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Supplement of

Development of a method for the scenario-based identification of calculation models (EMS)

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Development of a method for scenario-based identification of calculation models (EMS)

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BACKGROUND / INTRODUCTION

- The derivation and identification of potential safety-relevant developments (scenarios) is the task of scenario development.
- The scenarios are to be treated within the framework of numerical model calculations.
- Up to now, only little research has been done on the question of when a scenario is covered by calculation cases.
- Therefore, one goal of this project is to assist the derivation of calculation cases based on scenario development.
- This should be achieved by close interaction of the working teams, scenario development and modelling.
- The outcome of the EMS project is intended to support BASE within the framework of supervision and approval in the evaluation process of whether scenarios have been sufficiently covered by calculation cases.

METHODOLOGY

Basic Approach

- The basic approach (Figure 1) pursues the procedure of breaking down the complex disposal system into smaller units so called subsystems and further sub-sub-systems, analyzing them and finally merging the results from the individual considerations into an overall picture. This procedure is also known as “divide and conquer”.

Figure 1

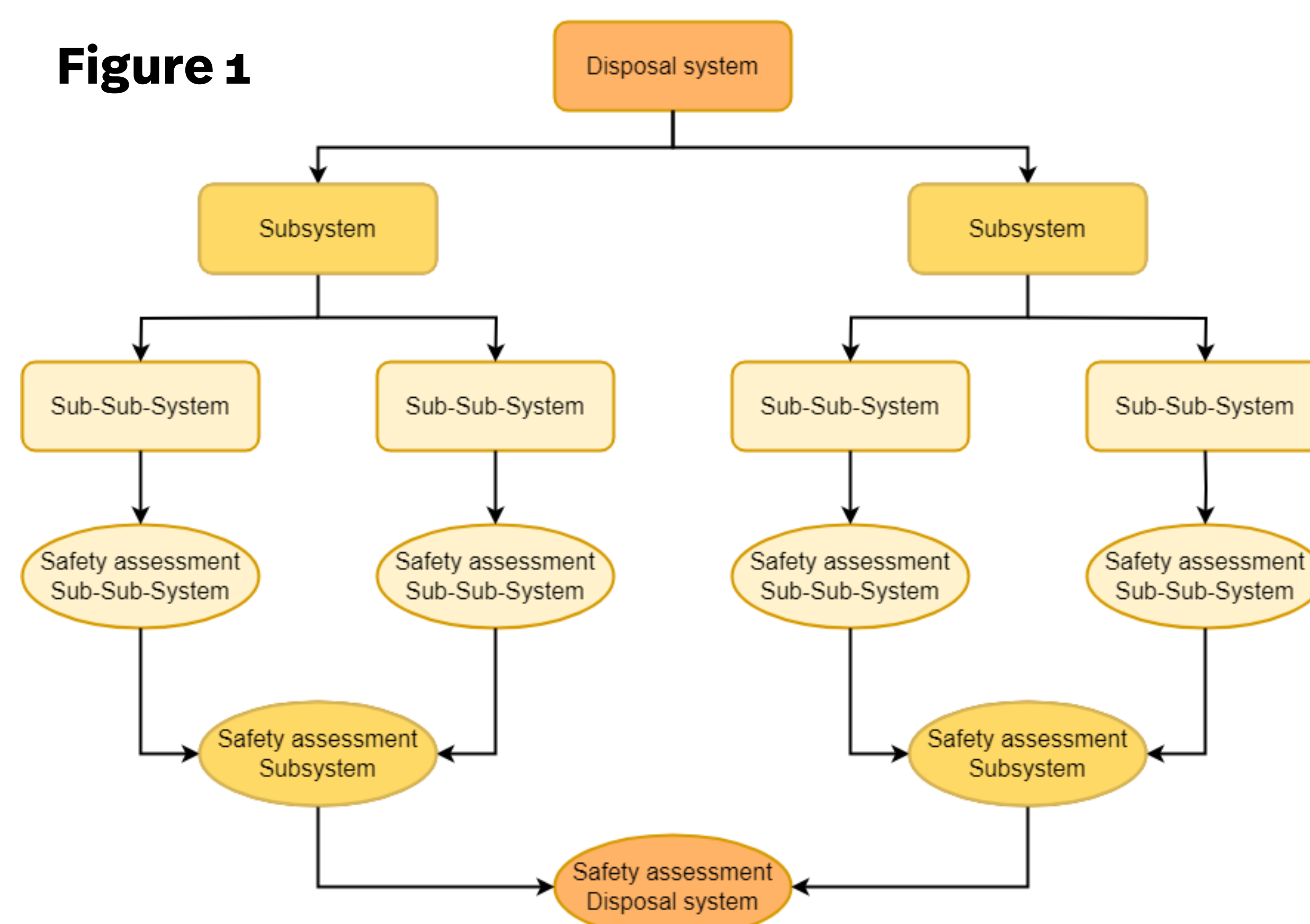
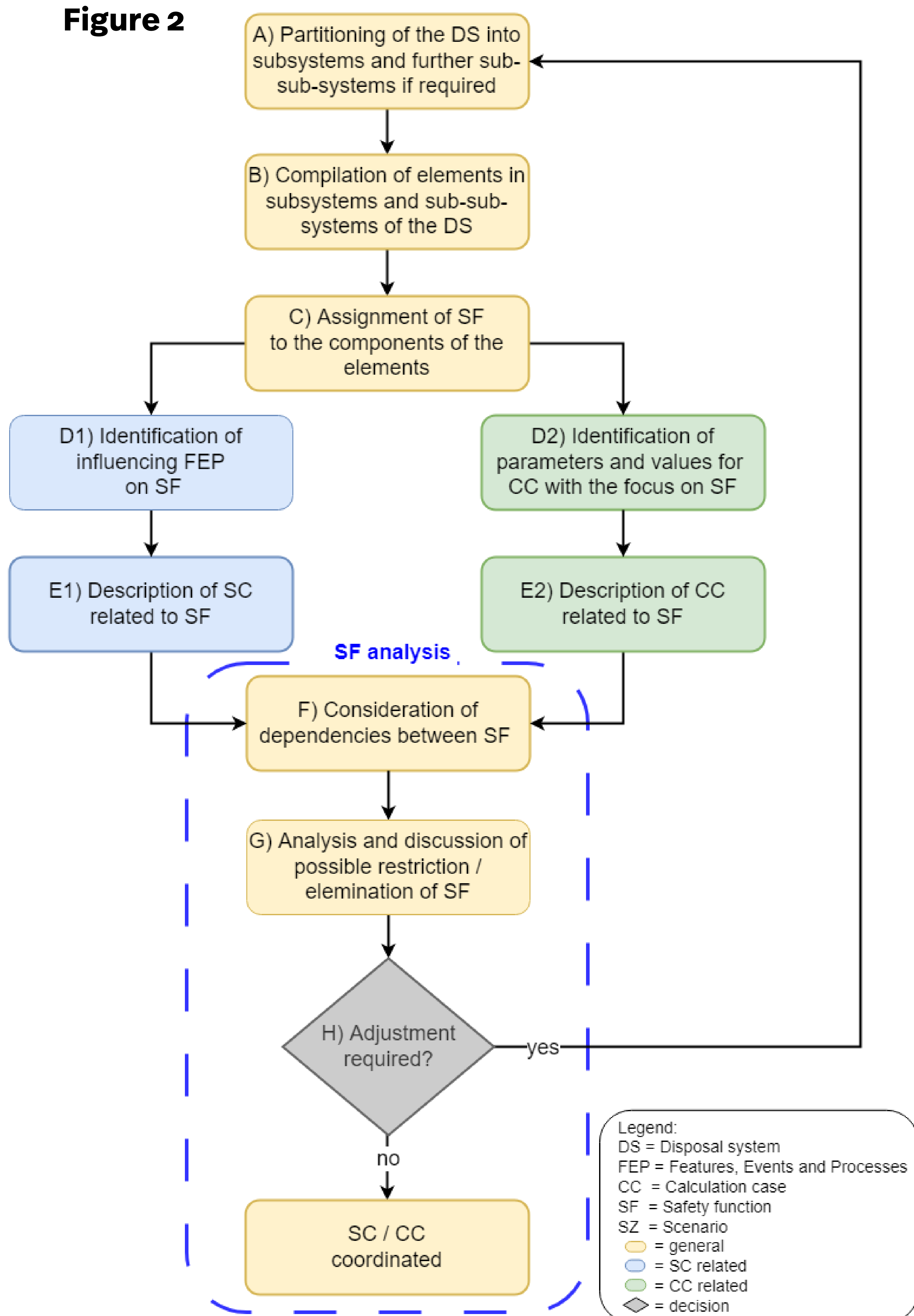


