



# The content analysis of emergency scenarios: Thematic survey of the context in the process industries



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## ABSTRACT

To manage an emergency situation in an effective way it is necessary to have certain capabilities. These capabilities focus on preventing, mitigation, responding to, and recovering from the major events. Designing a system of emergency exercises without a balanced approach for all capabilities may fail the preparedness. The main objective of this study is finding the main concentration of the practiced exercises on the desired capabilities. The Content Analysis technique was used to conduct a thematic analysis of the contents of records of some implemented scenarios. The findings showed that there was not a balanced system for enhancing the needed capabilities. Most of the planning attempts concentrated on the response phase and aspects like the protection and recovery capabilities were ignored. To plan an exhaustive system of emergency preparedness such findings are helpful.

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## 1. Introduction

To manage an emergency situation in an effective way, it is necessary to have some certain capabilities (Alim et al., 2015). The success of an emergency response is not the sole function of the response phase. A vigorous system of emergency management encompasses those qualities that are needed to prevent, protect against, respond to, and recover from the major events. Many organizations use the operational or discussion-based exercises to promote these capabilities (Dausey and Moore, 2014). In the light of these exercises, it is understandable that employees, equipment, system elements, and processes are competent to meet emergency requirements in an effective manner.

Exercises are conducted based on the scenario-planning concept. Scenarios are tools to construct, depict or describe plausible and internally consistent future behaviors of a system (Boden et al., 2015). To have an intact system of exercises, the scenario selected to be tested should be picked up carefully, and all the planning, implementation, recording, and analysis of the processes should follow a standard pattern. A well-designed exercise can place the expected behaviors within a hypothetical chain of events and then compare the expected behaviors with the observed behaviors. In addition, all proposed activities, due to be implemented during an exercise, should be kept under the maximum level of control while keeping the situation as genuine as possible.

As implied before, a harmonic system of the emergency management is grounded on the symmetric legs of the required capabilities (see Fig. 1). It is not surprising to see organizations that are unable to respond to an emergency as expected despite the numerous recorded exercises. Restricting the exercises to a limited group of capabilities can unbalance the emergency management system. An unbalanced growth of the capabilities makes the system vulnerable due to the immaturity of some required capabilities.

According to our knowledge, there is no comprehensive thematic analysis of the implemented emergency scenarios. Therefore, this paper tries to answer the following questions: are the current emergency exercises balanced enough in terms of the required capabilities to respond to the various types of emergencies? In addition, what are the least concerned capabilities within the current emergency exercises? The Content Analysis (CA) technique was employed to review the previously implemented exercises so as to find the overall focus of the current practices and exercises.

### 1.1. Literature review

#### 1.1.1. An exercise challenges

A typical exercise follows the steps of planning, production, implementation, and evaluation. Each step has its own problems. In order to develop a well-functioned scenario, the scenario should be plausible, scientifically defensible, internally consistent, and suitably challenging in an emergency management system (Dettinger et al., 2012). Live exercises are costly and

