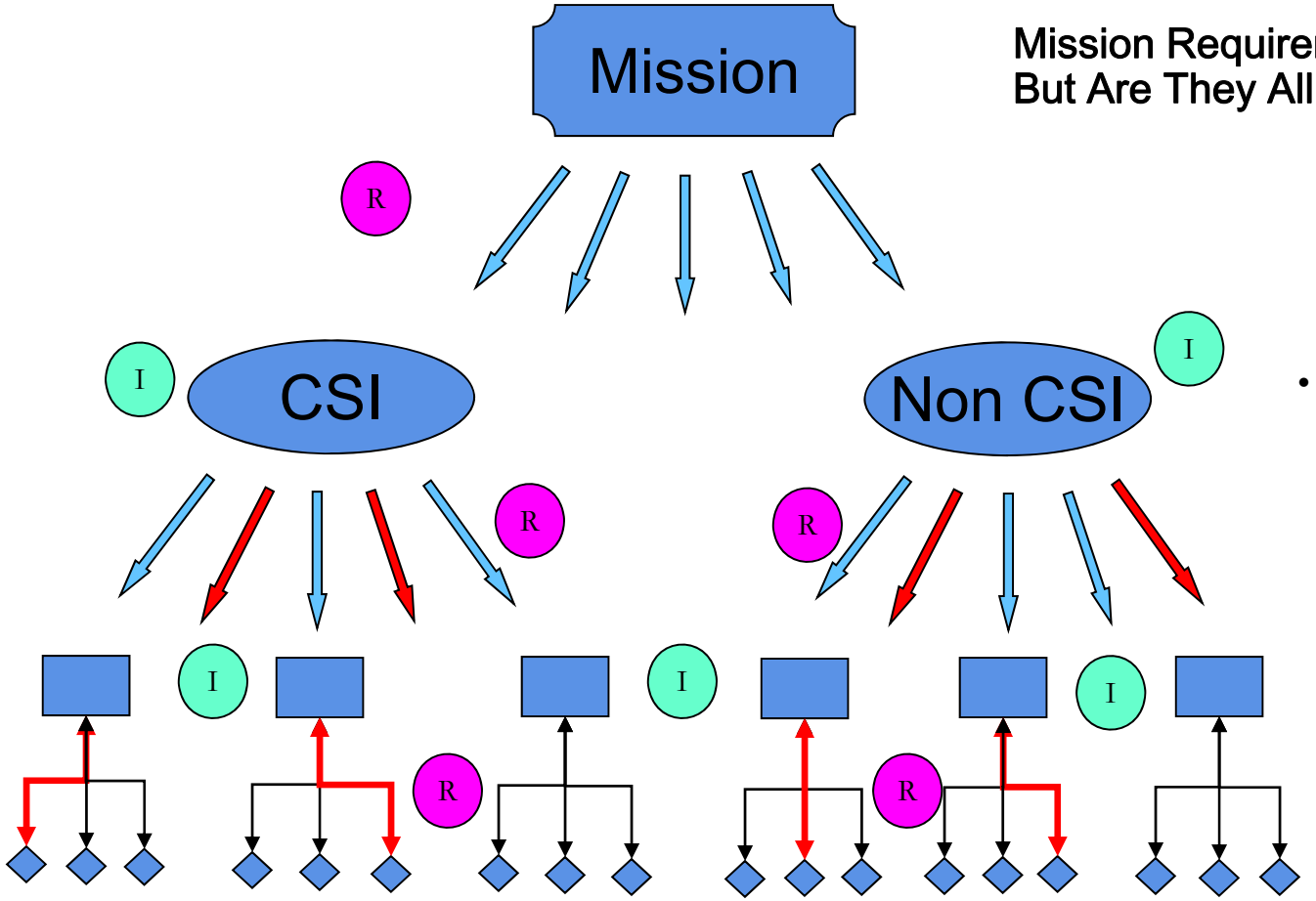
APPENDIX A

SPECIAL REQUIREMENTS

REQUIREMENTS

- All requirements are not created equal
  - Failure of some requirements will have greater impact
  - Some requirements will require additional attention and oversight
  - Some requirements will not easily tolerate variance

REQUIREMENTS FLOWDOWN



Mission Requirements Must All Be Met
But Are They All Equal In Significance?

