The 2017 Manchester Arena Bombing: A Sociotechnical Systems Analysis

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SUMMARY

The paper describes a sociotechnical systems approach to modelling a terrorist incident, namely the bombing of the Manchester Arena on 22nd May 2017. The paper probes more deeply into the underlying factors contributing to the bombing in order to extract lessons, particularly in terms of the future management of crowd events and their policing. The analysis of the research employs a hybrid version of Rasmussen's Accimap (1997) and a sociotechnical systems analysis based on the work of Turner (1978). The research tries to identify how the incident developed and to investigate its origins in order to avoid similar events occurring. A set of conclusions are drawn relating to systemic archetypes of failure and how to evade these and plan for them in advance of a potential incident and future events involving potential safety critical threats including terrorism.

KEYWORDS

Systems analysis, Manchester Arena bombing, Accimap

Introduction and study aim

This paper presents a sociotechnical systems approach to modelling a terrorist incident. The aim of the work was to investigate the incident both in terms of system failures and any associated organisational issues and wider lessons learnt. The case study discussed here is the widely reported terrorist bombing of the Manchester Arena, which happened on 22nd May 2017 after a concert by the singer Ariana Grande. There were 22 fatalities and numerous people were injured. This is considered to be the deadliest terrorist attack on UK soil since the 2005 London bombings but was only one of five mass casualty terrorist attacks in the UK in 2017. The aim of this paper is to explore the interdependencies between the numerous actions, oversights and decisions that led to the terrorist being able to detonate a bomb, rather than to apportion blame to any individual or organisation.

The overall aim of the paper is to probe more deeply into the underlying factors which contributed to the Manchester bombing and to extract lessons learnt from the bombing, particularly in terms of the future management of crowd events and their policing. This involves three objectives: (1) To carry out a detailed qualitative systems analysis of the official report from the Manchester bombing, as well as other evidence such as news reports and other related documentation. The purpose of this activity was to extract contributory factors leading up to the bombing. (2) To construct a detailed Accimap (Rasmussen, 1997) which outlines the interaction between contributory factors leading up to the bombing. (3) To compare this with a sociotechnical systems analysis based on the work of Barry Turner (1978; Turner and Pidgeon, 1997) and to use the outcomes from 1 - 3 to identify key lessons learnt and preventative measures which might be put into place in the future.

Study methods

Two methods were employed in the research: (1) an Accimap analysis and (2) a sociotechnical systems analysis based on the work of Barry Turner (1978; Turner and Pidgeon, 1997): (1) An Accimap is an approach to incident analysis and was developed by Rasmussen (1997) as a means of analysing a series of events and decision-making processes that may interact and result in an organisational accident (Branford et al., 2009); (2) A sociotechnical systems analysis which takes into consideration the development of disasters, utilising a sequence model for the analysis of the origins of incidents.

Findings and conclusions

The Accimap (figure 1) and Turner analysis identified a series of common causal factors underlying the bombing, collected under the following groupings. Examples are taken from the official Inquiry Report of the Manchester Arena bombing Volume 1: Security for the Arena (Gov.uk, 2021):

- Equipment and surroundings – Rasmussen (1997): physical characteristics of the buildings, equipment, tools and general locale involved. Turner (1978) – 'informational difficulties and noise' E.g. 'CCTV blind spot allowed bomber to hide' (Gov.uk, p117)
- Physical processes and actor activities – the actions taken before the incident. Turner (1978) – 'failure to comply with regulations in existence'. E.g. 'Lack of adequate security patrol during the event' (Gov.uk, p22)
- Technical and operational management –the decision makers who had an influence on the causal factors at the operational and technical level. Turner (1978) – 'failure to comply with regulations in existence'. E.g. 'The security perimeter was insufficient' (Gov.uk, p114)
- Local area Government company management – describing the decision makers who had an influence on the causal factors at the higher level. Turner (1978) – 'institutional rigidities of belief and perception'. E.g. 'Facilities management agreement confused the responsibilities for security' (Gov.uk, p135)
- Inter-organisational communication – Rasmussen (1997) the communication between the various organisations involved in the security of the Manchester Arena and its surroundings. Turner (1978) – 'Failure to comply with regulations already in existence' - E.g. 'Lack of multiagency training and awareness' (Gov.uk, p96)
- Background and context – Rasmussen (1997) - the underlying setting and circumstances of the incident. Turner (1978) – 'institutional rigidities of belief and perception'. E.g. 'Bomber carried out hostile reconnaissance prior to the attack' (Gov.uk, p14)

The paper concludes with a set of revised set of systemic archetypes of failure (partly influenced by Marais et al., 2006; Kontogiannis, 2012) which might be used to focus attention on areas which might serve as a 'heat map' for the future organisation and planning of large-scale events which are vulnerable to terrorist or other types of safety-critical related incidents.

