

WOC2 - SG2.3 report: Skills and Competencies for UGS Activities

PART A: Skills and Competencies for UGS Activities

PART B: IGU WOC2 Young Employees Exchange Programme

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Venue: Kuala Lumpur



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Objectives of the study

In recent years, human resources have become critically important in all areas of business including the UGS business too.

Recruiting suitable and qualified employees, motivating and remunerating them appropriately and training them continuously – these are the main objectives pursued by every HR department and team and project leaders.

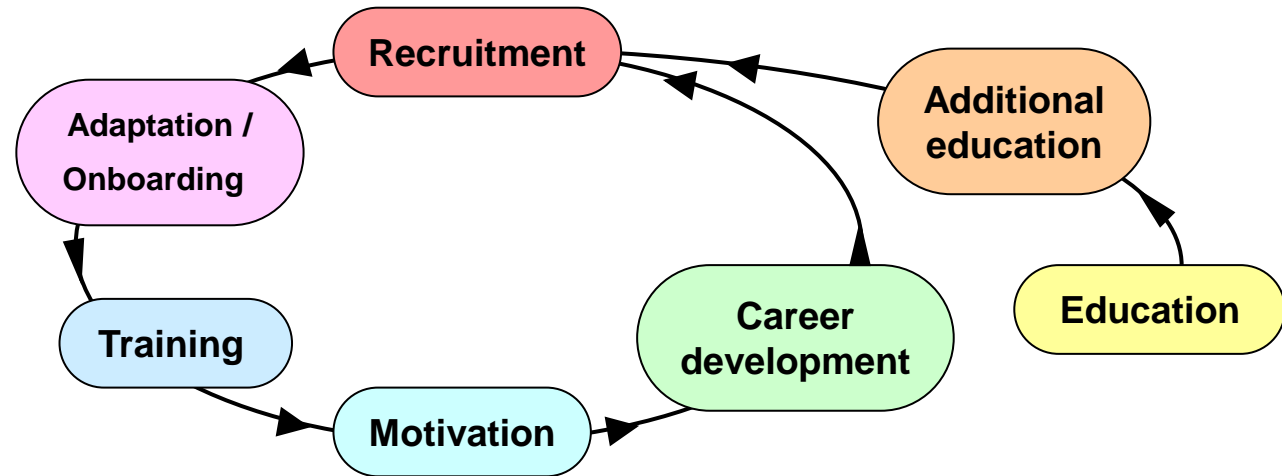
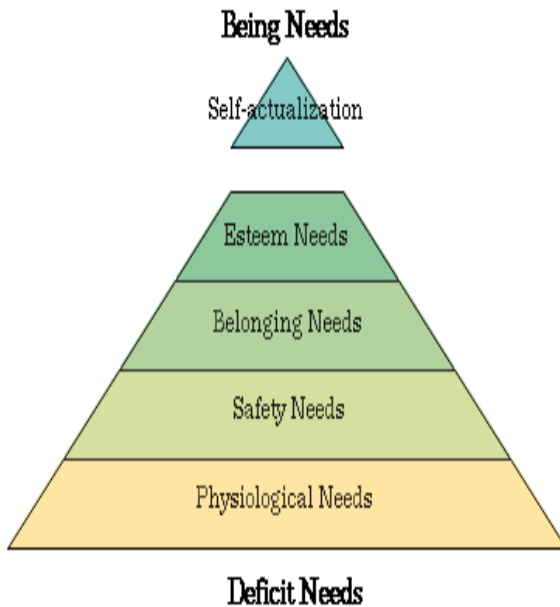
The first purpose of this study, described as Part A **Skills and Competencies Model**, was to provide a brief outline of the fundamental activities entailed in personnel management in theory and in practice, ranging from personnel planning to recruitment and selection of skilled employees working in the UGS industry such as petroleum or reservoir geologists and geophysicists, reservoir engineers, drilling and completion specialists, UGS managers and IT related key personnel. In this complex, it was also necessary to include other phenomena of the sustainable education model such as the adaptation process, performance evaluation, remuneration and motivation.

The second purpose of this study group, described as Part B, was to organise three two-week intensive advanced courses for 15 young UGS professionals from WOC2 member companies aged under 30, called **Young Employees Exchange Programme (YEPP)**. Within the organisation of YEPP, it was necessary to arrange sponsorships and course providers, prepare entrance tests, syllabi, lectures and mentors, and handle all administration issues covering accommodation, visa, air tickets, etc.

