

# Advanced Product Quality Planning

Advanced Product Quality Planning or APQP as it is commonly referred to, is a structured methodology for planning the introduction of new products that minimises risks to success. It is no different to Project Management and has the following features.

- Effective communication between all functions involved in the project is central to the methodology
- APQP is not planning by the quality department but planning by the organization.
- Planning is not simply drawing timing charts but assessing risks and developing solutions to the engineering problems that are encountered
- The first step is to form a project team or cross functional team that brings together the necessary expertise to realize the product through the various stages of development
- All team members are focused on the goals of the project and continually listen to the voice of the customer
- The specialists work simultaneously so that as details of the design concept emerge, the impact on downstream processes is assessed and the procurement and production processes designed to facilitate a smooth entry into production
- The project proceeds through five phases each having defined inputs and outputs and goals focussed on meeting customer requirements.
- Phase 1 is the concept phase that establishes the customer needs and expectations and transformed these into detail requirements that include design goals and planning information. On completion and satisfactory review, approval is given to proceed with the project.
- Phase 2 is the design phase during which product design proceeds in parallel with process design. Product and process characteristics are determined, feasibility studies, product and process FMEA conducted and the outputs subject to design review. Any special characteristics, equipment, tooling and measurement requirement are determined and preliminary control plans developed. On completion and satisfactory review, approval is given to proceed with construction of prototypes.
- Phase 3 is the process development phase during which prototypes are constructed to test functionality and develop the manufacturing capability. Preliminary process capability studies and measurement systems analyses are conducted and when confidence is assured, pilot production is authorized.
- Phase 4 is the validation phase during which pre-production quantities are produced and trials undertaken to prove product and process design. Process capability studies and MSA are conducted, special cause variation eliminated and the Production Control Plan validated following which evidence necessary for part approval is gathered together.

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- Phase 5 is the feedback and improvement phase during which any undesirable variation is reduced, experience from in-service use obtained and customer satisfaction enhanced.

Typical problems that arise in the use of APQP are

- Insufficient analysis of customer needs and expectations
- Insufficient resources being allocated by management
- Commencing phases prematurely before the recommendations from design and process FMEA have been implemented
- Insufficient analysis of process capability and reduction of special cause variation
- Poor communication between team members and between the team and top management
- Treating the Control Plan as an output document rather than a driver for action
- Slow response to notified changes allowing abortive work to continue
- Reacting too swiftly to notified change and not taking into consideration the effects by reworking the planning and analyses before implementation

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