

NASA Case Study



Stephen Carver BSc MSc CEng FAPM FIRM

Senior Lecturer
School of Management
Cranfield University

stephen.carver@alsconsultants.co.uk



Challenger



January 28th
1986

The Challenger Crew

Mike Smith Dick Scobee Ron McNair

Ellison Onizuka Christa McAuliffe Greg Jarvis Judith Resnik





John F Kennedy

“Perception is
nearer the truth
than reality.”

“During the heat of the space race in the 1960’s, NASA realised that Astronauts would have to be able to write things when working in zero gravity.

Normal pens will not work since they need gravity.....”

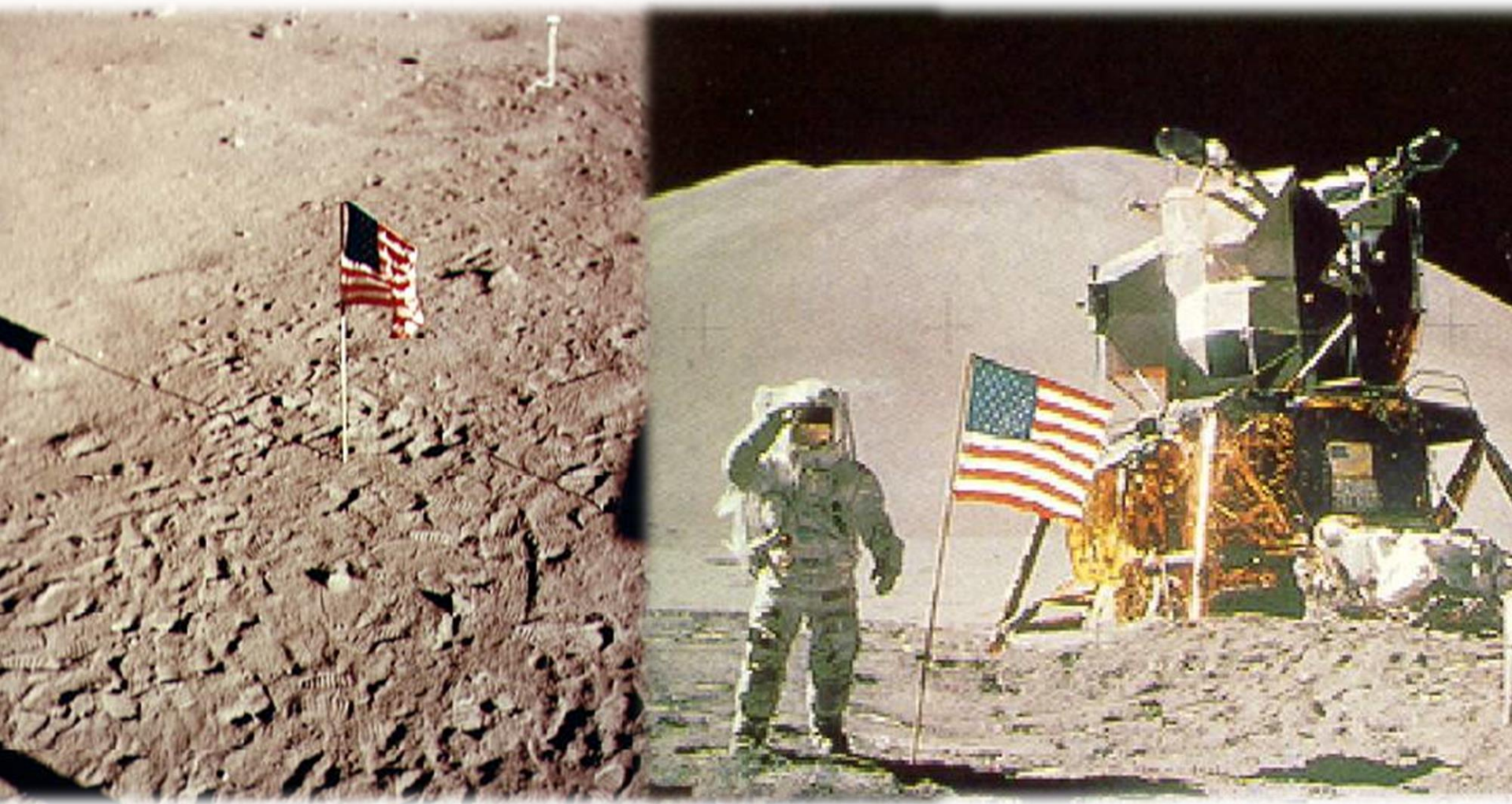


“.....After considerable R&D, the first working Zero-G Astronaut Pen was developed at an approximate cost of \$1 million. The initial production run was just 50 pens.....”



