

case study: engineering services helps solve thorny apu software problem

global aerospace firm

results at a glance:

problem: The client had too few skilled people to meet an aggressive project timeline coupled with complex technical software problems that, if unsolved, threatened to derail the project. Cumbersome client review processes created lengthy delays.

solution: The Randstad Engineering team brought the skilled people and project management processes needed to develop a creative solution to the client's technical problems while fulfilling the project's manpower requirements. Modifying the client's review process resulted in enhanced efficiencies.

results: Successfully achieved the following:

- The TES team reduced project review time by as much as 70%.
- Process improvements resulted in significant cost savings.
- Project plan reduced the original schedule by approximately 18 months.
- Randstad Engineering redesigned the software to increase throughput and reduce ROM requirements.
- An almost unheard of feat—the software received approval by the DER before the hardware.
- Memory usage actually declined by about 5% even as the requirements of the software grew.

client profile:

This 100 plus year-old global corporation designs and manufactures a variety of products for commercial and military aircraft. With annual revenues of approximately \$6 billion, this firm's products include airborne auxiliary power units and ground power units, small expendable and recoverable turbojet propulsion systems, as well as fans and vapor cycle cooling systems.

business problem:

The client was under contract to a foreign airframe manufacturer to develop the Auxiliary Power Unit (APU) for one of their aircraft designs. Part of this project entailed the re-design of the APU engine controller software (FADEC). The project had an extremely challenging schedule and the client lacked sufficient personnel to complete the project. Additionally, there were two significant technical stumbling blocks that the client needed their supplier to overcome: 1) there was insufficient memory to support efficient collection of structural coverage data and, 2) memory utilization was too high to support additional new functionality.

As they issued Request for Proposals for this project, another issue weighed heavily on the client. For other APU software projects, they had experienced cost overruns of over \$1 million. They needed to feel confident this project would not suffer the same fate.

the Randstad Engineering solution:

The Randstad Engineering Services (TES) team originally held out little hope of acquiring this project. The incumbent firm, which had many people already at the client's site, was located in India and enjoyed a significant labor cost advantage. The proposal team decided that offering a creative solution to the two main technical problems might sway the client's selection decision. They were right.

Their proposal outlined the creative use of an in-circuit emulator in a unique manner to capture structural coverage data and other suggestions to more efficiently “compile” code so that additional functionality could be supported.

Immediately after the project award, a PMP Certified Project Manager and a TES Engineering Technical Lead were assigned to interface with the client’s counterparts. The TES project team found that the client’s project review processes were consuming inordinate amounts of time and recommended changes. These modifications to the review process increased efficiency. The Randstad Engineering team instituted their usual program of executive-level monthly project management reviews. These meetings presented the status of the project including financial performance, schedule fulfillment issues, and a review of the risk management plan including risk mitigation strategies.

Randstad Engineering project managers also met regularly with the FAA-assigned DER whose job it was to conduct SOI audits to assure compliance to approved processes and give final approval to the Randstad Engineering software and associated documentation.

The Randstad Engineering team was completely dedicated to meeting the aggressive project timeline with people at times working multiple shifts during 7-day workweeks. The team presented creative solutions to issues that had never been considered. The software code was written to run more efficiently. Some functionality omitted from the requirements because the processor lacked the bandwidth to support them could now be realized as the throughput was increased.

To better control project costs, Randstad Engineering included one of their near-shore partners who worked at the TES team’s direction. Strict compliance to the International Trade in Arms Regulations (ITAR) were managed and adhered to by Randstad Engineering.

Benefits Delivered:

The Randstad Engineering team’s suggestions regarding the client’s review process paid dividends, as efficiency was greatly enhanced—sometimes resulting in 70% improvements in efficiencies. Improving processes reduced costs. The Randstad Engineering project plan reduced the original schedule by approximately 18 months.

In what is a rare occurrence, for this project the software received approval by the DER before the hardware. By redesigning the software, Randstad Engineering reduced the size of the code and improved processor throughput thereby maintaining performance while increasing capabilities to accommodate new requirements. Memory usage actually declined by about 5% even as the requirements of the software grew.

Randstad Engineering did not just provide manpower to allow this client to successfully deliver this highly complex project within the aggressive timeframe, but provided capable people who were committed to creatively solving their client’s problems—and then skillfully managed them to attain the desired results.

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