

## WP4–Human factors simulation in BETs and definition of a related behavioral-based (B-based) resilience metric

**T4.2 Simulators application to selected BETs in their current state and by applying current SUOD/SLOD standards mitigation strategies. Interferences assessment between selected SUOD/SLOD through simulation-based approach, with possible overlap of effects and related amplifications. Definition of a set of KPIs for overall resilience evaluation of BE and criteria for their correlation**

### D4.2.4 – B-based (multi-risks) resilience metric for BE

**ABSTRACT.** Resilience assessment should pursue a single to multi-risks approach to provide a holistic way to promote risk reduction solutions and evaluate their effectiveness. Users-related approaches should be promoted by means of simulation-based assessment, to verify the behavioural effects of certain circumstances on the overall BE resilience, measuring the ability of a given system to face the disasters. According to this standpoint, the current deliverable proposes a resilience-based metric for the BE rooted on the behavioral simulation performed through the T4.1-to-T4.2 flow. KPIs defined in D4.2.2 (relating to SUODs) and D4.2.3 (relating to SLODs) are combined into a unique metric to assess the BE resilience. These KPIs can evaluate the outputs of the simulations on a given BE or BET by means of the model developed in D4.1.1. Each KPI has been normalized to be comparable with the others in a 0 to 1 scale, and then associated to a specific weight using controlled assessment techniques (i.e. Analytical Hierarchy Process), depending on the metric goals also in reference to the application standpoints (i.e. metrics for final users, for the BE managers, for rescuers/law enforcement agencies). Metrics can be then assessed through a 3-level process to perform comparisons between input scenarios: 1) by 1-to-1 perspective for each of the KPI composing the metrics, so as to detect the most critical parameters in a specific input scenario, and their differences in different scenarios; 2) an overall comparison thanking to the whole metric result, to compare different scenarios; 3) by the analysis of metrics trend depending on the specific BE parameters or input variables from different scenarios. The last comparison purpose can also support the development of regression models to test the effectiveness of different solutions under many application levels, thus promoting the use in D5.2.1, D5.2.2 in a BET-related perspective and to D6.2.3 and D6.2.5 in a specific BE perspective.

