



ORGANIZACJA  
UCZĄCA SIĘ



# Synergy of business and science for innovation and new competences



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Katowice, 12.12.2018 r.

# The need for constant improvement

**World**

Industrial and economic revolution

**Labour market**

Changing professions, qualifications

**People**

Changing requirements for skills

*Lifelong learning*

**„AVOID RUNNING FASTER  
AND FASTER ONLY TO STAY IN  
THE SAME PLACE”**



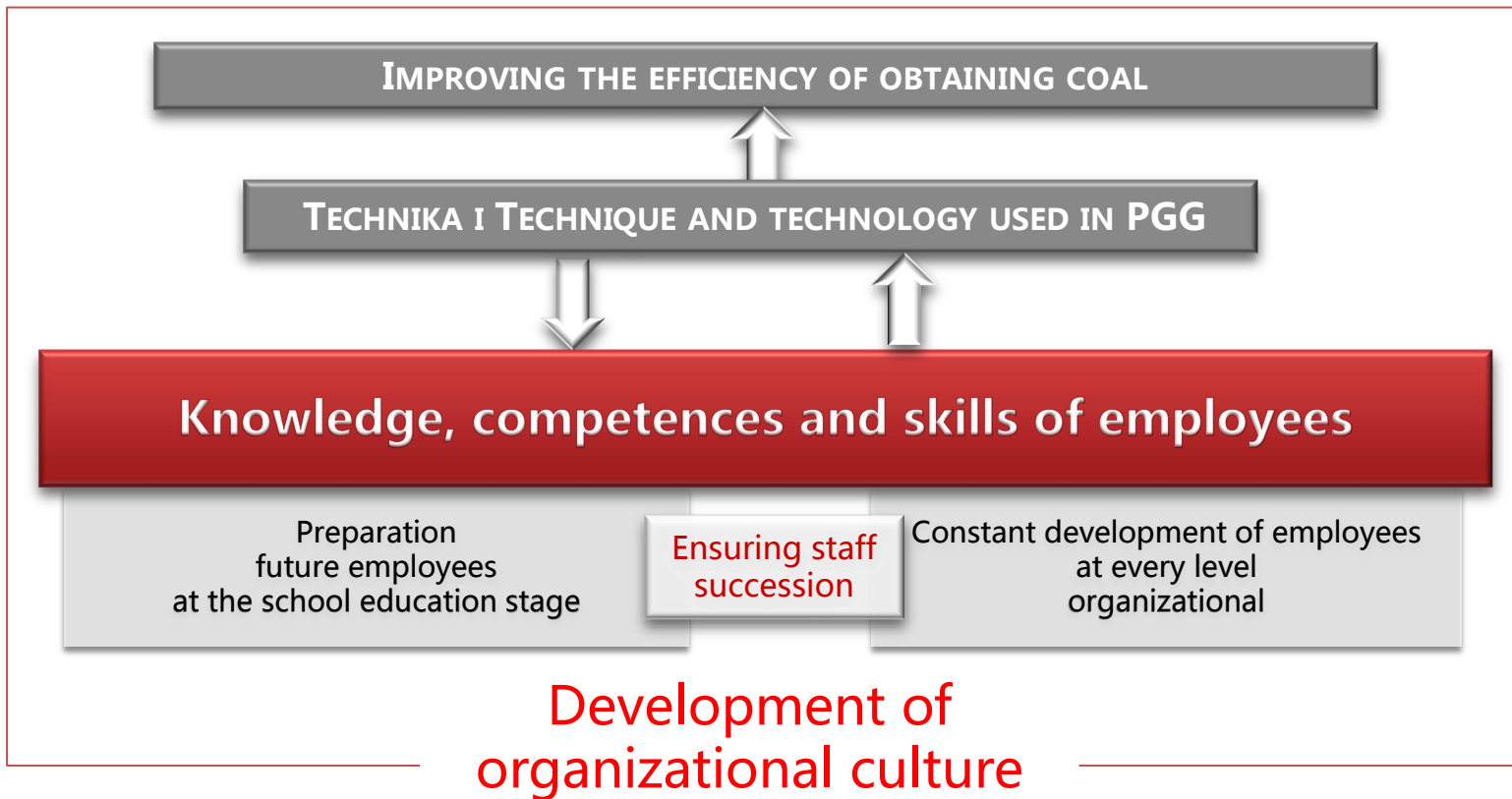
*The Red Queen effect*

Changes in the production organization related with the introduction of Industry 4.0 technology



