



## Case Study 2 – Aero Industry / Work flow and managing the bottleneck

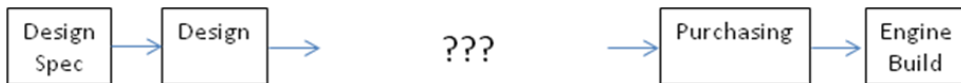
### A \$40 million project saved in 60 minutes

#### Introduction

This was an interim management position Jim Beswick had taken on with a world leader in the aviation industry. The project was to supply virtually the entire instrumentation for a new jet engine design. The project was not going well when Jim joined with 50% of the 250 or so instrumentation designs running late and threatening not just the \$40 million instrumentation project, but the whole engine development project. The pressure was on!

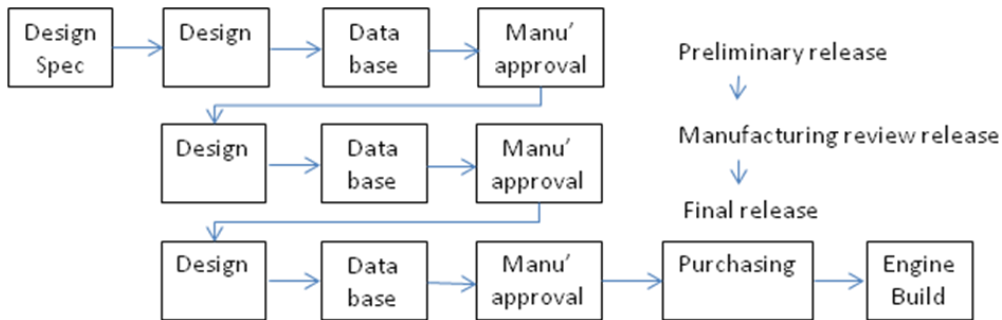
#### Map the process

On joining the team, it was obvious how hard everyone was working, yet delays were stopping designs and material getting to Engine Build on time. When initially asked how the process worked, nobody knew! Parts of the process were known, but some links were missing.



So we set out to trace the process. 60 minutes later we had walked the process and could map it.

From the newly mapped process two things jumped out at us immediately:



- First, we had found where the process bottleneck was. Everyone had assumed it was the design engineers as they were “swamped” with work. In fact, the bottleneck was the challenge of manually entering the bill of materials from the design drawings into the necessary databases for the ERP and safety systems. The actual team doing this work was massively overloaded.
- Secondly, an incredible amount of repetition was happening in the process, with designs going back and forth between design and manufacturing engineering (Manu’ approval) for approval.

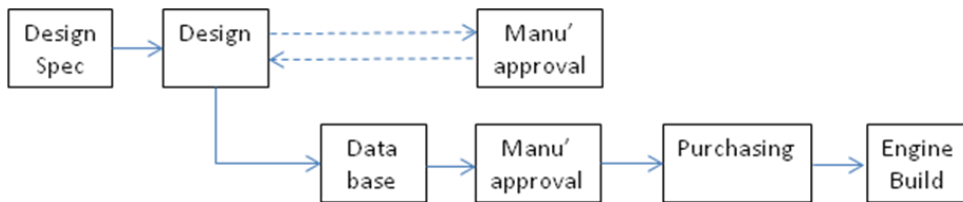
The process needed changes that could be implemented immediately and at none or little cost.



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We explained the problem to the engineers responsible for the manufacturing approval. It was quickly suggested that they check the engineering drawings before being issued for database entry and record their findings. This way, they could immediately approve the Final Release Version. A new and simpler process was put in place.



In a mere 60 minutes, we had identified the process bottleneck and unloaded it by two thirds. Now the bottleneck was where we thought it had been all along, at the design stage. So the next challenge was how to move the engineering work through the design process quicker.

#### Get back to working

As was normal with many engineering projects, when the pressure starts to mount, engineers become loaded with multiple projects. The idea is to allow the engineers to get an early start on the new design work to ensure this work (at least) is delivered on time. However, what rarely happens is someone actually deciding what work the engineer should stop doing and delay in order to start the new work. In contrast to the intent of speeding up the work, the people with multiple projects on the go inevitably spend more time swapping between projects (to get people like Jim, the project manager off their back) than they do in actual project work. The result is that the lead time of, say 60 hours, to do one design job suddenly becomes at least 4 or 5 times that as the engineer swaps between the 4 or 5 jobs on their desk.

In this case, we typically had engineers working on 3 to 6 separate design jobs. Slowly we shifted the engineers to working on one job at a time. As we did this, the jobs started to get completed in their original time estimates because the engineers were better able to focus. The project managers were also able to quickly identify when too many hours were being taken up on a job and intervene to support the engineer to get that job back on schedule.

When a rush job was required (as happens), the first question addressed was what design work would be put on hold to allow the new job to be completed. It was now addressing priority, process, and required personnel.



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#### Savings

At the half way point of the project, the anticipated cost overrun had been at least 10%. After carrying out the above activities and a couple of other process improvements, no design work was delivered late to Engine Build (admittedly things were tight in places). As a result of the changes, the entire instrumentation design work was completed within its original estimate avoiding a \$4 million overspend and, most importantly, causing no delay to the engine development project.

Comment [LH1]: