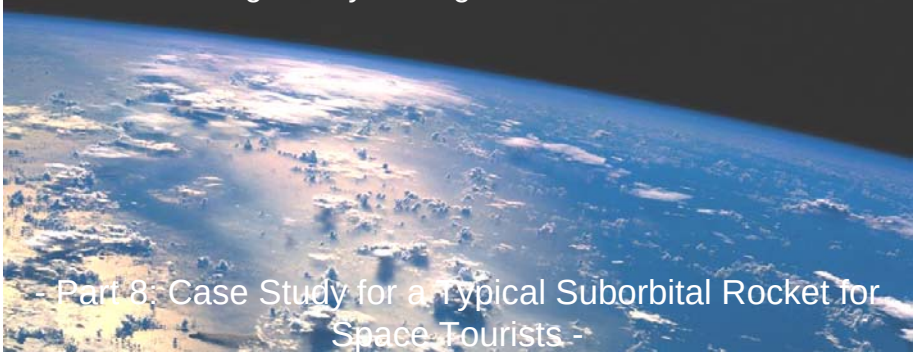
Part 8

C·O·S·T ENGINEERING™

„Design and Marketing of Rockets"

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



- Part 8: Case Study for a Typical Suborbital Rocket for Space Tourists -

Content

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General
Goal of Today‘s Lecture

„You will learn about details, pros and cons of a typical suborbital rocket for space tourists.“

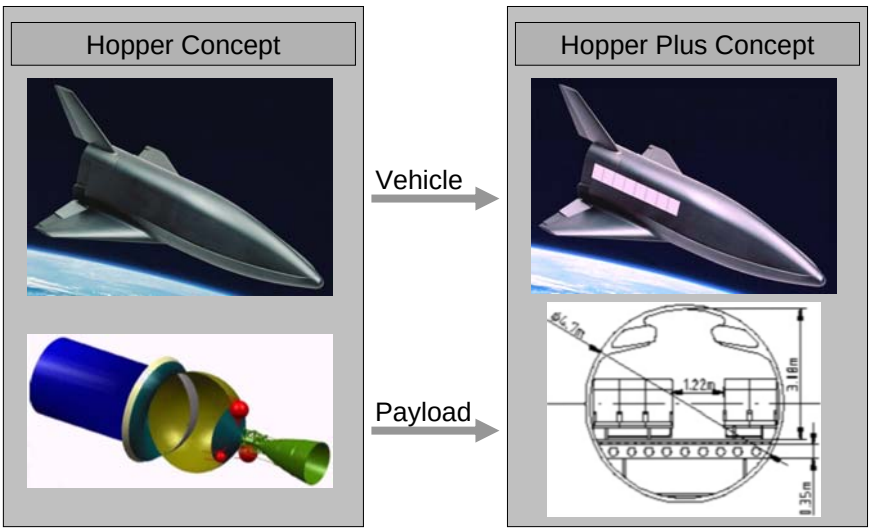
Hopper Concept

Suborbital Flight for Satellite Delivery

(movie)

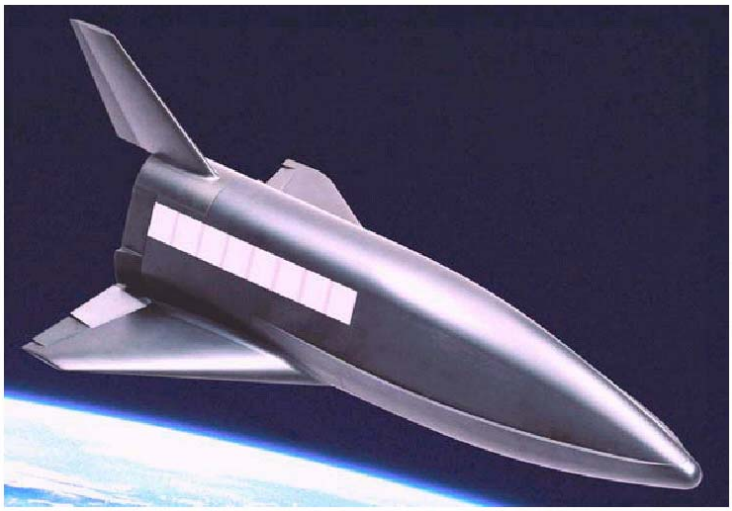
Hopper Concept‘s Suitability for Tourists