### Changes in employment

- Retraining of employees
  - adopting new work and organization models
- recruitment in accordance with the needs of Industry 4.0
- commitment to strategic planning in the area of employee development



# Profile of the engineers' personality

## Engineer 3.0 – before Industry 4.0 era

- a logical, analytical and systematic person who operates according to procedures
- has the innate need to correctly perform tasks and focus on issues rather than on people
- can work with people, but in a team that he knows
- he does not like changes and new situations
- he works calmly, from the beginning to the end prudent, and has the ability to bring things to the end
- is a very attentive, organized, predictable and methodical person

## Engineer 4.0 – engineer of future

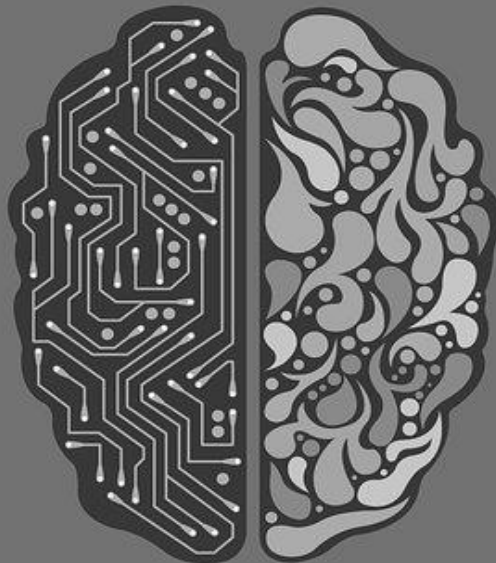
- an open and active person who likes diversity both in terms of contacts with people and the tasks performed
- has the ability to communicate to others with very technical and detailed information with enthusiasm and optimism, which arouses positive feelings in the listeners about the ideas it shares
- attaches great importance to details and strives for perfection
- ensures high quality of work and compliance with standards
- applies to rules and procedures



