

LEVEL OF PERFORMANCE CAPACITY OF THE WORKERS IN OIL AND GAS PROCESSING INDUSTRY

Onayev S., Balayeva E., Kurmangalieva D., Shadetova A.

*National Center of Labour Hygiene and Occupational Diseases of the Ministry of Healthcare
of the Republic of Kazakhstan, Karaganda, e-mail:ncgt.ergo@gmail.com*

We made the estimation of the working capacity level of the second generation oil and gas processing plants' workers. The level of the performance capacity depended on age, seniority and workers' profession. Thus, the number of persons having a low level of performance was found among the operators and engineers aged 19-29 with the working experience of 10 years.

Keywords: age, seniority, production factors, occupational groups

Oil and gas processing industry is one of the most profitable and quickly developing branches of the fuel energy industries in the Republic of Kazakhstan. Modern enterprises for oil and gas processing are being reconstructed and new generation plants are built which use latest technologies that significantly improve the working conditions [1, 2]. However, the use of modern equipment at the enterprises on the one hand facilitates the work of employees, and, on the other hand leads to the production factors making a harmful effect on the health of the operators. One of the ways to assess the impact of production factors on the functional state of the workers is to evaluate their performance during the work shift.

Study purpose. Evaluate the performance of the oil and gas processing workers while doing various operations.

Materials and methods of research

Performance of the workers of the second generation plant (SGP) and sour gas injection (SGI) plot was studied by a questionnaire (3-5). The questionnaire consisted of 7 questions which were evaluated from 1 to 10 points. WAI Index (performance) was calculated by the sum of the points obtained. Scores from 7 to 27 points corresponded to the low level of efficiency, 28-36 points – to the medium level, 37-43 points – to good performance, and 44-49 points – to the high level of performance.

120 SGP and SGI workers aged $36,5 \pm 1,0$ with the working experience of $9,5 \pm 0,5$ years took part in the interview. All respondents were divided into four age groups (18-29, 30-39, 40-49, 50 and elder), 3 work experience groups (1-9, 10-19, 20 years and more) and two occupational groups different in the nature of the labour operations: 1 group (64,2%) – operators engaged in service of the process equipment for a production plant, group 2 (35,8%) – leading engineers watching the process at the control panel, managers of various levels, and consultants.

Results of research and their discussion

Analysis of the results obtained in the calculation of the integral performance index – WAI index showed that performance of 42,5% of the workers in group 1 and 20,8% of the respondents in group 2 corresponded to the good level of performance, 4,2% of the people in group 1 and 10,8% of those from group 2 corresponded to the medium level of performance. High level of performance was recorded in 14,2% of the workers of group 1 and 2,5% of the workers of group 2. Low level of performance was registered only in 3,3% in group 1 and 1,7% of group 2.

A more detailed analysis of performance among the different age group showed that the most part (55%) of the workers with low values of WAI index was registered among the workers aged 30 and elder age group (40%) (table 1).

Table 1

Number of persons with different levels of WAI Index taking into account age-related changes

Age groups, years	Index of performance, %			
	7-27 Points	28-36 Points	37-43 Points	44-49 Points
18-29	55	45	...	7,4
30-39	21,6	60,8	17,6	10,1
40-49	31	44,8	24	5,2
50 or more	40	45	15	„

Number of individuals with a high level of performance (10,1%) was registered in the group of the workers aged from 30 to 39. The number of

the respondents having a good WAI index in all age groups was 40-60% and was not below 44% indicating high working capacity of the workers.

Index of performance of the medium level was registered in the workers aged 30 and older and made 39,1–41,7 %. It shows that despite of the age Tengizchevroil workers maintained their performance at the good level, due to professional experience and skills enabling them cope with the work effectively.

Nature of the changes of efficiency confirms the validity of our findings (table 2). Thus, the greatest number of the interviewed workers

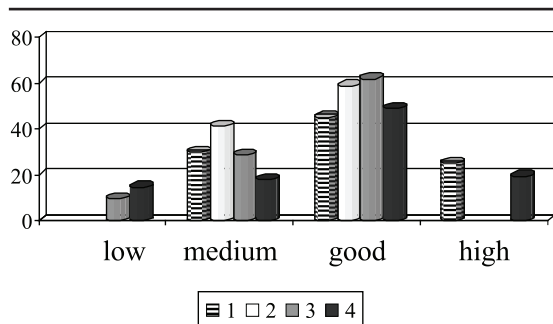
(41,3 %) having a low level of performance was observed among the workers with the working experience of 1-9 years whose average age exceeds 31 years. Number of persons keeping good performance during work length increased in 6,5–24,1 % cases, despite the increase in the average values of the calendar age from 30,7 years to 48 years, thus showing that the high level of professionalism allows to maintain a high working capacity, even elder age groups.

Table 2

Number of workers with different levels of WAI Index in the dynamics of seniority

Working experience groups, years	Index of performance, %			
	7-27 Points	28-36 Points	37-43 Points	44-49 Points
1-9	41,3	40,2	6,5	5,5
10-19	22,9	50,3	18,8	8,3
20 and over	31	44,8	24,1	...

Analysis of the prevalence of different levels of performance among workers of different specialties showed that the low level of efficiency met both in workers serving process equipment at SGI and SGP plants, and among workers watching the technology process at the remote control systems. In 14,5 % of the cases these were operators, and in 9,5 % of the cases these were the technology engineers (Figure).



Index of performance among workers of different occupational groups of «Tengischevroil» Ltd

Note: Occupational groups: 1 – managers of various levels, 2 – consultants, 3 – leading process engineers, 4 – operators

Thus, the analysis of the questionnaires assessing the performance of Tengizchevroil workers has shown that good values of WAI index level were typical for the age group from 30 to 50 years with the working experience of more than 9 years. Number of persons with the low levels of performance was registered in persons aged under 30 years with the working experience less than 10 years. Among the occupational groups we identified two professions (operator, engineer) where there were workers with low levels of performance.

References

1. Usenov S.M. Health of oil industry workers and the population of region of the Tengizsky oil and gas complex SEE // Mediko-social aspects of health of the population of regions of ecological disaster of Kazakhstan. – 1994. – P. 84-188.
2. Nadirov N.K. Prospect of use of new technologies in the oil and gas industry of Kazakhstan // Oil and gas. – 1999. – №3. – P. 35-40.
3. Veikko Kujala, Jouko Remes, Ellen Ek, Tuija Tammelin and Jaana Laitinen Classification of work ability index among young employees // Occupational Medicine. – 2005. – №55. – P. 399-401.
4. Juhani Ilmarinen The Work Ability Index (WAI) // Occupational Medicine. – 2007. – №57. – P. 160
5. Nurka Pranjić, Ljiljana Maleš-Bilić, Azijada Beganlić, and Jadranka Mustajbegović Mobbing, Stress, and Work Ability Index among Physicians in Bosnia and Herzegovina: Survey Study // Croat Med J. – 2006. – October; 47(5). – P. 750–758.