Laborelec
RESEARCH & INNOVATION

TORSO PROTECT

Addressing harmful torsional vibrations in shaft lines

Among the potential harmful conditions for turbo groups, torsional vibration is one that is generally overlooked although it can lead to dramatic failures. The issue requires special attention in today's new normal of constantly changing grid circumstances and interactions with wind farms and power electronics.

PROTECTING YOUR SHAFT LINE

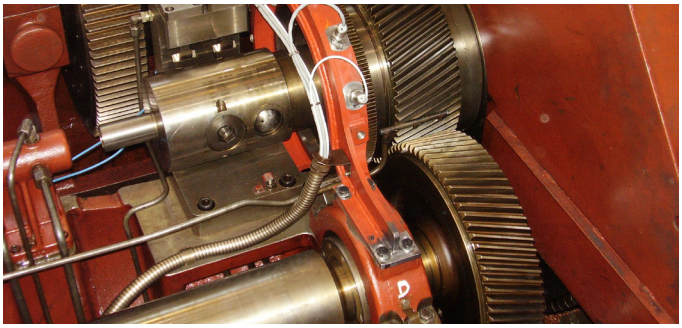
TORSO Protect is the high-end automatic protection system. It involves existing or newly installed speed sensors at well-chosen locations of the shaft line along with precise signal conditioning to ensure redundancy and robustness.

NO HARMFUL SITUATION GOES UNNOTICED

TORSO Protect continuously monitors frequency and peak amplitude of critical resonance frequency bands. Thresholds are defined for critical vibrations. Whenever a threshold is reached, TORSO Protect sends an appropriate alarm or trip signal to your DCS or SCADA system, protecting your shaft line from severe damage. No harmful situation goes unnoticed while avoiding false alarms.

ANALYSIS AND DIAGNOSIS

Through its customizable interface, measurement data are presented for analysis, diagnosis, and identification of remedial action by power plant staff or ENGIE Laborelec experts.



In most cases existing sensors can be used. If needed, additional sensors can be installed.

CAPABILITIES

INSTALLATION

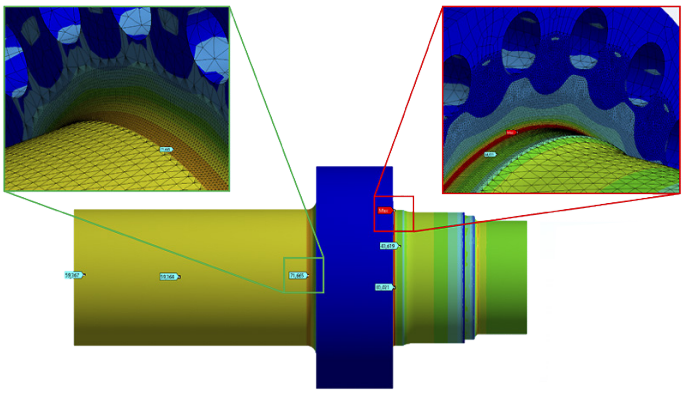
- 19" rack in a floor-supported or wall-mount cabinet.
- Easy DCS connection (alarm, trip, watchdog & analogue outputs).
- Possibility of using existing sensors (unless they are badly positioned).

FUNCTIONING

- Continuous protection and monitoring for turbomachinery applications.
- Alarm strategy based on specific fatigue lifetime consumption for the shaft line.

STORAGE & POST-PROCESSING

- Significant torsional vibration events stored automatically and available for post-processing.
- RAW data stored in approximately two-month circular buffer (depending on number of sensors).



Alarm and trip limits are engineered based on a detailed finite element model of the shaft line.

GENERAL SPECIFICATION

Input channels	Up to 6 galvanically isolated channels (analogue and digital)
Speed range	0.05 Hz - 20 kHz pulse rate (depending on sensor type)
Analogue outputs	4x 4 - 20mA
Digital outputs	6 dry contact relays
	2x redundant watchdog
	2x redundant alarm
	2x redundant trip
Pulse timing resolution	80MHz
Acquisition sampling rate	Up to 20 kHz depending on pulse rate and rotation speed
Post-processing capabilities	Dedicated software for post-processing
Amplitude tracking band-pass filters	Yes, configurable according to torsional modes

MECHANICAL SPECIFICATION

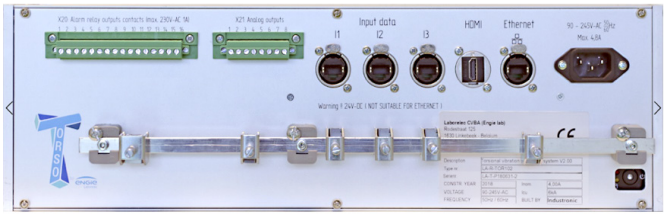
Dimensions	Standard 19" 3U EMC rack
Weight	~9,4 kg

ELECTRICAL SPECIFICATION

Power requirement	90-245V AC 5A 50/60 Hz
Internal power supply	3x 24VDC redundant

ENVIRONMENTAL

Rack operating temperature	-20°C - 55°C
Rack storage temperature	-40°C - 85°C
Rack operating humidity	10% RH - 90% RH, noncondensing
Rack storage humidity	10% RH - 90% RH, noncondensing



SHOCK AND VIBRATION

Random (IEC 60068-2-64)	5 g rms, 10 Hz - 500 Hz
Sinusoidal (IEC 60068-2-6)	5 g, 10 Hz - 500 Hz
Operating shock (IEC 60068-2-27)	30 g, 11 ms half sine; 50 g, 3 ms half sine; 18 shocks at 6 orientations

MEMORY

Data recorder	Integrated digital recorder – circular buffer (2 months)
	Permanent event storage in case of alarm or trip
Internal data storage	500GB
Pre - post event data	Yes

OTHERS

Remote connection	LAN/WAN
Ethernet integrated	10/100/1000 Mbps TCP/IP
USB	1XUSB3.0 for data back-up
Visualization	HDMI port integrated
Warranty	2 years for hardware components.
	Extendable via optional service contract
Electro-magnetic compatibility (EMC)	EN 61326-1 (IEC 61326-1): Class A emissions; Industrial immunity
CE Compliance	Yes

WOULD YOU LIKE TO KNOW MORE?

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