Bloodhound SSC - A Project / Program with Problematic Governance

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BLOODHOUND SSC
ENGINEERING ADVENTURE

Governance without Structure

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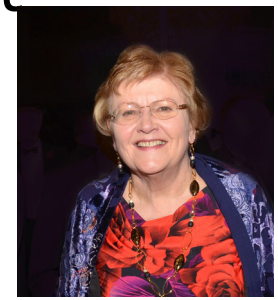
Concept Symposium Norway September 2014

Today's Agenda

1. Introduction –
2. A case Study – Bloodhound SSC
3. What is important

Who Am I?

- Over 30 Years in Aerospace and Defence Business
- Degree in Systems Engineering
- Managing Director Mary McKinlay Projects Ltd
- Board Member APM
- Board Member ICCPM
- Adjunct Professor SKEMA France
- Teaching Fellow National Centre for Project Management (University of Hertfordshire)
- Vice President of IPMA



Initiating a Successful Project

- National Audit Office Report in 2011
- Based on examination of large number of projects
- Why does the project matter?
- How can I start the project well?
- Would I bet my own money on this project delivering?

National Audit Office report 2011

- **Purpose** – having clarity on the overall priorities and desired outcomes;
- **Affordability** – understanding what delivery will cost and not being over-optimistic;
- **Pre-commitment** – having robust internal assessment and challenge to establish if the project is feasible;
- **Project set-up** – the detailed specification, procurement, contract and incentive design; and
- **Delivery and variation management** – maintaining delivery pressure throughout the life of the contract and flexibility to recover the integrity of the project in light of unanticipated events or significant variations from the original plan.

A Case Study

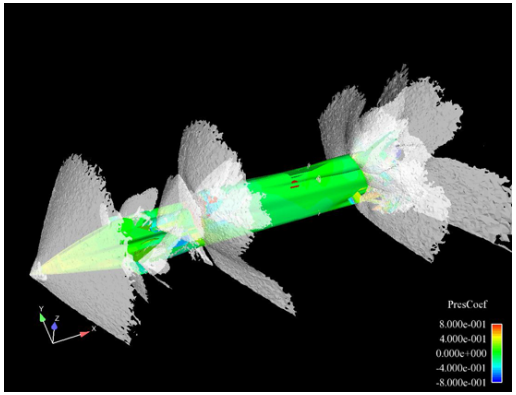
- I’m going to tell you about the most exciting project in Britain today
  - Technical Challenges
  - Management Challenges
  - Financial Challenges
  - The potential impact on UK Engineering