Modifications



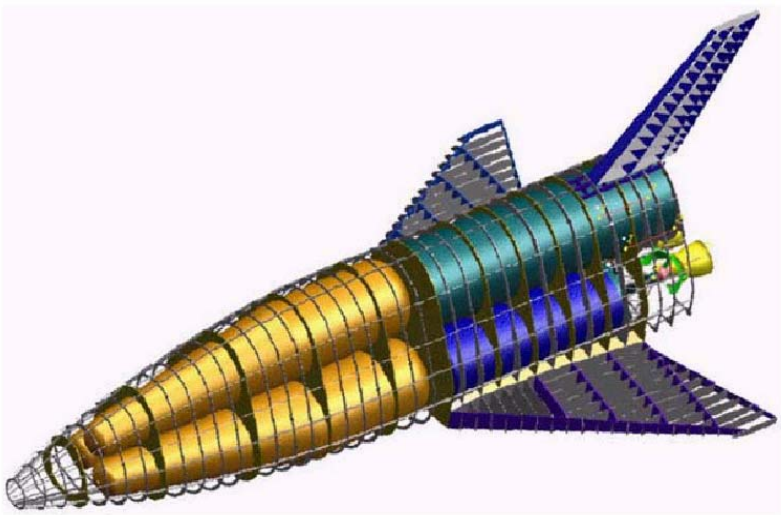
Vehicle Design (Hopper Plus)

Outside View



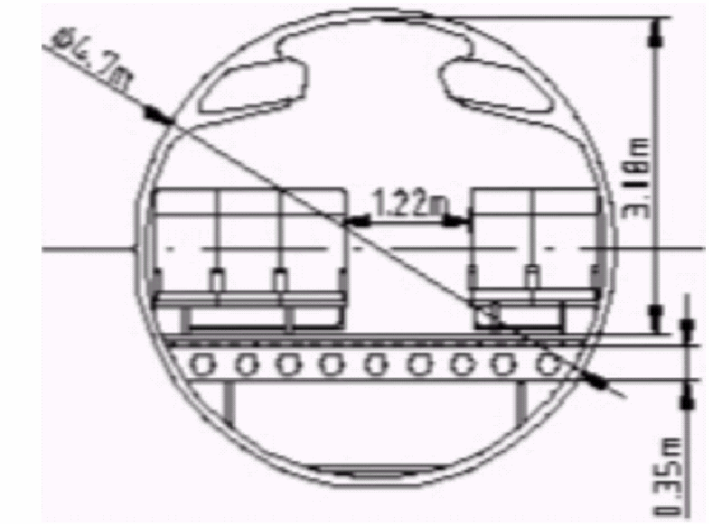
Vehicle Design (Hopper Plus)

Interior View



Vehicle Design (Hopper Plus)

Passenger Compartment (Interior View)



Mass Characteristics (Hopper Plus)

Subsystem	Vehicle	Pax Module	Total	Unit
Cold Structure	16,8	2,1	18,9	Mg
Hot Structure	12,6	0	12,6	Mg
LH2 Tanks	6,2	0	6,2	Mg
LO2 Tanks	3,9	0	3,9	Mg
Equipment	9,3	1,7	11,0	Mg
Engines	8,4	0	8,4	Mg
Recovery	2,0	0	2,0	Mg
DRY MASS	**59,2**	**3,8**	**63,0**	**Mg**
Payload	0	3,0	3,0	Mg
Propellants	394	0	394	Mg
TAKE-OFF MASS	**453,2**	**6,8**	**460,0**	**Mg**

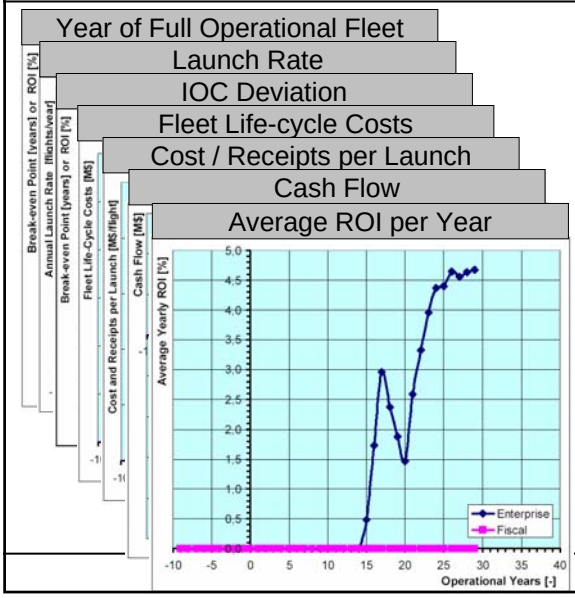
Flight Profile (Hopper Plus)

Launch: Kourou Spaceport	Cruise: Space, 130 km	Landing: Santa Maria Island
		

Economic Performance (Hopper Plus)