This study contributes to the work of Task Force 1: “Building Strategic Human Capital”

General Conditions

- The Maslow hierarchy of needs
- Employee „life cycle“
- HR Difficulties within UGS Industry



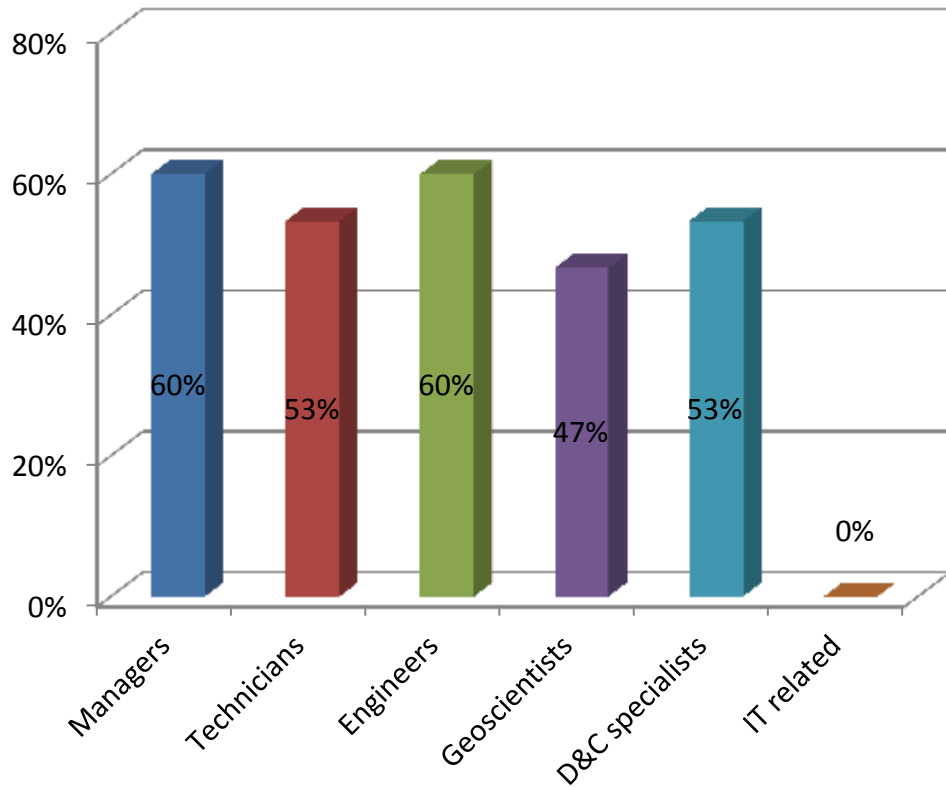
All personnel difficulties related to the UGS industry:

- * Widely known shortage of skilled professionals in UGS (multidisciplinary) business
- * Aging of current specialist vs. lack of newcomers - specialists
- * Lack of students/incentives for studies
- * Lack of young talented specialists
- * New technologies and IT to be adopted in UGS - needs for new skills
- * Needs for continuous education, systems of knowledge management
- * **Gas is not perceived to be so green and sexy as before;**
- * **Public discussion on the end of the peak oil age;**
- * **Limited attractiveness of technical disciplines.**

Legal requirements

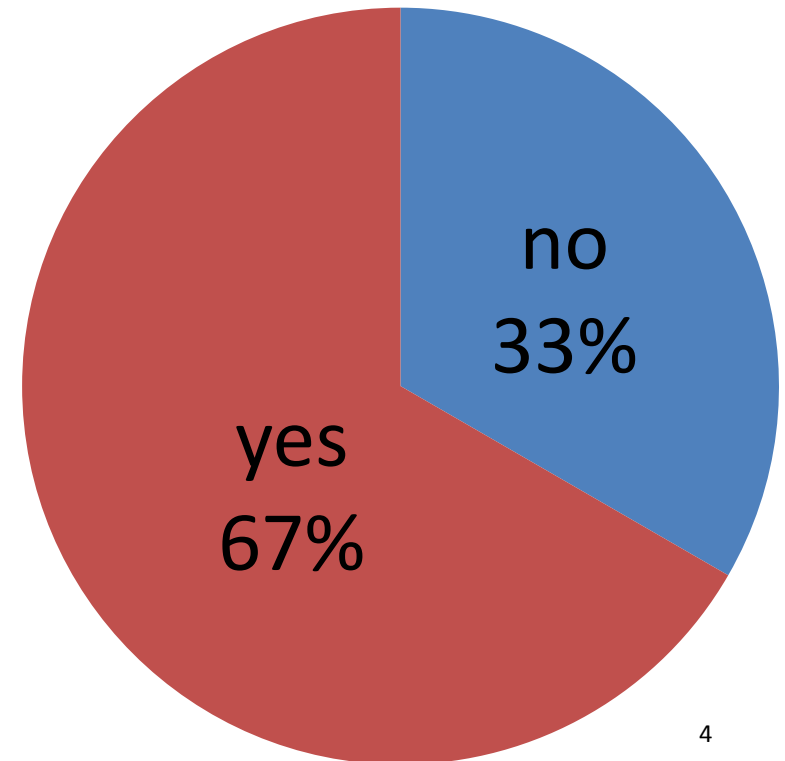
Does your UGS development and/or operation require any specific authorisation /legal requirements in the mentioned positions?

