Process safety stages

3) Definition of (functional) safety

- > SIL/SIS/SIF (risk matrix, LOPA)
- > Hardware / software design
- > System verification / planning
- > PI&D design
- > Zoning / area classification

4) Basic / detail engineering

- > Definition safety tasks and responsibilities (competence)
- > Implementation of previous stages
- > Reliability block diagram analysis

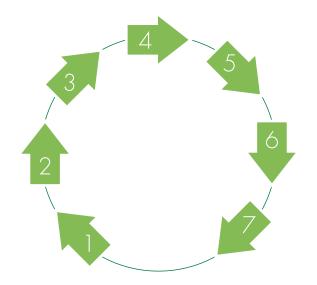
2) Definition of safety concept (processes, design, operations)

Based on:

- > (EU) directives (CE, ATEX, 114/153)
- National legislations (NPR, PGS, AREI, NFPA, SEVESO), standards (EN / IEC) or specific requirements (manufacturer)

Risk and Hazard Analyses:

- > HAZOP, LOPA, FMEA ...
- > Dust testing (EX)
- Live tests / CFD modelling / simulation (CFX, LS-DYNA, Flacs, Phast)



5) On site acceptance testing

- On site inspections (visual, and detailled) for existing and new safety systems, equipment
- > Defining / implementation of remedial actions
- Documentation check (permits, procedures, explosion safety documents (BRZO)

6) Management of Change

Supporting periodic inspections

1) Investment stage

Definition of basic concept of assets, technical review for proven / new technology and existing / new application project management

7) Incident investigation

Failure investigation / root cause analyses (multi disciplined approach)

Customer oriented services throughout all process safety stages: GAP-analysis, Training (IECEx05)

