

***NOTE: THIS IS AN EXAMPLE. THIS PROCESS MUST BE
TAILORED TO MEET THE NEEDS OF A SPECIFIC COMPANY***

A Concurrent Development Process

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A Concurrent Development Process

- How can I better leverage new technologies?
- How can I have more control over projects?
- How do I determine what projects to do?
- How do I know when to drop a project?
- How can I broaden staff core competencies?

A Concurrent Development Process

- **How can I decrease time-to-market?**
- **How can I increase product reliability?**
- **How can I increase product longevity?**

Project Terms

- **Project**
 - The development of a new product, or a significant enhancement, change or addition to a released product
- **Product planning steering committee (PPSC)**
 - Department heads of sales/marketing, engineering, manufacturing, possibly others

Project Terms

- **Resource**
 - **Person, place or thing**
- **Aggregate Resources**
 - **The collection of all resources utilized across all projects**

The Goal of this Training

- **Introduce a comprehensive concurrent development process**
- **Emphasize that the correct level of effort at the front end of the process increases better the chances of performing on time and on budget**

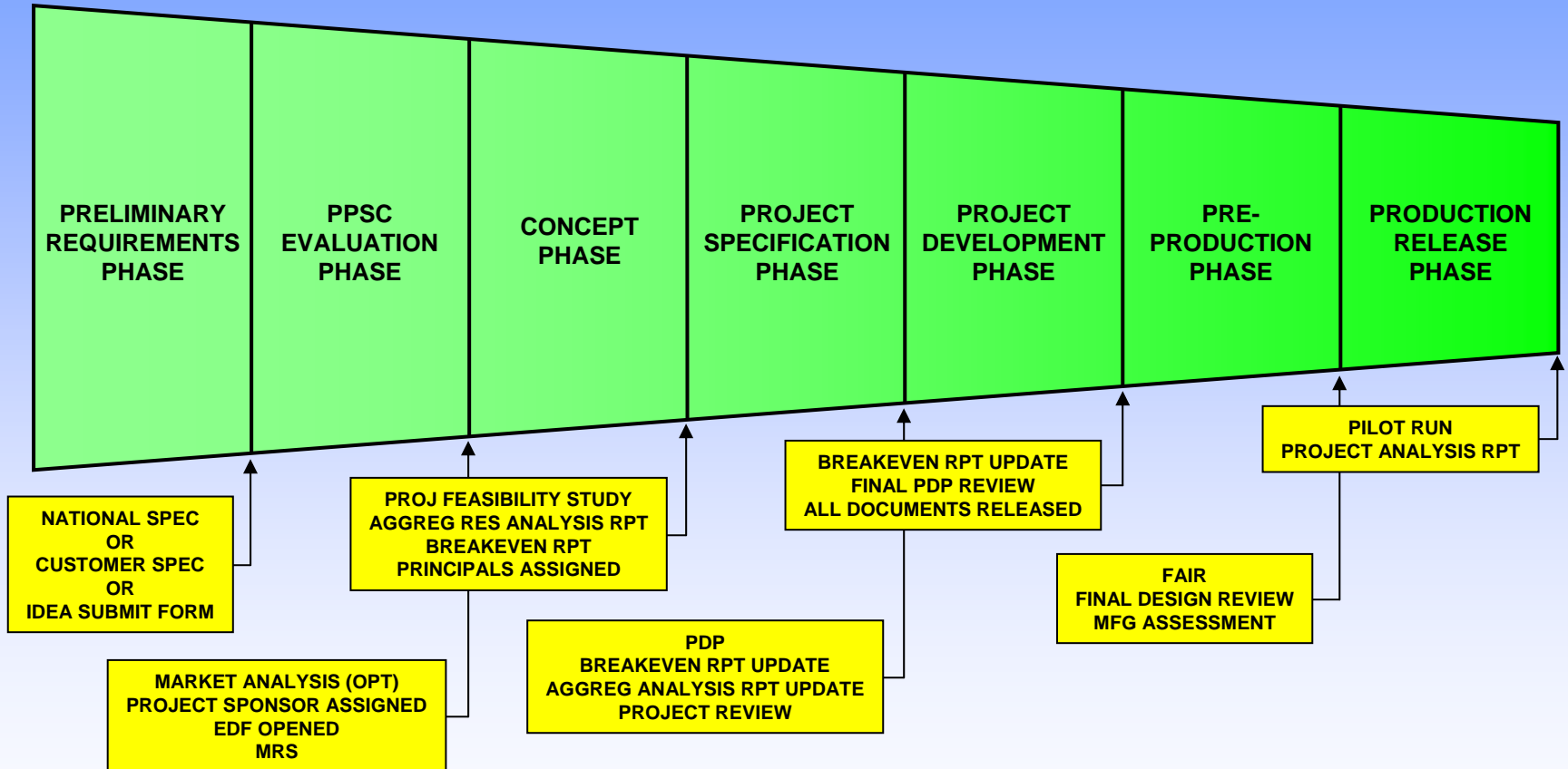
A Concurrent Development Process

The Development Process

The Development Phases

Q & A

Project Development



Project Development

- **Preliminary Requirements Phase**
 - Supports a submittal process for customer requirements and innovative ideas
- **PPSC Evaluation Phase**
 - Gives the PPSC an opportunity to evaluate submissions from the preliminary requirements phase