## Competences of Engineer 4.0

### Engineer 4.0

**Hard  
competences**

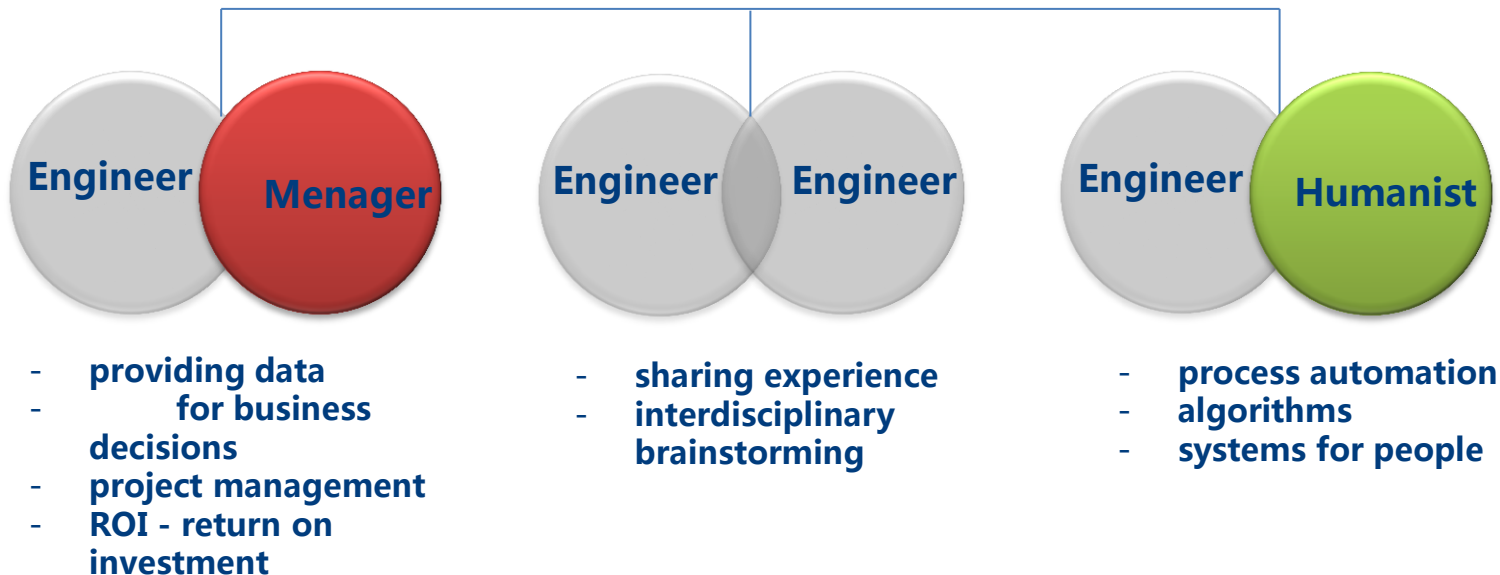


**Soft  
competences**

**Speed of action, openness to change and flexibility versus change,  
openness to contacts with people.**

# New competences of an engineer

## COOPERATION





**„The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn”**

*Alvin Toffler*

# Adaptation of the education model at PGG in the era of Industry 4.0



**CREATIVE THINKING**  
**THEORETIC KNOWLEDGE**  
**PRACTICAL ABILITIES**



ORGANIZACJA  
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PZU LAB



**Avoiding or limiting critical events  
and production stoppages  
thus ensuring business continuity.**



*Inauguracja programu*

# Pillars of the program

analyzing and drawing  
conclusions and learning  
for the future from events that  
have occurred

getting to know each other  
with technical novelties  
and technological and innovative  
solutions used  
in various branches of industry,  
KNOW HOW acquisition

acquiring knowledge through  
mutual learning  
and learning from others

Generating innovative  
solutions  
Creating the change process



## PROGRAM TEAM

### PZU Lab engineers

34 PGG engineers  
- 5 industry groups:  
mining, electrical,  
mechanical, transport,  
threats.



**Koordynator projektu** Andrzej Sączek – Dyrektor Departamentu Wsparcia HR

**Lider projektu** Rafał Gąsior – Dyrektor Biura Innowacji i Implementacji Nowych Technologii

# Division of the interdisciplinary team for working industry groups

## TEAM WORK

Exchange of experiences  
and implemented solutions  
in Branches in given areas.

Exchange of expert knowledge in  
the areas in question.

Joint development of new solutions  
to current problems



# Communication platform for solutions and experience exchange



The screenshot displays the web interface for the 'Organizacja Ucząca Się' project. At the top, it includes the 'POLSKA GRUPA GÓRNICZA' logo, the project title 'Witryna projektu "Organizacja Ucząca Się"', and an 'EDYTUJ ŁĄCZA' link. A left-hand navigation menu lists: 'Strona główna', 'Aktualności', 'Dyskusja', 'Kalendarz', 'Kontakty', 'Zadania', 'I Grupa Górnicza', 'II Grupa Logistyki i Transportu', 'III Grupa Elektryczna', 'IV Grupa Mechaniczna', 'V Grupa Zagrożeń', and another 'EDYTUJ ŁĄCZA' link. The main content area is titled 'WITRYNA PROJEKTU "ORGANIZACJA UCZĄCA SIĘ"' and is divided into two sections: 'NARZĘDZIA' (Tools) and 'GRUPY' (Groups). The 'NARZĘDZIA' section contains five tiles: 'AKTUALNOŚCI', 'DYSKUSJA', 'KALENDARZ', 'KONTAKTY', and 'ZADANIA'. The 'GRUPY' section contains five tiles: 'I GRUPA GÓRNICZA', 'II GRUPA LOGISTYKI I TRANSPORTU', 'III GRUPA ELEKTRYCZNA', 'IV GRUPA MECHANICZNA', and 'V GRUPA ZAGROŻEŃ'. Each tile features a stylized white line and circle icon on a dark red background.



# Experience exchange

- 01.**  
Study visits in other  
companies



- 02.**  
Study visits in PGG  
departments



- 03.**  
Working meetings of  
programme participants



- 04.**  
Working workshops for  
programme participants



- 05.**  
Participation in  
workshops,  
conferences, etc.



**GENERATIONG SOLUTIONS OF DIAGNOSED CRITICAL POINTS**



**„Innovations are valuable,  
but copying solutions,  
which succeeded,  
is far more practical.”**

*Jorge Paulo Lemann*



ORGANIZACJA  
UCZĄCA SIĘ



# Schedule of activities January – December 2018

Initiation meeting with PZU Lab      Action continuity management workshops      Workshop – the goal of self-learning company

Study visit at KWK ROW Ruch Marcel      Workshop: Diagnosis of problems disrupting the action continuity

4experience 3D Platform meeting      Study visit at KWK Murcki Staszic      Automation and safety conference

Study visit at PCC Rokita      Study visit at KWK Sośnica      PZU Lab safety forum

