



# Making Claims for Operator Response

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## Background

Do we make sufficient use of our knowledge of decision-making under stress and uncertainty when planning for severe accidents? Does the knowledge we have gained in areas such as command and control in major incidents (e.g. guidance developed since the Piper Alpha disaster) transfer to individual behaviours in emergencies? Do we understand the emotional component of an event?

The Costa Concordia cruise ship accident, or the Hillsborough football stadium crowd-crush disaster in the UK, both show that individual behaviour exhibits significant variability. On the Costa Concordia, some passengers exhibited creative decision-making – using a smart-phone app to wayfind escape routes. Robinson and Higgins (2012) have estimated 10% of people will exhibit constructive behaviour, 60%-80% indecisive behaviour, and 10%-15% seriously maladaptive behaviour (freezing, state of denial, memory lapses, etc).

At Hillsborough there was evidence of police officers ‘freezing’ in the face of the event – despite being trained emergency responders.

Do we understand enough about the behaviour of ‘local’ operators rather than commanders, to make claims in Level 2 and Level 3 PSA?

It’s also important to acknowledge the very positive behaviours that can be exhibited. For every Deepwater Horizon or Buncefield, there is a Flight US1549 (Hudson River).

Any measures to improve the reliability of response during emergencies must also build on positive behaviours.



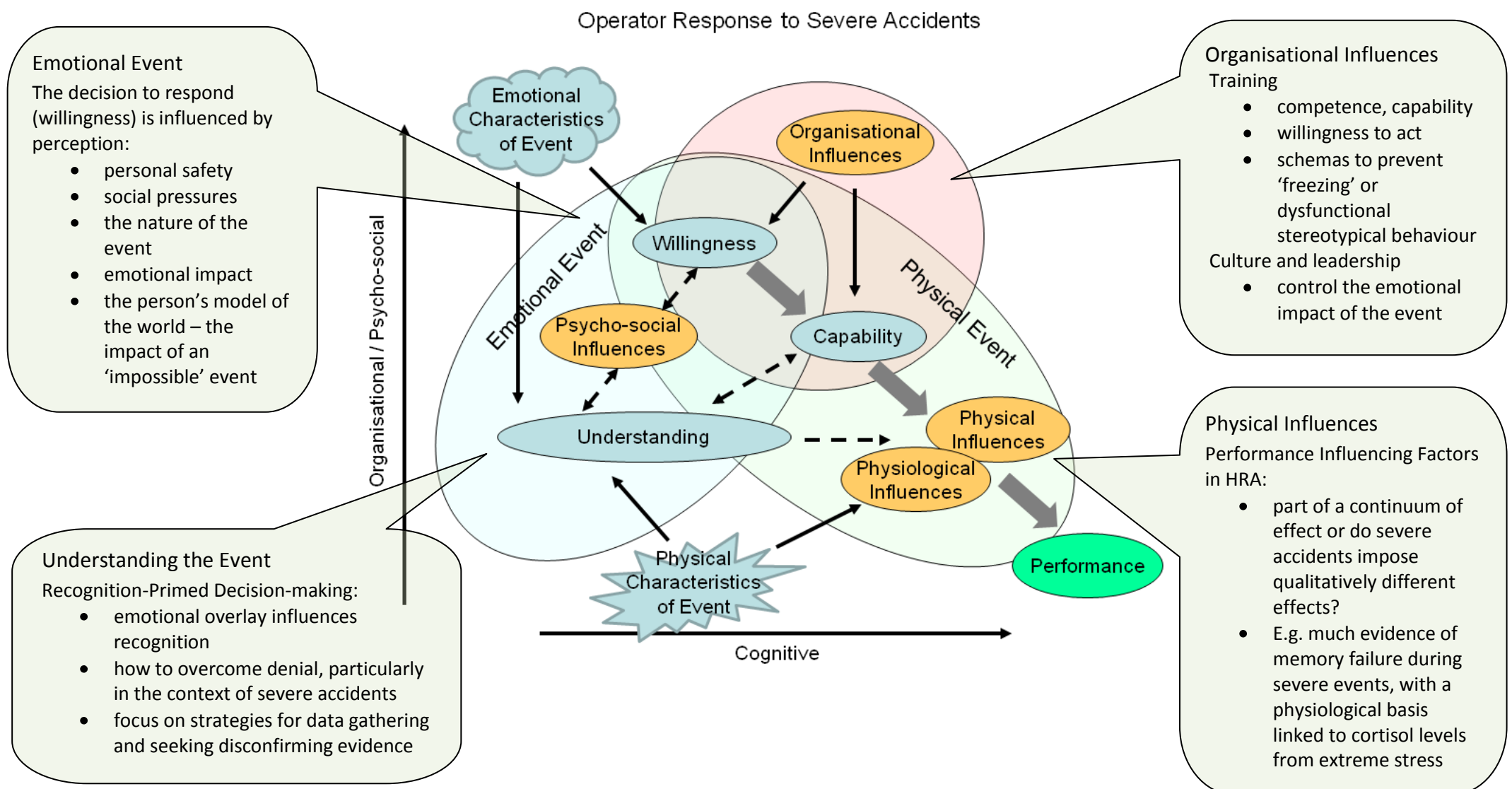
## A Model of Human Behaviour in Severe Accidents

We have developed a simple model of performance in severe accidents, to help direct our focus of research. The intent is to illustrate potential interactions between elements that affect performance.

Typically, organisations focus on the elements of severe accident response they perceive they can influence – clear procedures, effective training, exercises, etc. There may be a reluctance to engage with issues around the psycho-social aspects of a severe accident, perhaps partly because they are less well understood, and partly because solutions may not appear fully compatible with normal operations.

For each responder, the event will have both a physical and an emotional/psychological manifestation. Based on their perception of these, and their understanding of the event, the operator will perform in their role. However, that performance will be further affected by:

- Willingness – the priority they give to incident response (fear, social pressures, etc)
- Capability – their ability to respond (knowledge, competence, etc)
- Performance Influencing Factors (Stress, environment, etc)



### Future direction for operator response

- Enhance existing modelling methods for use in severe accidents, and clarify their limits
- Identify the limits of existing HRA methods, in order to substantiate the claims
- Explore and characterise non-homogeneity of people/performance
- Identify data sources and take account of cultural differences

### The Challenge

We need adequately to incorporate human performance in PSA. We may need to be more explicit about the limitations we might expect during severe accidents.

We may also need greater focus on how we can enhance such performance, learning from military, emergency services, and other sources, in the context of training, selection and procedures.