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Notices for hiring offshore security and medical professionals: a documental analysis

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ABSTRACT

Aim: To investigate, by means of calls for tenders, the provision of professionals for the conformation of offshore SESMT.

Method: This is a documental research, in which we selected 18 notices from between 2008 to 2012, from tenders demanded by Petrobrás for the fulfillment of vacancies of professionals expected at SESMT. These tenders were obtained from the Petrobrás websites, PCI tenders, Folha Dirigida and Google. They were subjected to a descriptive and documental analysis.

Results: 434 jobs were offered to professionals expected to work in the SESMT. 49% of vacancies were made available for the state of Rio de Janeiro and the highest remuneration was offered to Engineers. Offshore professionals are subject to physical, chemical, biological, mechanical and ergonomic hazards.

Conclusion: We perceived there would be an investment in hiring professionals in the SESMT, with salaries above the ones offered by the labor market and a profile demand outlined for the development of different duties required by the complexity of the offshore environment. This highlights the performance of preventive activities with regards to workers' health disorders.

Descriptors: Occupational Health Nursing; Occupational Medicine; Working Environment; Occupational Health; OHSAS 18000.

INTRODUCTION

With globalization and the improvement of methods for extracting raw materials,, areas in Brazil, only recently explored, have developed. They are now laregely responsible for the expansion of the national labor market. One example is the exploration and production of oil at sea (offshore), which was initiated in the 1960s by Petróleo Brasileiro SA (Petrobrás), a Brazilian state-owned company[1].

The expansion of the oil and gas sector, in view its specific and cyclical nature, has increased the demand of labor-diversified and specialized work. However it is very difficult to articulate the formation and absorption of these professionals by the contracting companies[2].

The work on offshore platforms and tankers is characterized by its continuity, its complex nature, its community and dangerous nature. It is continuous work as extraction / production occurs for 24 hours a day, 365 days a year and so requires the teams of workers to alternate by predetermined shifts, with regular alternation of work[3] The complex and dangerous environment is due to the technological apparatus necessary for the development of a range of simple and specialized activities. These are interconnected to a system of continuous monitoring and are susceptible to unforeseen events which can trigger life-threatening situations[3].

The peculiarities of the organization of the work process for the offshore sector increase the likelihood of injuries and accidents, including mental ones caused by the psychological changes imposed by the regime of boarding and shift systems such as distance from family and confinement[4.5].

Analysis of the environment, risks and work related accidents have been increasingly valued as an auxiliary instrument and as a guide to help prevent injuries. Although the overall number of accidents has decreased, the outlook is worrying. In the period from 1970 to 2011, the number of accidents decreased by 42%. However, the analysis of the period 2000-2011 shows an increase of 95%. In 2009, the output of the National Institute of Social Security (INSS) on social security benefits as a result of accidents and occupational diseases, was higher than US$14 billion[6].

Control of the working environment and the development of health and safety measures is very difficult in the offshore facilities which extract oil and gas and where the structural and functional organization is highly complex and involves a large variety of technical activities. Between 2007 and 2009 the growth in the number of work accidents in this business was 9% while the increase in total number of accidents was 3% for the whole country[6].

Faced with the peculiarities of working on boats and need for health and safety regulations for waterway workers, the Ministry of Labor and Employment (MLE) issued the Regulatory Norm (RN) 30 in 2002[7]. However, in its first edition it left a regulatory gap that allowed the facilities and work on board to develop according to the companies' critera. Therefore, the government, employers and employees formatted the text of Annex II of the NR 30. This was published in May 2010 and established the minimum health and safety requirements on drilling rigs and for production of oil and gas[8]. Annex II also proposed preventative measures against accidents, established the creation of the Internal Accident Prevention Commission (IAPC) within the platforms and created a program of medical management and risk control. It also scaled the Specialized Safety Engineering and Occupational Medicine (SESMT) for this environment[8].

SESMT was arranged in 1983 by RN 4 and states that the companies which have employees governed by the Consolidation of Labor Laws (CLT) should keep them in order to pro-

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mote and protect the health and integrity of workers at work[9].The importance of the role of the professional members of SESMT is therefore justified in offshore environments as it allows focus on the promotion, maintenance and protection of workers' health, as predicted by the NR 4 and 30[7,9].

Despite the expansion of offshore areas, the growth in the number of work related accidents and explosions which have occurred in recent years on oil rigs (as in the case of rigs P-36 and P-33 from Petrobrás, both in the Campos Basin (RJ) and more recently, in 2011, the platform located in Rio Grande do Norte) the amount of research and the number of national publications which focus on this is still very limited[4].