In many countries across Europe (and elsewhere) authorities require certified/responsible persons for specific positions in UGS company activities



Do the mining (and similar) authorities in your country require a periodical examination of authorised persons?

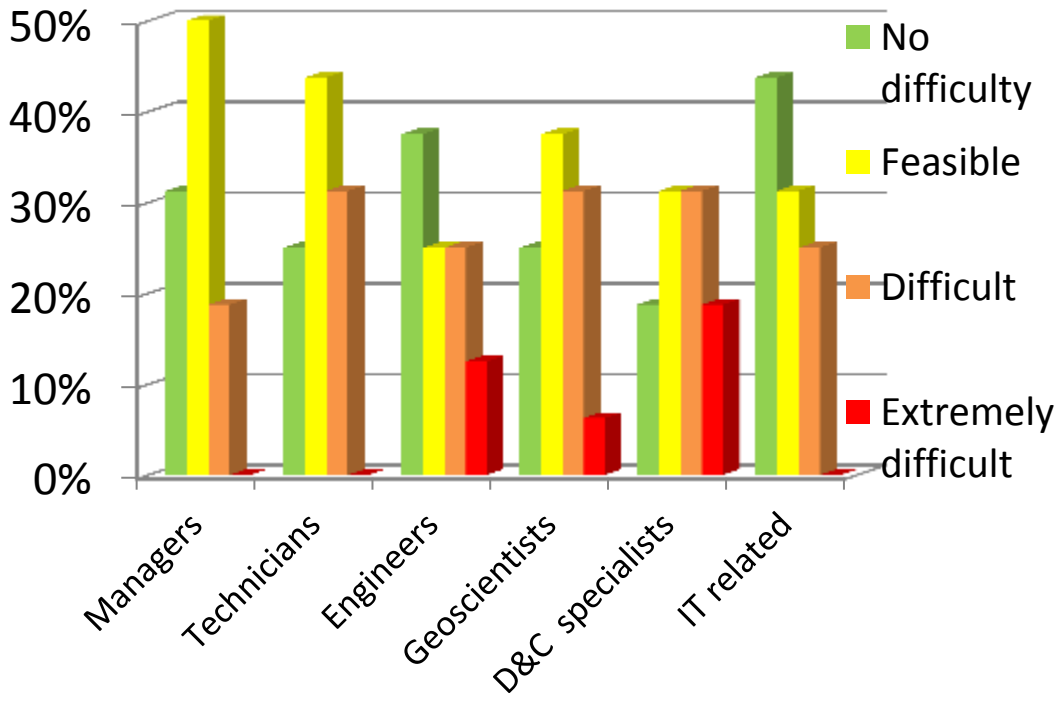
According to the results, in two thirds of the cases certification has to be periodically renewed, specifically in the case of managers, reservoir engineers and drilling and completion specialists.



Education – External: Relationship between company and HR suppliers – universities

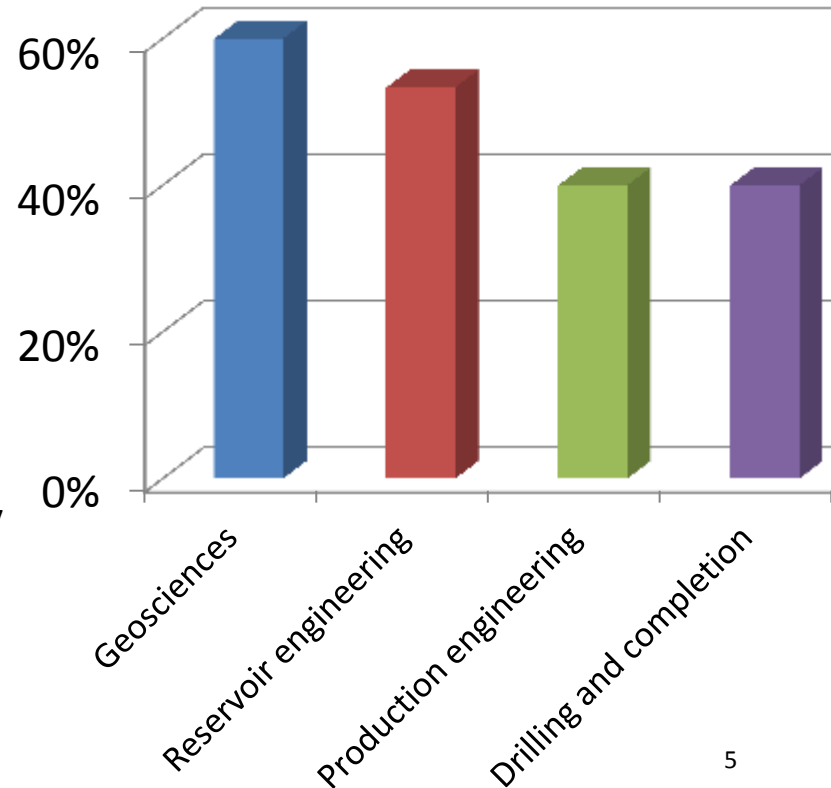
Which of the UGS position are sufficiently supplied by universities and others schools in your country?

