item containing flashpowder ( )	10	6.1
	(f) Blackpowder ( )	10	3.7
	(g) Other – please specify below		

		Maximum	Average
F – Safety	(a) Increased use of electric firing systems ( )	10	3.4
– How great are your concerns about display safety or operation in the short/medium term?	(b) Use of low quality igniters ( )	10	7.6
	(c) Mortar construction methods ( )	9	5.8
	(d) Mortar racking systems ( )	9	6.9
	(e) Prescribed crowd safety distances ( )	10	6.6
	(f) Terrorist/protestor activities ( )	6	3.4
	(g) Effects of climate change – eg weather ( )	10	3.6
	(h) Changes to daylight saving time ( )	7	3.7
	(i) Other – please specify below		

surveys to address, identified by the respondents include the following:

- Use of close proximity effects
- Compliance costs issues
- Equitableness of enforcement – those companies that have the highest profiles are policed more heavily than those that maintain a "low profile"
- Storage of UN 0333 (1.1G) fireworks
- Security of fireworks in transport
- Qualifications for drivers
- "Stabling" of explosives vehicles on long journeys
- Entry criteria for new companies in the professional display market
- Restrictions on who may import

		Maximum	Average
G – Domestic issues	(a) Training of firers ( )	10	5.3
– Please rate the impact of the following on your business in the short/medium term?	(b) Changes to storage regulations ( )	9	5.5
	(c) Changes to transport regulations ( )	9	5.9
	(d) Changes in supply regulations ( )	8	5.9
	(e) Changes to use regulations ( )	8	5.1
	(f) Difficulties in supply – domestic ( )	9	3.8
	(g) Difficulties in supply – international ( )	9	4.0
	(h) Other – please specify below		

H – Other	
– Please indicate any other aspects you consider will affect the industry in the short/medium term, or which you feel should be included in future surveys.	

Conclusions

The UK firework display industry has highlighted the areas of current concern to them, which probably reflect the concerns worldwide.

Future iterations of the survey will attempt to address the highlighted concerns and extend its scope to enable comparisons

- Between countries
- Between users and enforcers.

Acknowledgements

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References

1 See http://www.eig.org.uk

2 See http://www.pyro.org.uk

3 This research forms part of an ongoing project between the following UK authorities – Health & Safety Executive (www.hse.gov.uk) and the Local Authority Coordinating Body on Regulatory Services (LACoRS – http://www.lacors.gov.uk)