

# RETROFITS CAN IMPROVE EFFICIENCY, REDUCE NOISE AND SAVE MONEY



## FAN RETROFIT AND ENHANCEMENT



THERE ARE MANY POSSIBLE REASONS FOR FAN RETROFITS. FANS IN POWER PLANTS, FOR EXAMPLE, WERE OFTEN OVERDESIGNED TO COMPENSATE FOR AIR HEATER LEAKAGE. SOMETIMES, SYSTEM RESISTANCE WAS SIMPLY MISCALCULATED. CHANGES OF ALL KINDS IN THE PLANT AFFECT THE SYSTEM RESISTANCE. FACTORS LIKE THESE HAVE A SERIOUS IMPACT ON FAN EFFICIENCY AND PERFORMANCE. AND EVEN WHERE A FAN MEETS ITS OUTPUT TARGETS, NOISE AND VIBRATION CAN CARRY HEAVY COSTS AND CONTRIBUTE TO MECHANICAL FAILURE.

### HOWDEN KNOW-HOW

#### THERE ARE THREE MAIN WAYS IN WHICH RETROFITS CAN BE APPLIED TO EXISTING FAN INSTALLATIONS.

THE FAN PERFORMANCE CAN BE OPTIMISED WITHIN THE INSTALLATION.

- The existing impeller can be replaced with a high efficiency design, allowing the fan to run at its optimum loading and highest efficiency.
- A tip can be added to the existing blade to increase performance, typically by 10-12%. This is a practical way to increase the capacity of an induced draught fan to cope with system resistance change.
- Casings, fairings and scrolls can be replaced or modified to improve aerodynamics or reduce noise.
- Inlet cone shape and clearance can be redesigned.
- The overall system, including the inlet box, RVC and differential louver, can be analysed and optimised.

THE EXISTING FAN CAN BE REPLACED WITH A DESIGN MATCHED PRECISELY TO THE SYSTEM.

- This is a preferred response to changed operating conditions and a demand for extra flow or pressure.
- It is an effective solution in situations where severe erosion or corrosion is preventing safe operation of the fan.
- It is the clear preference where the existing fan is incorrectly matched to its situation or application.

SYSTEM RELIABILITY NEEDS BE INVESTIGATED AND IMPROVED.

- Bearings can be modified to cope efficiently with the fan parameters, for example by replacing rolling elements with sleeve bearings to solve problems arising from temperature issues.
- On-line automatic balancing gear can be fitted on a shaft to reduce vibration during operation. This is an effective solution where there is extensive corrosion or dust.

## FAN RETROFIT AND ENHANCEMENT



Problems are compounded where the fan diverges from the geometry and parameters used for performance testing and design – by, for example, omitting internal fairings or introducing system components which were not present when demands on the fan were assessed. Unless the fan is matched perfectly, system loss as well as the application, efficiency will be compromised. The motor may be more powerful than necessary. The fan may be pushed beyond the limits of its aerodynamic ability. Foundations or casings may have become inadequate. And the costs incurred by stalled operation, failures of blades or bearings, impeller fatigue or other associated problems such as corrosion, erosion, or issues with variable speed drives can be very high.

Retrofits can improve efficiency, reduce noise, save money and, increasingly importantly, make an enormous contribution to energy saving targets. Each retrofit project is based on a thorough analysis of the prevailing situation as well as the target performance. For instance, Howden can establish the dynamic foundation stiffness and use this in calculating the shaft critical speeds.

EACH RETROFIT PROJECT IS BASED ON A THOROUGH ANALYSIS OF THE PREVAILING SITUATION AS WELL AS THE TARGET PERFORMANCE



For further information on Fan Retrofit and Enhancement please visit [www.howden.com](http://www.howden.com) or contact your local Howden company.