Project Development

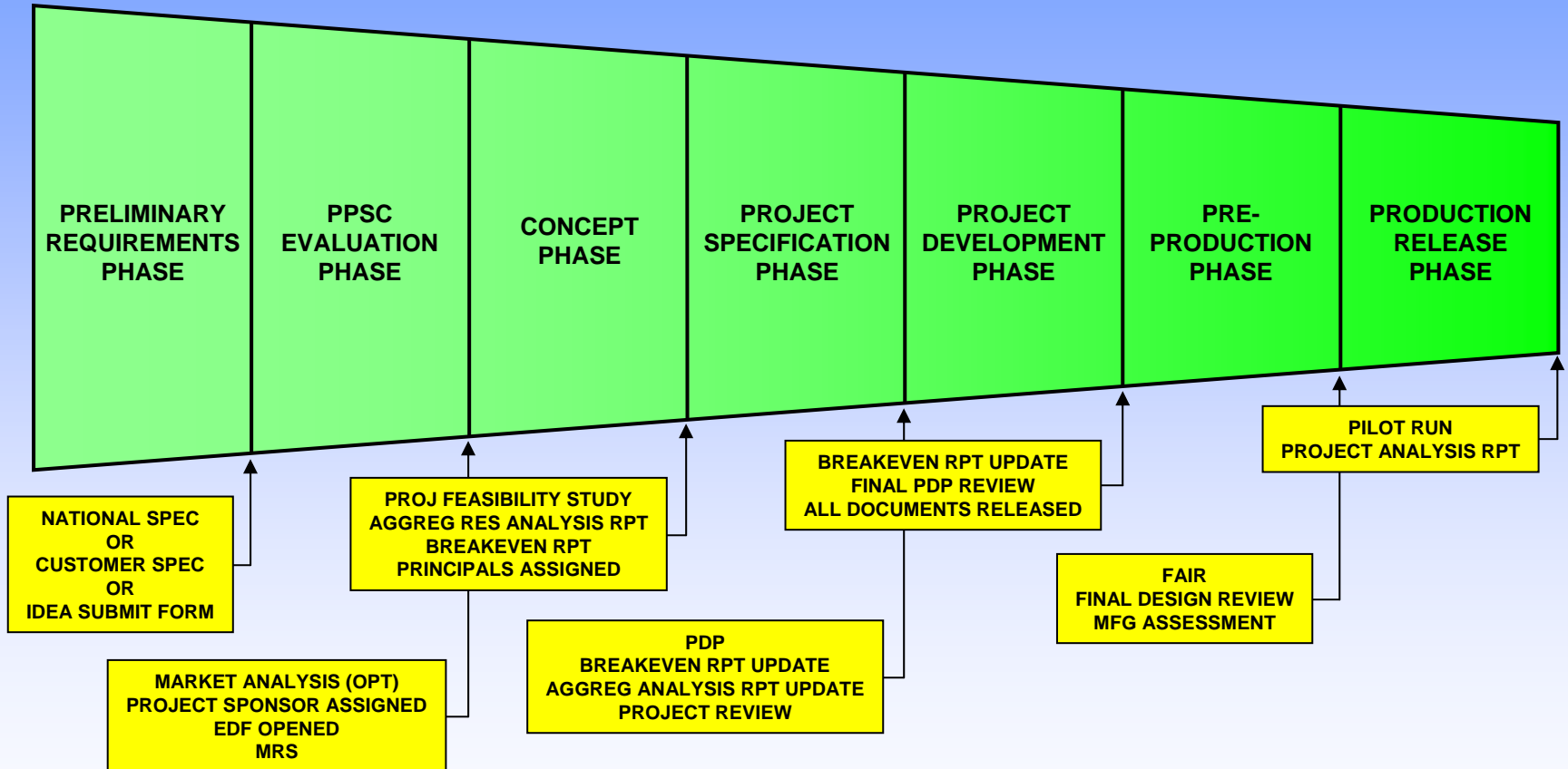
- **Concept Phase**
 - Expands on the project proposed in the PPSC evaluation phase
- **Project Specification Phase**
 - Creation of a project development plan (PDP)
- **Project Development Phase**
 - Execution of the PDP

Project Development

- **Pre-Production Phase**
 - Provides an opportunity to identify and correct issues that may adversely affect manufacturing
- **Production Release Phase**
 - Pilot run and closure of the development stage of the project

