INDUSTRIAL PROPHYLACTIC MEDICINE AS A SYSTEM OF NEW TECHNOLOGIES OF LIFE-SUPPORT OF THE PERSONNEL OF LLC NADYMGAZPROM OJ-SC GAZPROM

Shishkina T.N., LLC Nadymgazprom OJ-SC Gazprom
Kononov V.I., Chugunov L.S., Golubkin V.K., Penkin V.V., Petropavlov E.A., Pisarenko A.A.,
LLC Nadymgazprom OJ-SC Gazprom, JSC Yamalgazinvest OJ-SC Gazprom

Development and exploitation natural gas deposits of Russia, the located in subpolar and arctic regions, have caused necessity of use of new technologies of a social life-support system working for preservation of their health and high work capacity in severe conditions of the Far North.

1. Objectives

The further increase of deliveries of gas will be provided, mainly, at the expense of involving in development of deposits peninsula of Yamal and shelf of the Arctic seas recognized by a pantry of oil and gas of Russia in third millenium.

Life, labour activity, preservation of health in the North are possible only due to the certain voltage of opportunities for physiological adaptation of human organism both creation of the deeply thought over and expedient social system of life-support. The development by mankind of extreme areas of the Earth, first of all of the Far North, has raised the importance of a problem «An Environment–Human health».

The lack of manpower in places of the development of gas deposits required attraction working from other regions and determined the urgency in solving the problems of the social and physiological adaptation of the migrants to the extremal climatic conditions of the high northern latitudes.

The distinctive industrial conditions of the gas extracting industry of the Far North demand for a high level of state of health of its workers as well as medicosanitary provision of its industrial units for the regular functioning. The factors, determining health, have many-sided and interdepartmental character. The elaboration of the system for health protection, preventive maintenance of diseases and medico-social rehabilitation of working in gas industry therefore is extremely important.

2. Methods

By development of the Concept of complex health protection of the LLC Nadymgazprom personnel the strategic tasks of social policy OJ-SC Gazprom on preservation and further development of personnel potential as by a major component of production, maintenance of the interdepartmental and multilevel approaches in questions of increase of quality of life, improvement of working conditions, life and rest, formation of a healthy image of life, preventive maintenance of diseases were taken into account.

One of components of the social policy of LLC Nadymgazprom is highly effective health protection of the personnel due to creation of system of Industrial prophylactic medicine in divisions of the Company.

3. The system of Industrial prophylactic medicine

The new model of public health services introduced since 1995 at Nadymgazprom, granting of the medical help sets as the purpose the organization of complex health protection of the enterprise personnel and their families for a high level capacity for work and extension of professional longevity, granting of the medical care in case of disease. It is realized due to joint interbranch medico-sanitary maintenance of labour collective by creation of Industrial prophylactic medicine at the enterprise and by Insurance municipal medicine of Russian Federation (scheme 1).
Complex health protection of the enterprise personnel and their families for a high level capacity for work and extension of professional longevity, granting of the medical care in case of disease

**Scheme 1.** Conception of the system of complex health protection of LLC Nadymgazprom personnel.

3.1 The aim and the main trends of the system of Industrial prophylactic medicine

The Industrial prophylactic medicine of LLC Nadymgazprom carries out tasks of health protection of working, medico-sanitary support of industrial manufacture, preventive maintenance of diseases and rehabilitation of a state of health, providing system interaction of divisions of the enterprise in the decision of questions for protection labor and health of the personnel, creation of conditions for introduction new highly effective precautionary and restoration medical technologies (scheme 2).

**Scheme 2.** The system of Industrial prophylactic medicine at LLC Nadymgazprom.

3.2 The new structural subdivision of the enterprise - Medicosanitary Provision Service

Performance of tasks in view of improvement of health protection of members of labour collective has caused necessity of creation at Nadymgazprom in 1995 year, for the first time in the gas branch, new structural subdivision of the enterprise - Medicosanitary Provision Service which alongside with departments of Labour Protection and Safety Measures, of Environment Protection and Industrial Sanitary, of the Staff of Civil Defense and Emergency Situations has made the functional interconnected parts of system of Industrial prophylactic medicine. In 2002 year Medico-sanitary Provision Service have been transformed into the Medico-sanitary department of LLC Nadymgazprom.

Priority in activity of divisions of the Medico-sanitary department is realization of precautionary measures directed on health protection and preventive maintenance of diseases, including medical maintenance of labour collectives, which were not including in the base program of obligatory medical insurance, but necessary for systematic functioning of the enterprise of gas branch and realization of the complex improving program.
For introduction of new technologies of social system of life-support of the personnel at industrial units and in shift settlements of LLC Nadymgazprom at the fields of gas deposits Nadym-Pur-Tazovsky regions and in peninsula of Yamal-«Medvezhanye», «Yamsoveiskoye», «Yubileinoye», «Kharasaveiskoye», «Bovanenkovo», «Novo-Portovskoye» have been created 52 divisions of the Medico-sanitary department as medical and medical assistant's dispensaries, seven Departmental health-improvement complexes and also three Centres of medical prophylaxis of ambulatory and stationary types in city of Nadym and in gas producers settlement Pangody.