- Mission Requirements
- Functional Objectives
- Mission Environments

- CSI – Critical Safety Item

- System Requirements
- Sub-System Req'ts
- User Needs

- Component Req'ts

- Part Requirements

Criticality Determined By:
- Risk Analysis
- FMEA
- Etc.

INTERRELATED CONCEPTS

- New and old terms that are interrelated
  - Special Requirements
    - Special requirements will be identified when determining requirements related to the product
  - Critical Items
    - Special requirements may then require the identification of critical items
    - Design output will then include identification of critical items that will require specific actions to ensure they are adequately managed.
  - Key characteristics
    - Some critical items will be further classified as key characteristics
    - Variation needs to be closely monitored and controlled.

SIMPLIFIED??

- Key Characteristics Simplified
  - Communication of criticality between Engineering & Production
  - In House or Outsourced Production
- Special Requirement & Critical items simplified
  - Communication of criticality between Engineering<>Engineering
    - both in house and outsources
- Common Expectations
  - More rigorous controls to be in place

3.2 SPECIAL REQUIREMENTS

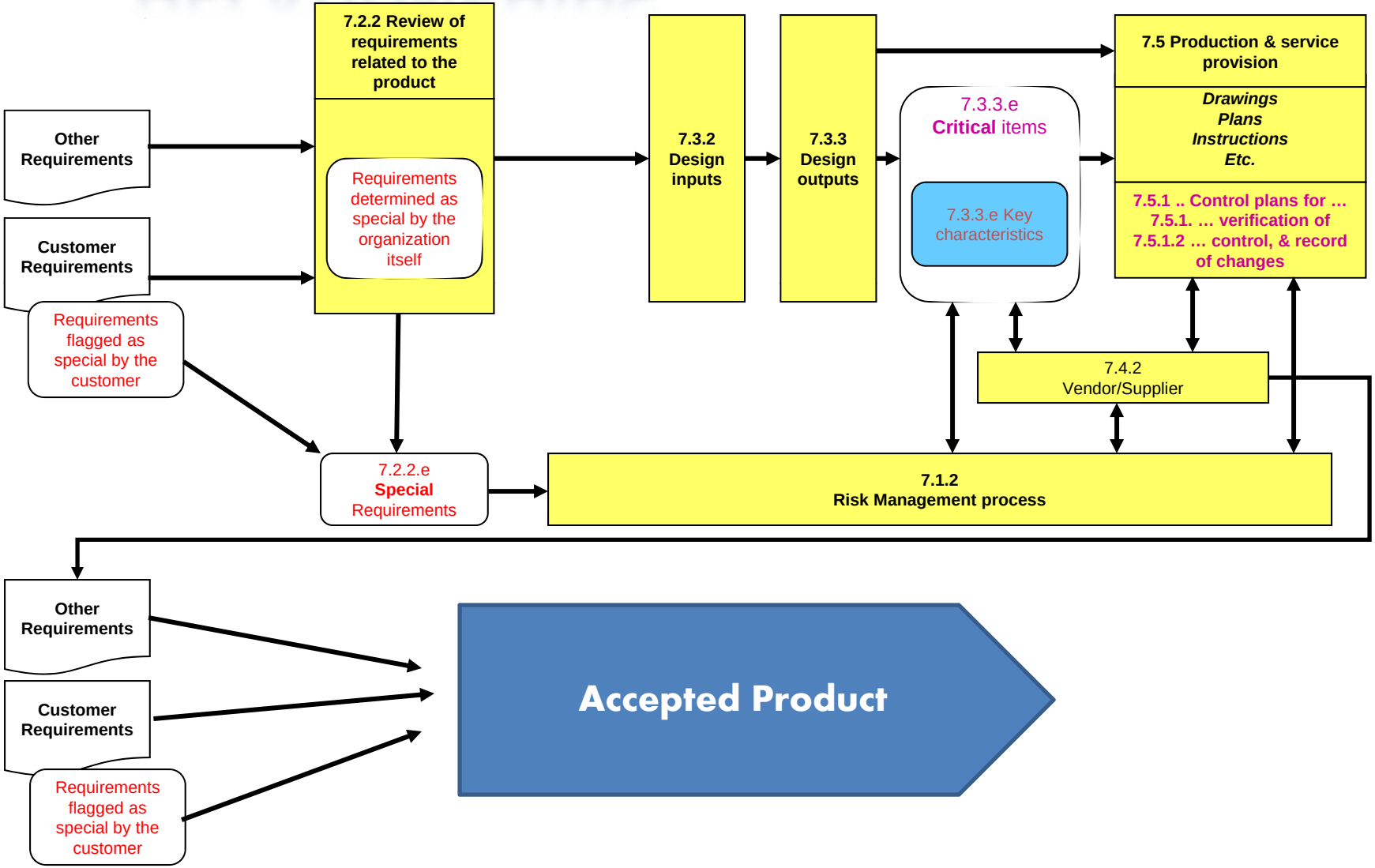
- Require inclusion into the risk management process
  - high risks to being achieved
  - identified either internally or externally
- Factors used in determination may include product or process complexity or maturity