Study visit at Połaniec power plant      Study visit at KWK RUDA Ruch Halemba

Study visit at Węglókoks Kraj KWK Bobrek-Piekary - transport logistics

Visit at ABB - Innovation department works      Study visit at OKD CZECHY

OUS report analysis PZU Lab workshop      Learning from mistakes workshop

Cyclic meetings within work groups

Ahead of  
us:

Visit at 3D printing house

Study visit at Azoty

**GENERATION OF  
SOLUTIONS FOR  
DIAGNOSED  
CRITICAL POINTS**

# Study visits



## A group of PGG engineers experienced the PCC Rokita actions:

- improving widely-interpreted **safety**
- improving the production processes
- positively influencing the continuity of actions



# Visits of the PZU Lab in departments of PGG S.A.

KWK ROW Ruch Marcel

KWK Murcki-Staszic

KWK Sośnica

KWK Ruda

## Goals of visits

- Classification of state of particular mines.
- Assessment of performance of the safety management systems and actions continuity, identification of areas requiring development.
- Elaboration of action plan in the direction of safety improvement in selected areas and definition of long-term strategy of managing the system for safety culture in the company.



# Conclusions from visit at KWK

## Observations

- Server rooms and monitoring centers require the improvement in safety from random events
- Need for common analysis of failures on the level of mines and the entire PGG group
- Standardization of machine park
- Application of uniform and integrated system in terms of production maintenance



## Repair actions

- Machines of the control room reconstructed in the higher storey, what eliminates the risk of sinking and construction of reserve control rooms, installation of sensors
- Energy machines control room
- Aggregated purchases of machines and devices

**We draw conclusions from experience**



# WORKSHOP

Analysis, diagnosis and innovative solutions in the management of action continuity

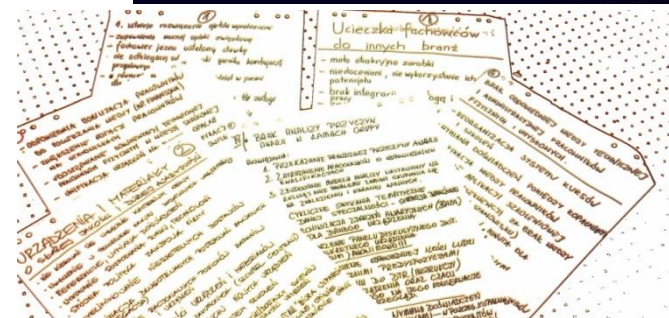
## Goal of workshops

Identification of the most important problems

Defining the directions of action

Generation of solutions

Indication of potential fields of application of derived solutions



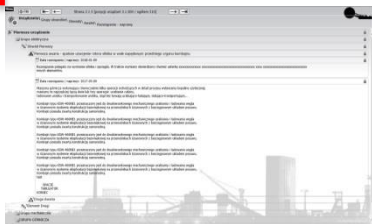
**THE NETWORK OF REALIZATION  
STAYS AS IT WAS,  
BUT THE COMMUNICATION AND  
INFORMATION EXCHANGE  
NETWORK BECOMES GIGANTIC**





# Selected solutions

## Application for failures recording



Replacement of controls made by people or impossible to do manually because of the technical limitations, during the production and the rescue action

## Unmanned system for excavation monitoring

## Application of remote control systems and visualization of busbars and lute fans

Full automation, remote control, work paramteres monitoring, assuring the action continuity

Ability for continuous connection with transport teams, increase of safety, improvement of performance (elasticity) in transport.

## Transport logistics system – wireless connection – stage I

# Selected solutions

## 3D scannig – virtual working wall model

Selection of the wall complexes with use of 3D scanning in the aspect of analysis of geological-mining conditions (especially drops, washouts, changes of slope)

Controls of mechanical and electric devices with use of thermal camera, which allowed to prevent failures of machines and devices relevant in keeping the continuity of production.

## Thermovision camera

## Magnetic-neodymium filter

Elimination of burdensome metallic impurities, protection of hudraulic systems, decreasing the frequency of hydraulic filters replacement, minimization of risk of failure of the main pump of tractor

New organization cell in the structure of PGG S.A.  
foundation: maj 2018 r.