The common features in the activity of gas departmental medicine subdivisions are: approaching of treatment-and-prophylactic base to the working units; the workshop principle in organization of work in accordance with conditions of production; fulfillment of intercommunicated program of health protection, prophylaxis of diseases and medicosocial rehabilitation of the personnel; the integral system of organization of medical measures in case of emergency at industrial units; creation of Engineer-medical squads and paramedical posts in each branch of LLC Nadymgazprom.

3.3 The departmental medicosanitary provision

The departmental medicosanitary provision of working collectives includes two basic trends: medicosanitary accompaniment of industrial production, prophylaxis of diseases and rehabilitation of the workers’ state of health.

Medicosanitary accompaniment of industrial production includes seven basic trends of activity: control of industrial sanitary; organization of medical examination of people working in unhealthy conditions; medicosanitary provision of rotation labor; attestation and passport system of working places; medical provision of transport means; medical measures of civil defense and emergency situations; organization of working system of engineer-medical squads.

3.4 The work for labor protection and safety

At LLC Nadymgazprom the work for labor protection and safety measures is realized according to a Uniform control system of labor protection in the gas industry and general concept of OJ-SC Gazprom in the field of labor protection and industrial safety. The large attention to creation of healthy and safe working conditions, increase of safety of manufacture, perfection of technological processes is given. The complex and control checks of a condition of protection of work, gas and fire safety on industrial objects will be carried out (scheme 3).

Scheme 3. The block diagram of inspection and improvement sanitary-hygienic of working conditions on a workplace.
The results of researches allow to establish an objective picture of a condition of workplaces and, most important, to develop the concrete program of measures for improvement of working conditions. In close interrelation with the Medico-sanitary department functions the department for Labor protection and Safety measures, the department for Environment protection and Industrial sanitary of the Scientific and Technical centre, using the results of certification of workplaces on working conditions in medico-prophylactic work for the prevention of development professional and manufacture - caused diseases.

3.5 Ingineer- medical squads

With the purposes of coordination of actions on improvement of working conditions of the workers, decrease of their morbidity and accidents, estimation of efficiency of the carried out complex of preventive and improving measures at the enterprise Nadymgazprom the effectively working network of Ingineer- medicas medical squads, including the Central Ingineer – medical squad of the enterprise and similar formations in its divisions have been created.

By the draft of their work, first of all, the measures on development of technical, preventive and medical-improving measures for structural divisions are provided, where the growth or high level morbidity with temporary disability, industrial injuries and physical inability is marked, the offers and remarks are taken into account on protection of health and medico-sanitary maintenance.

3.6 The functional components of Industrial prophylactic medicine

The creation of system of Industrial prophylactic medicine at LLC Nadymgazprom has enabled to carry out monitoring a condition of health working on the uniform circuit and has allowed to carry out comparison of the received results, to accept effectual measures for complex protection of work and health of labour collective, promoting systematic industrial activity.

Thus, according to the elaborated program, the functional components of Industrial prophylactic medicine are: Medico-sanitary department, the department for Labor protection and Safety measures, the department for Environment protection and industrial sanitary, the Staff of civil defense and emergency situations.

3.7 New medical technologies of life-support of the personnel

With the purposes of decrease the levels of morbidity with temporary disability and proof loss of work capacity of the LLC Nadymgazprom workers the Medico-sanitary department will carry out versatile meduco-preventive measures according to the complex program of medical preventive maintenance and rehabilitation workings’ state of health.

The program of medical preventive maintenance provides approaching the medical stations of the primary medico-sanitary aid to working objects, control industrial and communal sanitary, realization annual clinic medical examination, preventive maintenance both infectious and uninfected diseases, including with application medicament of means raising protective forces human organism and his stability to extreme climatic conditions of the Far North, - such as vitamins, adaptogenes, vaccine, immunomodulators, purchased by the enterprise.

At LLC Nadymgazprom have been developed and introduced 3-stages model of rehabilitation of a condition working health. It includes realization of improving courses in Departmental complexes at industrial units and in shift settlements with use of modern medical technologies. The second stage of rehabilitation will be carried out at the Centres of medical prophylaxis maintenance. The third stage provides the sanatorium treatment in other regions (scheme 4).
Scheme 4. Complex program of medical prophylaxis and rehabilitation of the personnel’s state of health at LLC Nadymgazprom.

Since 2000 year at LLC Nadymgazprom have being introduced “The program of extension of active professional longevity and prophylaxis of the same age pathology of the personnel of OJ-SC Gazprom”. The improving medical technologies using by LLC Nadymgazprom at the Departmental complexes, equipped at industrial and in shift settlements, and also at the Centres of medical prophylaxis and rehabilitation, are submitted on the scheme 5.