External – outsourced education is mainly provided by specialised universities and training/consultant companies. But the high standard educational process is mainly based on universities producing highly qualified graduates and consequently on a relationship between universities and the UGS industry.

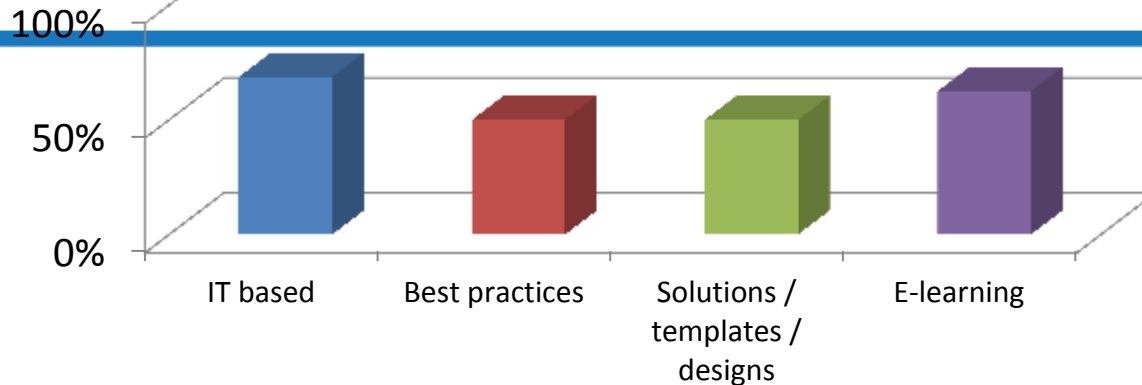


Does your company have any specific agreements with universities regarding support and development of specific disciplines?

Despite numerous specific agreements between industry and universities there is a lack of UGS specialists, newcomers on the market



Education – Internal: Knowledge transfer within the company



Does your company use a Knowledge Management System in the area mentioned?

75% of companies involved in the gas business rely on internal knowledge management. It is a key element in doing business to ensure that the right people have the right competencies and to ensure that the companies have an overview of the knowledge base.

69% have an IT-based system that ensures quick and broad overview of the personnel. This relates to the fact that 63% offer an e-learning feature to ensure that staff have access to education and competency development.

50% of the companies rely on structured Best Practice systems together with templates and designs that guide the way for internal education.

It is considered to be a vital form of knowledge transfer in the gas business, as no structured educational programme for education in the gas business exists throughout Europe.

From our investigation into the gas business it is evident that the use of internal education is a vital and very important way of educating the people in gas business and it is a core part of ensuring that companies can continue to rely on the fact that the people employed have the right skills.

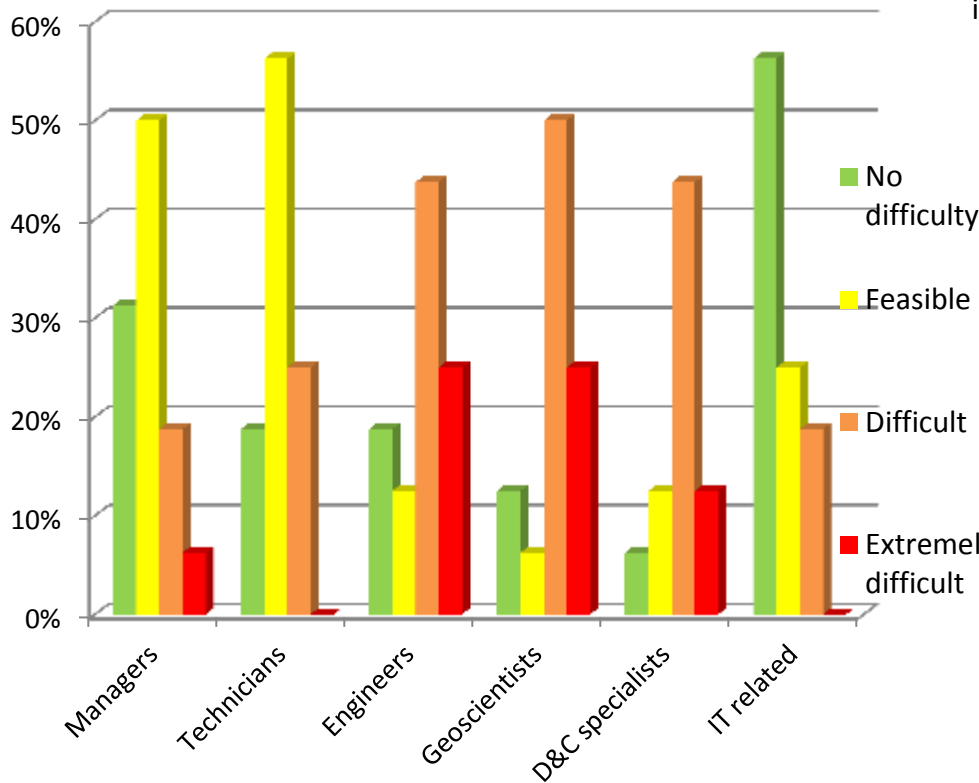
Knowledge is being transferred through teamwork, specific training and continuous education in up to 94% of the gas business. This provides a structured systematic way of ensuring that the skills and competencies are handed over from employee to employee. Internships where the companies give new employees a structured way of learning the business as an intern are used in 63% of the companies.

