

CASE STUDY

INDUSTRIAL MACHINERY

TMD for stacks for a power plant, Saudi Arabia

PROJECT DETAILS

Short description

Vibration control of a stack under wind loads through the installation of a tuned mass dampers with a horizontal helical compression spring and viscoelastic dampers.

Product details pendulum

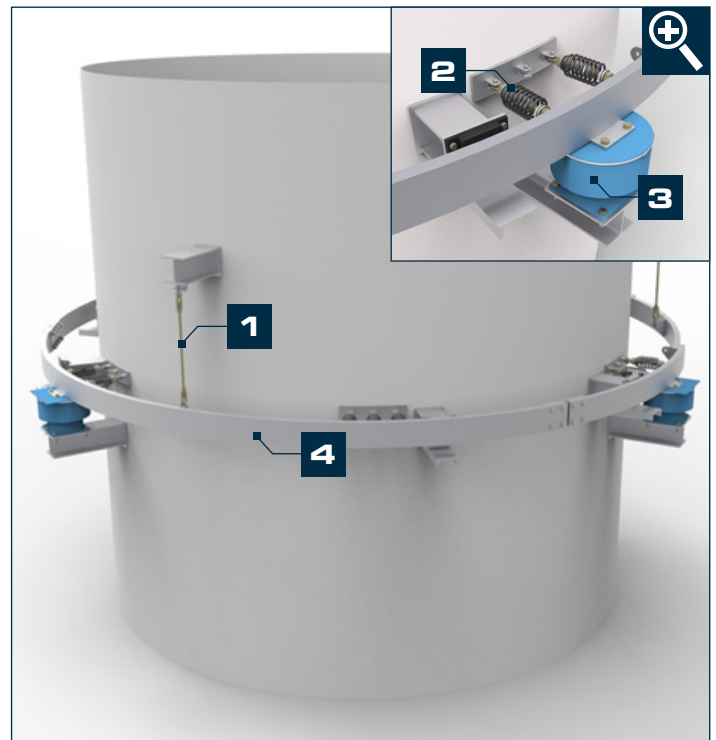
Quantity:	4 tuned mass dampers
Moving mass:	2.5 t
Frequency:	1.5 Hz
Damping ratio:	10%
Ø tuned mass damper:	7 m
Manufacturing and quality:	Inspection certificates for material according to EN 10204 type 3.1
Corrosion protection:	According to EN 12944 class C4 high
Design service life:	50 years

PROJECT DESCRIPTION

A new combined cycle power station with a total power output of 1390MW is being built in Saudi Arabia. Stacks are used with a height of 60m and a diameter of 6 m. Wind induced vibrations often leads to inadmissible vibrations and fatigue phenomenons. When the vortex shedding frequency coincides with the natural frequency of the stack a resonance amplification is expectable resulting in a reduced lifetime.

SOLUTION

VICODA undertook the dynamic interpretation according to Eurocode (EN 1991-1-4:2005) and prepared the construction documentation. The tuned mass dampers were manufactured in completion with the requirements and were all tested in the VICODA test facility. After the installation of the tuned mass dampers on the stack an on-site precision tuning was made. Through the adaption of the pendulum length and the helical compression spring the damper frequency can ideally be adjusted. In this way the optimal principle of operation is achieved and therefore the stacks will see an extended lifetime.



- 1 Pendulum
- 3 Viscoelastic dampers
- 2 Springs
- 4 Mass ring