## The Office for Innovation and Implementation of New Technologies

## **PZU Lab' s report Summarizing the actions of „self-learning organization”**



***Ceremony of report forwarding - PZU Lab  
Day  
1<sup>st</sup> October 2018***

# The influence of the organization culture



**CULTURE IS LIKE GRAVITY  
— IT CAN THWART EVEN THE  
BEST STRATEGY**

# Learning in PGG supporting the safety and production processes

Using the experience of all employees of the organisation in order to create new knowledge

Learning by studying

Learning by experience

Learning from others

Self-studying

Learning from environment

Learning from external units

Teching the future workforce



Self-learning organization- the term proposed by Peter Senge, meaning the organization able to learn and to adopt to changing conditions of functioning

# EDUCATION SYSTEM IN PGG

## Education of future employee

Basic education

Higher education

Dual education  
Basics of education programme  
adjusted to the needs of employer

## Education of PGG' s employee

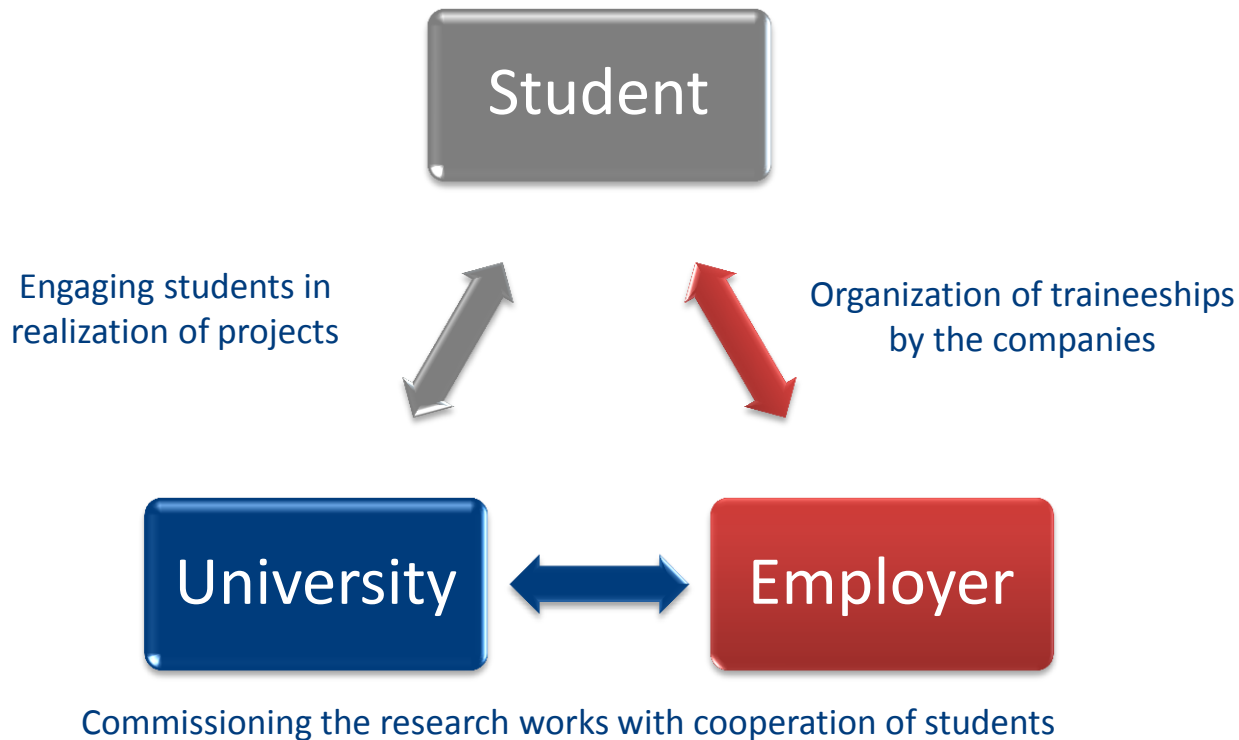
Higher education

Courses and workshops

Unformal learning

Development programs and projects

*Adjustment of the direction of staff development for acquiring appropriate qualifications, convergent with actual needs of the company*





# EDUCATION SYSTEM IN PGG

Future employee

## Ministry of education

Cooperation in terms of:

- Creating the basics of programmes,
- Practical learning of the profession in realistic conditions of work
- Profession exams



MINISTERSTWO  
EDUKACJI  
NARODOWEJ

## Education Development Center

Cooperation in elaboration of:

- Professional development paths,
- Plans and schedules of teaching,
- Supplements for qualifications and diplomas.



OŚRODEK  
ROZWOJU  
EDUKACJI

## Central Examination Committee

Co-authoring and carrying out of the practical part of the profession exam.