Concept To Market

CONCEPT TO MARKET



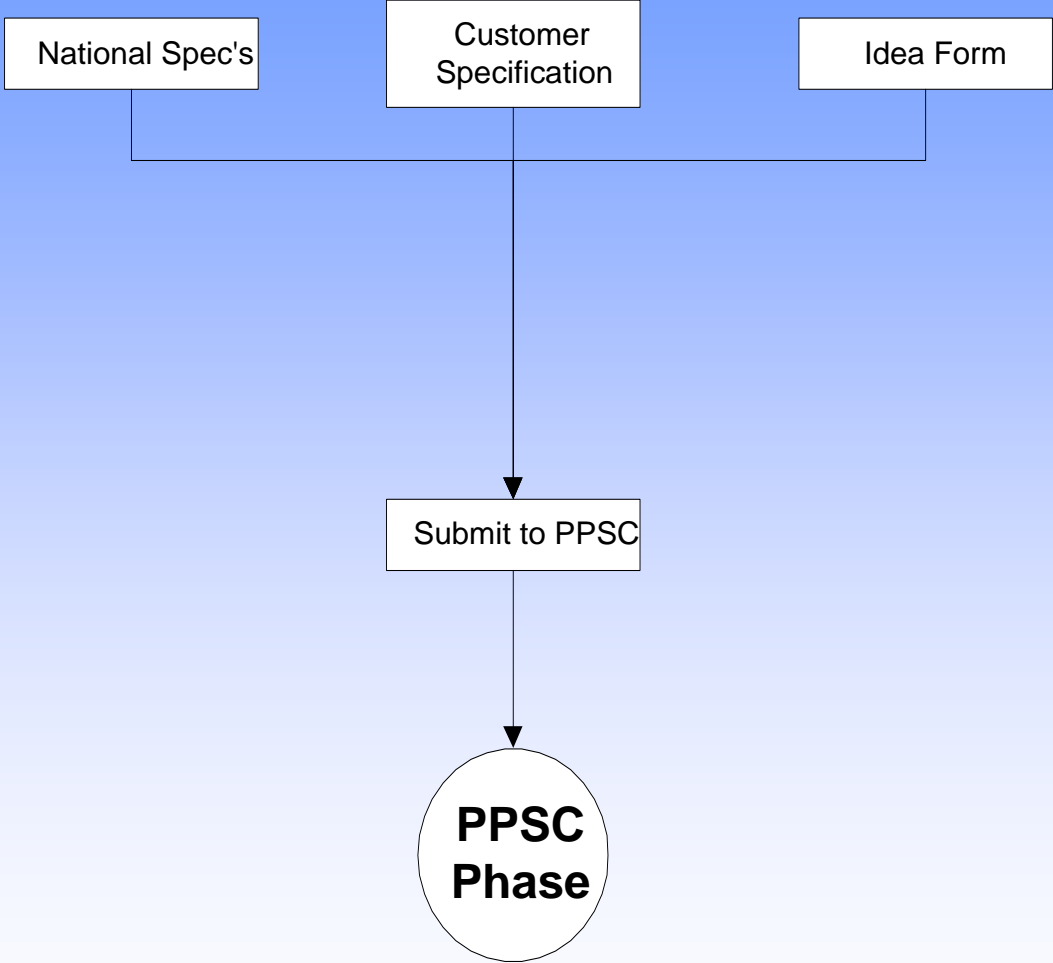
A Concurrent Development Process

The Development Process

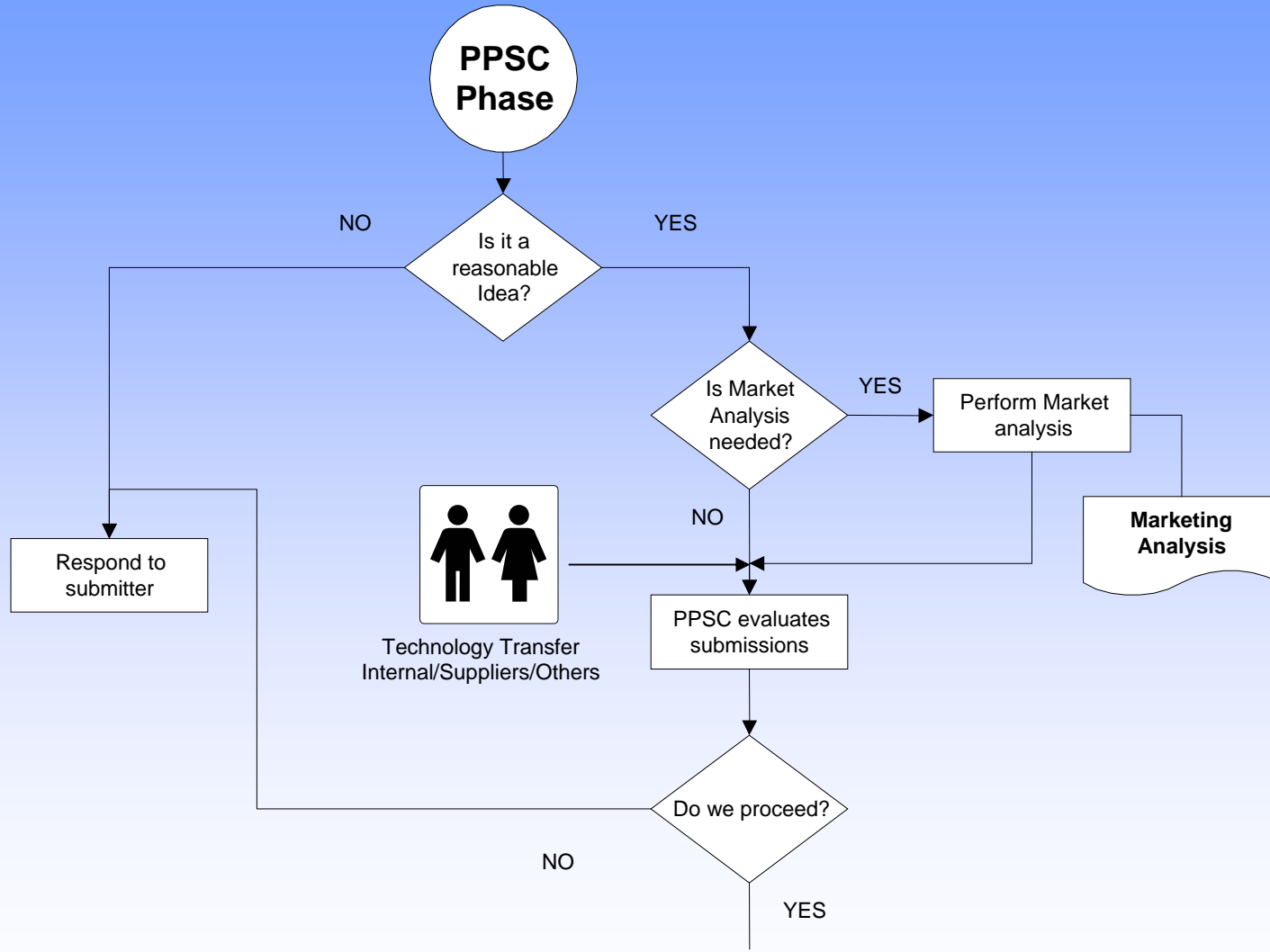
The Development Phases

Q & A

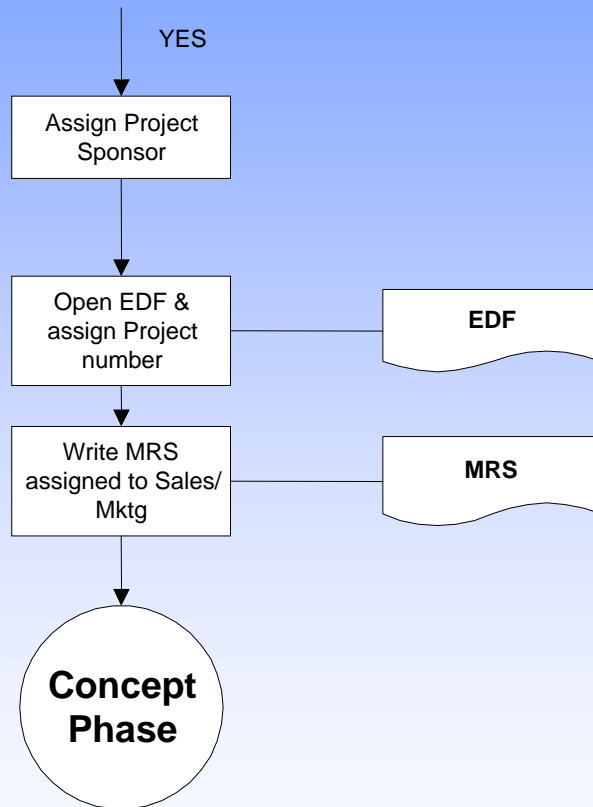
Preliminary Requirements Phase



PPSC Evaluation Phase



PPSC Evaluation Phase



Market Analysis

- **Only performed if the PPSC determines it is necessary**
- **May be generated by any department**
- **Purpose is to provide information so that the PPSC can determine if an idea is worthy of moving to the next phase**