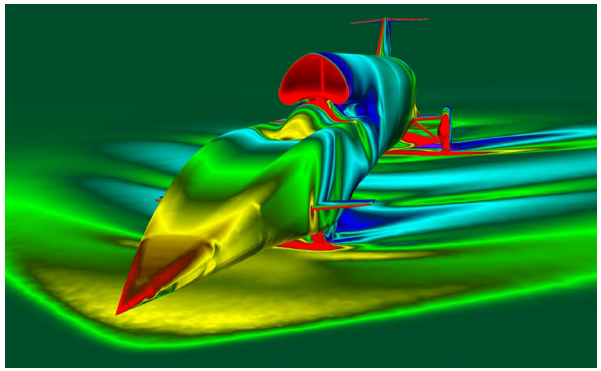
Technical Challenges

- Stability
  - Keeping it on the ground
- Safety
  - Driver
  - Team
  - Public

Strange things happen at high speeds

- Air does not behave normally

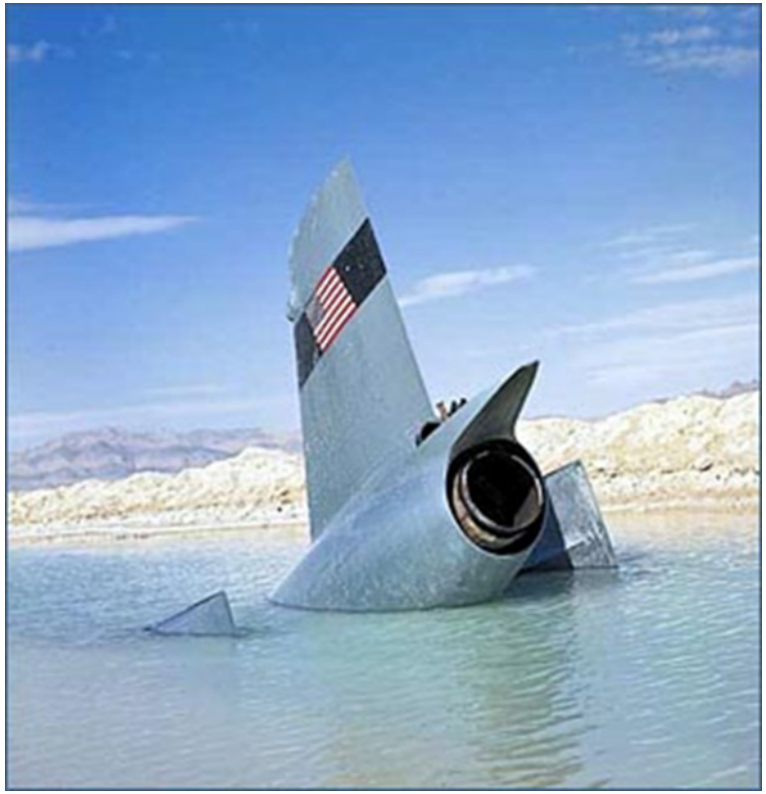




The World Land Speed Record – fast but..

- Going fast can present other problems!!

We need good brakes – but what type?



How do you slow down very fast things?

- Air brakes
  - High speed

- Parachutes
  - Slow speed

- Mechanical brake
  - Even slower

How does Bloodhound stop?

- Air Brakes slow down to 200mph
- Parachutes deployed at 600mph if air brakes fail
- Disc Brakes to stop

Funding

- No Official Funding
- Raise money from Public
- Recruit Sponsors
- Funding can be regarded as a project in itself

What is Bloodhound SSC?

- Car designed to take the World Land Speed record to 1000mph (1600kph)

- Current record 763mph (1228kph) held by Thrust SSC, same Project Team

What is The World Land Speed Record?

- The FIA World Record for the fastest car
- Strict Rules including length of track
  - 12 miles, two runs in space of 1 hour, measured mile
- Has to be driven by a human being
- Unlimited design – but must have 4 or more wheels
- Held by UK for 65 out of 109 years – deep in UK Culture
- Thrust teams have held the World Land Speed Record for 26 years continuously

What we are building now!

Designing the Car

- All Design Information is open to the world
- Computer Designed
- Modelled using Computational Fluid Dynamics
  - Ron Ayers MBE Chief designer (born 1932,) worked on Bloodhound missile in the Seventies
  - Students at Universities of West of and Swansea

