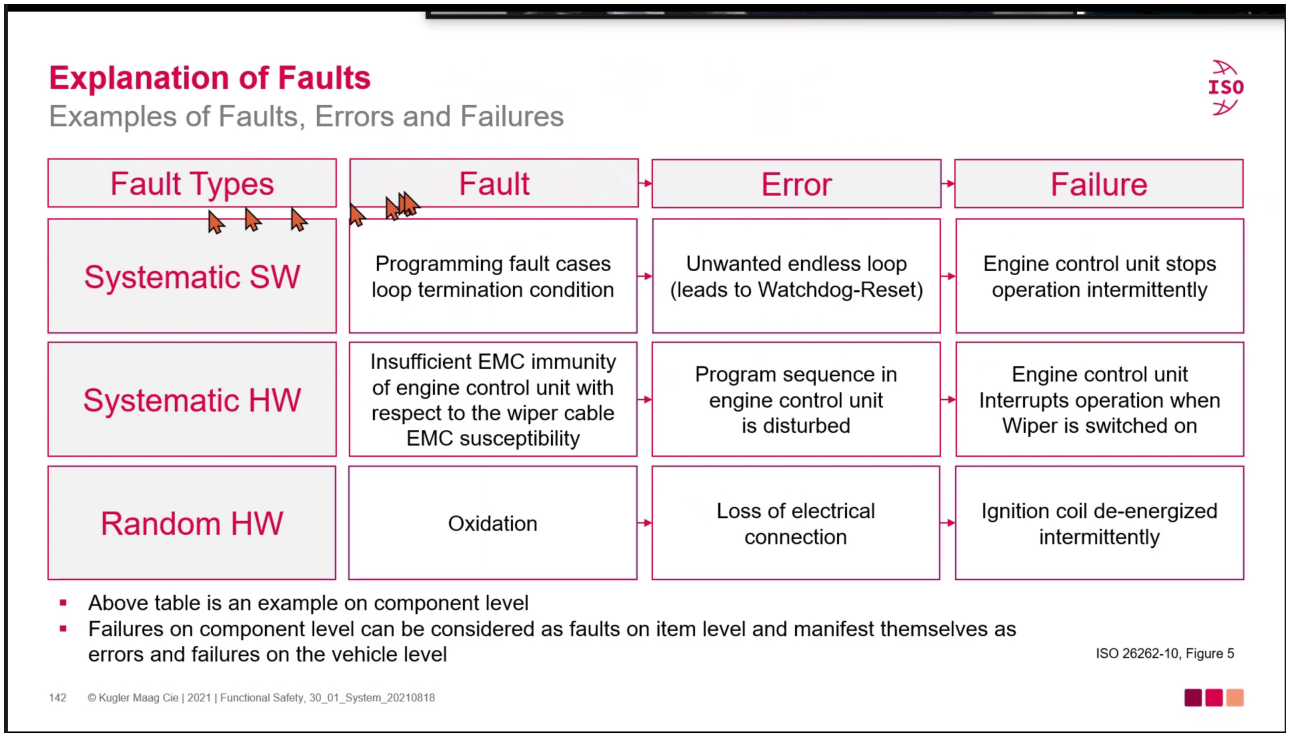
Safety Analyses Day 1

Methods for Safety Analyses and Safety Analysese on system Level

- Explanation of Faults ㅖ ㅖ



  - systmematic HW - Random HW
    - systematic은 특정 상황에서 발생

- System Design Safety Analyses
  - Perfoem safety of the system design accoding to the folllowing table and iso 26262-9, clause 8