Market Analysis

- **Contents:**
 - **Competitive Analysis**
 - **Market Potential Analysis**
 - **Market Share Analysis**
 - **Customer Analysis**
 - **Pricing Analysis**
 - **Marketing Research**

Engineering Design File (EDF)

- A repository for key project documentation
- Required for all design projects
- Initiated by the project sponsor using a design control checklist form
- Once a project engineer/manager is assigned, he/she takes over responsibility for the EDF

Marketing Requirements Specification (MRS)

- **Required for all design projects**
- **Generated by Sales & Marketing department**
- **Contents:**
 - **Project/Product Name**
 - **Project/Product Purpose**
 - **Target Market Price**
 - **Target Margin****(cont.)**

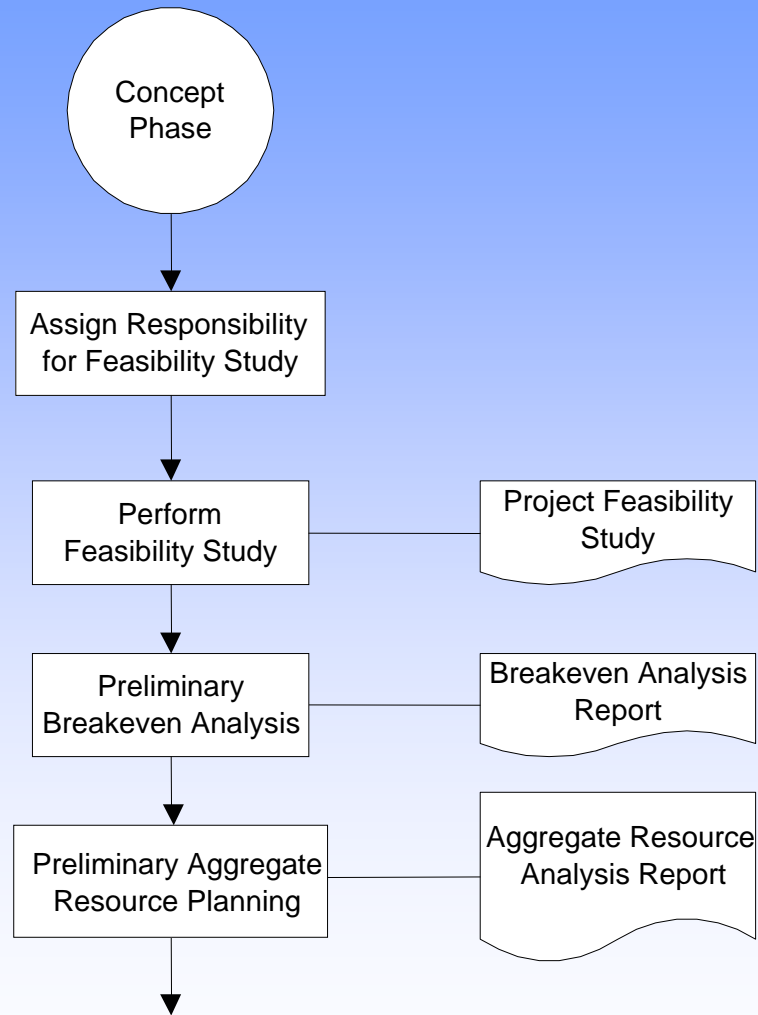
Marketing Requirements Specification (MRS)

- **Contents (cont.):**
 - **Expected Volume**
 - **Delivery Time Frame**
 - **Product Life Cycle**
 - **Referenced Documents**
 - **Affect on other Sales and Products**
 - **Affect on Market Place**
- (cont.)**

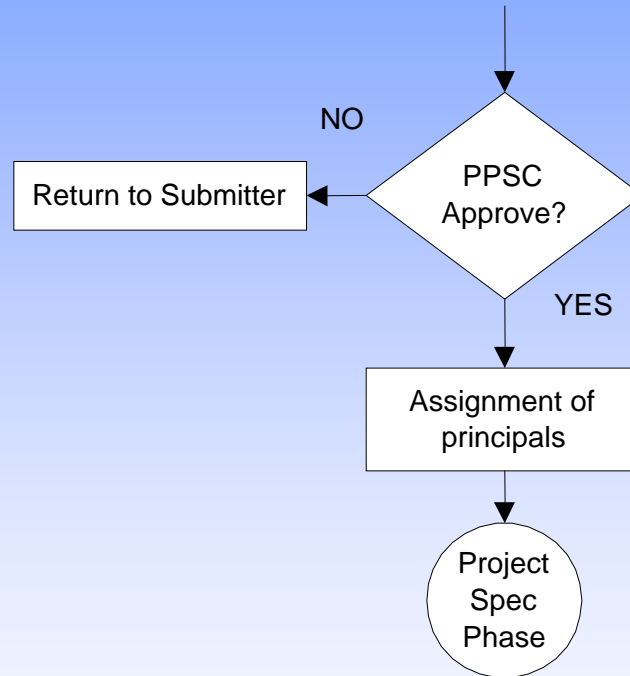
Marketing Requirements Specification (MRS)

- **Contents (cont.):**
 - **Detailed Requirements**
 - **Inputs**
 - **Outputs**
 - **Functions**
 - **Performance**
 - **Manufacturing Costs**
 - **Power Type and Consumption**
 - **Physical Size and Weight**
 - **Design Priorities**

Concept Phase



Concept Phase



Project Feasibility Study

- **Required for every project**
- **Contents:**
 - **High-Level Technical Feasibility**
 - **Technology/Supply Analysis**
 - **Manufacturing Cost Estimate**
 - **Development Cost Estimate**
 - **Preliminary Development Schedule****(cont.)**

Project Feasibility Study

- **Required for every project**
- **Contents (cont.):**
 - **Estimate to Prepare the PDP**
 - **Estimated Product Costs**
 - **Predicted Product Life Expectancy**
 - **Statements Identifying In-house, Contract, or Outsourced Work**

Breakeven Analysis Report

- **Required for every project**
- **A form generated by the finance department**
- **Contains the data to readily determine the estimated time and number of units to be sold to get a return on investment**
- **Revised for design reviews as necessary**

Aggregate Resource Analysis Report

- **Required for every project**
- **Generated by the aggregate project administrator**
- **Provides aggregate resource and schedule information for all current and proposed projects**