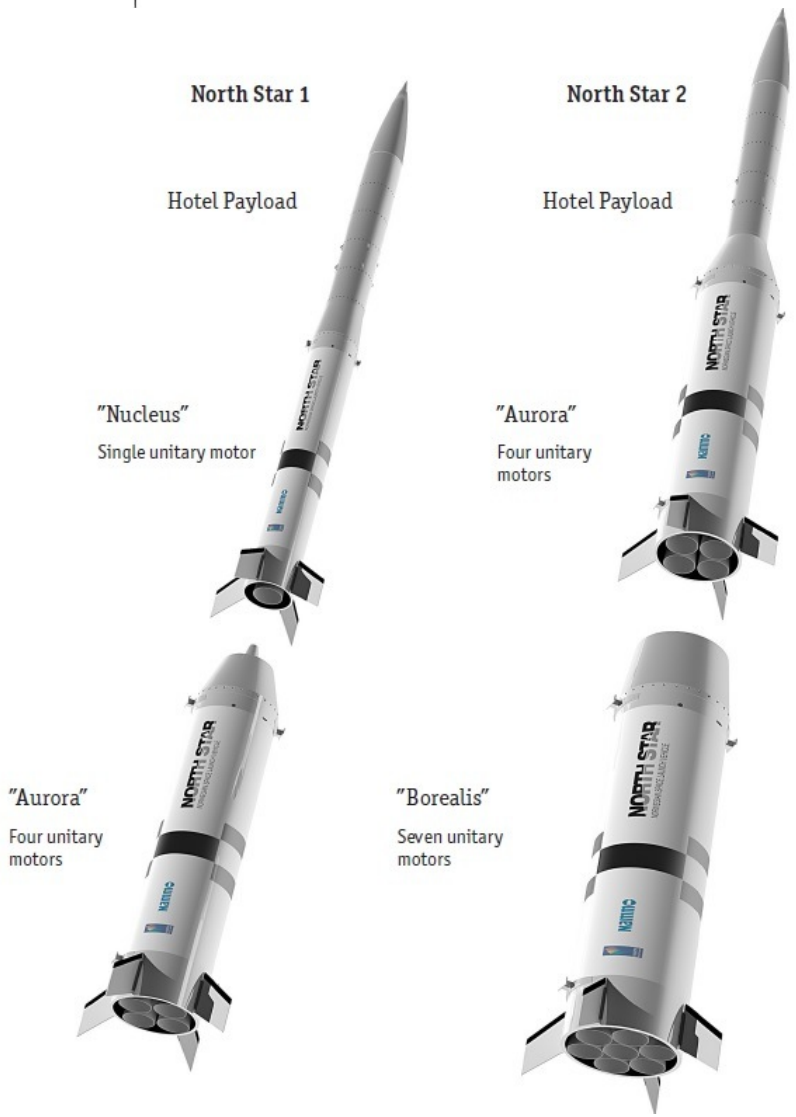
Powering the Car

- Jet Engine Rolls Royce EJ200
- Hybrid Rocket – dual fuel
- Racing Car Engine – to drive fuel pump

