

“Saving a 30 year-old 1,000 ton Hydraulic Press”

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Context: *A pulp & paper company in New England had an industrial press with potentially dangerous cracks in the pulp press frame. The Original Equipment Manufacturer had indicated “weld repair is not practical, reliable, or recommended.” The exact areas and extent of cracking was indeterminable utilizing traditional Non Destructive Evaluation (NDE). The options of press replacement and crack repair (requiring significant structural steel cutting & disassembly) involved unacceptable downtime and prohibitive costs and lead times.*

Challenges: We needed to...

- Quantify implications of externally visible weld cracks
- Develop repair/replacement options
- Execute emergency structural repairs, minimizing downtime and production delays to prevent lost customers
- Do it at a cost significantly lower than simply replacing the press

What We Did:

We consulted industry & code experts to implement Acoustic Emissions (AE) NDE testing, which helped determine the extent and location of the cracking, whether or not the cracks were propagating, and quantify the remaining number of operational cycles before catastrophic failure...subsequently calculated to be approximately 2 months of continued operation.

Next, we began by identifying all necessary elements and expertise for a fast track repair. We then assembled an “ad-hoc” (ie temporary) team from within the client system. That team consisted of in-house Maintenance/Reliability (Paul Lenfest), Mechanical Engineers, Welding Trainers and Machinists from the Trades, and Press Operators. We also contracted the OEM’s Service Representative, an R-Stamp (welding) Repair Organization, and an independent Structural/Metallurgical Engineer, Welding Engineer, QA/QC Inspector/Senior Certified Welding Inspector, and hydraulics expert.

By collaborating with the internal “ad-hoc” team and engaging a process of trusted networking we were able to...

- Definitively specify the cost, quality and timeliness of all materials and services in comprehensive Purchase Orders
- Redesign the press’ existing load bearing structure, strategically modifying the press by adding new structural members to “unload” the areas containing cracks.
- Respond quickly to errors in structural calculations, a design omission, delayed material deliveries, material quality & fabrication issues, inadequate welder proficiency levels, and round-the-clock supervision problems
- Avoid significant added costs or downtime because all problems were identified early and corrected on-the-fly

Results:

- Successful startup; only one leaking hydraulic hose
- NDE performed throughout and after the rebuild did not reveal any workmanship flaws
- Permanent repairs done within original budget and allowable production downtime schedule
- Press performance restored to full design capability
- Approx. \$2MM in savings, no lost customers, no indication of recurrent problems