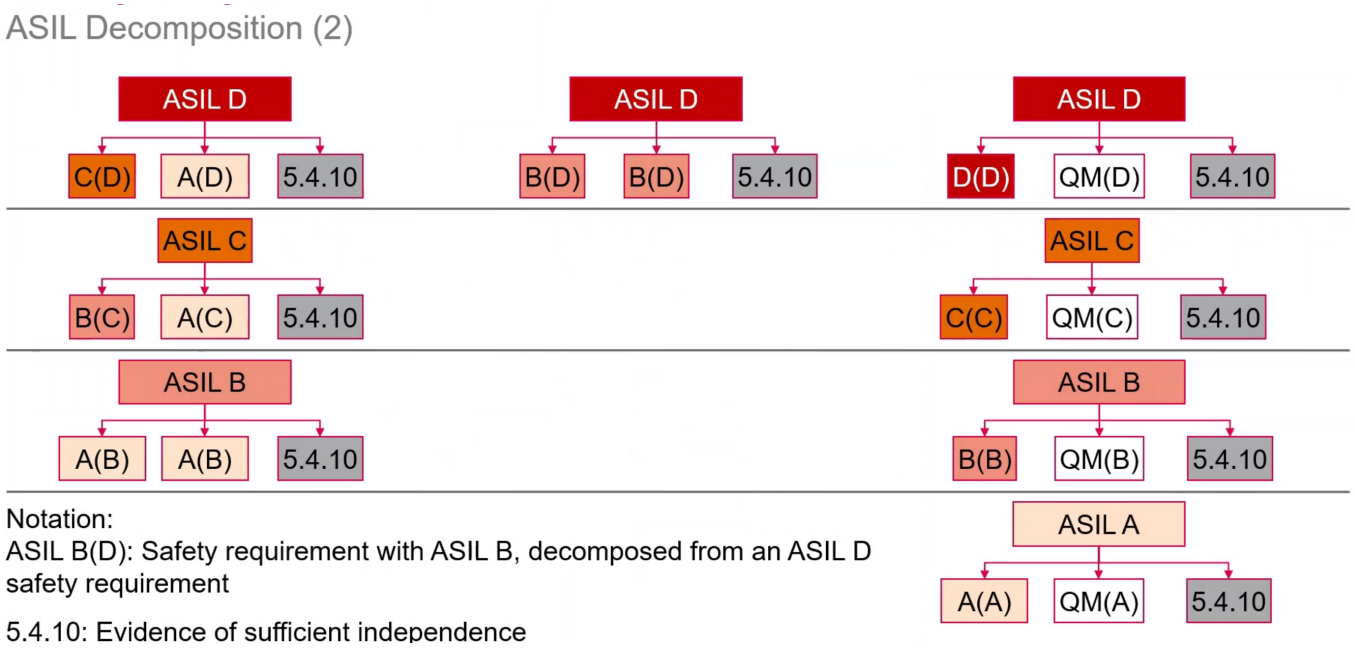
Methods		ASIL			
		A	B	C	D
1	Deductive analysis	o	+	++	++
2	Inductive analysis	++	++	++	++
Deductive analysis methods include FTA, reliability block diagrams, Ishikawa diagram. Inductive analysis methods include FMEA, ETA, Markov modelling.					

ISO26262-9

ASIL Decomposition

- **Obecjectvie**
    - To ensure that a safety req. is decomposed into redundant safety reqs at the next level of detail, and that these are allcocated to sufficiently indepent design elemets
    - To apply ASIL decomposition according ot permitted ASIL decomposition schemas
- **Benefit?**
    - Avoid signle-point faults, achieve hw qunatiative tagets
    - less developments effort because of lower ASIls or elements
    - Avoid implementing intended functionality with ASILs

ASIL Decompotion



* why? * .....

ASIL Decompotion(3)

- ASIL decompostion taolopring during the design process
    - ASIL decompostion applies to **safety reqs**, not to ach elemets
    - decomposition can related to any archi lv.
    - more than one such ASIL decomposition may be applied
- Possible reasons for decomposition:
    - Reduced developmennt effort for decomposed elements due to reduced ASIL.(eg. analysis effort, specificaiton effort, review, test)
    - Redundancy allows to achieve hardware metires and reliability targets easier. (eg. less single point faults)

ASIL Decompotion(4)

- similar safety reqs., sufficiently indepnednt achitectual emelmets or subsystems.
- Use reduced ASIL for developments activities.
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Analysis of dependent Failures (1)

- Objectives
    - To confirm tha tareq independece or freedom from interference is sufficiently achieved in the design by analysing their potential causes or initiaotrs
    - To define safety measures to mitigages plausible dependent failures , if nessary
    - The following info. shall be availabvle for the analsis:
        - Req for indepence and freedom from interfeerence at the applied lv.
        - Acrhi. info.
- Dependent Faulures
    - failure that not stiatistically indepent.

