

2005-1003

On-Demand Science Missions

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On-Demand Science Missions

- Introduction
- Traditional Science Missions
- On-Demand Science Missions
- Responsive Science Spacecraft
- Science Enabling Technologies
- On-Demand Science Mission Life Cycle
- Conclusions

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Objective

To understand the key elements of an on-demand (responsive) science mission.

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Main Message

On-Demand Science Missions:

- Lower costs
- Increase reliability
- Quality improvement
- Greater performance

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Introduction

On-Demand science missions:

- Highly flexible mission architectures.
- Integrated operations (ground & space).
- Automated manufacturing.
- Modular processes & systems.

Sourced on-demand – Integrated rapidly.

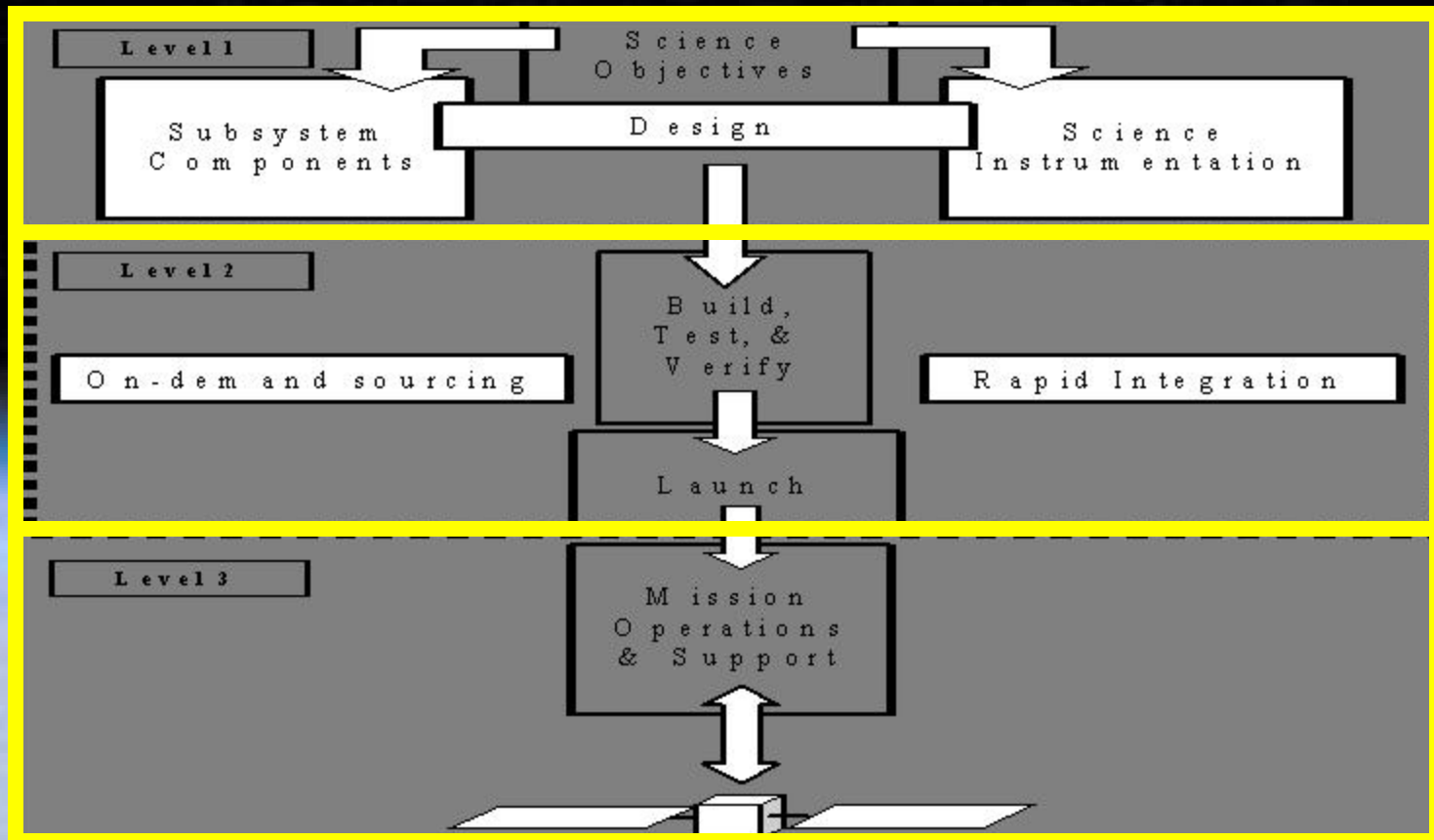
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Traditional Science Missions

- Standard project life cycle.
- Resource distribution & utilization.
- Budget and cost pressures.
- Complex costing & analysis.
- Project delays or cancellations.