“..... The Soviet Union, faced with
the same problem, issued
pencils.”





Apollo11





x3



Marshall



Cape



Washington



Houston



Marshall Space Flight Centre
Huntsville Alabama



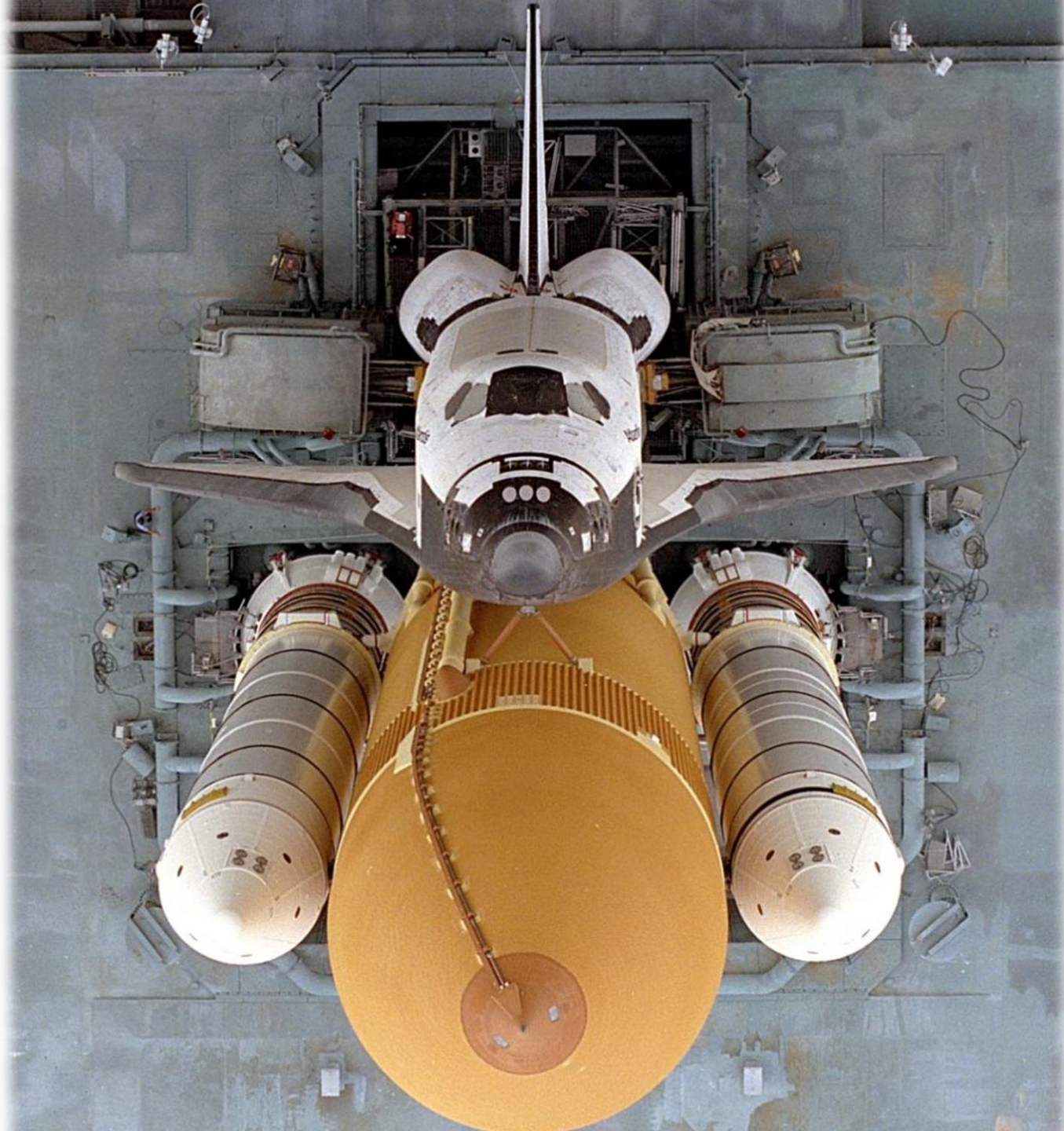
“The Marshall Space Flight Centre is run by one man, Bill Lucas.

