Developing a Crisis Management Exercise Training in Industrial Environment: From Needs Analysis to Exercise Facilitation

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Learning Role-Playing Game Scenario Design for Crisis Management Training: From Pedagogical Targets to Action Incentives

Background

Why developing a LRPG design methodology for crisis management training?

Since the 1970’s → Continuous improvements of major accident prevention

But industrial accidents still occur

→ Prevention based safety management is not enough

Protective system such as emergency and crisis management must be implemented and tested through specific exercises (+ SEVESO directive)

Nevertheless developing such exercises is complicated, expensive and time-consuming → Companies may be reluctant to set them up
Context

**Expert’crise project**: ESF funded training in emergency and crisis management for Seveso plants and critical infrastructures

→ Lectures and **Immersive exercises** (also testing emergency planning §6 Art. 12 SEVESO 3)

→ **9 Walloon Seveso** companies have participated to one of the seven exercises organized
  - Exercises on industrial sites with usual materiel, equipment, device...
  - Specific material arrangement (record & immersion) and human organization (observation & facilitation)

The design methodology is based on the **continuous improvement** throughout the project from 2015 to 2018
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Structure of the methodology

1. Needs analysis
2. Emergency system analysis
3. Establishing training limits
4. Scenario draft defining situation-task
5. Accidental sequence choice
6. Refining scenario including incentive and perturbation
7. Facilitator’s sheet redaction and facilitation files design

One or more contact person of the company:
- Explain needs and organization of the company
- Validate or amend proposition

Rules, Medium, Players, Context & Thematic

Define the framework

Company dependent

Diegesis or “Crunch”
Preliminary analysis lead to the scope usually divided in 3 levels: operational, tactical (optional) and strategic.

Direct facilitation is avoided and target audience remains alone during the exercise (only with observer).

Target audience interacts with facilitation through peripheral audience (directly or not) mentored by facilitators or indirectly with facilitators playing other organization’s roles (by phone, mail...)

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The situations-tasks, hinges of the scenario

Needs statement of the company → Knowledge Skills Attitudes → Situation-task

A **situation-task** aims to “force” trainees to **do an action** (**the task**) under **special circumstances** (**the situation**) through serious game interface and gameplay.

The task is a mean to involve trainees in a **reasoning process** harnessing knowledge targeted.
Accidental sequence and first draft

**Accidental sequence** = Causes of the accident, the accident, dangerous phenomenon, and asset affected.

**Justification for situations-tasks’ perturbations and incentives**
Crisis/Emergency LRPG “fluff” (in opposition with the “crunch”)

Situations-tasks are organized in a chronology inspired by the hero’s journey (J. CAMPBELL) into a scenario.

**Scenario** explains the diegesis of exercise and develops the **sequence of input** to the target audience.

<table>
<thead>
<tr>
<th>Time block</th>
<th>Situation-task</th>
<th>Pedagogical target</th>
<th>Incentive/Perturbation</th>
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Refining the scenario until the facilitator’s sheet

**Situation-task** How to have people do a task?

**Choice of relevant incentives and perturbations which**
- Lead to the task to do
- Are realistic enough
- Are not too obvious

Keep trainee in a *flow* state

Once inputs are defined, a 5-minutes meshing chronology is established:

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<th>Facilitator sheet</th>
<th>Precise timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>14h00-14h15</td>
<td>Warning chain. Crisis unit establishment</td>
<td>Procedures check</td>
<td>Imprecise alert Weak signals No feedback from operators</td>
<td>Intervention chief</td>
<td>14h00: Small event 14h00/5: Information check not successful 14h15: Warning confirmation. Major accident</td>
</tr>
</tbody>
</table>
Conclusions and prospects

Methodology allows to design efficiently emergency and crisis exercises for chemical industries.

But require a high level of competences to choose and arrange situations-tasks cannot be directly used by SHE manager.

Next step: Identifying a limited number of situations-tasks that can be staged in exercises to offer an user-friendly method for SHE

Design a pedagogical process to conceive situation-task and Design a methodology to arrange situation-task in the scenario to keep trainees focus

Questions ?