Aggregate Resource Analysis Report

- **Treats sustaining engineering and engineering services as projects**
- **Includes training time and TQM teams**

Aggregate Resource Analysis Report

- Contents:
 - The current aggregate schedule of ongoing projects
 - Proposed aggregate schedule of containing the project under consideration
 - Identifies ***all resources required for each project***
 - May contain critical path, suggestions for schedule improvement and other points of interest

Aggregate Project Administrator (APA)

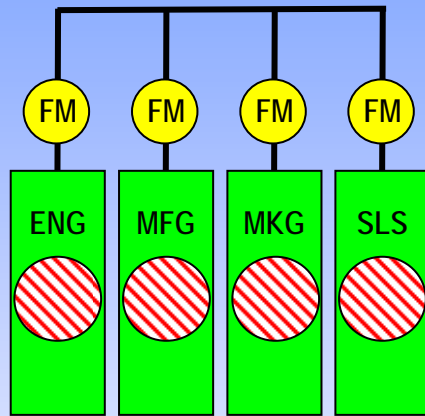
- **Generates the aggregate project report**
- **All company resources must be accounted for in a Microsoft Project database**
- **Project engineers/managers submit their projects to the APA using strict Microsoft project guidelines and formats**

Aggregate Project Administrator (APA)

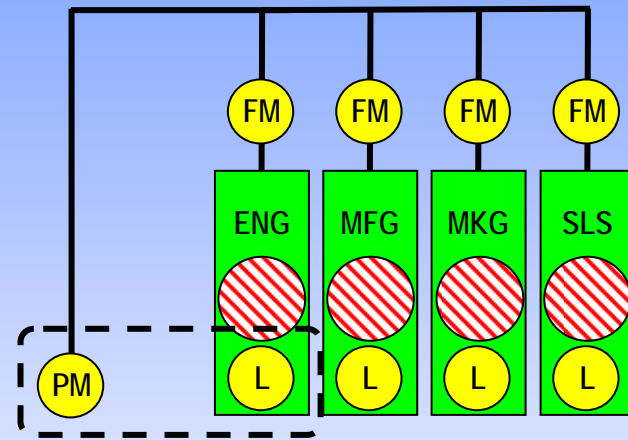
- **Need to give margin for unplanned events**
- **The APA is an administrative role to support the PPSC - not a project management role**

