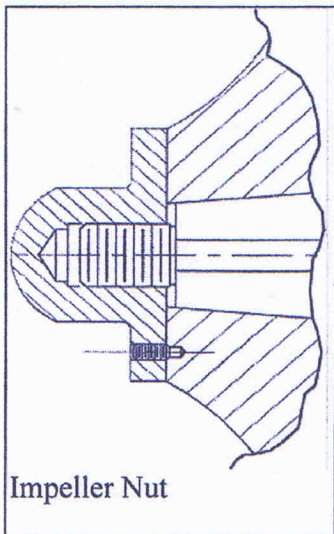
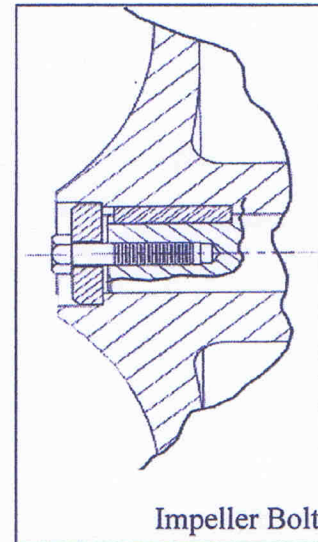


Often today, we come across many things that are built smaller, lighter and probably much cheaper than they used to be. Obviously technology has advanced in many ways that allow this practice to continue without *major* sacrifice in quality or integrity. However, designers and engineers continue to push the envelope and produce products that are “adequate” but much less expensive to manufacture. Pumps are no exception. Competition for new pump business is fierce and often we come across designs that are marginal for the intended service.

Recently, we visited the Deer Island wastewater treatment facility in Boston that has 81, 12" centrifugal pumps in Return Sludge application. These pumps have only been in operation for approximately five years and are already experiencing failures at an alarming rate. The most common failure has been shaft breakage immediately behind the impeller. As you know, centrifugal pumps do not always operate at the “design” condition and sometimes have to perform at conditions well away from their BEP (Best Efficiency Point), which can induce higher than anticipated *radial loading*. These loads create shaft deflection and high stresses on the pump shaft and bearings, often to a point beyond their design capability.

Earlier this year ABBA was asked to look at the problem and recommend a solution. The existing pump design has a steel shaft which is turned down through the stuffing box area to accept a stainless steel sleeve and further turned down through the impeller. The impeller and shaft fit are straight, 1-3/4" diameter and the impeller is locked on the shaft with a bolt, loctite and separate washer. The radial bearing is a single row ball bearing and the pump is fitted with a mechanical seal.

ABBA designed a new shaft made of high tensile stainless steel having a larger diameter through the stuffing box area which is carried through to the impeller. The impeller and shaft fit was changed to a 2-1/2" diameter taper fit to ensure positive and full contact thereby eliminating the possibility of clearance between the impeller and shaft.



The mechanical seal is now installed directly on the stainless steel shaft as opposed to separate sleeve, eliminating the possibility of leakage under the sleeve. The impeller is locked on the shaft using a large diameter flanged acorn nut with dog-point set screw that mechanically locks in a drilled hole in the impeller. The radial bearing has been changed to a double row ball bearing and the customer is able to re-use his existing mechanical seals.

Our customer is extremely happy with the ABBA design upgrades and is now in the process of refitting all 81 pumps with ABBA replacement parts.

Another example of how ABBA can solve your pump related problems, increase operating life and save you money. Tell us your problems and we'll do our very best to solve them.

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