



# Application of SPT in CEZ

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ČEZ, a.s.

## CEZ

- Join stock company
- Main producer of electricity
  - Distribution of electricity
  - Supplier of gas

**[www.cez.cz](http://www.cez.cz)**



## Reasons for SPT

- Economical and competitive environment
- The status of the machinery
  - Old equipment
  - New installation
- Way of operation
  - Long time operation  
beyond the life time expectation
  - Big number of SU/SD
  - Intervals between overhauls



## PLIM

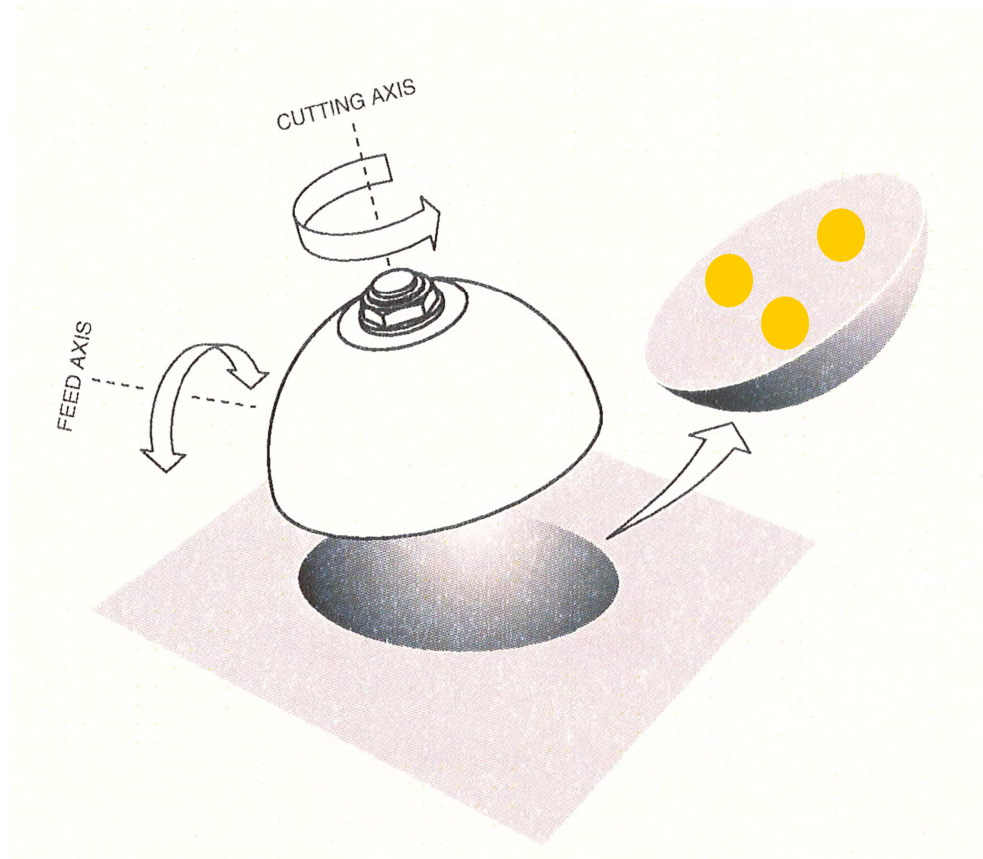
### Plant Life Management

- Ageing Management Program
  - methods of preventive maintenance, monitoring, inspections, diagnostics etc.
  - Traditional test methods
  - New methods
    - UT (robotic mamipulator, phase array)
    - SPT**



## Small Punch Test

- MMV Ostrava
- Rolls Royce SSam TM2





## Small Punch Test

### **Material characteristics**

- Mechanical properties
  - Tensile  
Yield Stress, Tensile Strength, Elongation
  - Fracture characteristics  
Fracture toughness  
FATT (fracture appearance transition temperature)
  - Creep
  
- Chemical composition
- Metallographic examination
  - Microstructure of material samples



## Small punch test

- Critical components of turbine





## Applications in CEZ

Date	Customer	Component
1993	Power Plant Vrané	Plate of quick opening valve
2004	EVI, a.s.	superheater chamber 12, 14, boiler drum
2005	EVI, a.s.	Turbine case
2006	Power Plant Tušimice	Fan wheel
2006	Power Plant Tušimice	Fan wheel
2007	Power Plant Počeradý	Pipe of overheat steam
2007	Škoda Power, a.s.	ETU - Rotor case
2007	Škoda Power, a.s.	ETU - TG C, D - Case; rotors, valves
2008	Škoda Power, a.s.	EPR - Case; rotors, valves
2009	Power Plant Prunéřov	Steam pipe-line
2010	Škoda Power, a.s.	ELE - Rotor cases; rotors
2010	Power Plant Prunéřov	TG22 rotors, cases



# ETU - IP case





## Power station Prunéřov - TG22





# EPR 2 TG22







## SWAT

- Plus
  - Semi destructive methods
  - Results of Destructive test
  - Convenient for the rotors
  
- Minus
  - No standard
  - Presentation of the results
  - Cost
  - Time of sample taking
  - Restriction of place for sample taking
  - Chemical analysis (cast cases)



## Standards for SPT

- CEZ Internal instruction on SPT
  - Škoda Power Plzeň
  - the routine use



CEZ, a.s., Diagnostics dept.

Thank you for your attention