Example: Performance requirements imposed by the customer that are at the limit of the state-of-the-art, or requirements determined by the organization to be at the limit of their technical or process capabilities.

3.3 CRITICAL ITEMS

- Items
  - * Hardware
  - * Functions
  - * Characteristics
  - * Software
  - *Parts
  - * Processes
- Have significant effect on product realization and use of the product
  - * Safety
  - * Form, fit, function
  - * Service life
  - * Performance
  - * Producibility,
- *Example: Include safety and flight critical items, fracture critical items, mission critical items*

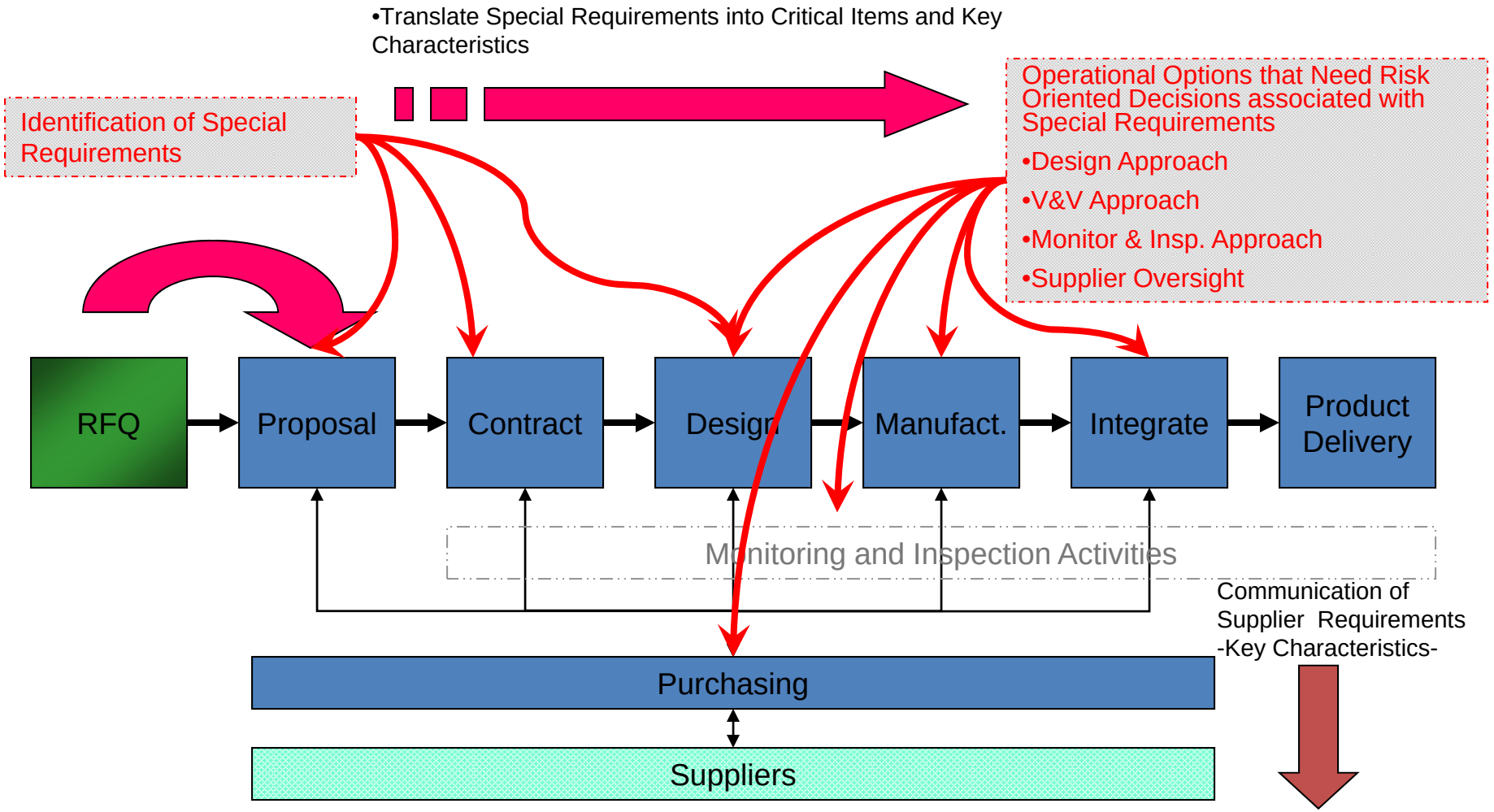
RELATIONSHIPS



EVALUATE IMPLEMENTATION

- Has the concepts of special requirements and critical items been integrated in the QMS with key characteristics
  - 7.1 Planning NOTE …requirements for the product include consideration of aspects such as…
  - 7.2.2 Review of requirements …d) contractual requirements are reviewed so that special requirements of the product are determined, and e) risks (e.g., new technology, short delivery time frame) have been identified
  - 7.3.1 Design… safety and functional objectives of the product in accordance with customer, statutory and regulatory requirements.
  - 7.5.1 Control of Production…– establishing, implementing and maintaining appropriate processes to manage critical items, including process controls where key characteristics have been identified,…
  - 8.2.4 Monitoring and measurement… When critical items, including key characteristics, have been identified the organization shall ensure they are controlled and monitored in accordance with the established processes.

IMPACT ON AS9100



All Requirements are not created equal

APPLIED THEORY

Aviation	Defense	Space
Special Requirements	Special Requirements	Special Requirements

