

# **RESCUING COMPLEX PROJECTS FROM OVERSPEND AND DELAY**

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### **EARLY HISTORY**

The Ministry of Defence had noted that Bloodhound 1 was developed more quickly and for less money than its competitors and considered that this was mainly due to the project review methods. It was deployed as planned to defend the British nuclear deterrent at V-bomber squadrons. Their life was extended by carrying standoff missiles, but it gradually became clear that they would be vulnerable to ballistic missile attack and the nuclear deterrent was switched to submarines. This freed the Bloodhound 2 system, which was air and land transportable, for service in trouble areas including West Germany, Singapore and Cyprus. I visited it at the last of these and saw the big contribution it made to deterrence and knowledge of the tactical situation.

The nuclear deterrent soon ran into trouble.

### **THE POLARIS SUBMARINES**

It became clear that traditional shipbuilding methods were failing in the Polaris submarines, with cost blowouts, programme delays and no view of completion. The Government, recognizing the Bristol G.W. expertise in complex systems, asked the team to sort it out.

To start with it was essential to have a complete definition of the system, which had to be created. It turned out that different submarines were differently wired, so discipline had to be introduced. The fire control system was complex and many problems existed.

Once the system was defined the problems could be tackled so that the programme was completed and the installations passed test.

### **THE BRITISH NUCLEAR WARHEAD**

The credibility of the submarine based deterrent rested on the invulnerability of the nuclear warhead to enemy defence systems which were deployed at many target areas and were continuously improving.

An improved warhead delivery system was ordered from British contractors. It had multiple decoys whose trajectories had to be controlled, while the nuclear targeting was unobservable until a late stage.

The programme went out of control because contractors could not master the complexity needed with their knowledge of technologies, so the Bristol team was again asked to come in and sort it out.

Once again they found an inadequate description of the complete system plus a failure to master its complexity and the demands on technology.

Once again the problems were solved, the programme completed and the system passes test.

The story was illustrated at the BAC 100 exhibition.

Members of the Bristol G.W. Team which achieved this were honoured, being highly decorated by the Queen.

### **A CURRENT NEED**

Because of limited experience in Australian industry, the Australian Navy's nuclear submarine failed to meet its specification in several ways.

The contract for the next generation submarine has become a political issue in which ability to achieve full performance is obscured.

Study of the Bristol experience would be well rewarded.

### **WHAT MADE IT POSSIBLE?**

Every member of the Bristol Weapons team had benefited from acquisition of skills in the many technical areas needed in guided weapons.

The Bristol –Ferranti sale of complete weapon systems to neutral countries had greatly broadened that knowledge, to a level of system engineering which the Government knew was unmatched elsewhere.

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