



# PROCESS QUALITY ASSOCIATES INC.

*"We Engineer the Quality of Your Success"*

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## PROTOTYPE PROBLEM SOLVING

### **CLIENT'S SITUATION**

After the award of the design patent, a new company was formed to do the development of a prototype and commercialization of the technology. Potential customers were spending between \$100,000 per year (to as high as a few million dollars per year) with alternative technologies that had many drawbacks on reliability, cost, environmental impact, etc. Prospective customers had reviewed the \$150,000 prototype and the projected savings, were very pleased, and were demanding fast delivery of a final product to solve their on-going problems. However, the prototype could not consistently attain the required specifications; there was a fundamental instability in its operation that the design team could not get rid of. The venture capital funding was running out after 3 months of trying to find a solution to this last remaining problem. A final solution was needed now.

### **PQA'S TASK**

Analyze the prototype and prescribe a fix without major design changes, nor operating costs increases, nor additional complexity, and that fit inside the current package envelope for the equipment.

### **PQA'S ACTION**

PQA sent their Sr. Consultant to the Client's site the next day. The prototype was quickly viewed as the designers explained how it was supposed to function. The Client started up the machine and demonstrated how it normally operated, and how it would become unstable in its operating mode, and start to produce off-specification product. PQA reviewed the limited operating data and specifications, then requested two separate tests be performed. Based upon the test results, PQA proposed 6 possible theories as to the root cause of the problem, and defined one additional test to confirm the cause, and propose a solution. After running the third test, the Client was convinced as to the cause of the problem. After 6 hrs., PQA had identified the root cause of the problem.

PQA returned to its offices. Within 3 days, PQA provided the Client with additional engineering proof of the root cause of the problem, as well as a solution consisting of design calculations, detail design specifications, sketches, and dimensions for the proposed solution.

### **CLIENT'S RESULTS**

The Client worked day and night to construct the modifications proposed by PQA. PQA was available around the clock for further consultation and support for the design engineers, CAD draftsmen, pipe fitters, and TIG welders who had questions on how best to proceed.

The design modifications were accomplished at a total cost approximately equal to PQA's consulting fees. The manufacturing costs for the improved prototype would be only a few hundred dollars above its previous cost (a 0.13% increase in manufacturing costs). The revised design worked first time, achieved significantly better results than the specifications, and eliminated the previous instability. The Client was ready to release its prototype to the awaiting customers.