CENTRALNA  
KOMISJA  
EGZAMINACYJNA

## PGG Campaign encouraging youths to study in modern mining professions

**Miner**

**Electronics**

**Locksmith**

**Electrician**

**Mechatronics**

**Geophysicist**

**Geologist**



Modern engineer will have to catch up with the technology progress, carrying about the development not only in own profession, but also in others, which strongly interconnect.

**Computer  
specialist**

**Automatics**

**Robotics**

**ITMATIC**

Future employee

## COOPOERATION WITH COUNTIES AND COMMUNES IN TERMS OF EDUCATION IN MINING AND OTHER PROFESSIONS NECESSARY FOR FUNCTIONING OF THE MODERN MINING

*Cities:  
Katowice, Ruda Śląska,  
Rybnik, Mysłowice, Chorzów  
and  
counties: mikołowski,  
wodzisławski and bieruńsko-  
lędziński*



*Vice-chairman for employment  
manners in PGG Jerzy Janczewski and  
vice-president of Katowice  
Waldemar Bojarun have signed the  
agreement giving the mining-classes  
absolvents the guarantee of hiring in  
the company' s mines.*



## Cooperation with high schools

### A practical apprenticeship program for students

- Employment guarantee
- Monthly scholarships
- Annual awards
- Practical profession
- Contact with experienced employees

Dual education

## Future employee



**Uwaga!!!**  
**Przyszły absolwencie szkoły gimnazjalnej**  
podejmij naukę w szkole branżowej lub technikum,  
w zawodzie: górniczym, elektrycznym, mechanicznym  
lub innym niezbędnym dla funkcjonowania nowoczesnego górnictwa.  
Rok szkolny 2018/2019

**Twoja przyszłość z Polską Grupą Górniczą S.A.**

**Oferujemy**  
**Program stypendialny dla uczniów szkół branżowych i techników wraz z gwarancjami zatrudnienia.**

Twoje korzyści po podjęciu nauki w szkołach współpracujących z Polską Grupą Górniczą S.A.

- stypendia miesięczne - 200 zł netto na miesiąc dla każdego ucznia
- nagrody roczne - 1 000 zł netto dla ucznia osiągnącego dobre wyniki w nauce
- poznanie branży od strony praktycznej
- możliwość kontaktu z doświadczonymi pracownikami PGG
- możliwość zatrudnienia w PGG

Kontakt z PGG: T: (32) 757 21 39  
Departament Wsparcia HR T: (32) 757 20 58

Szczegółowych informacji udziela Sekretariat Szkoły.

## Cooperation with universities

### Mentoring program for students of Faculty of Mining and Geology

- Employment guarantee
- Monthly scholarships
- Practical profession
- Paid apprenticeships
- Contact with experienced employees
- Intentional diploma thesis to be used on the mine



Politechnika  
Śląska

Dual education

## Future employee



POLSKA GRUPA  
GÓRNICZA

### Uwaga!!!

Studencie studiów stacjonarnych II stopnia

Wydziału Górnictwa i Geologii Politechniki Śląskiej w Gliwicach

### Twoja przyszłość z Polską Grupą Górniczą S.A.

Oferujemy udział w praktykach i zajęciach organizowanych w kopalniach PGG!

#### Twoje korzyści ze współpracy z PGG

stypendia miesięczne 600 zł netto, płatne wakacyjne praktyki pod ziemią 2500 zł brutto miesięcznie

- |   |  |
|---|--|
| ■ poznanie branży od strony praktycznej                   | ■ weryfikacja wiedzy nabytej w trakcie studiów inżynierskich |
| ■ możliwość kontaktu z doświadczonymi pracownikami PGG    | ■ możliwość zatrudnienia w kopalniach PGG                    |
| ■ opieka i konsultacje na etapie pisania pracy dyplomowej |  |

Kontakt:  
Biuro Szkoleń i Rozwoju PGG  
T: (32) 757 21 39  
T: (32) 757 20 58

Dziekana Politechniki Śląskiej  
T: (32) 237 24 02

Regulamin praktyk studenckich  
dostępny na stronie [pgg.pl](http://pgg.pl)  
w zakładce „pozostała  
działalność”