Scheme 5. Health-improvement medical technologies using at the Departmental health improvement complexes and at the Centers of medical prophylaxis and rehabilitation of LLC Nadymgazprom.
3.8 Complex health protection of the shift workers.

At LLC Nadymgazprom also was developed and introduced the complex program of diseases’ prophylactic and medico-social rehabilitation of the shift workers (scheme 6).

I. Improvement of organization of interregional rotation method.

<table>
<thead>
<tr>
<th>Orientation on the North-Western region as a basic one for rotation to the Far North</th>
<th>Use of the rotation regiments appropriate to adaptation periods to the extremal climate of the high northern latitudes (30-30, 60-30 labor days/vacation days)</th>
<th>Protective labor regiment during the first week of interregional rotation</th>
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II. Medicosanitary provision during the rotation period.

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<tr>
<th>Examination of the state of health</th>
<th>Prophylaxis of disadaptation meteoroneurosis and uninfectious diseases: taking of vitamins and adaptogenes, etc</th>
<th>Prophylaxis of infectious diseases: control on the maintenance of communal sanitary of the shift settlements; vaccine- and immunoprophylaxis</th>
<th>Realization of rehabilitation courses of the first stage in the departmental health-improvement complexes of a shift settlement</th>
<th>Speleotherapy in artificial saline rooms</th>
<th>Rendering medicosanitary aid on diseases and injuries</th>
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III. Medical provision of innerregional and interregional rotation at the basic region during stay-home period.

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<th>Carrying out medical profselection for shift working in the regions of the Far North</th>
<th>Organization of annual prophylactic examinations</th>
<th>Provision of execution of the basic program of compulsory medical insurance</th>
<th>Examination of the state of health during stay-home period. Realization of rehabilitation courses of the second type</th>
<th>Carrying out before rotation medical examination</th>
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Scheme 6. Complex prophylactic program and medico-social rehabilitation of the shift workers of LLC Nadymgazprom.

4. Results

The visitings in divisions of the Medico-sanitary department of LLC Nadymgazprom with the treatment and preventive purpose, at the rate of on 1 working, within 7 years of its existence, have increased with 6 up to 48 per one year, from them the two third parts is carried out for preventive maintenance and rehabilitation (scheme 7).

![Graph showing the amount of visits to the ambulant subdivisions of Medico-sanitary department of LLC Nadymgazprom per 1 worker in a year.](image)

Scheme 7. The amount of visits to the ambulant subdivisions of Medico-sanitary department of LLC Nadymgazprom per 1 worker in a year. (Without the account of daily prescheduled and after scheduled examinations of the drivers).
The parameters of use by the personnel of LLC Nadymgazprom of preventive and rehabilitative technologies are submitted at the schemes 8 and 9.

Scheme 8. The usage frequency of types of disease prophylaxis by LLC Nadymgazprom workers.

Scheme 9. The structure of application of rehabilitation courses by Nadymgazprom workers and their families.

About efficiency of the system, submitted to your attention, of the complex protection of health workers and members of their families, including creation the system of Industrial prophylactic medicine as a component of the social policy of the enterprise, demonstrates a positive dynamics of a condition of health of labour collective testifies at its introduction at LLC Nadymgazprom within 7 years, which have caused not only decrease morbidity with temporary disability, but also reduction in 2 times of the first time of disability and mortality of the workers of the enterprise (scheme 10).
Scheme 10. Dynamical analyses of the data about indexes of the first time of disability and mortality levels of Nadymgazprom personnel during the period in 1995-2001 years.

5. Conclusions and Recommendations

The elaborated and approved at LLC Nadymgazprom model of organization of the Industrial prophylactic medicine, taking into consideration the specification of the branch and extremal climatic conditions, promotes systematic industrial activity, gives an opportunity to solve directly the problems of disease prevention and recovery of the workers’ health of industrial enterprises of the high northern latitudes, for a high level capacity for work and extension of professional longevity. Improvement of the state of health of the members of work teams in conditions of introduction of the Industrial medicine system at the gas extracting enterprise with realization of the complex program of prophylaxis and rehabilitation proved the efficiency of the elaborated system.

Organization of a new structural subdivision of gas extracting enterprise enabled to introduce those types of medical provision which are out of the basic program of compulsory medical insurance of the municipal public health system, but they are necessary for the balanced production work and health preservation of the people working in the extremal climatic conditions. A positive dynamics of the state of health of the working collective demonstrates the efficiency of the elaborated model of Industrial prophylactic medicine of the gas extracting industry, in spite of a short space of time since its introduction into Nadymgazprom enterprise in 1995. The self-repayment of expenditure taken for the creation of the health service model are ensured during 1,5-2 years at the expense of the saved capacity for work of the enterprise workers.

The urgency of the received results of creation the complex model of health protection of the gas enterprise personnel with introduction of a new technologies of its life-support amplifies also in connection with forthcoming development of the deposits located on peninsula Yamal, in polar and arctic zones of the Far North, which has concentrated in the bowels up to 30 % of world reserves of gas - the basic energy carrier of XXI century.