As Centre Director, he has established a personal empire where the only criteria for advancement is total loyalty to this man....”

Snr Manager at Marshall

“For the first time ever it became apparent that cost would need the same considerations as the usual design parameters of weight safety and performance.”

Sam Beddingford
NASA Development Engineer





The definition of Criticality 1R is:-

“Loss of mission, vehicle and crew due to metal erosion, burn through, and probable case burst resulting in fire and deflagration.”





“When people go in front of Dr. Lucas, they know that if they use words like think or feel or judgement to try to explain something, they will be shot down in flames.

Roger Biosjoly MTI
Chief O Ring Engineer

Icicles
hanging off
Challenger
the day before the
fateful launch





Presidential Report on Challenger



Good Technical Skills but..
Too much "Management"
Too little Leadership
Low Empowerment
Poor Communication
Fear of Escalation
No "one" Vision
Silo Mentality
Complacency



“Disasters happen when decisions are made by leaders who cannot remember what the consequences were last time”

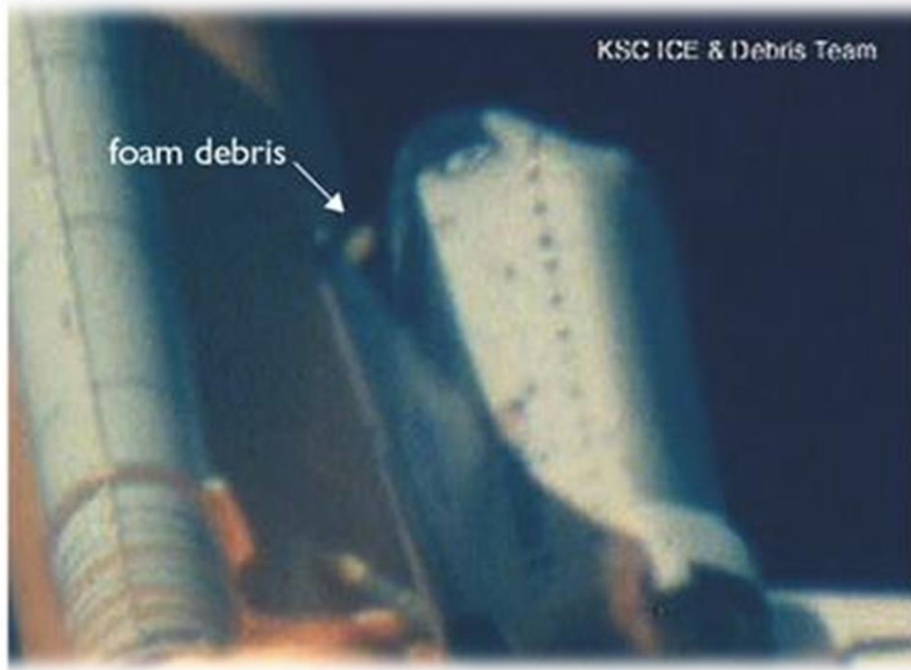




Space Shuttle Columbia

Feb 2003





"The foam did it"

Official Report into Columbia Disaster



NASA leaders admit that despite knowing about Columbia tile damage they decided not to inspect for damage..



Ron Dittmore
Columbia Programme Manager



“Any reports on the tile damage or are we just crossing our fingers and hoping for the best?”

“It kinda says that it will *probably* be alright”

Official CAIB Report Columbia Disaster



CAIB

Columbia Accident
Investigation Board

“A rescue mission was challenging
but entirely feasible”

CAIB Report, Appendix D.13



<http://arstechnica.com/science/2014/02/the-audacious-rescue-plan-that-might-have-saved-space-shuttle-columbia/3/>

Failure is only an
opportunity to begin
again more intelligently.

Henry Ford (1863-1947)
American industrialist, inventor



NASA

reflected, learnt and
completely changed their culture ...



July 2011



"The trouble is,
if you don't risk anything,
you risk even more."

Erica Jong
Writer

NASA Case Study



Stephen Carver BSc MSc CEng FAPM FIRM

Senior Lecturer
School of Management
Cranfield University

