Part 6

C·O·S·T ENGINEERING™

„Design and Marketing of Rockets"

Lecture Series given by Dr.-Ing. Robert Alexander Goehlich

- Part 6: Basics about Space Transportation Systems -

Content

- **General**
- **Space Transportation Systems**
  - Expendable versus Reusable Rockets
  - Single-stage versus Multi-stage Rockets
  - Propulsion Technology
  - Typical Ascent Trajectory
  - Spaceports
- **Definition**
  - Cost Engineering (Practice VI)
- **Requests from Audience for Lectures**

General
Contact

Dr.-Ing. Robert Alexander GOEHLICH
Mobile: +81-(0)90 1767 1667
Fax: +81-(0)45-566-1778
Email: mail@robert-goehlich.de
Internet: www.robert-goehlich.de

Ms. Akiko FUJIMOTO (Teaching Assistant)
Mobile: +81-(0)80-5039-6222
Email: af07302002@yahoo.co.jp

Mr. Kenji HASEGAWA (Webmaster)
Mobile: n.a.
Email: malayzaru@hotmail.com

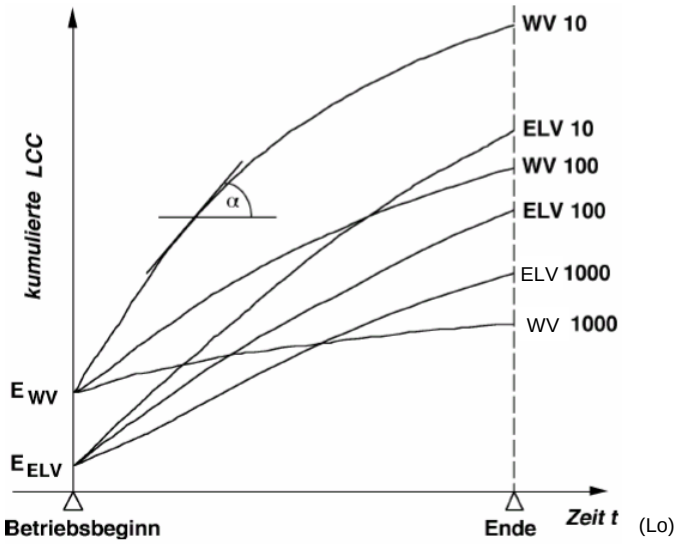
Keio University
Department of System Design Engineering
Ohkami Laboratory
(Space System Engineering)
Office 14-609/14-620
3-14-1 Hiyoshi
Kohoku-ku
Yokohama 223-8522
JAPAN

General
Goal of Today‘s Lecture

„You will learn about basics of space transportation systems and do some exercises with selected examples.“

Expendable versus Reusable Rockets

Cost (Life-cycle) Diagram



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Single-stage versus Multi-stage Rockets

Single-stage Rocket

- example: Venture Star concept
- not feasible with today's technology
+ potential for aircraft-like operation
  => mass space tourism flights

Multi-stage Rocket

- example: Space Shuttle System
+ technical realization is easier
- little potential to cut operation costs
  => no mass space tourism flights

Propulsion Technology

Isp versus Acceleration of Different Concepts

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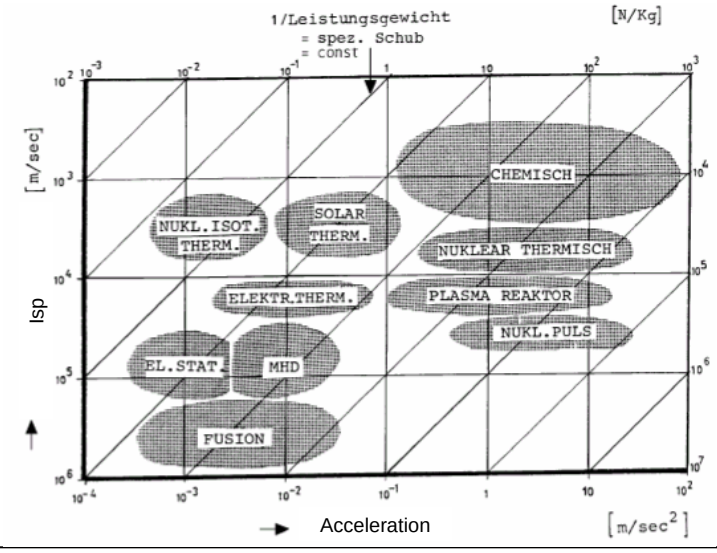

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Typical Ascent Trajectory

Realtime Simulation

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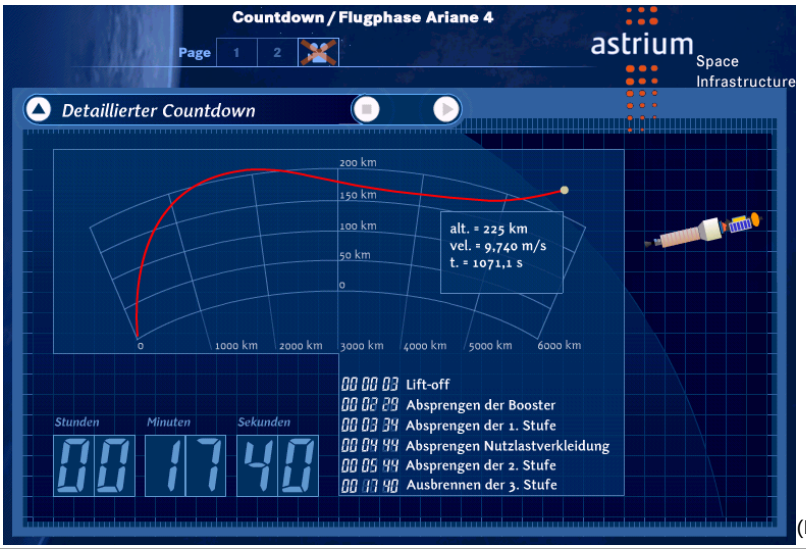

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Spaceports

Personal Experiences at Kourou Spaceport

Ariane 5 Core Stage

-1 Day before Lift-off

Definition

Definition of Cost Engineering (Practice VI)

Case C

- *Step 6: Make a drawing of the infrastructure of a typical spaceport by using your knowledge about cost engineering.*

Dr.-Ing. Robert Alexander GOEHLICH
Keio University
Department of System Design Engineering
Space System Engineering (Ohkami Laboratory)
3-14-1 Hiyoshi, Kohoku-ku
Yokohama 223-8522, JAPAN
email: mail@robert-goehlich.de
Mobile: +81-(0)90-1767-1667
Fax.: +81-(0)45-566-1778
Internet: http://www.robert-goehlich.de