Poster – media campaigning



## DUAL EDUCATION – THE COMBINATION OF PRACTICE WITH LEARNING

### PRACTICAL BASE PGG S.A. FOR PRACTICAL VOCATIONAL TRAINING

#### Examination Centers

KWK ROW Ruch Chwałowice  
KWK Piast-Ziemowit  
KWK Wujek  
KWK Ruda Ruch Halemba

#### Tunnels

KWK ROW Ruch Chwałowice  
KWK Piast-Ziemowit  
KWK Ruda Ruch Halemba

#### Wall for active methane extinguishing

KWK ROW Ruch Jankowice  
KWK Murcki Staszic

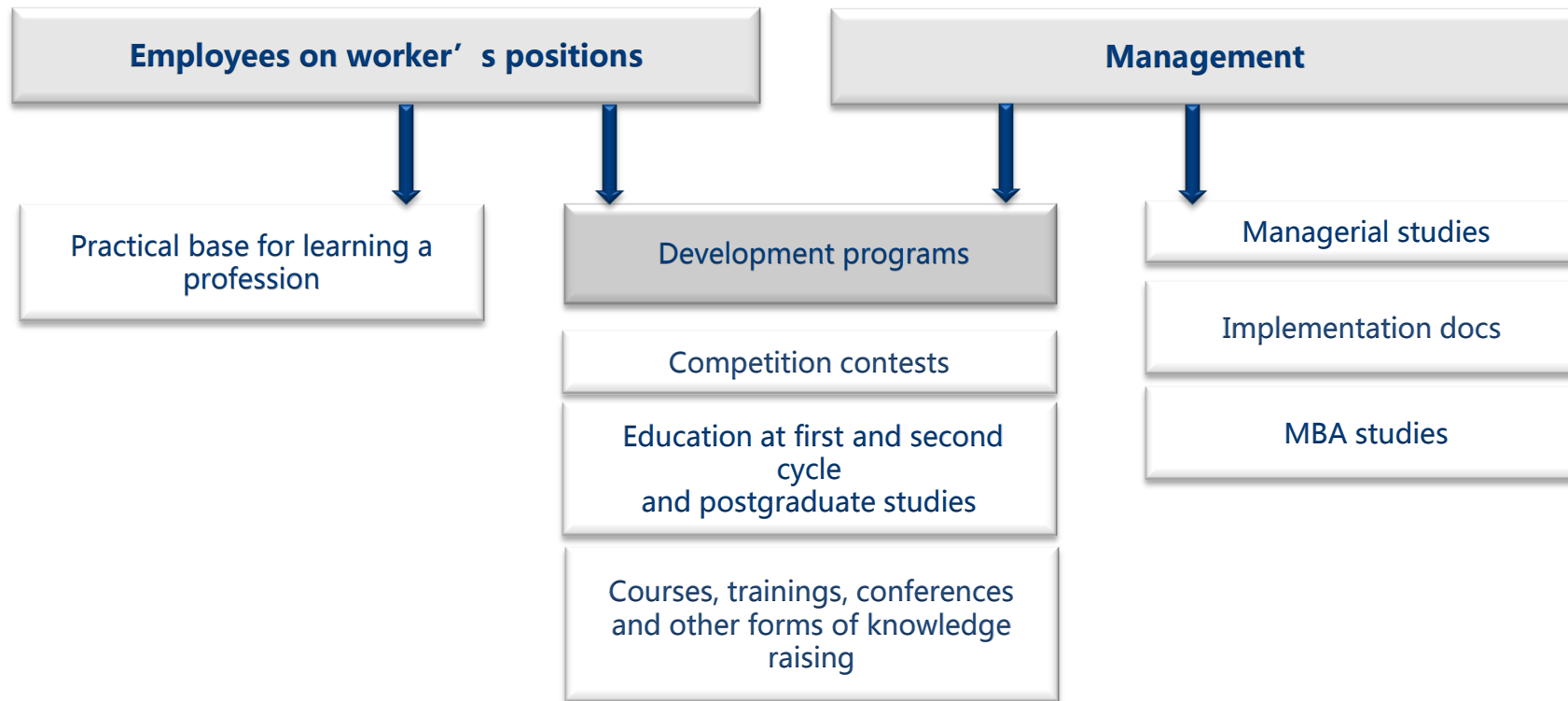
#### Electrical laboratory

KWK ROW Ruch Rydułtowy

Practical base of the SCUW  
Center



Practical mine field KWK Wujek





## Methods for the development of PGG S.A. employees



**Virtual reality**



**Interactive training games**



**computer animations and  
reconstructions of accidents,  
training videos**

## Educational and learning platforms



**PROFI**



**GWAREK**



**Competition platform  
,I work safely'**



**A training platform for conducting  
health and safety training**

# Science and business. Together

Doctoral studies  
Mining and Geology Field

## ESTABLISHING INNOVATIVE CUSTOM SOLUTIONS



GŁÓWNY  
INSTYTUT  
GÓRNICCTWA  
KATOWICE

Implementation into mine department

Implementation into other mine  
departments

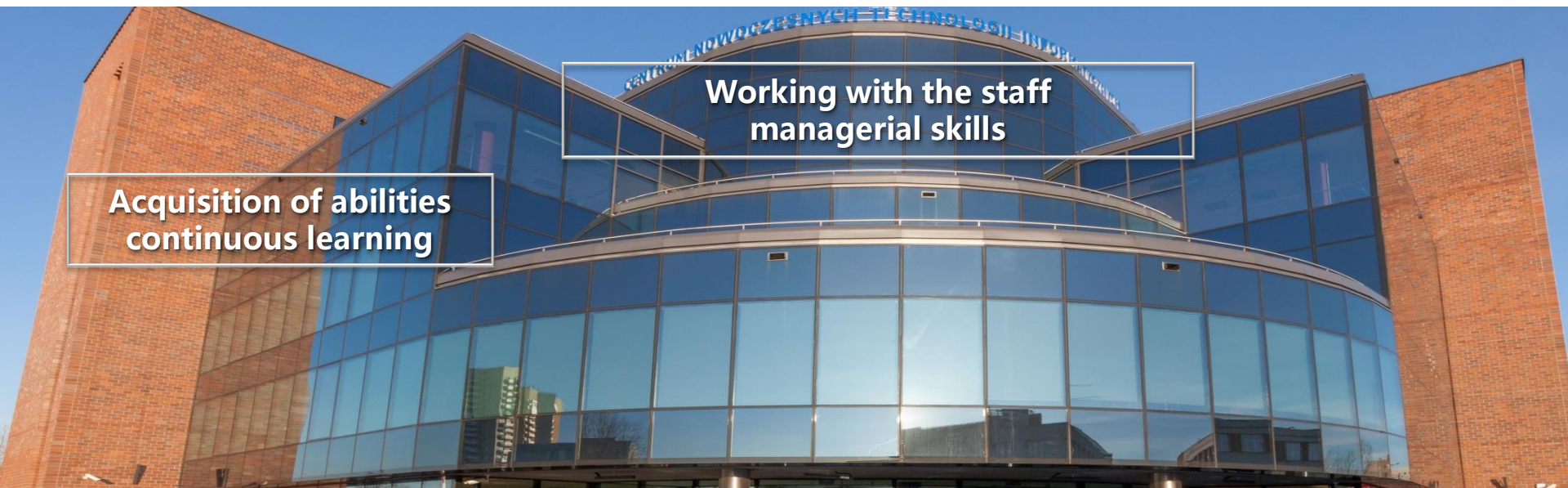


KNOWLEDGE ACQUISITION AND  
EMPLOYEE DEVELOPMENT

IMPLEMENTATION OF INNOVATIVE SOLUTIONS

20  
PGG S.A.  
employees