Look inside


Swansea University
Prifysgol Abertawe
EPSRC
serco
UWE
BRISTOL
STP

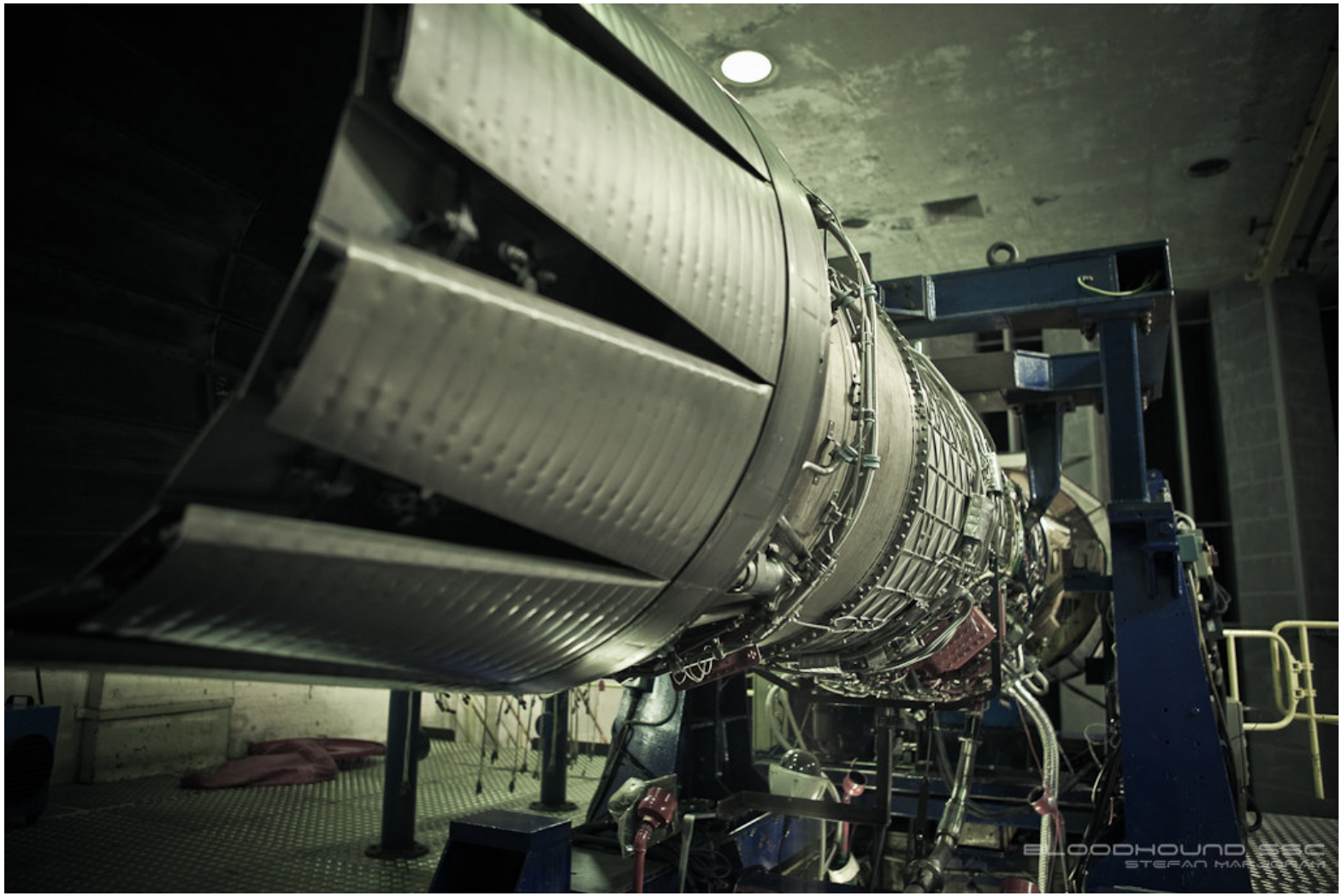
Cluster of 4 hybrid Rockets



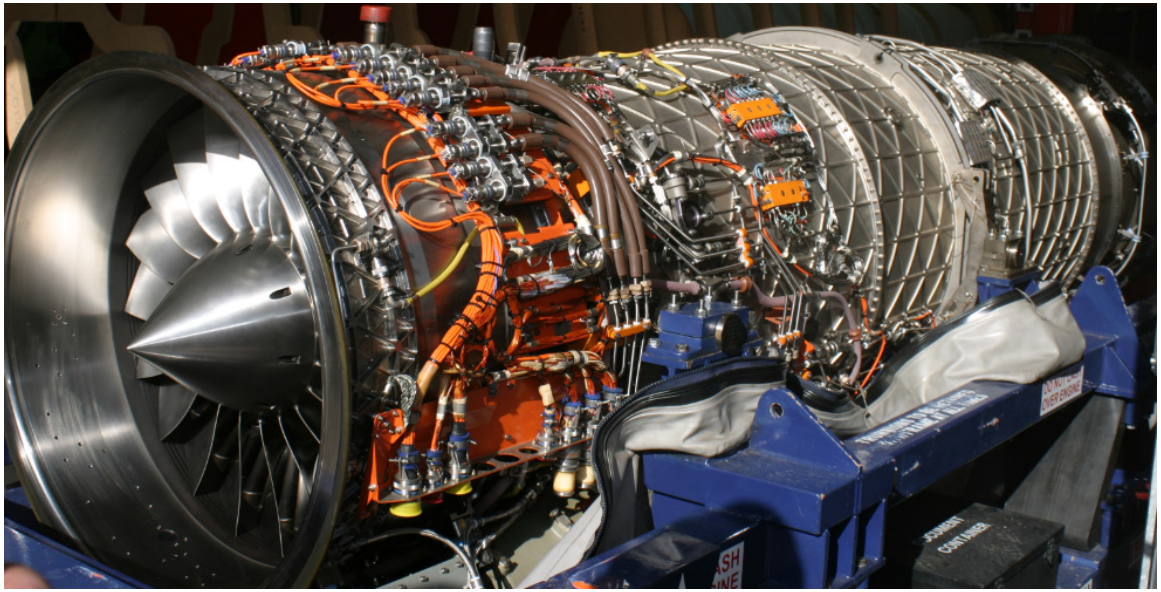
Getting the Jet! (EJ200)

- Lord Drayson Minister of Defence Procurement Bloodhound can have the engine – with conditions….
- UK PLC has a dire shortage of Engineers
- NASA Moon Landing inspired many engineers in the USA so..
- A UK EDUCATION Programme is needed!
- Rolls-Royce adapted the engines to run at ground level plus now supporting the education programme

EJ200



BLOODHOUND SSC engine



What just Happened There?