Therefore the purpose and **overall objective** of this study is to assess, through tender notices, the provision of human resources for SESMT in offshore environments. We outlined the following as specific objectives: to describe the characteristics of the hiring of professional staff expected in the SESMT team; to describe, according to the notices, the main risks to which offshore workers are subject; to identify the key responsibilities of these professionals, provided in the notices.

METHOD

This is a descriptive and exploratory study, outlined as documentary research, in which we used a qualitative approach. It will investigate calls for tenders and the selection processes demanded by Petrobrás. We include the notices of this company because it produces the highest percentage of oil and national natural gas, which in 2011 was over 91%(10).

The inclusion criteria were: the notices of the last five years (2008-2012) with a forecast of vacancies for professional SESMT staff, namely: labor safety engineer, labor physicians, labor nurses, labor nursing technicians/assistant and labor safety technicians. These were associated with the offshore environment, regardless of the type of employment and status of the tendering process (ongoing or completed).

The exclusion criteria were public tenders calls reports and Petrobrás' subcontractors and distributors.

The notices of interest in this study were obtained in November 2012 from the databases described below and by the following steps:

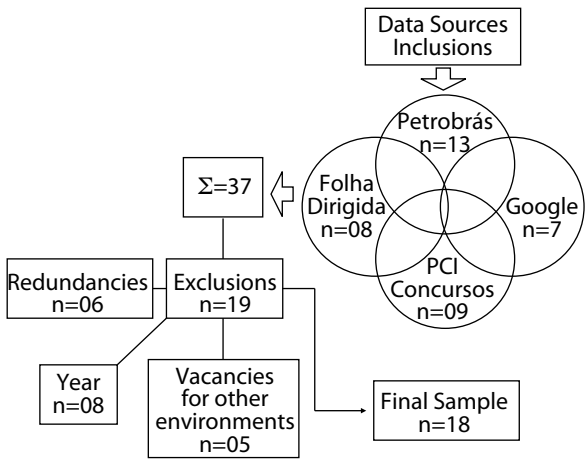
- **Step 1** – a research was carried out on Petrobrás' website, <http://www.petrobras.com/pt/home.htm>. The search was conducted in a specific section of the site that deals with tenders where it was not possible to search for terms but only filter by notice launch date.
- **Step 2** – we searched for notices in tender banks, namely PCI Contests, <http://www.pciconcursos.com.br> and Folha Dirigida, <http:// www.folhadirigida.com.br>. Searches were conducted by filtering according to the organ that requested the tender (Petrobrás), educational level (upper and secondary / technical school), position of the openings provided and year of the notice
- **Step 3** – we searched for the documents on Google as it is the world's largest online search engine (http://www.google.com/). Here the survey was conducted using different associated terms to "notice", "Petrobrás", "jobs", "hire", "nurse", "engineer", "security technician", "nursing technician", "physician", "nursing assistant".

Of the documents found, various quantitative data which comprised a bank built in an Excel® spreadsheet was extracted. This data was analyzed using descriptive statistics. The qualitative data was selected in accordance with the objectives and analyzed descriptively.

RESULTS

The process of data collection resulted in the identification of 37 notices, of which 19 were excluded as they were repetitions, had been published in different periods from the time period stipulated or were offering jobs for environments other than offshore. Therefore only 18 notices were considered eligible, as illustrated in Figure 1.

Figure 1: Flowchart of the process of collecting notices according to an online source. Brazil, 2012



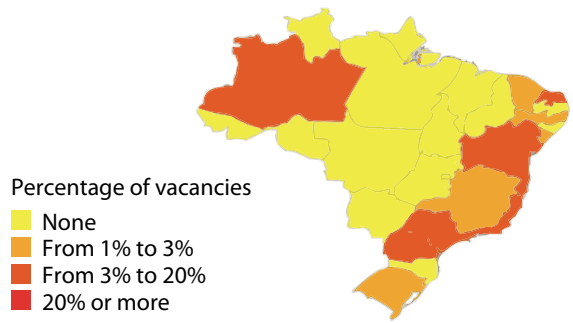
Source: prepared by the authors, 2013

Recruitment features

Of all notices, the majority (n=6) was published in 2010; 5,495 jobs were offered for various positions in offshore environments. Of these, 39% (n=2,143) were for high level positions and 61% (n=3,352) for secondary level positions. The professionals working at SESMTs were offered 434 vacancies, of which the lowest percentage was made available for labor safety engineers (2%) and the highest for labor safety technicians (71%). Among the top-level categories, the largest number of vacancies made available was to the of labor nurses (6%), although the percentage of openings offered for technicians in this category was higher (17%). It is worth noting that 14 of the total notices also provided for training registration booking.

