It is not economically feasible to statistically prove that an automated driving function is safer than a human driver with current test methods such as field operation tests. Therefore, new methods and tools are needed for the release of automated vehicles. The approach of functional decomposition is broadly used in informatics, mathematics and robotics to split complex functions into sub functions. Functional decomposition is also used to analyze human failures that lead to traffic accidents. Assuming that the absence of accidents is the approval criterion for highly automated driving and that accidents can be traced back to failures, the decomposition approach can be used for approval. Within the research project PEGASUS, a scenario-based decomposition approach for approval of the “Autobahn-Chauffer” is developed. This approach is presented here for the first time and proposes a six-layer decomposition of the automated driving function. Based on the functional decomposition and identification of relevant scenarios, particular test cases and corresponding fail criteria can be derived. By eliminating redundant test cases and aggregating test cases that are subsets of each other, the method promises to
reduce testing effort.