From these identified Special Requirements list some possible associated Critical Items and Key Characteristics.

- Engine that produces in excess of 2 pounds of thrust for every pound of weight and 25% less fuel consumption
- Emergency Egress from passenger compartment of commercial passenger jet must be15 minutes or less.
- New cargo jet must be able to land and take off from smaller general aviation airports

APPLIED THEORY

Aviation	Defense	Space
Special Requirements	Special Requirements	Special Requirements

From these identified Special Requirements list some possible associated Critical Items and Key Characteristics.

- An armored personnel carrier that will exceed 55 mph in off road conditions with a range of 200+ miles.
- A shipboard search radar system that can simultaneously track over 200 individual targets.
- A 9mm light weight infantry weapon with a rate of fire between 200 and 300 rounds per minute when automatic fire is selected.

APPLIED THEORY

Aviation	Defense	Space
Special Requirements	Special Requirements	Special Requirements

From these identified Special Requirements list some possible associated Critical Items and Key Characteristics.

- An auxiliary solid fuel booster to be used by both the Delta and Atlas missile.
- Onboard universal navigation software to be used for interplanetary exploration on both manned and unmanned platforms.
- A high reliability positioning motor for use on the new constellation program.

OBSTACLES TO IMPLEMENTATION

- Developing and integrating the Essential item lifecycle
  - Understanding all aspects of internal and external special requirements
  - Understanding how the Risk Concept influences the identification of special requirements which translate to critical items and key characteristics
  - Finding effective ways to communicate special requirements critical items and key characteristics throughout the organization and to Suppliers
  - Others?