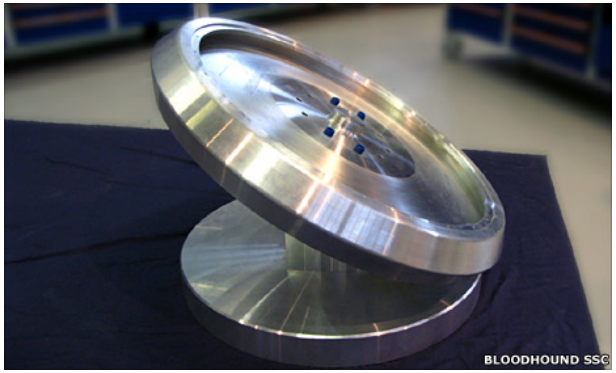
- Our Programme has acquired another Project
- Now includes an education element
  - Generate interest in Engineering
  - Increase number of young people entering the profession
- Need to produce materials, contacts, network of instructors, training etc

Summary so far

- Multiple Objectives
  - Speed
  - Safety
  - Education
- High Risk
- No Guaranteed funding
- Several projects – in fact a programme
- Very small team plus volunteers and sponsors
- Planning difficult

Strange things happen at high speeds

- Steering becomes a problem!



Andy Green

… the world's fastest mathematician and our driver

What Type of Track Do We Need?

- 12 miles long
- Where?

South Africa

Hakskeen Pan

Verneuk Pan

South Africa Desert Preparation

Bloodhound - The Timeline

- **2007-2008**

  Research programme and Project launch
- **2008-2014**

  Detail design & vehicle build
- **2014**

  Low speed UK runs
- **2015**

  South Africa Land Speed Record runs
- **2016**

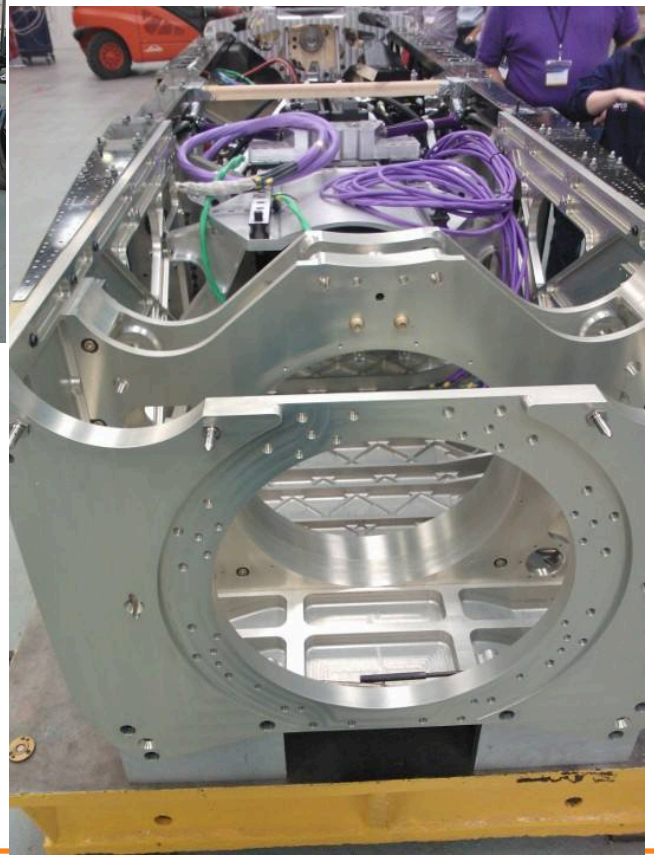
  1000mph record

Key Success Factors

- Understand the objectives of the project
- Identify the success criteria for the project
- Understand the stakeholders
  - What do they want?
- Manage using influence and prioritise
- Use the experts in the team to solve problems
- Remember Project Management is both an art and a science

Questions?

Current Status



More


Objectives
1 Inspire the next generation about science, technology, engineering and mathematics
2 Share an iconic research and development programme with a global audience
3 Set a new World Land Speed Record of 1,000mph


Mission Statement
Create a unique, high-technology project, focussed around a 1,000mph World Land Speed Record attempt. Share this Engineering Adventure with a global audience and inspire the next generation by bringing science, technology, engineering and mathematics to life in the most exciting way possible.
First aid