



ENERGY EFFICIENCY IN ELECTRIC DRIVES

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Short description of the lecture:

Energy efficiency is basis of technical systems working. Electric drives account for approximately 65% of the electricity consumed by EU industry. The efficiency of an electric drive depends on more factors, including: motor efficiency, motor speed control, proper sizing, power supply quality, distribution losses, mechanical transmission, maintenance practices, end-use mechanical efficiency (pump, compressor, fan, etc.). The energy efficiency has influence on the work of electric drive, its consumption and paying of electric energy (active, reactive), the working life etc. What energy efficiency practice for? The answer is simple - because of getting high quality and cheaper products, lower production costs and reducing of global pollution. How to realize energy efficiency in electric drives? The right way is with usage of better working machines, power convertors for getting variable speed to reduce power losses and energy efficient motors. These lectures deal strongly with energy efficiency in electric drives through energy parameters - efficiency η and power factor λ (in special case with ideal supply without harmonics $\cos \varphi$). The attention is focused on motor speed control with saving potential of 50 billion kWh/year for EU-25 and motor losses expressed through its efficiency and power factor with saving potential of 27 billion kWh/year for EU-25.



Syllabus of the lecture subjects (enlisted)::

1. Importance of electric drives (1 hour);
2. Electric drives as consumers of electric energy (2 hours);
3. Measurement of electric power (P (kW), Q (kVAr), D (kVAr)) according DIN 40110 (2 hours);
4. Why Adjustable Speed Drives (ASD) are preferable? (3 hours);
5. AC ASD (3 hours);
6. Comments on EU Project Motor Challenge (3 hours);
7. Conclusion (1 hour).

TERMINY WYKLADÓW			
Data	Dzień tygodnia	Godzina	Sala
2014-11-03	Pn	9.15-12.00	EiA E28
2014-11-04	Wt	9.15-12.00	EiA E28
2014-11-05	Śr	9.15-12.00	EiA E28
2014-11-06	Cz	9.15-12.00	EiA E28
2014-11-07	Pt	9.15-12.00	EiA E28