Aside for the notices which did not determine the location of the job, the number of vacancies is greatest in Rio de Janeiro (48.8%), followed by Bahia (10, 6%) and São Paulo (10.4%). Figure 2 shows the distribution of jobs per state.

Figure 2: Distribution of vacancies provided in the submission selected, according to the percentage of concentration of vacancies in the states. Brazil, 2012



Source: prepared by the authors, 2013

With regards to the organization of the selection processes, outside institutions were contracted. These were namely Cesgranrio Foundation, the Center for Selection and Promotion of Events (CESPE), the University of Brasilia (UNB) and Business University Foundation of Technology and Science (Fundatec) which were responsible for 14 processes, 1 and 2, respectively. Only one selection process was performed by the institution itself, Petrobrás Transport (Transpetro).

The modality of registration via internet was provided for in 100% of notices. The selection strategies adopted were objective tests and curriculum evaluation for higher level positions and only objective tests for the technical level.

All notices described the basic pay according to professional category and guaranteed

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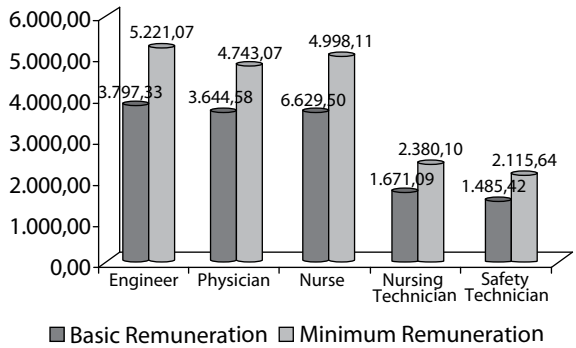
minimum remuneration with additional benefits. The highest base salary (R$ 4,756.65) was offered for the post of labor safety engineer which reached the amount of R$ 7,416.12 when benefits were added. The lower base salaries, in turn, were offered for the positions of labor nursing technician (R$ 1,778.15) and labor safety technician (R$ 2,001.34).

Graph 1 shows the average base remuneration and minimum remunerations (with added benefits) provided for the notices.

Graph 1: Average wages in real (R$) provided for in the notices selected, according to professional category. Brazil, 2008-2012



Source: prepared by the authors, 2013

The benefits which may be received predicted in the notices were childcare assistance or caregivers aid, educational aid (pre-school, elementary and high school) for children, food stamps, transportation vouchers, multidisciplinary health care (medical, dental, psychological and hospital) and pharmacy aid, complementary pension plan (optional), Special Assistance Program (designed for children of employees with special needs) and profit sharing and / or results. Other benefits added up are health and risk premiums.

The planned hiring in all notices was the legal regime Hired under Employment Laws. There was no mention as to the working hours.

Occupational hazards in the offshore environment and professional assignments

Work on oil rigs includes a wide range of activities and therefore it brings together various economic risks. The selected notices call attention to the dangerous and unhealthy conditions and the exposure to risks and emergencies to which workers may be subjected in the offshore environment.

Within the program content, multiple and different expertise relating to physical, chemical, biological, mechanical and ergonomic hazards are listed. Amongst these the risks associated with boilers, pressure vessels, cargo handling, electrical installations, machines and tools, as well as welding and cutting stand out. There is also the knowledge of risks related to accidents with multiple victims, working in confined spaces, civil construction, working at heights, noise, gases, vapors and heat exposure, ionizing and non-ionizing radiation, working under hyperbaric conditions, fire and flammable products.

Due to this risks, knowledge as to how to work in an offshore environment is indispensable. The notices therefore list the main daily duties of professionals, which are explained in Table 1.

Table 1: Main duties provided in the notices selected, according to professional category. Brazil, 2008-2012

Professional	Main attributions
Labor Safety Engineer	Monitor, participate and perform activities related to capacity building, educational and awareness programs, in order to comply with legislation, standards and procedures applicable to security issues related to the various activities of the company, and the specification of safety equipment, issuing technical advice for the purchase of materials.