Figure 2



Developed Method* (Figure 2)

- **A)** Division of the DS into subsystems and, if necessary, further subsystems (sub-sub-systems).
- **B)** Compilation of the elements of the subsystem such as components and SF.
- **C)** Assignment of SF to components, barriers etc.
- **D1)** Identification of which FEP affect which SF.
- **D2)** Identification of parameters and parameter values for possible CC.
- **E1)** Description of the SC or developments (expected, deviating) with reference to SF.
- **E2)** Description of the CC with reference to SF.
- **F)** Consideration of possible dependencies or interactions of SF among each other.
- **G)** Analysis or discussion of a possible restriction/cancellation of SF taking into account the interaction of scenario development and modelling/CC.
- **H)** Assess whether the SC and/or the CC need to be adjusted by taking steps F) and G) into account. If the result is positive, a new iteration from the beginning or from a specific step e.g. **B), C), D1)** and **E2)** is required.

*used abbreviations cf. legend in Figure 2

OUTCOME / OUTLOOK

- A first method was developed by intensive exchange between the established working teams of the EMS project.
- It brings together the scenario development and the derivation of calculation cases by consideration of safety functions.
- The next steps of the project focus on the test phase, so it is possible that the method can still change.
- However, the working teams are of the common opinion that the method appears promising overall in order to achieve the desired objective of the EMS project.