NEOTech

Mid-life Design Upgrade for Medical Imaging Injector Systems

CASE STUDY

NEOTech able to take advantage of intimate knowledge of customer's product to drive engineering lifecycle assessment and re-designs needed for mature product design.

A major medical OEM building radiology equipment offers an extensive line of imaging equipment and associated supporting injector systems. The occurrence of supply disruption challenges has increased as their injector products are relatively mature after being on the market for several years. Various electronic components originally specified have become obsolete and no longer available. To continue selling these medical products in the market, the OEM decided that the product line needed a mid-life design upgrade to extend the product life at least another 7 years. The OEM engineering team had the capability to perform this redesign activity; but, their priorities were focused on designing the next generation flagship products. To facilitate, they decided to seek an outside partner to perform the mid-life upgrade and product life extension.

WHAT THEY WERE SEEKING TO HAVE DONE

The OEM needed to analyze the life-cycle status for all the PCBAs in three product families which encompass over 30 separate PCBA. It was their target to extend the future life for another 7 years. The activities included a complete BOM lifecycle status assessment. Where problem parts were found, new drop-in replacement parts were identified where ever

possible. Also, both hardware and software re-engineering were also included in the assessment when available component options required this and included producing new prototypes for the OEM validation.

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WHY THEY CHOSE NEOTECH

NEOTech was the incumbent supplier building the PCBA, and we were intimately familiar with the designs and related supply chain challenges making us a logical candidate for the redesign activity. We also performed some of the initial VAVE and DFM analyses that raised the awareness at the OEM that some of the mission critical components were headed for end-of-life. When initial engineering discussion identified many of the problems ahead if no action was taken, NEO-Tech was chosen as the preferred engineering solution partner.

WHAT WAS ACCOMPLISHED

NEOTech performed a full product life-cycle analysis on the electronic materials specified on the several product families.

- Reduce risk of part obsolescence and unplanned redesign for the 7-year expected life.
 - o Identified alternative drop-in replacement parts for most problem parts found.
 - Where PLC data was not known using commercial databases, NEOTech component engineers validated directly with the manufacturers.
 - o +5 of the PCBA required redesign to accommodate new components. These layouts were complete and prototypes produced for customer validation.

Upon project completion the OEM was the NEOTech efforts in both the quality of the ed activities in a short

- Many alternatives were added to what were formerly sole sourced parts. This reduced future PLC risk, while also adding cost and procurement flexibility.
- Optimize procurement cost and material lead-times.
- Achieve environmental compliance.
- Conform to current legislation.

Output included all replacement component details and redesign board packages that were formatted to directly upload into the OEM's ERP and product data management systems using the same CAD systems as the OEM's internal engineering teams. A key enabler for success of the project was the close interaction between the engineering team doing the life cycle project connected with the manufac-

turing and supply chain teams with the history building the product. This cooperation facilitated the information flow between engineering and the supply base and allowed completion in a compressed timeframe.



Upon project completion the OEM was highly satisfied with the NEOTech efforts in both the quality of the output and the ability to complete the needed activities in a short period of time. This included completing the component engineering replacement of all at risk components and complete redesign of over 5 of the PCBAs that needed to have the design and fabs redesigned as replacement parts required new placement geometries. Internal NEOTech quick turn prototype capability enabled our development engineering team to validate and confirm all component and design changes met the intended function. Having this capability in-house is a key element of being able to complete the engineering activity in the time constraints requested by the OEM customer.

NEOTECH AFTERMARKET SERVICES PROVIDED THE OEM NEEDED CAPABILITY

NEOTech leveraged our extensive engineering, supply chain and aftermarket service expertise to sustain this OEM's products throughout their lifecycle. By providing a customized aftermarket



service for this OEM, we optimized the supply chain and extended product life cycles that enabled them to continue fulfilling their customer's orders for these important life-saving products. Our expertise and history of servicing products in FDA regulated medical

markets served this customer well; by providing specific solutions to their product needs that delivered end-user customer satisfaction. Our broad range of aftermarket solutions was carefully customized to enable these products continue to be available for medical needs long after their launch into the marketplace.

CONCLUSIONS

Developing products that meet time-to-market, manufacturability, reliability, profitability and sustainment goals is more challenging than ever. Continuously changing technology, global supply chain uncertainties, concern for the environment, and extended life cycles are causing unprecedented component selection challenges. For this medical OEM, component obsolescence issues caused increased supply disruption with their mature medical products.

SUSTAINING SOLUTIONS AND AFTERMARKET SERVICES:

- Repair
- Refurbishment
- Upgrade
- Advanced exchange
- Reverse logistics
- Sustaining Engineering Solutions
 - o Lifecycle management
 - Redesign for cost reduction and improved reliability
 - Redesign for obsolescence mitigation
 - o Failure and root cause analysis
 - Managing ASIC discontinuation with reverse engineering and replace with FPGA solution re-design including component selection and firmware engineering
 - o Product revitalization
 - o Design for excellence
- Sustaining Supply Chain Solutions
 - Electronic component lifecycle management
 - Proactive obsolescence management
 - o End-of-life component management
 - Alternate component sourcing



It was vital these medical products still be available for their customers; but, with the OEM engineering team focused on designing the next generation products, they just didn't have adequate bandwidth to prioritize sustaining engineering.

Identifying the right components and supply chain partners, while avoiding obsolescence, compliance and counterfeit risks can make the difference between success and failure. It was a logical decision for the OEM to engage NEOTech to extend the reach of their engineering team. Working with the customer, we were able to assess PLC issues, identify alternatives,

re-design boards and prepare prototypes for validation. This also allowed us to complete the project in timely and cost-effective manner, with the added benefit of complete seamless documentation and updated CAD files in the same systems used by the OEM. This professionalism and attention to every detail is indicative of how NEOTech is committed to interact with every one of our customers.



NEOTech

Electronic Manufacturing Services exceeding the quality requirements of our world's most complex products. NEOTech – an industry-leader specializing in high-reliability programs for the Aerospace and Defense, Medical Device, and Industrial Technology markets.

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