Occupational Physician	Monitor, participate and perform occupational medical examinations, emergency care and immediate medical assistance to workers, evaluating, medicating and accompanying the clinical treatments provided, guiding them regarding their health preservation, within the resolution capability of the local medical agency, as well as incidents, deviations from health and work accidents analysis, proposing corrective and preventive measures.
Labor Nurse	Monitor, participate and perform nursing care and consultation at various levels of complexity, during accidents or health problems, linked or not to the nature and conditions of work and the evaluation of nursing technical programs and technical advice in occupational health.
Labor Safety Technician	Perform and participate in studies, evaluations and inspections of working conditions, concerning the safety aspects and safety theoretical and practical training, to keep workers informed and trained about the risks, standards and procedures.
Labor Nursing Technician	Perform and participate in nursing care activities within the outpatient and emergency situations, within the pre-hospital care as well as actions to promote health, occupational hygiene, ergonomics and environmental health.

Source: prepared by the authors, 2013

DISCUSSION

Health is an essential and fundamental patrimony of the worker. It is inseparable from labor as it is the main tool in the development of production relations. The first laws aimed at protecting men from life threatening risks present in the workplace appeared in Brazil in the early twentieth century. Currently, besides the CLT which incorporated issues of health and safety at work and the 1988 Constitution which guaranteed workers' health as a social right and a part of the Unified Health System (UHS), numerous NRs endorse workers' safety. Some examples are RN 5, which establishes CIPA, and RN 6, which states that companies are required to provide employees with personal protective equipment (PPE) which is appropriate to the risk, in perfect condition and free of charge[11].

Health problems for the worker may be due to the characteristics of the social or work environment, the presence of physical, chemical, biological, mechanical and ergonomic agents. Furthermore, socioeconomic, organizational and technological determinant, such as the development of machinery, may also trigger health problems.

The Regulatory Norms, in particular RN 30 and its annex, are therefore a step forward for the offshore area. They are also an instrument with which to measure the performance of trained professionals in order to develop and promote health care for workers, from health planning to identifying, among other information, the main risks associated with the workplace.

We therefore noted the existence of tenders which aimed to hire professionals related to SESMT by the largest Brazilian company in the field of oil and gas. Of the notices collected, the highest percentage of vacancies was offered to labor safety technicians. This can be explained partly by the support of the legislation that does not oblige the presence of higher level professional in environments of risk level 4 (which is the case of services related to the extraction of oil and gas) which employ up to 100 workers[9]. Such situations only required the presence of a labor safety technician. Thus, the proportion of technicians in relation to the population of workers is much higher than that of higher education professionals to workers.

The need, distribution and concentration of vacancies provided per local for professional allocation follows the distribution of the

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operating units of Petrobrás. These, especially the drain terminals, are concentrated on the Brazilian coast. There is an emphasis on the states of Rio de Janeiro, Espirito Santo and Rio Grande do Norte which are today considered the largest oil producers in Brazil. These states provide, respectively, 74%, 15% and 2.8% of the national production[12].

With respect to the wages provided, for the labor nurse the average minimum wages set were not above to R$3,650.00. However, with the added benefits this would exceed R$4,900.00. These values are higher than the average national wage for nurses (R$3,240.34) and health and social services professionals (R$1,167.00)[13]. In comparison to the latter, the average salaries of other professionals in the health field specified in the notices (labor physicians and nursing technicians) is greatly inferior.

The average salary for engineers and safety technicians is greater than the average wage for the extractive industries sector (R$1,933.00), manufacturing industries (R$1,019.00) and construction (US$1,065)[13].

Among the notices studied there was no mention as to the weekly working hours to be performed by the professional contractors. However, it is known that Petrobrás maintains a forty hour week for its employees, except for those working on board. The professionals working on board work to a shift system of 14/21 where they work 14 days and then have 21 days off. This therefore follows a working to not working ratio of 1 to 1.5[14].

It is worth noting that in recent years Petrobrás has invested in outsourcing workers and that the negotiations it undertakes with the contractors regarding working hours may be different for each company and working position. For the new contracts signed with the service providers, Petrobrás required a 14/14 scale, 14 working days followed by 14 days off. This has generated a dangerous setback for the entire oil category. In addition to not paying many of the benefits historically achieved by various Tanker Unions, it creates situations that are solely and exclusively aimed at restricting and suppressing the results of these achievements. This creating a new labor pact that may become the new reality for the entire oil category[14].

When analyzing the risks mentioned by the selected notices, it was observed that there were no allusions to mental health issues, despite the fact that confined work can directly influence the mental state of workers due to isolation, separation from family and friends and an irregular sleeping routine.