Project Management / Team Structure

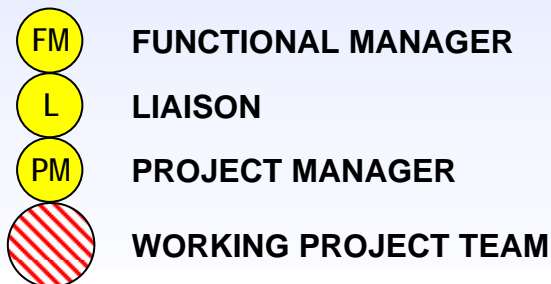
FUNCTIONAL TEAM STRUCTURE



LIGHTWEIGHT TEAM STRUCTURE

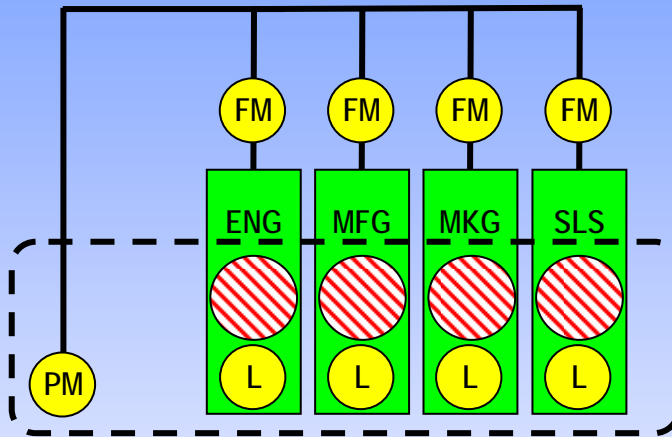


AREA OF STRONG
PM INFLUENCE

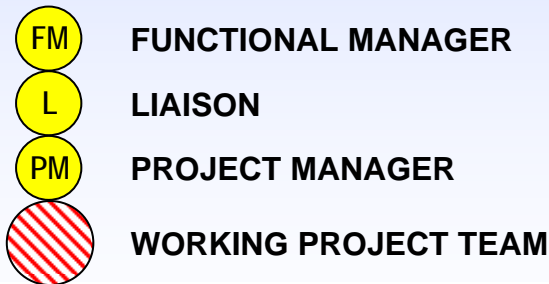


Project Management / Team Structure

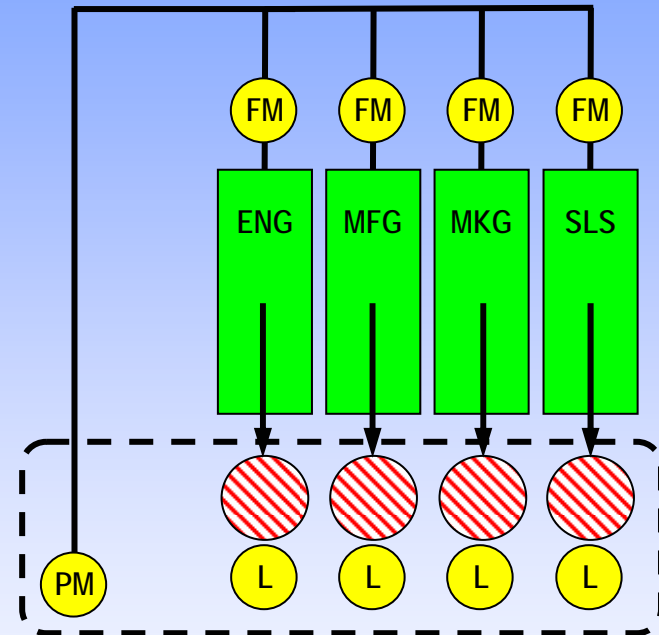
HEAVYWEIGHT TEAM STRUCTURE



AREA OF STRONG
PM INFLUENCE



AUTONOMOUS TEAM STRUCTURE



AREA OF STRONG
PM INFLUENCE

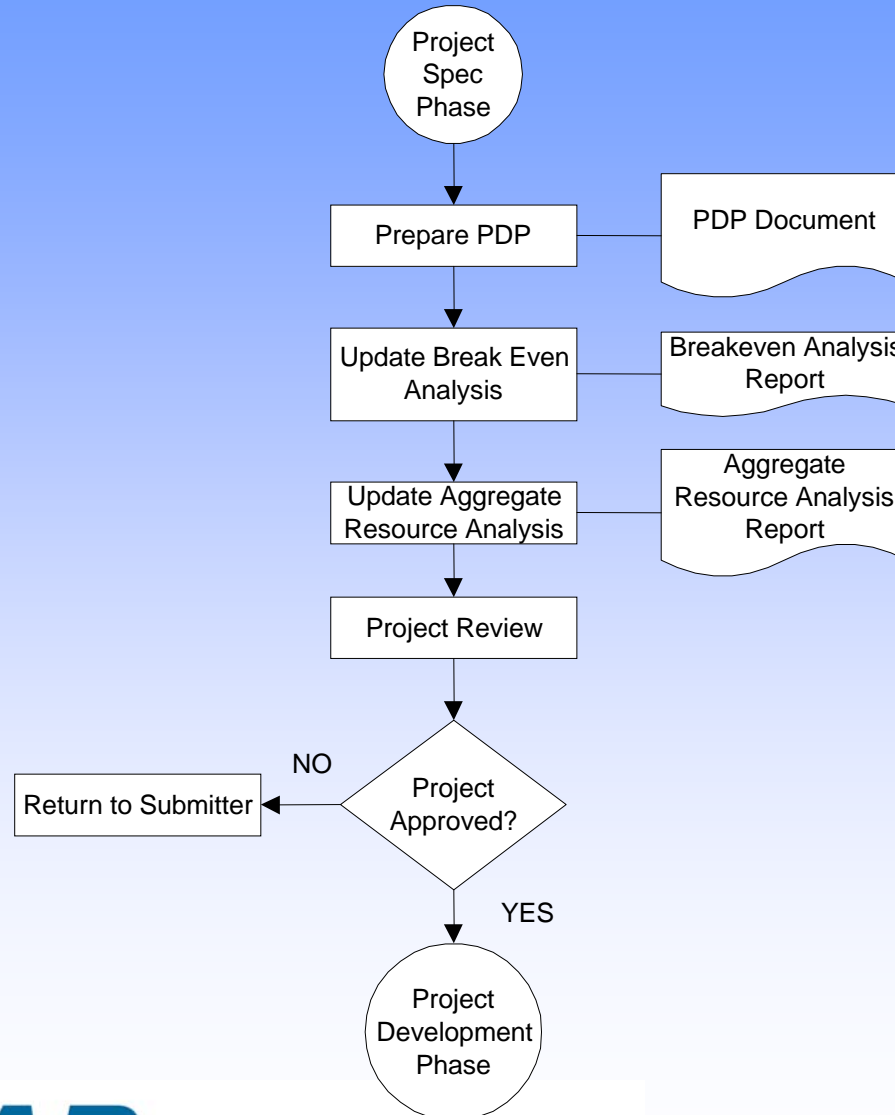
Project Management / Team Structure

- **Functional Team Structure**
 - **Work completed in the function and coordinated by functional managers**
- **Lightweight Team Structure**
 - **A coordinator works through liaison representatives but has little influence over the functions**

Project Management / Team Structure

- **Heavyweight Team Structure**
 - **Strong leader exerts direct, integrating influence across all functions**
- **Autonomous Structure**
 - **Heavyweight team is removed from the function, dedicated to a single project and co-located**

Project Specification Phase



Product Development Plan

- Addresses all of the remaining design activities using guidelines from the project sponsor and preceding development documents
- Contents (direct ISO requirements in red):
 - Approvals
 - Design specifications and requirements (may reference outside documents)
 - Organizational and technical interfaces(cont.)

Product Development Plan

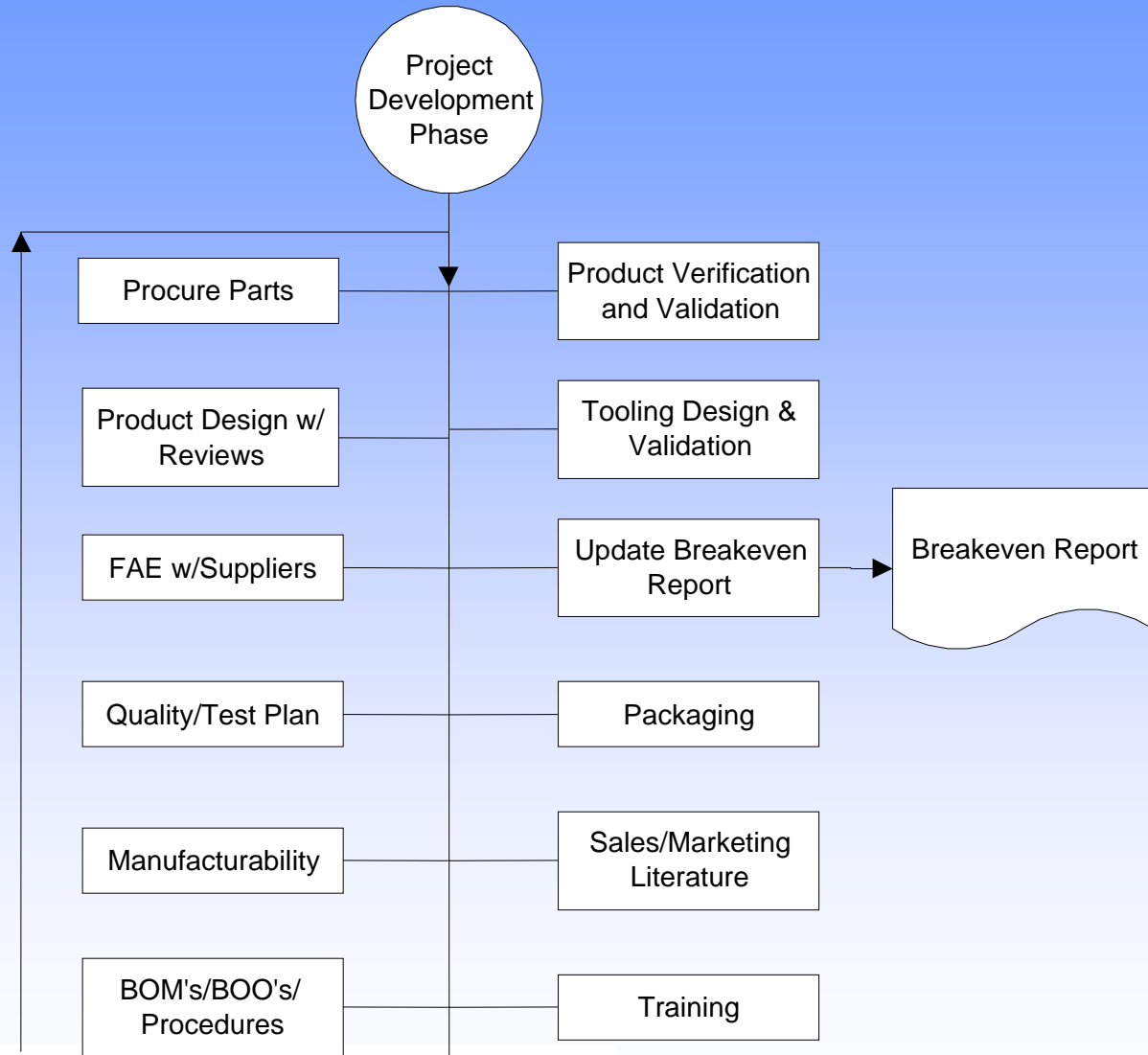
- **Contents (cont.):**
 - **Task description and schedule**
 - **Each development activity identified and scheduled**
 - **Resource responsibilities identified**
 - **Special resource requirements and how they will be obtained**
 - **Design review meetings**
 - **Design verification**
 - **Design validation**