Simulation with TRASIM

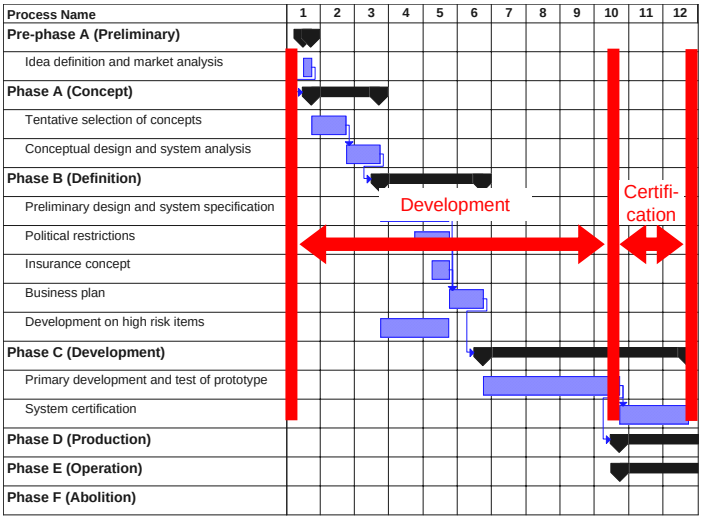
- Year of Full Operational Fleet
- Launch Rate
- IOC Deviation
- Fleet Life-cycle Costs
- Cost / Receipts per Launch
- Cash Flow
- Average ROI per Year



Economic Performance (Hopper Plus)

Example: Master Schedule

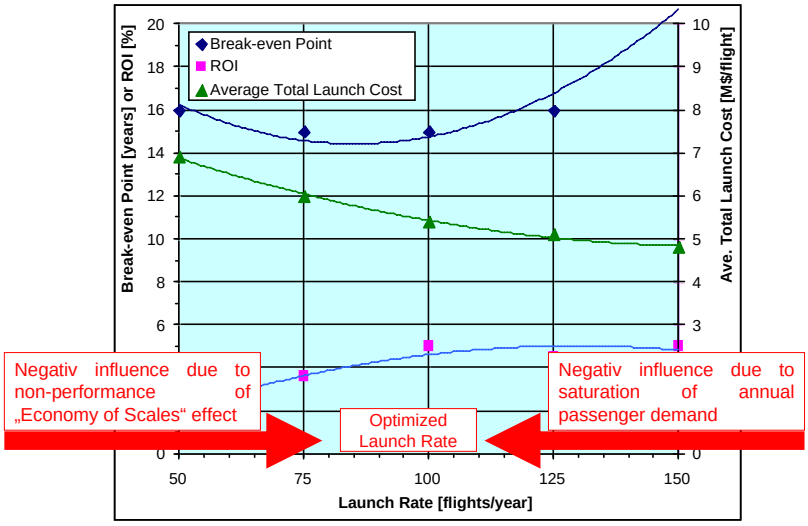
No. 13



Economic Performance (Hopper Plus)

