



Novel vibration and acoustical technologies for condition monitoring of complex rotating and reciprocating machinery

Visiting Professor: prof. Len Gelman, Cranfield University (UK)

Short description of the lecture:

The lecture will present a summary of the existing condition monitoring and decision making technologies that are employed for complex rotating machinery (e.g. aircraft engines, gearboxes, steam and gas turbines, bearings, etc.) and reciprocating machinery (e.g. diesels, reciprocating compressors, etc.).

The lecture will describe the radically novel vibration and acoustical condition monitoring technologies that were proposed by the Visiting Professor, developed by him in collaboration with his Cranfield's colleagues and successfully applied in multiple industrially funded projects (for aircraft engines, Dresser Rand steam turbines, bearings, Caterpillar and Dresser Rand gearboxes, train engines, etc.).

In particular, the classical and novel adaptive spectral kurtosis technologies, the classical and novel wavelet technologies, the novel time tracking technologies, the novel technology for complete amplitude-phase extraction from time-frequency transforms, the novel time and frequency averaging technologies and the novel non-parametric decision making (i.e. anomaly detection) technologies based on the weighted majority rule will be described.

The comprehensive industrial validation of the technologies via modelling, test rig and in-field trials will be also described.

Contents:

1. Summary of the state-of-the-art
2. The classical and novel adaptive spectral kurtosis monitoring technologies
3. The classical and novel wavelet monitoring technologies
4. The novel wavelet de-noising technology for condition monitoring
5. The novel time tracking monitoring technologies



6. The novel technology for complete amplitude-phase extraction from time-frequency transforms
7. The novel time and frequency averaging for machinery
8. The novel non-parametric decision making (i.e. anomaly detection) technologies based on the weighted majority rule
9. Validation of the proposed technologies by numerical modelling

Terminy wykładów			
Data	Dzień tyg.	Godzina	Sala
2015-04-15	Śr	11.15-15.00	EiA E28
2015-04-16	Cz	9.15-15.00	EiA E28
2015-04-17	Pt	9.15-14.00	EiA E28