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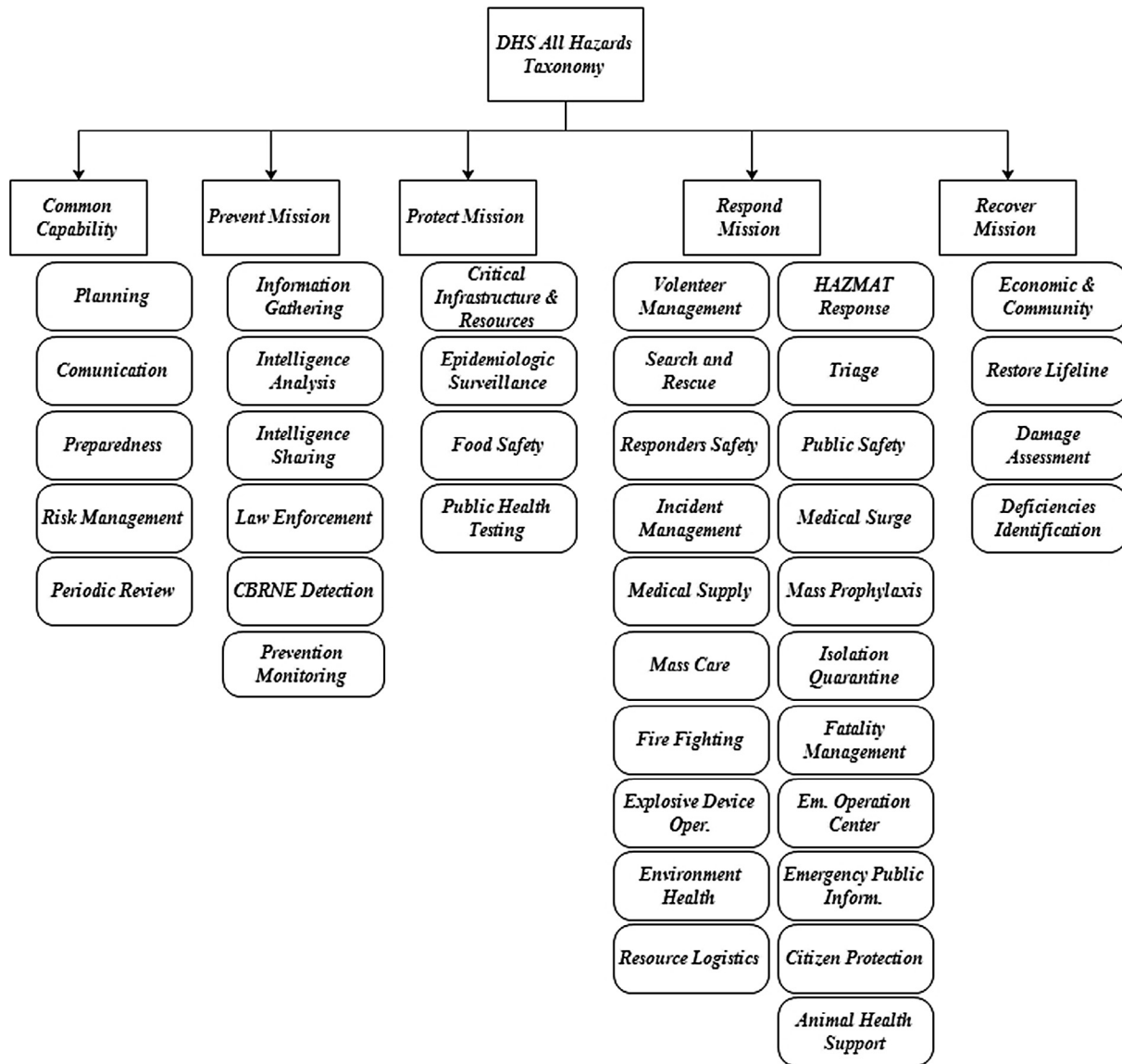


Fig. 1. The target capabilities list of DHS for all hazards.

time-consuming in nature and interrupt the normal operation of companies (Cohen et al., 2013). Practical exercises include difficulties in demonstrating the immediate results of decisions made during the exercise (Araz et al., 2012). Evaluating the effectiveness of emergency exercises is another important challenge (Alim et al., 2015). A weak or incomplete evaluation can waste all planning and implementation efforts. Other challenges may include lack of enough reality in most exercises, low level of employees' participation, crying wolf syndrome, and risks produced during exercises. Shortage in any components of an emergency exercise may lead to the total failure of the emergency preparedness. Subsequently, it is necessary to find the existing weaknesses of the preparedness system. Due to these difficulties, it is a logical practice to plan exercises based on the determined drawbacks and priorities. Therefore, the CA was employed to achieve this goal.

### 1.1.2. Content Analysis

Content Analysis is a systematic and replicable technique for summarizing large contents in fewer contents based on the established rules (Stemler, 2001). CA is used to infer the message or the overall meaning of a text or content through objectively identifying

the pivotal theme of contents (Holsti, 1968). This technique organizes, categorizes, and compares texts and infers an overall result from them (Özyurt and Özyurt, 2015). As Krippendorff states, CA is a learnable tool that "provides new insights, increases a researcher's understanding of particular phenomena, or informs practical actions" (Krippendorff, 2012). In order to be reliable, the technique can only be applied to data that are recorded in nature. One striking feature of CA is that it is possible to review available data without having to be present in the field (Ikeagwuani and John, 2013). Therefore, the CA technique was selected to conduct a thematic analysis of the exercised emergency scenarios.

## 2. Research methodology

This paper seeks to find the main planner's concern and tendency about how and why an emergency exercise is planned. As stated before, the content analysis was used to understand the basic interests of the emergency planners. The previously conducted scenarios were collected, analyzed and interpreted. The overall process of scenario analysis is described below.

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