Job sharing where new employees are introduced to the business by on the job training together with experienced colleagues is used in 53% of the business. This offers a reliable way of ensuring that the knowledge already present can be handed over to new employees. However, this can also present a situation where possibly an unwanted way of doing business is handed over. Therefore it is always a challenge to ensure that on the job training relies on well-defined solutions or templates.

UGS Company activities/positions

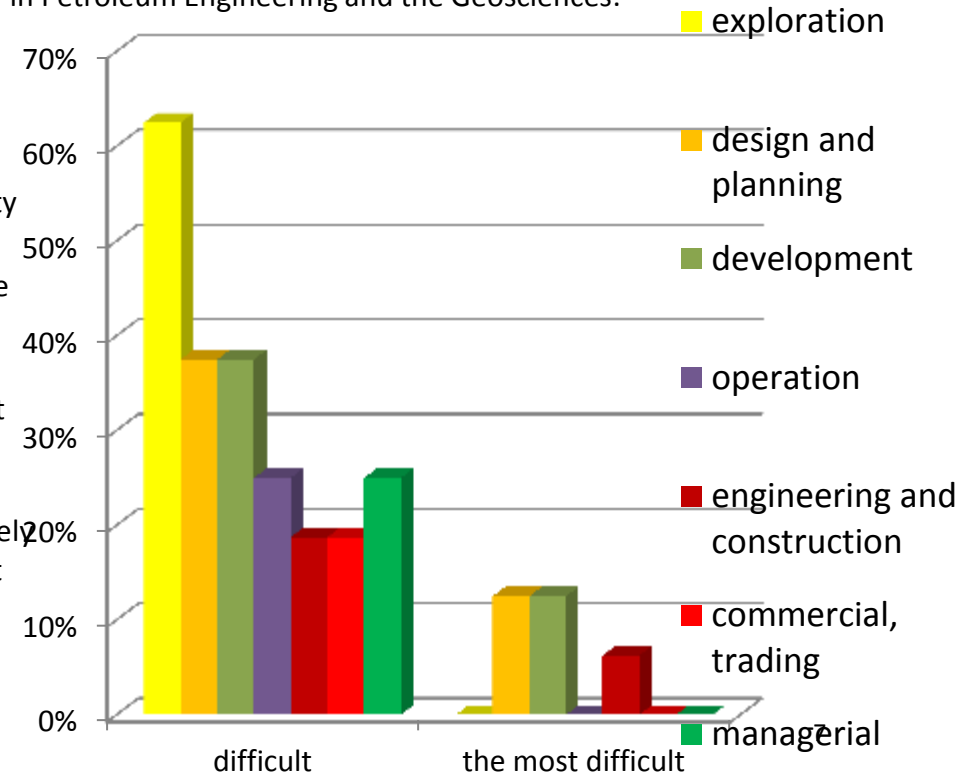
Which UGS positions are the most difficult to fill in your company/country?

Some key professions and activities related to UGS were selected in the distributed questionnaire. The following were found among the most difficult positions to be filled in your company: engineers, geoscientists and drilling specialists. Regarding the most difficult activities, exploration, design and planning and UGS development were found.



Which of the activities are the most difficult to fill in your company?