The night shift can also have a negative effect on physical and mental health as it is a time when the body naturally wants to rest. This can be seen in signs and symptoms of physical and / or mental illness such as fatigue, myalgia, agitation, mood changes and slow thinking which may result in accidents at work[15].

Working in the offshore environment is highly dangerous and unhealthy. In addition to the possibility of toxic substance leaks, fire and explosions, there are many other factors, such as loud noises, high temperatures, the shift work pattern and everyday work accidents which can affect the workers' mental stateand the impact of these factors at a mental level[4,5,16]. Workers are exposed to various risks which may lead to injuries, accidents and fatalities in the offshore environment. The most serious accident ever to have occurred in an offshore oil rig was the explosion of the Piper Alpha platform in 1988 in the British sea as a result of a natural gas leak; over 160 people died[4].

A study developed in a small shipping company indicated that multiple factors play a significant role in health and safety levels for offshore personnel. The factors which stand out are working conditions, infrastructure,

interpersonal relationships with superiors and coworkers, crew size, work overload, weather conditions and the personal experience of the worker[17].

Other factors that might affect health and safety for offshore workers are reported in other publications. These include exposure to climate variations, movement of vessels, which demands compensatory muscular effort and causes disturbances in repose and sleep, psychological factors, triggered mainly by work in a confined space and social isolation and noise[3-5].

In a study carried out with tugboat mariners, by means of measuring blood biochemistry and doing physical and life quality assessments, the main health problems were indicated to be obesity and high cholesterol. Moreover, the group studied showed a higher than required energy consumption and an inadequate fat percentage[18].

A similar study, focused on port workers, who are exposed to occupational hazards similar to seafarers, identified hypertension, back pain, lung disease and depressive episodes as major health problems[19].

A Norwegian study on offshore workers found that the major health problems here were musculoskeletal issues followed by psychiatric, neurological and malignant disorders for women and cardiovascular, neurological and psychiatric problems for men[20].

Based on these, we can understand the importance of the role of SESMT. These professionals are responsible for applying their specific knowledge of safety engineering and occupational medicine in order to reduce and/or eliminate risks to workers' health[9].

The professional assignments presented in the public notices are quite generic, but can include promotional, preventive and protective health actions in the context of labor safety. These assignments aim to minimize the risks of inadequate working conditions and continuously incorporate and improve the increasingly stringent safety requirements and strategies as well as the methods used to detect risks.

The intervention of SESMT is imperative, particularly through the establishment of programs and actions to promote health, psychosocial support and the use of PPE to help decrease risk. It is also important to conduct sanitary inspections of offshore environments to reduce the risk of contamination and disease transmission via food and water, it is also important to conduct sanitary inspections in offshore environment[5].

Moreover, the finding, identified in a recent study[17], of a crew's poor knowledge of how to face and act in dangerous situations demands education and training.

CONCLUSION

Upon analysis of 18 notices of public tender procedures conducted between 2008 and 2012 we identified 434 openings for SESMT in offshore environments. Of these the lowest percentage was for labor safety engineers (2%) and the highest for labor safety technicians (71%).

The planned hiring in all notices was based on the legal regime Hired Under Employment Laws. They had no specification with regards to the working day but there was a description of the basic remuneration and added benefits.

The selected notices call attention to the dangerous and unhealthy conditions, the exposure to physical, chemical, biological, mechanical and ergonomic hazards and the emergency situations to which the workers may be subject in the offshore environment.

We also identified the major tasks of the professionals of SESMT given in the notices. We highlighted the preventive actions.

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It was found that Petrobrás has invested in hiring professionals provided by SESMTs. Of the total number of vacancies of the selected notices only 7.8% were for engineers and safety technicians, doctors, nurses and labor nursing technicians.

The performance of SESMTs is essential for the reduction and elimination of risk to workers' health, especially in the offshore environment which is highly dangerous and unsanitary. The appropriate practices of occupational safety and hygiene conditions, associated with the improvement of work, are important in order to prevent accidents and guarantee the health of offshore workers.

The professionals of the SESMT teams have unique and essential skills which are required to secure and develop health care for workers, especially those related to the identification, evaluation and control of environmental risks.

The analysis and discussion of the results was limited due to the small number of studies related to the topic. Furthermore, the research has not investigated whether the professionals approved in the tenders were effectively incorporated. It is hoped that this research will encourage other studies and contribute to the scientific development of the offshore area, especially considering the innovations and expansion of this sector in Brazil.

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