# MANAGERIAL STUDIES "MANAGER IN THE MINING INDUSTRY" I edition of ordered studies



Working with the staff  
managerial skills

Acquisition of abilities  
continuous learning

**Legal environment  
company**

**human capital  
management**

**Business finance**

**Company management**

## Increase of competence to create effective mining brigades

### The "Effective Dagger" project Building effective teams

- building teams
- managing people
- behavior in stressful situations
- issuing commands
- feedback
- group work
- assessment and motivation



450 employees

diagnosis:

- managerial competences
- styles of thinking
- styles of action



## Katowice - the city of professionals





**KATOWICE  
MIASTEM  
FACHOWCÓW**

*Wizyty  
studyjne*

Students taking part  
in the project "Katowice  
Miasto Fachowców"  
September - November 2018  
450 people

Number of study visits at PGG,  
primary and secondary  
schools  
September - November 2018  
30 people



**KATOWICE**  
*dla admnary*

**The effect of the actions taken  
within the framework of the "Learning Organization"  
program  
in the field of education and development**

**„TRUSTWORTHY EMPLOYER"  
2018**  
in the education category  
for a comprehensive educational  
offer



***Honorary patronage of the event:  
Ministry of Family, Labor and Social Policy, Ministry of Energy and  
Ministry of Agriculture and Rural Development***



# **PGG**

## **Self-learning organization**