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PROJECT SPOTLIGHT

Challenging the concept to deliver a better outcome

Being part of a major national aerospace programme to develop nose and side pod concepts within a much wider engineering project has provided an opportunity to demonstrate our concept design expertise on a significant scale. It has also demonstrated the engineering judgement required when individual design decisions have implications far beyond the immediate brief.

Photo: Cpl Tim Laurence RAF/MOD, OGL v1.0OGL v1.0, via Wikimedia Commons

We initially came to the client's attention in early 2022 to support a relatively small modification to a wing project. As one of many specialist engineering partners contributing to a much larger programme, our immediate brief was clearly defined. Applying our wider programme experience, we identified an opportunity to look beyond the task in hand.

By challenging the proposed approach to weight and mass calculations and demonstrating an alternative methodology, we were able to help the client find a more efficient route forward. It was a relatively small intervention, but one that demonstrated the value of applying wider engineering judgement rather than simply delivering against the original brief.

That contribution built trust and we were subsequently asked to take on a much larger concept design challenge for a flag-ship national project.

TECHNICAL INSIGHT TO FIND A BETTER WAY

Working within programmes of this scale means operating as one part of a much bigger engineering ecosystem. No individual supplier necessarily has visibility of every workstream, which makes collaboration, communication and an understanding of downstream implications particularly important.

"On paper, it appeared the more drastic solution. Viewed across the project lifecycle, it created a more practical route to manufacture and the potential to deliver the required outcome faster and more cost-effectively."

Nick Howarth, Operations Manager, Cascade Engineering

As we developed the concept, our engineers identified that the original approach could create manufacturing challenges later in the programme. Our assessment identified an alternative approach which, while requiring a more significant structural intervention at concept stage, offered a more practical route through manufacture and subsequent delivery.

Challenging an established direction is never something to do lightly. Our role was not simply to say that something could be done differently, but to demonstrate why the alternative would deliver a better overall outcome.

In this case, that meant recommending more invasive cuts and removing more of the existing aircraft structure. On paper, it appeared the more drastic solution. Viewed across the project lifecycle, however, it created a more practical route to manufacture and the potential to deliver the required outcome faster and more cost-effectively.

The trust established through our earlier work meant we could have that conversation constructively, using engineering evidence to bring the customer with us rather than simply challenging the brief.

CONCEPT DESIGN IS ABOUT MUCH MORE THAN FINDING A TECHNICALLY VIABLE SOLUTION.

Decisions made at this stage influence structural integrity, manufacturability, weight, cost, programme timescales and ultimately the route to certification and delivery.

The engineering challenge is to balance two fundamental requirements. Will the concept meet its regulatory and safety obligations, and will it successfully perform the function for which it was designed? In this case, that meant developing a solution capable of carrying additional equipment while meeting weight and functionality requirements and understanding its interaction with the wider aircraft structure.

On a programme of this scale, those decisions cannot be considered in isolation. Interfaces change, requirements evolve and decisions elsewhere can alter the assumptions on which an original brief was based. Concept design expertise therefore requires more than technical capability; it requires the experience to recognise those dependencies, challenge assumptions and understand the downstream implications of decisions being made today.

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Sometimes the greatest value isn't delivering exactly what was originally asked for. It's recognising when there is a better solution and having the engineering evidence and client trust to take it forward.

As the programme progresses into testing and flight trials, we are proud to see the concept move from engineering challenge towards physical reality, and to continue supporting a long-standing client on another significant programme.

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