# Articolo in materia di analisi del rischio per gli eventi ad alto affollamento sulla rivista internazionale «Crowd Safety»

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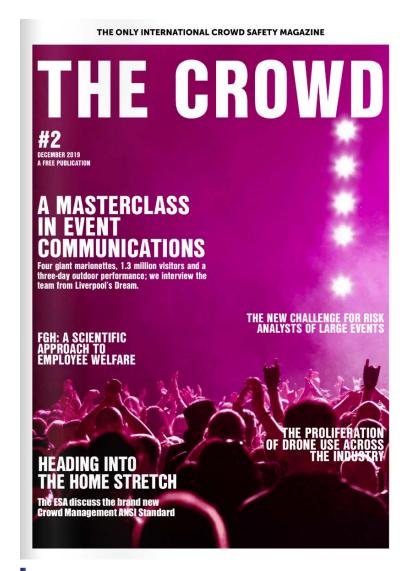
# **Luca Fiorentini**

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# Estratto da The Crowd n. 2/2019



## A PERFORMANCE-BASED APPROACH TO SAFETY AT **SPACES: FROM RISK TO** SCENARIO ASSESSMENT

conference held in Matera.

To satisfy this necessity means to

make the artistic and cultural herit-

age, exhibited to large crowds during

exploitable, protecting both the people

and itself from the risks of being hurt

(the former) or damaged (the latter)

in case of a loss of control in crowd

Matera is a very peculiar case study.

complexity is given by the layout of

of buildings are excavated into the

the town and the fact that the majority

management.

public events, safely accessible and

public spaces is a scrintive annmaches are not suitable while partial performance and risk-based regulations (at national and local level) revealed to be ineffective. Tragic recent events have demonstrated this (e.g. the Piazza San Carlo crowd incident in 2017. Turin Italy). The reason of their ineffectiveness relies on the peculiarities of both each large event (a football match, a concert, a festival) and the space in which they are organized (a specific stadium, an old town centre, a public park), that may nullify the benefits of a rigid approach using check-lists. Even if yet performance-based.

### PUBLIC EVENTS AND SECURITY

Taking inspiration from the safety needs of the events for Matera 2019 (European Capital of Culture for year 2019, see Fig.1), Fabio Dattilo (Head of Italian National Fire Corp), Salvatore Tafaro (Matera Provincial Fire Brigade Commander) and Luca Fiorentini (Executive Director of TECSA S.r.l. and SFPE Italy Vice President) discussed the necessity to integrate art and safety when managing large events in public spaces, during a dedicated

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### SAFETY AND SECURITY OF LARGE PUBLIC SPACE EVENTS

During the conference, Fabio Dattilo highlighted four key elements for safety and security of large events in public spaces:

1. sharing information and accountabilities with stakeholders; 2. risk assessment as the basis to define the management strategy; 3. standards and laws; 4. usage of modern tools to verify if performance targets are reached

taking into account some key parame-



ters when assessing complex situations (like the number of participants their features, the layout and space configuration).

### BOWTIES: A PERFECT TOOL TO **IDENTIFY AND ASSESS CROWDING-**RELATED RISKS

After presenting a recap about the most recent regulations on fire safety in Italy. Salvatore Tafaro discussed the necessity to identify credible scenarios, representative and conservative. of what can go wrong when managing such complex and large events.

BowTies are a perfect tool to identify and assess crowding-related risks, as shown in Fig.2. Before advanced software simulations are used, this identification has to be formalized to define the scope and the "perimeter" of what needs to be analysed and which are the safety targets to reach. The BowTies for this project have been developed using BowTieXP by CGE Risk Management Solutions, NL.

### THE NEW CHALLENGE FOR RISK ANA-LYSTS OF LARGE EVENTS

Finally, Luca Fiorentini talked about a preliminary fundamental step before launching a software simulation like Pedestrian Dynamics by Incontrol Simulation Software (Fig.3) allows: it's the knowledge of human behaviour. intended both as individuals and the

The same word "crowd" hides an intrinsic undetermination that is



the new challenge for the risk analyst. Such problems, at both micro and macro level, are the base of the emerging complexity and the need to use a shared, modern and pragmatic approach to analyse them from an engineering point of view.

### CONCLUSION

It is possible to claim that, in analogy with the spirit of the current laws about safety protection, fire and security prevention, the "sustainability" warranty of high complex events cannot prescind from the definition of a resilient strategy which is participated stakeholders. Beyond the available and shared among all the stakeholders tools, this remains the true challenge and is based on a serious and initial risk assessment.

This must take into account all the scenarios characterised by both hard and Tafaro (Matera Provincial Fire Brigade soft elements (like parked cars, chairs and tables along the path) and, in the meanwhile, must allow to consider the macroscopic and undetermined effects of the crowd without leaving

apart the peculiarities of the individuals who make the crowd.

The advanced simulation allows enables us important insights for some aspects, however it is true that without a proper definition of the boundary conditions and the basic parameters, or without a correct evaluation of the results, also in terms of sensitivity, the outcomes cannot be used as a reliable base to make informed decisions.

Only a shared and rigorous approach allows us to go from data to information, and from here, to decisions by

Special thanks to Fabio Dattilo (Head of Italian National Fire Corp), Salvatore Commander) and Luca Fiorentini (Executive Director of TECSA S.r.l. and SFPE Italy Vice President).

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