

Five Problems that Lead to Catastrophic Failure

Our company got an emergency call recently from a manufacturing facility that experienced a catastrophic failure to its centrifugal fan's impeller center plate. And with a velocity of 30,945 feet of air per minute, the results were spectacular. As you can see from this photo, the plant looked like a bomb had exploded.



There are lessons to be learned in avoiding the catastrophic mechanical failures that often lead to plant shut down. Let's discuss five problems experienced at other facilities:

- 1. Failure from erosion** can be prevented by establishing a routine inspection at your plant. In one particular case, examining the fan's center plate would determine if the thickness was suitable to avoid impeller failure. Record the findings so you can spot trends and schedule repairs, rather than impose a plant shut down due to catastrophic failure.
- 2. Failure from low cycle fatigue** is the second problem and it could have been prevented by conducting a stress analysis on the fan's blades. Don't gamble with the lifecycle of your fans. Call the manufacturer to conduct on-site testing to spot fatigue.
- 3. Failure to adhere to designer specifications** was unfortunately demonstrated by a sugar mill in Louisiana. It was found that additional weight was added to the fan, which increased its centrifugal forces, producing a stress failure. If your company decides to modify a draft system, it's imperative to check with the OE's design or engineering team to see if changes overly stress the fan.

4. Failure to watch the temperature gauge is another example. To prevent temperatures rising beyond design limitations, put a policy in place and monitor the temperatures. If you have a departure, document the duration and the temperature levels.

5. Failure from embrittlement welds can cause delayed cracking and fracturing after welding. A cement kiln experienced this problem, whereas a rotor was welded in an area that had been sprayed with chrome or tungsten or another harden material, which caused the embrittlement.

Many mechanical fan failures can be avoided. We can help give you the tools and put a routine plan in place. [Click here](#) and we'll email you a planning template and white paper for more information.