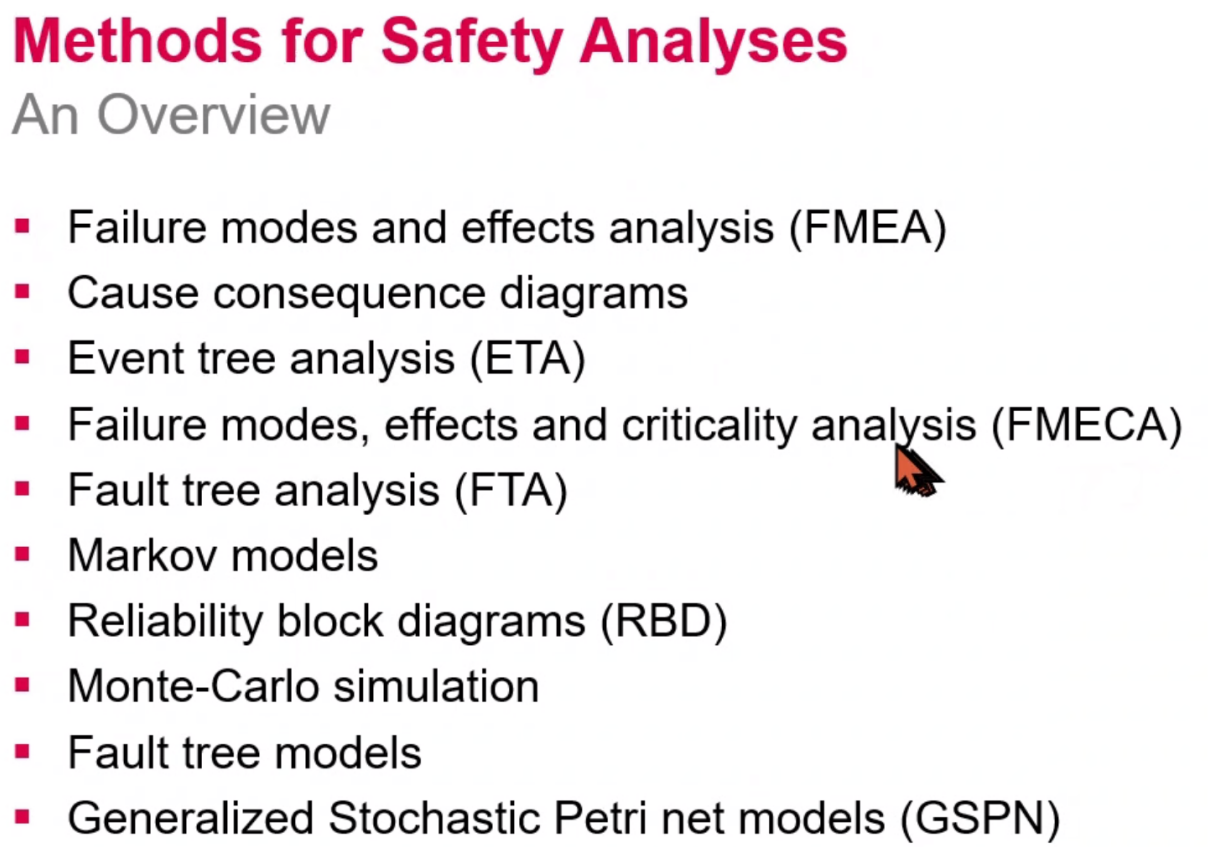
Analysis of dependent Failures (2)

- Each identified potiential for dependent faulures shall be evaluated to determin if foreseeable causes exist that lead to the occurrence of dependent failures and consequently violates a requred independece.

Safety analyses (general)

- Objcetive
    - To ensure that the risk of a safety goal violation due to systematic faults or random hardware faults is sufficiently low
- Validation / verification of safety goal safety concepts and safety reqs.
- Indentifacation of conditions, faults and failures taht could lead to a vilation of safety

Methods for Safety Analyses



Safety Analyses in the safety lifecycle

- Purpose is to assit int the design

Realibility Block Diagram (RBD)

Goal and Definition

- Goal
  - Set of events that must take place and conditons which must be fullfiled for a succesful operation of a system or a task
  - Depict Success path cosisting of blocks, line and logical juctions.
  - more a method of reporesentation than a method of analysis.

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FTA (Fault Tree Analysis)

FTA

- Analytical technique where the causess of an undesired state of a system are analyzed
- the system is anayzed using boolen logic in the context of its enviroments and operation to find all circumstances under which the top event can occur
- Graphic model of the parallel and sequential combinations of fauls whic can cause the top event
- Top-down, deductive approch