(cont.)

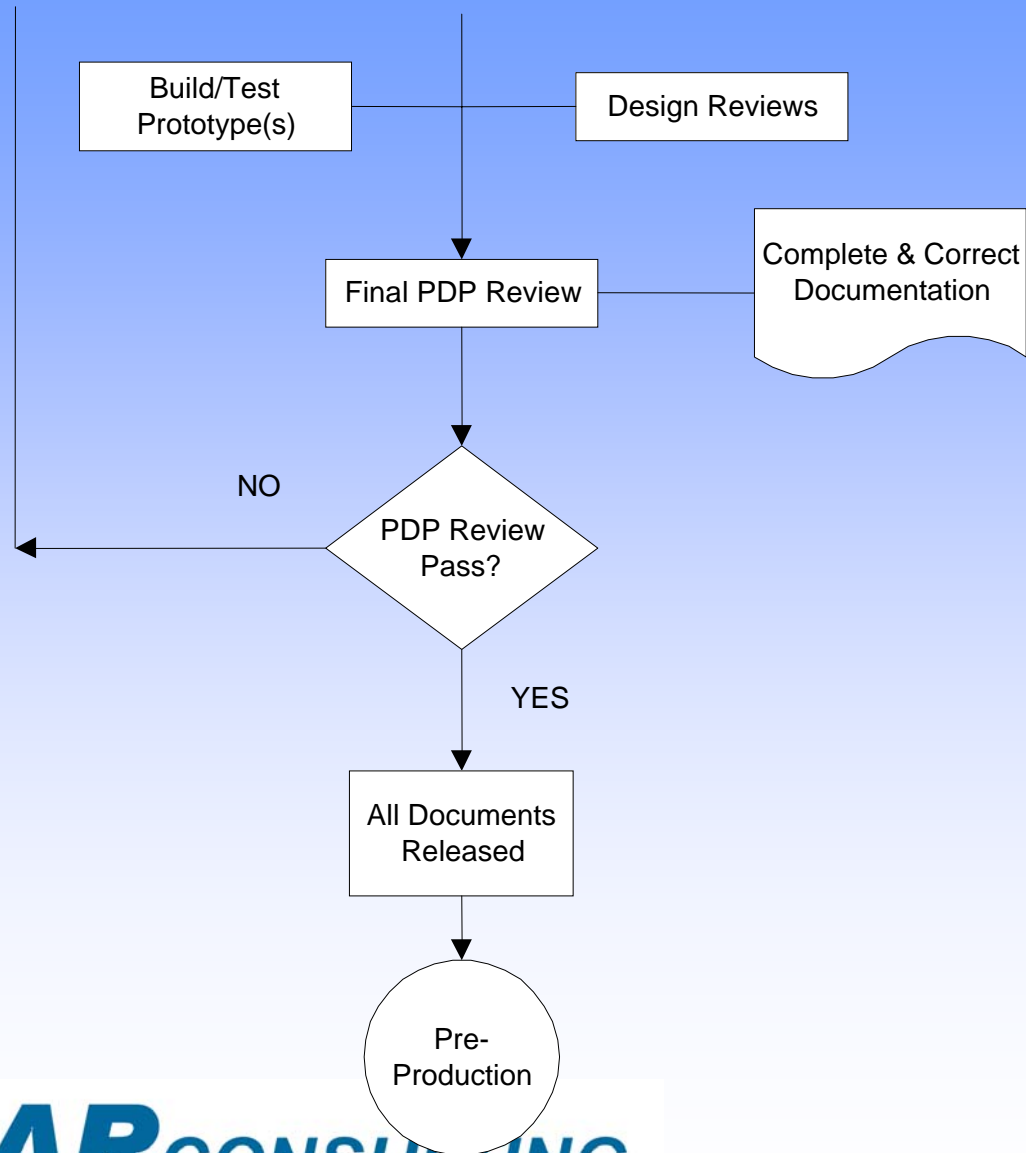
Product Development Plan

- **Contents (cont.):**
 - **Project cost estimates**
 - **Product cost estimates**
 - **Design output**