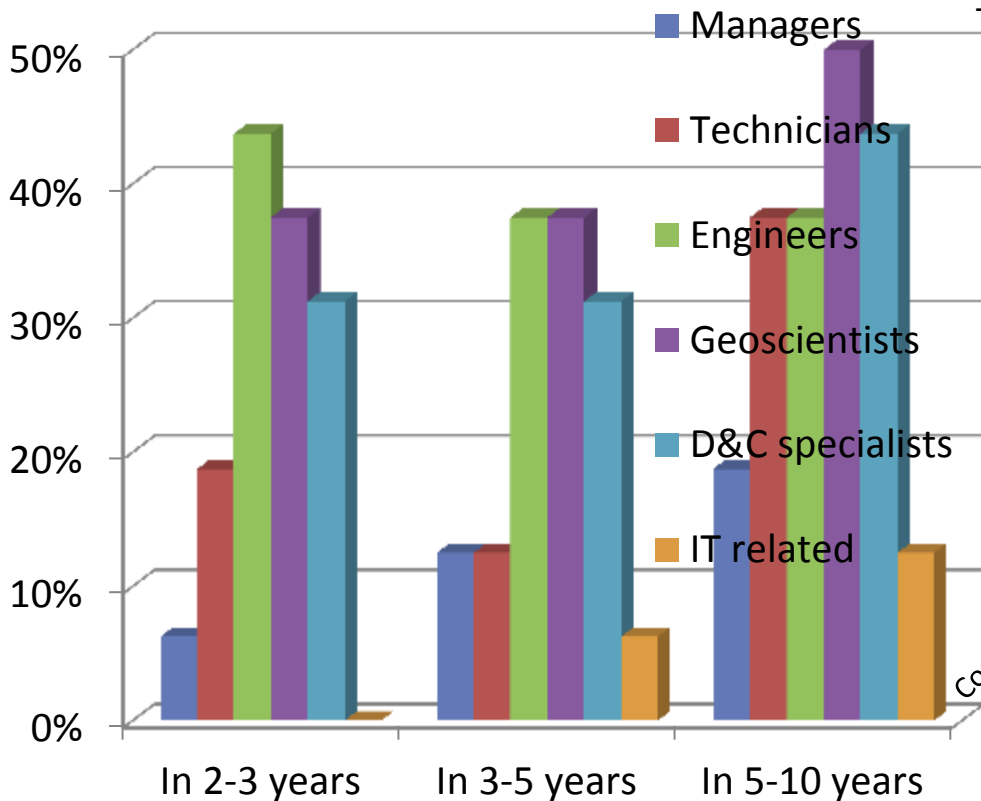
A very large number of people our age became Petroleum Engineers and Geoscientists in the 1970s and early 1980s during the oil crisis. Very few students were attracted to these fields in the late 1980s through 2005 due to the low price of oil and the trend in the oil industry to downsize and consolidate during this period. The industry is now trying to catch up and salaries have grown considerably over the last 5 years and more students are being trained in Petroleum Engineering and the Geosciences.



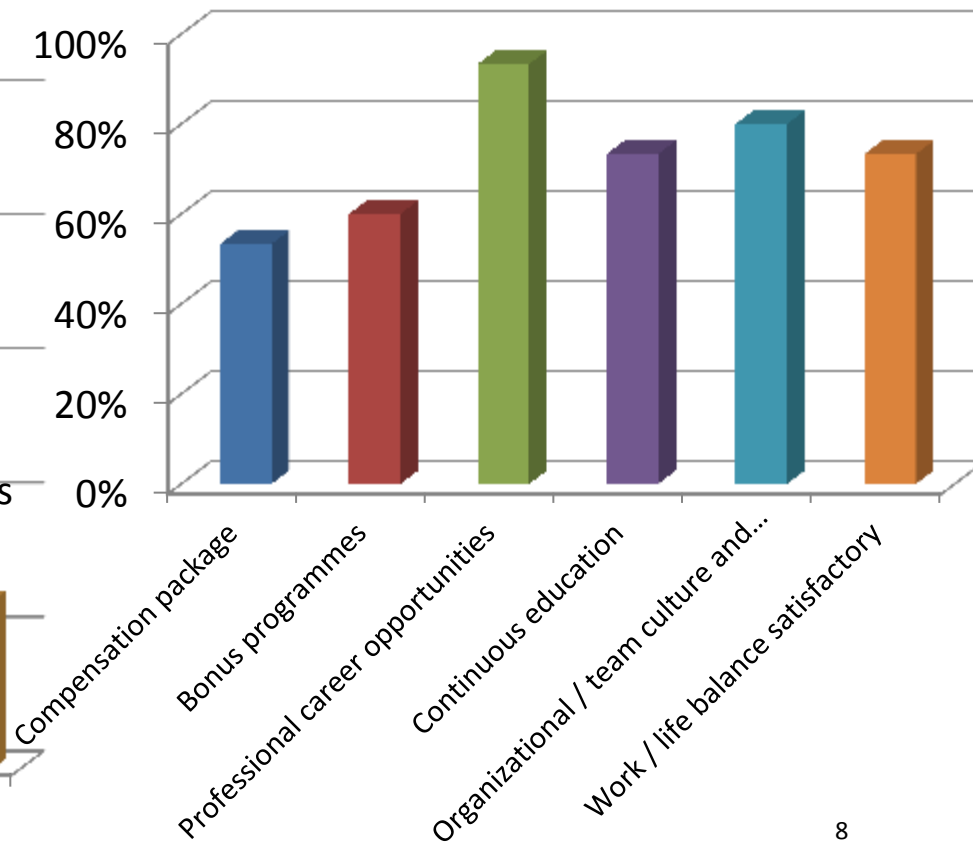
Skills shortage in UGS business in the near future a employee retention

Shortage of which skills in UGS business in your country do you expect in the future?