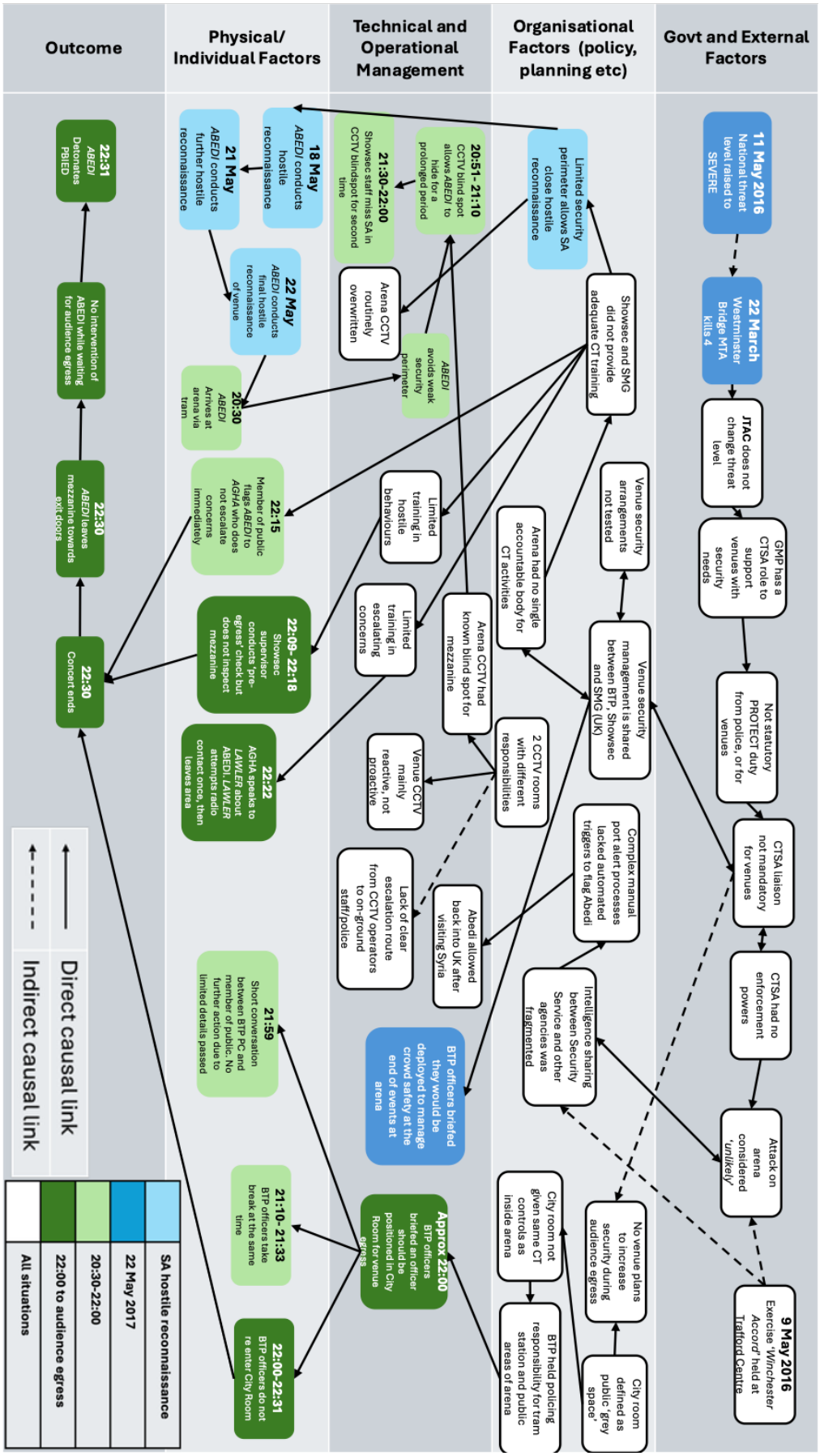

Figure 1: Outline Accimap of the Manchester Arena Bombing

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