Project Development Phase



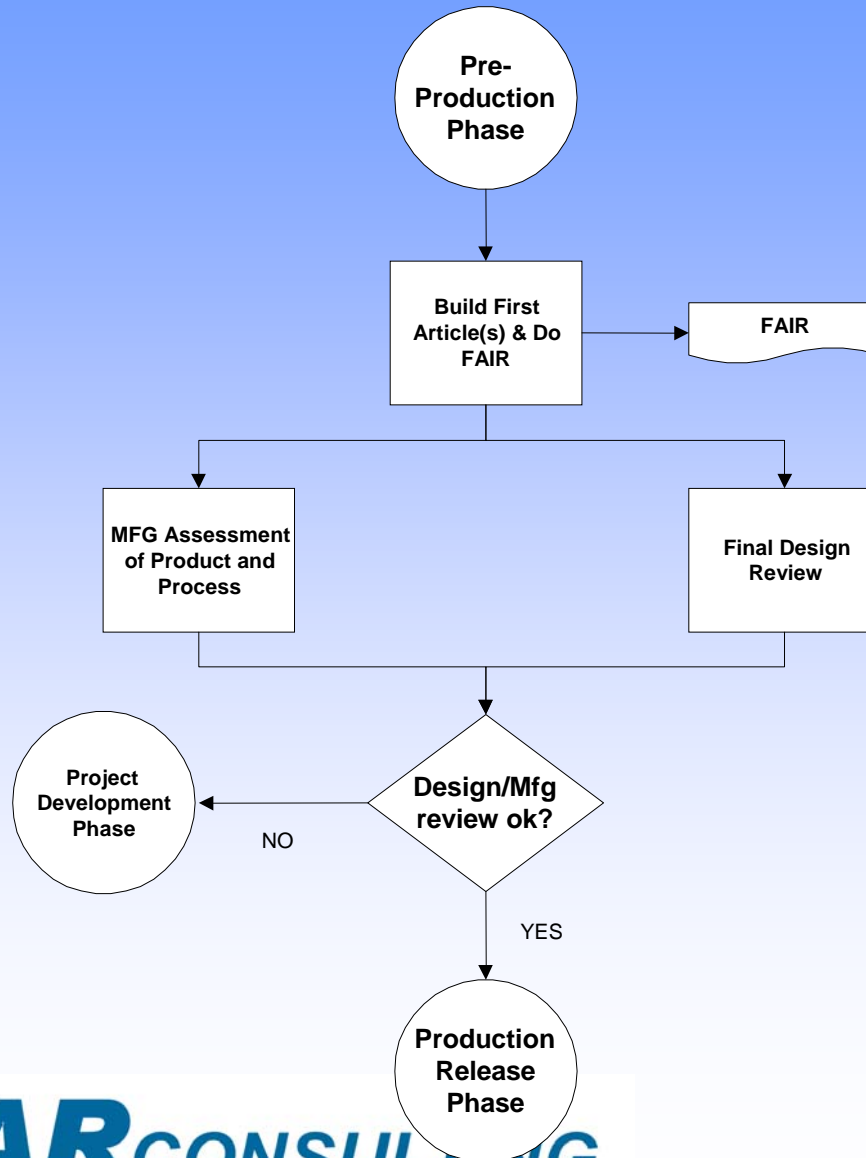
Project Development Phase



Engineering Procurement

- **Must react quickly to engineering needs**
- **Can read schematics and formulate BOMs**
- **Cost items and buy in small quantities**
- **Has technical expertise to cross over components**
- **Tied into the goals, restrictions and directions of the purchasing department to avoid downstream surprises**

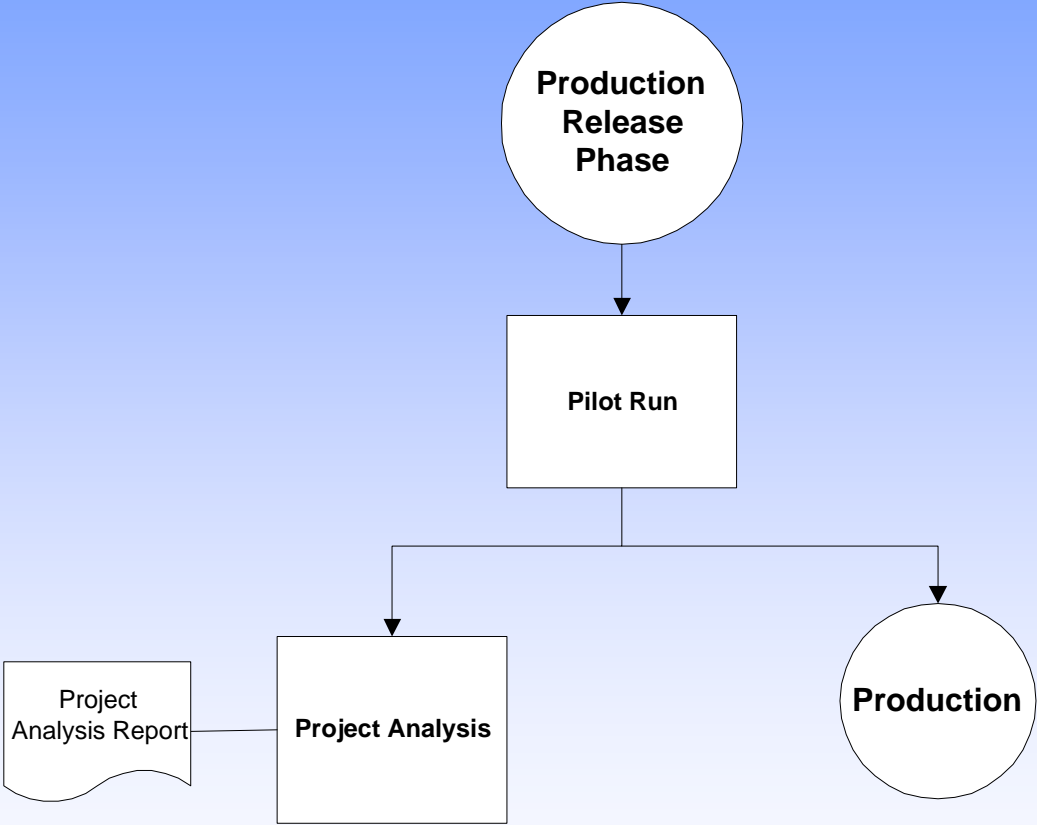
Pre-Production Phase



First Article Inspection Report (FAIR)

- **First article inspection and report is completed**
- **Manufacturing assessment of product and process is performed**

Production Release Phase



Project Analysis Report

- **Provides feedback to the development process at the conclusion of a project**
- **Contains an overall assessment of the project**
- **Lists positive and negative aspects of the project**
- **Suggests modifications or enhancements to the development process**

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