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On-Demand Science Missions



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Responsive Science Spacecraft

3 Key Elements:

- Capability
 - Operations
- Capacity
 - Performance
- Cost Effectiveness
 - Efficiency

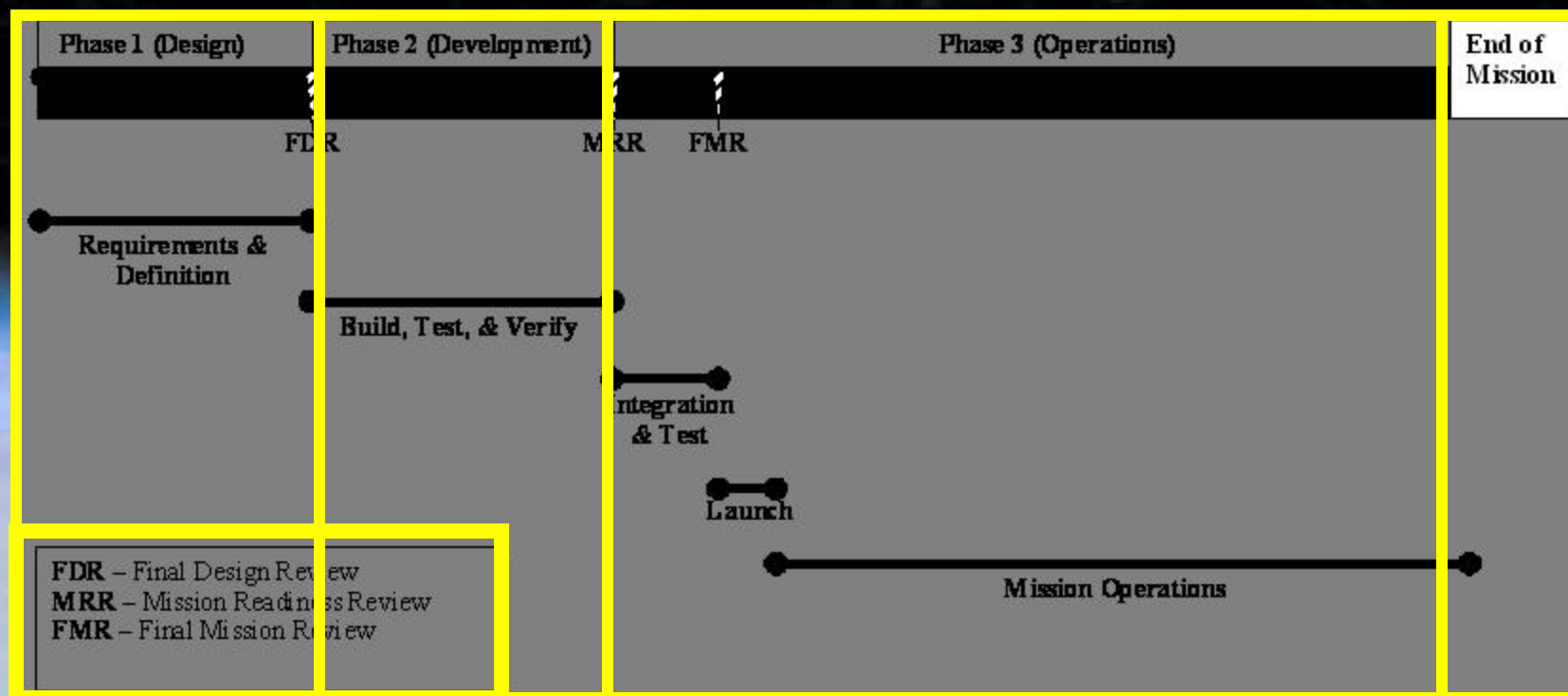
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Science Enabling Technologies

- **Rapid design & development**
 - Prototyping, Simulation, Integrated Manufacturing.
- **Propulsion**
 - Electric Ion, and Nuclear.
- **Power**
 - Solar cells, batteries, RTGs.
- **Communications**
 - Laser technology.
- **Software**
 - Autonomous systems.
- **Materials**
 - Nanotechnology, and enhanced properties.

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On-Demand Science Mission Life Cycle



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Conclusions

On-Demand Science missions:

- + Greater efficiencies
 - + More flexibility
 - + Scalable hardware
 - + Reduction in complexity
 - + Utilize fewer resources
 - + Accelerated processes
- = **Greater return of science.**

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