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| --- | --- | --- |
| **Input Process Output**  Specification of HW safety requirements  Technical safety concept, HSI & system design specification | **Description, means, references** | **Responsible** |
|  | Derive HW safety requirements from technical safety requirements allocated to HW. Consider demands by safety measures and environmental constraints.  Specification of HW verification criteria shall be planned and performed.  ISO 26262‑5 6.4.1  Handbook chapter 5.2  #5\_PD\_HW\_Template | Project FS Manager |
| HW safety requirements |  | Project FS Manager |
| HSI specification (refined) |  | Project FS Manager |
| Classification of hardware components | If an SEooC or reused component shall be used for a functional safety task, the hardware component to be evaluated shall be classified according to references below.  ISO 26262‑8 13.4.1.1  Handbook chapter 8.9.1  HW\_Evaluation\_Plan\_Template | Project FS Manager |
| Evaluation of Class I HW components | Hardware components of class I do not need to be evaluated due to their simplicity. The HW element class I components are integrated in shall be developed according to ISO 26262.  ISO 26262‑8 13.4.2  Handbook chapter 8.9.2  HW\_Evaluation\_Plan\_Template | Project FS Manager |
| Evaluation of Class II HW components | Hardware components of class II shall be evaluated by analysis and/ or testing, which shall be planned. In case of testing, a test plan shall be created.  The evaluation report shall state whether the component passed or failed.  ISO 26262‑8 13.4.3.1 to 13.4.3.5  Handbook chapter 8.9.3  HW\_Evaluation\_Plan\_Template | Project FS Manager |
| **Input Process Output** | **Description, means, references** | **Responsible** |
| Hardware element evaluation plan |  | Project FS Manager |
| Hardware element test plan | If applicable, a test plan shall be created. | Project FS Manager |
| Hardware element evaluation report |  | Project FS Manager |
| Evaluation of Class III HW components | If hardware components of class III are not developed compliant with ISO 26262, they shall be evaluated by analysis and/ or testing, as components of class II.  ISO 26262‑8 13.4.4  Handbook chapter 8.9.4  HW\_Evaluation\_Plan\_Template | Project FS Manager |
| No work product |  | Project FS Manager |
| HW safety requirements verification | Verification of HW safety requirements according to  ISO 26262‑8 Clauses 6 and 9  Handbook chapter 5.2  09\_VERIFICATION & VALIDATION  #5\_PD\_HW\_Template | Project FS Manager |
| HW safety requirements verification report |  | Project FS Manager |
| **Input Process Output** | **Description, means, references** | **Responsible** |
| Specification of HW architectural design | HW architectural design specification shall implement HW SReqs according to highest ASIL of each component. Architecture shall avoid systematic faults due to e.g. high degree of complexity of HW design.  ISO 26262‑5 7.4.1  Handbook chapter 5.3.1  #5\_PD\_HW\_Template | Project FS Manager |
| Specification of HW detailed design | HW detailed design applicates lessons learned to avoid common design faults. Ensure operation of HW parts under specified conditions.  ISO 26262‑5 7.4.2  Handbook chapter 5.3.2  #5\_PD\_HW\_Template | Project FS Manager |
| HW design specification |  | Project FS Manager |
| Safety analyses | Performance of safety analyses to figure out faults (safe, single point, multiple point) to enable evidence of effectiveness of safety mechanisms for avoidance of SPFs and MPFs  ISO 26262‑5 7.4.3  Handbook chapter 5.3.3  #5\_PD\_HW\_Template | Project FS Manager |
| HW safety analysis report |  | Project FS Manager |
| HW design verification | Verification of HW design shall check completeness and compliance of HW design with HW SReqs.  Provide safety related special characteristics (coming up to be relevant while analyses) for production and operation planning, including verification measures and acceptance criteria.  ISO 26262‑5 7.4.4  Handbook chapter 5.3.4  09\_VERIFICATION & VALIDATION  #5\_PD\_HW\_Template | Project FS Manager |
| HW design verification report |  | Project FS Manager |
| **Input Process Output** | **Description, means, references** | **Responsible** |
| Specification of requirements for SLC after development | Safety-related special characteristics shall be specified if safety analyses have shown them to be relevant. Further requirements for production, operation, service and decommissioning are shown in references below.  ISO 26262‑5 7.4.5  Handbook chapter 5.3.5  #5\_PD\_HW\_Template | Project FS Manager |
| Requirement specification for production & operation | Specification of requirements for production, operation, service and decommissioning | Project FS Manager |
| Evaluation of HW architectural metrics | Evaluation of HW architectural metrics of item regarding Reqs for fault handling. ASIL dependent values to be reached for SPFM and LPFM as well as methods are listed in references below.  ISO 26262‑5 8.4  Handbook chapter 5.4  #5\_PD\_HW\_Template | Project FS Manager |
| Analysis of effectiveness of item architecture | Analysis of the effectiveness of the architecture of the item to cope with the random hardware failures | Project FS Manager |
| Verification review report of architecture evaluation | Review report of evaluation of the effectiveness of the architecture of the item to cope with the random hardware failures | Project FS Manager |
| Evaluation of safety goal violations due to random HW failures | For ASILs higher than A, a sufficiently low risk of HW caused SG violation is to prove. Evaluation shall be performed by calculation of probabilistic metric of random HW failures (PMHF) or by individual evaluation of each fault (residual and SP).  A verification review of evaluation results is required.  ISO 26262‑5 9  Handbook chapter 5.5  #5\_PD\_HW\_Template | Project FS Manager |
| **Input Process Output** | **Description, means, references** | **Responsible** |
| Analysis of SG violations due to random HW failures |  | Project FS Manager |
| Specification of dedicated measures for hardware | Specification of dedicated measures for hardware, if needed | Project FS Manager |
| Verification review report of SG violation evaluation | Review report of evaluation of safety goal violations due to random hardware failures | Project FS Manager |
| HW integration and verification | Provide evidence of requirement compliance by testing. Testcases shall be specified by using methods listed in references below. Tests shall examine completeness and correctness of safety mechanisms and the HW´s robustness against external stresses.  ISO 26262‑5 10  Handbook chapter 5.6  #5\_PD\_HW\_Template | Project FS Manager |
| HW integration and verifica-tion specification |  | Project FS Manager |
| HW integration and verifica-tion report |  | Project FS Manager |

# Version overview

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| --- | --- | --- | --- | --- | --- |
| Change history | | | | | |
| Ver-sion | Author | Division | Date | Changes | Statement |
| 1 | Franz Montowski | IBH | 31.03.2020 | Document initiation |  |