

ALMACO Design Process

Developing new products utilizing a DFSS
approach

Design for Six Sigma

- ⦿ Built on Six Sigma principles
- ⦿ Uses well defined technical requirements
- ⦿ Uses statistical modeling
- ⦿ Focuses on solution refinement
- ⦿ IDOV process
 - > Identify
 - > Design
 - > Optimize
 - > Validate

Concept

- ◉ Identify customer and product requirements
- ◉ Establish the business case
- ◉ Identify technical requirements
- ◉ Determine roles and responsibilities within the project team
- ◉ Set project milestones

Design

- ◉ Formulate concept design
- ◉ Identify potential risks (using FMEA)
- ◉ Identify design parameters
- ◉ Create a raw materials and procurement plan
- ◉ Create a manufacturing plan
- ◉ Utilize design of experiments (DOE) to determine effect of critical features on technical requirements

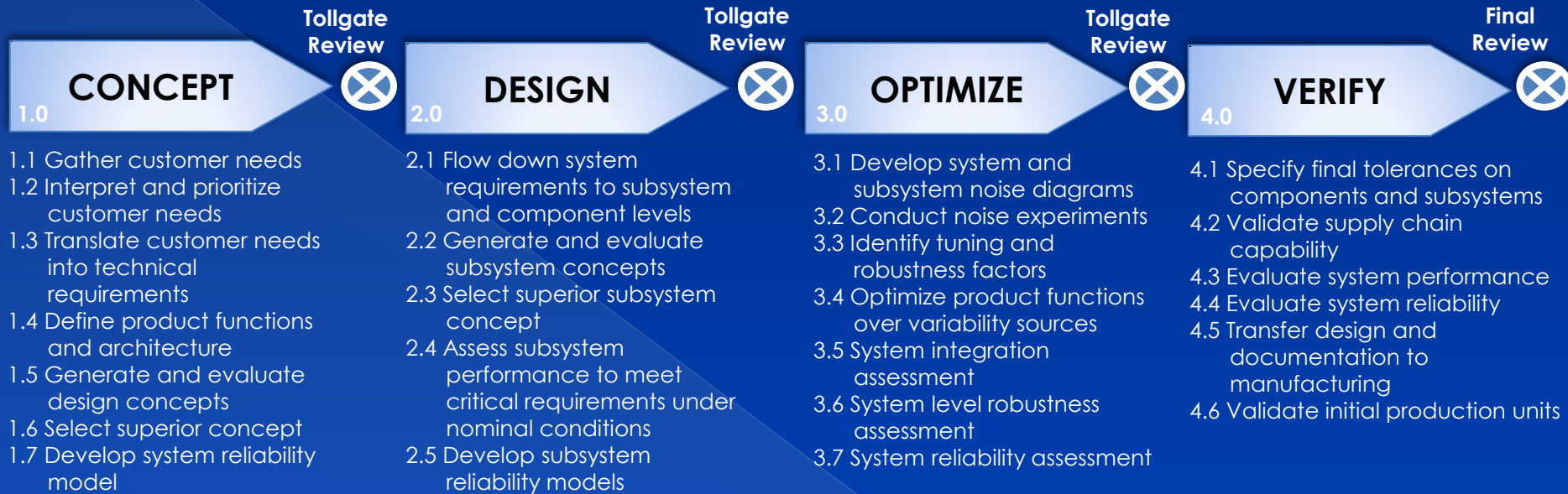
Optimize

- ◉ Optimize design to minimize critical feature sensitivity to process parameters
- ◉ Design for robust performance and reliability
- ◉ Error proof design and manufacturing processes
- ◉ Commission and startup

Validate

- ◉ Prototype test and validation
- ◉ Assess performance, failure modes, reliability and risks
- ◉ Design iteration
- ◉ Final design review

CDOV Process Flow



TOOLS/PRACTICES:

- Market segmentation analysis
- Market trend forecasting
- Business case development
- Competitive benchmarking
- VOC gathering methods
- KJ analysis
- Quality Function Deployment
- Critical parameter management
- Concept generation techniques
- Modular and platform design
- System architecting methods
- Pugh concept selection
- Knowledge-based engineering methods

TOOLS/PRACTICES:

- Design for manufacturability
- Design FMEA
- Graphical data methods
- Descriptive and inferential statistics
- Measurement systems analysis
- Mathematical modeling
- Design of experiments
- Regression methods
- Reliability modeling
- Accelerated life testing
- Process monitoring
- Design capability analysis

TOOLS/PRACTICES:

- Noise diagrams
- Screening experiments
- Response surface methods
- Taguchi methods
- Sensitivity analysis
- Monte Carlo simulation
- Life testing methods
- Design capability analysis
- Design FMEA

TOOLS/PRACTICES:

- Tolerance design analysis
- Multi-vari studies
- Statistical process monitoring
- Operations capability assessment
- Capability growth index
- Reliability growth modeling

Questions