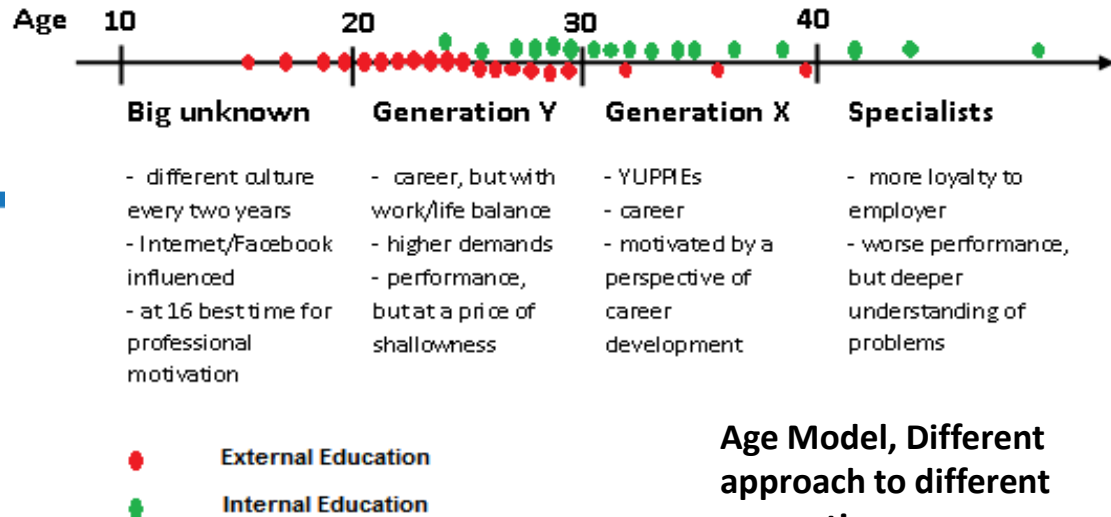
Skills shortage and aging of current UGS personnel are among widely known phenomena. Based on questionnaire results, the foreseen conditions will even be worse.



What are the most important points of satisfactory in recruiting and retaining specialists and key personnel in your company?



Education Model



Age Model, Different approach to different generations

Universities – standard study

- + Goes into depth of problems
- + Cheap
- + Gives scientific background
- Lengthy, time consuming
- Not always what company needs

Universities – special courses

- + Can be tailored for given company/people.
- + Flexible places/times.
- + Relatively cheap.
- Lecturers not always reflect the practice
- Fast, not much background

Consultancy companies

- + Giving training in what GS business really needs.
- + Fast, intensive.
- Expensive
- Flexibility/tailoring for extra costs.

In-house training

- + Gives knowledge special for the company
- + Flexible, customizable
- Usually no company has a training centre, extra work for older employees.
- Expect some prior background in given field.

For the successful planning of HR, companies should start to attract pupils and students at a very young age, between 16 and 20 years. In higher age groups the need for specific education is decreasing and it is replaced by experience.

Conclusions

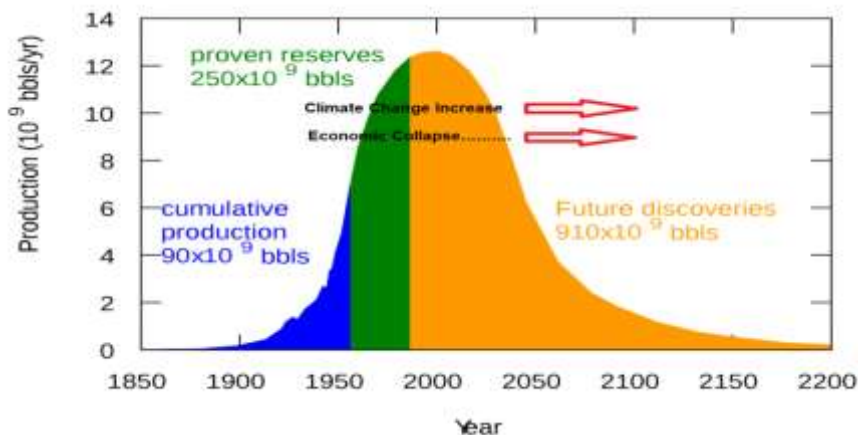
Among the negatives why the attractiveness is relatively low are the following issues:

- A relatively long chain of required education, starting with technical branches at secondary schools, through relatively difficult university studies and long-term training/adaptation process in the company. A specific relationship between the industry and the educational environment, working together, is required.
- Negative perception of hydrocarbons and technology related to gas production such as hydraulic fracturing applied for unconventional gas due to negative impacts on the environment.
- Rigidity of the gas business and society and low salary increases with a slow position/career growth.
- Workplaces, UGS locations often out of big cities and need for travelling.

On the other hand, based on the analysis of the questionnaire, among the pros and positive future UGS HR development we have evaluated the following:

- Stability of the UGS business specifically if society recognises that gas can be a good solution for a low carbon future.
- Very good starting salary and other compensation packages and bonuses.
- Good environment for personal specialisation and education throughout the UGS specialist's career.

Through obtained uncomplete information and analyses about building people's capacity to innovate and implement solutions, education is essential for the safe and optimised UGS development and operation.