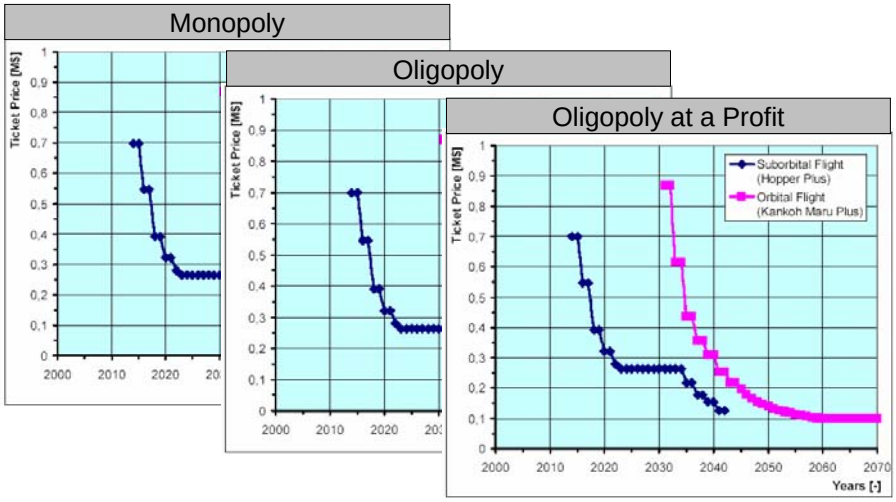
Example: Optimized Launch Rate

No. 14



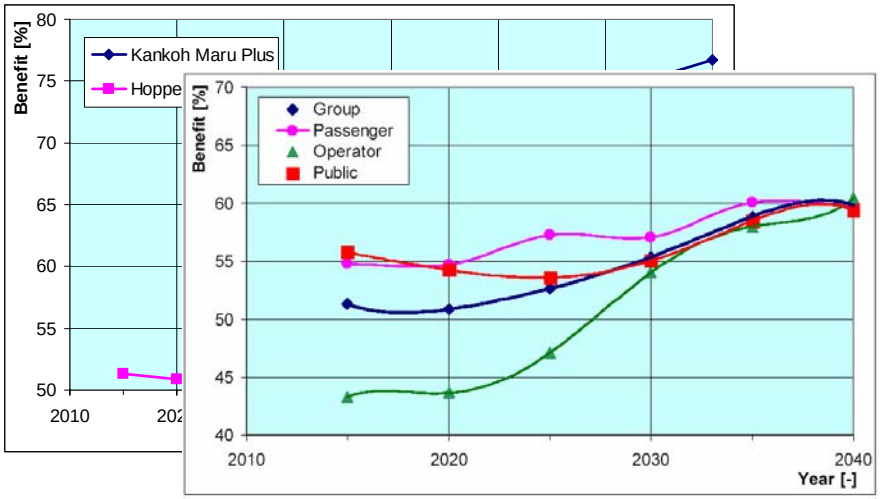
Economic Performance (Hopper Plus)

Example: Price Strategy



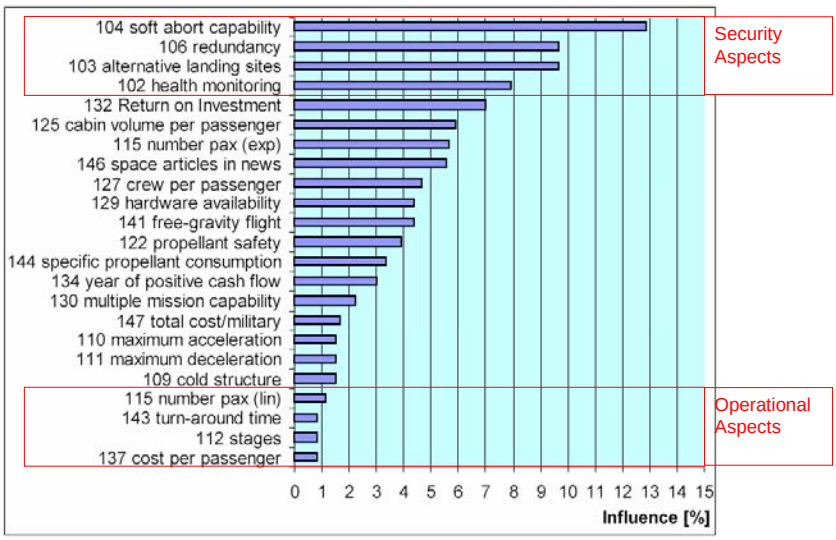
Benefit Performance (Hopper Plus)

Benefit of all Sub Objectives



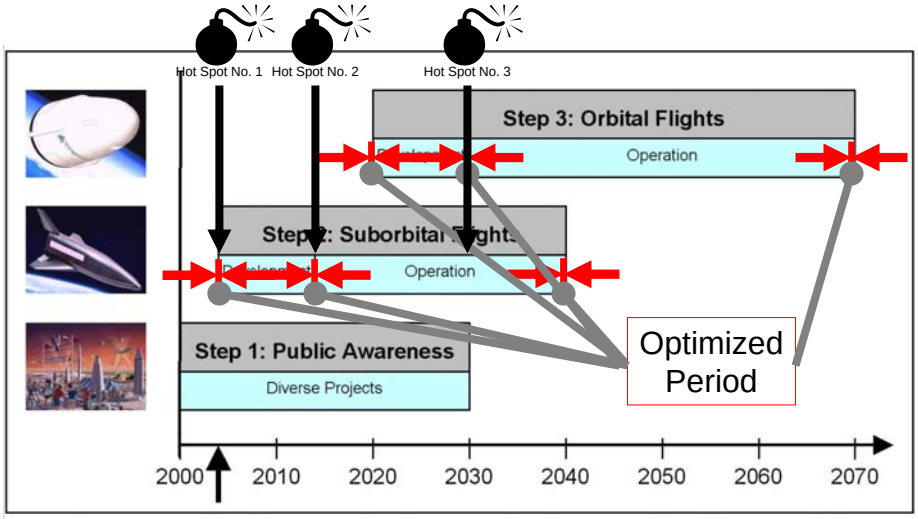
Benefit Performance (Hopper Plus)

Contribution of Benefit Indicators to Total Benefit



Results from Case Study

Promising Steps...



Definition

Definition of Cost Engineering (Practice VIII)

Case C

- *Step 8: Prepare a layout for seat arrangement of an suborbital tourist rocket.*

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