Making Electronic Parts and Packaging Technology Viable for Flight Projects

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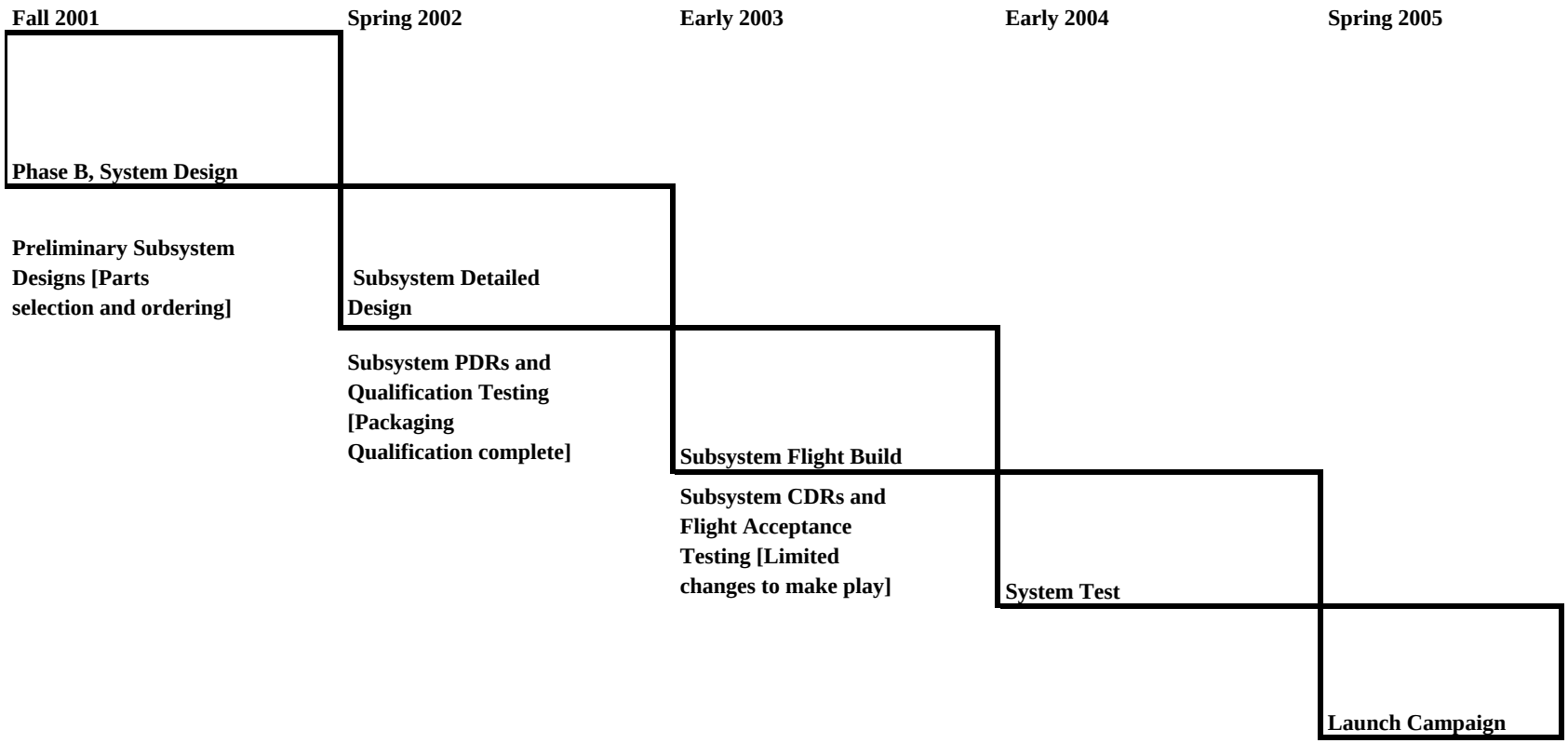
Example Project Life Cycle



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- **There are currently many different types of missions either in development or in planning**
  - **Earth orbiters and Deep Space probes**
  - **Landers and rovers**
  - **Technology demonstrations and Science missions**

- **All off these missions can have widely varying radiation, thermal and dynamics requirements that can affect both electronics parts selection and electronics packaging**

- **There are two requirements that are common for all missions which also affect electronic parts selection and electronic parts packaging**
  - **The hardware must work**
  - **The objectives for the mission must be met**

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- **What does this mean for NEPP?**
  - **In order for technologies to be acceptable for flight use they must have demonstrated enough maturity to represent acceptable risk to the project**
  - **"Acceptable risk" is hard to define as varies from project-to-project depending on the mission objectives**
  - **Determine what are the important criteria that encompasses the needs of the projects and develop a methodology to support those needs**
  - **Provide for higher levels of integration to reduce size and mass**

- **Electronic Parts**
  - **Development of a database that can provide the capabilities, availability, and reliability and make it readily available to designers**
  - **In the case of impactors and penetrators, what are the dynamic environments and are they encompassed by the existing parts screens?**
  - **In the case of any surface missions, what are the thermal extremes, operating and non-operating, and will the devices meet specification/survive?**
  - **What are the radiation environment capabilities for new technologies?**

- **Electronic Packaging**
  - **Database of new components with footprints for packaging designs**
  - **In the case of impactors and penetrators, what are the dynamic environments and what packaging techniques are qualified over those levels**
  - **In the case of any surface missions, what are the thermal extremes, operating and non-operating, and what packaging techniques are qualified over those levels**
  - **Compatible with contamination control and planetary protection requirements**

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- **Continued pressure to make the spacecraft small, reduced mass and reduced power consumption**
  - **For a wide variety of projects there is a need to infuse new technology to accomplish this desire**
  - **Technology needs to be sufficiently mature to represent acceptable risk to the project both technically and programmatically**

- **Technology programs need to be looking at the family of projects that are five or more years into the future to understand the spacecraft and instruments requirements**