We cannot simply extrapolate society's development into the future we could arrive at the wrong conclusion. However, history teems with examples of episodes when the world and society did not evolve linearly. From time to time, there are revolutions, collapses, conflicts and natural disasters with local, national, or global impacts.

Part B – Young Employee Exchange Programme



The fact of the lack of qualified experts has a fundamental impact on the operation of underground gas storage facilities and the development of new storage capacities.

For these reasons, the International Gas Union (IGU) decided that during the 2009-2012 Triennium, in Study Group 2.3 (Skills and Competencies for UGS Activities) of Technical Committee WOC 2 (Storage), this problem would be addressed by an exchange study programme called Young Employees Exchange Programme (YEEP). This programme was prepared for companies that deal with the issues of underground gas storage in porous media.

Dedicated to young newcomers to UGS Industry - university graduates working, or starting to work, with the issues of underground gas storage and was divided into the following three fields describing the workflow from the storage reservoir to the gathering network, i.e., particular courses, which are: (Summer 2011 each course took 2 weeks, in total 6 weeks)

Course I

Geological aspects of underground gas storage (UGS) design, construction and cyclic operation – Gubkin Russian State University of Oil and Gas **in Moscow** (Russia)

Course II

Reservoir Engineering – Technical University **in Liberec** (Czech Republic)

Course III

Treatment of Natural Gas – Institute of Chemical Technology **in Prague** (Czech Republic)

YEEP was run in the spirit of the IGU, i.e., free of charge. Course financing was provided by sponsors, i.e., participation was free of charge for the attendees; All overhead charges (e.g., travel costs, accommodation, insurance etc.) was covered by the attendees' employers; The **sponsorships** were provided by Gazprom, RWE Gas Storage and the Czech Gas Association.

Final Exam Question Sample

Name:

Surname:

300 multiple choice questions in total, i.e. 100 questions per course

1. Reservoir Engineering deals with
 - a) Construction of pipes and flowlines
 - b) Flow through pipes and surface facilities
 - c) **Flow through porous media**

2. Which of the following is NOT a task of reservoir engineers?
 - a) Estimation of gas initially in place
 - b) **Removal of wellbore damage**
 - c) Optimization of hydrocarbon recovery

3. Porosity is a
 - a) **Measurement of storage capacity of underground formations**
 - b) Measure for the size of the grains
 - c) Measure how good oil and gas flows through porous media

4. The theoretically maximum porosity is
 - a) Between 1 and 10%
 - b) Between 50 and 55 %
 - c) **Between 35 and 50%**

5. The porosity in a reservoir during pressure decline will
 - a) remain constant
 - b) get larger
 - c) **get smaller**

6. Which of the following is WRONG: porosity can be determined from
 - a) cores
 - b) logs
 - c) **material balance methods**

List of attendees IGU WOC2 YEPP – in alphabetical order

	Surname	Name	Country	Company	Position	Specialty
1	BODNÁR	Jozef	Czech Republic	RWE Gas Storage, s.r.o.	Specialist, Asset Operation	UGS operation
2	KOVALEVA	Yana	Russia	LLC "Gazprom UGS"	Chief engineer	Development and operation of oil and gas fields
3	LI	Chun	China	China National Petroleum Corporation	Engineer	Reservoir engineering
4	MIHOČOVÁ	Mariana	Czech Republic	MND a. s., Hodonín	Reservoir engineer	Numerical simulation of flow (Petrel+Eclipse), analyses of reserves and duration of their viability
5	MÖBIUS	Christian	Germany	E.ON Gas Storage	Project Manager	Geoscience
6	MOTOV	Eugenii	Russia	LLC "Gazprom UGS"	Oil-gas production operator	Technology and equipment for exploration of mineral deposit
7	NIKITIN	Maxim	Russia	Gazpromenergodiagnostika	Specialist in Petroleum Engineering	
8	ORESHINA	Natalia	Russia	LLC "Gazprom UGS"	Engineer on new technology and equipment implementation	Geology and geochemistry of fossil fuel
9	PAVLIKOVA	Ivana	Czech Republic	MND a.s.	Completion Engineer	well performance, design and optimization in Prosper
10	POLAK-OSINIAK	Dorota	Poland	Polish Oil and Gas Company (PGNiG SA)	Specialist	Underground Gas Storage
11	RAN	Lina	China	China National Petroleum Corporation	Engineer	Geotechnical engineering
12	SALZWEDEL	Alexander	Germany	E.ON Gas Storage	Project Engineer	Reservoir & Production Engineering
13	SELIVANOV	Daniil	Russia	LLC "Gazprom VNIIGAZ"	Junior research officer of UGS Department	Chemistry
14	VORONOV	Svyatoslav	Russia	LLC "Gazprom VNIIGAZ"	Research officer of UGS Department	Underground gas and liquid storage
15	WANYAN	Qiqi	China	China National Petroleum Corporation	Engineer	Geological engineering

IGU WOC2 YEOP – Closing Ceremony

Thank you for your attention!

