

Part 11

No. 1



C.O.S.T ENGINEERING™

„Design and Marketing of Rockets“

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



- Part 11: Conclusion -

Content

No. 2



- **General**
- **Conclusion**
 - Potential of Cost Engineering
 - Limits to Realize Strategies
- **Definition**
 - Cost Engineering Practice
- **Requests from Audience for Lectures**

General Contact

No. 3



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General Goal of Today's Lecture

No. 4

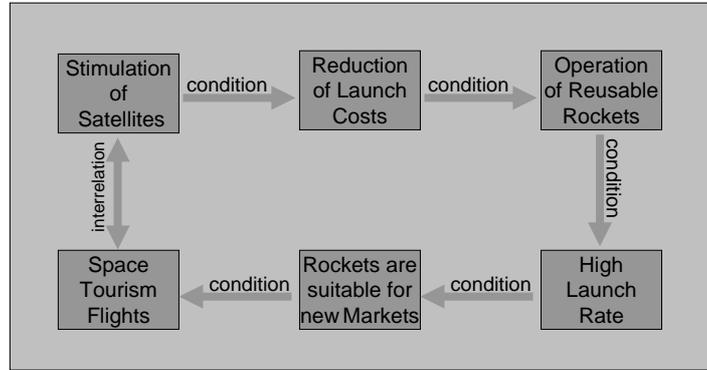


„You will learn about the potential as well as the limits of Cost Engineering.“

Chicken-Egg-Circle

Assumption for Long-term Aspects

No. 5



Potential of Cost Engineering

Comparison of Different Business Approaches



Cost Engineering

Smart Business Strategies

No. 7



Development	Production	Operation
Program Organization	Annual Production Rate	Pre-launch Operations
Type of Contract	Timing	Catastrophic Failure
Annual Funding Profile	Engine Chamber	Refurbishment
Schedule Deviation	Propellant Combination	Launch Site Support
Rapid Prototyping		Flight Rate
Technology Readiness		Payload Capability
Step-by-Step Method		
Mass Estimates		
Vehicle Concept		
Engine Overdesigning		

Potential of Cost Engineering

Comparison of Business Case Studies

No. 8



Vehicle	Phase	Business as Usual	Smart Business	Savings
Hopper Plus	Development	14,7 B\$	7,9 B\$	46 %
	Production (first unit)	1,2 B\$	0,6 B\$	50 %
	Operation (average)	30 M\$/launch	5,6 M\$/launch	81 %
Kankoh Maru Plus	Development	14,2 B\$	9,7 B\$	32 %
	Production (first unit)	0,8 B\$	0,6 B\$	25 %
	Operation (average)	24 M\$/launch	2,7 M\$/launch	89 %

Limits to Realize Cost Engineering

No. 9



- Manager and politicians are sceptical for novel changes.
Example: NASA budget.
- It takes much time to change the employee's way of thinking.
Example: NASDA, NAL and ISAS merging to JAXA.
- Due to political restrictions, it is not possible to realize all strategies.
Example: Airbus factories limitations.
- Due to budget limitations, it is not possible to realize optimal design.
Example: Space Shuttle.
- Due to sometimes quick priority changes in politics, it is not possible to use the full potential of cost saving strategies.
Example: Apollo program, Energia program.

Definition

Definition of Cost Engineering (Practice)

No. 10



Case C

- *Step 11: Prepare an action plan on how to implement cost engineering philosophy to existing aerospace industries or organizations.*



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