

# “Meetings on the work”: an analysis device for understanding the articulation between outsourcing and other organizational innovations

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**Abstract.** The purpose of this article is to discuss professional education and training programs offered to teams of operators by the main company in the area of Bacia de Campos (Petrobras), Rio de Janeiro, Brazil. It also discusses the necessary skills to the new functions derived from the implementation of an organizational innovation, the polyvalence, and how such innovation has impacted operators' activity. By using elements of WEA and the device “Meetings on the Work” it was possible to gain a better understanding of both the distance between the dimensions of prescribed work and real work, and the articulation between outsourcing and the proposition of polyvalence, which have stimulated the creation of new functions, namely, the polyvalent operator and the operator-maintainer, this latter being in fact an evolvement of the first.

Keywords: “meetings on the work”, polyvalence, offshore oil industry

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## 1. Introduction

Since the end of 2002, the authors of the present article have been working on the identification of several risk factors related to work organization in the offshore sector. Their purpose was a reflection on the subject of life, health, reliability and safety in the worlds of work, specially in the so-called “complex sociothechnique systems”. After a request from the Norte Fluminense Oil Workers Union (Sindipetro-NF), a study has been launched on the production process, focusing on several work situations observed in offshore exploration and production units in Bacia de Campos, the largest petroliferous area in Brazil, located on the Southeast of the country, in the state of Rio de Janeiro. This marked the beginning of a partnership with the worker’s union, consisting of systemic interlocution to allow the interaction with several aspects of offshore work routine and its ups and downs, by being in contact with the workers, having access to documents and boarding areas, by organizing and participating in events.

The same initiative also brought about a sponsored research project called “Work, Health and Safety in the offshore oil industry of Bacia de Campos”, whose aim was to approach part of the material collected in these debates (around 80 cassette tapes and their transcriptions) and throughout the research process in general. Results of this stage of the project were:

- The organization of the event *Ergology, Ergonomics and the Worlds of Work*, in March 2003, with researchers from the Département d’Ergologie de l’Université de Provence, Directors of the Sindipetro-NF, researchers from nucleus of study NEICT-UFF and members of the discussion network RAPT–Camaleoa;
- a dossier forwarded to Sindipetro-NF in December 2004 (Figueiredo, Alvarez *et alii*, 2004) [17];
- supervision of both scientific initiation scholars, and graduate and post-graduate students;
- publication of articles (Figueiredo, Alvarez *et alii*, 2004, 2007, 2010, 2011) [10,17,18,19];
- reports, monographs and dissertations;
- a booklet on the accident at Platform P36, in 2001;
- and a book now in print.

With this material in hands, an effort has been made to understand and analyze a few factors that have contributed to the process which brings about a significant and dangerous gap between technological sophistication and incidental and accidental situations

management. Such gap seems to be constituted of the following factors: singular work relations between companies (contractors and clients); the kind of professional education and training programs offered to work teams; the processes of implementation of health, environmental and safety programs (HES); the necessary skills for certain functions; the relations between the establishment of production goals and the fulfillment of safety prescriptions; management styles and work performance assessment; organization of work shifts and journeys, among others.

In the present article, we discuss professional education and training programs offered to operators teams by the main company in the studied area (Petrobras). We also discuss the necessary skills for the new functions derived from the implementation of an organizational innovation, the polyvalence, and how this innovation has impacted operators’ activity. The elements of WEA and the device “Meetings on the work” allowed a better understanding of the distance between the dimensions of prescribed work and real work, and of the relation between outsourcing and the proposition of polyvalence that has stimulated the creation of the new functions of polyvalent operator and operator-maintainer, this latter being in fact an evolvment of the previously mentioned polyvalence.

## 2. Methodological considerations and theoretical references

In the following lines, theoretical and methodological reflections that have guided the study are presented in a summarized way.

The methodological support used here contributes to a closer approach on real work, as well as on the real of work, and therefore, on the gap between the dimensions of prescription and of what has actually been carried out. This is done by means of indirect methods, with the participation of workers in the debates, by giving special consideration to the experience they have accumulated over the years, their know-how-to-do, and the attributes associated with that part of knowledge that comes with experience. The activity is therefore a central concept to allow a closer look on the subjective dimensions of action and understanding of work as a permanent space of microchoices, of debate on norms and values. This can be explained considering that, at work, the subject, making use of himself, is confronted with different rationalities and values. Therefore, there is a tendency to operationalize

devices to promote a more dynamic relation between scientific knowledge and experience—having “mutual convocations” as a principle—, combining intellectual discomfort and epistemological humility [23].

In conformity with such inspirations, the theoretical-methodological tool box used in the research includes materials from Activity Ergonomics [2,3,11,13,14] and its methodology (WEA), specially the stage concerning the analysis of the work, from Work Psychodynamics [5-8,9] and from an ergological perspective [23,24,25], making use of its conceptual framework and highlighting the dynamic three-pole device (D3PD). We also resorted to the proposition of “enlarged scientific communities” to mobilize [12] an “enlarged research community” (ERC) [15,16], which consists of an attempt to go beyond the proposition developed by Oddone [12]. The ERC involved “direct researchers” (project coordinators), the “Union group” (research requester) and a “group of directly interested workers” (contacted with the help of the Union leadership), as well as two “indirect researchers” (for research follow-up, independent of any systemic field participation)<sup>1</sup>. The device ERC has been more widely used between the end of 2002 and the end of 2004, under the format of “meetings on the work”, from the perspective of the dynamic three-pole device (D3PD) [25]. The main point in these “meetings” were the discussions on work organization (focusing on the distance between prescribed work and real work) and its consequences to workers’ health and safety. Efforts were made so that the all the knowledge invested in the activity engaged in a (dialectical) debate with disciplinary skills, giving visibility to the debates on norms and the re-singularizations observed in a number of situations, in conformity with the ergological perspective and the interventions on the Activity-centered Ergonomics. Throughout this period, there were twenty (20) “meetings” (all recorded in cassette tapes) following, in a flexible way, a semi-structured conversation script to favor dialogism. The “meetings” lasted around 2h30min each and formed the main source of material to be handled here. Contents of these “meetings” provided access to important aspects of the productive process and the functioning (or malfunctioning) of the technical system, as well as to organizational aspects (types of outsourcing, operator’s education and

training), and the constraints that follow from that. It also allowed a better understanding of the subjective experience that emerges when the workers’ ability to analyze their own situation is put into practice, specially as regards risk perception [8], alternative reserves, and the available competence ingredients for work management [24,25]. Important questioning arising from the debated themes were confronted with the academic literature before they were brought back to the systematic debate with the group.

Between 2002 and 2003, oil workers participating in the groups were mostly members of the Union directorship who belonged to the permanent staff of Petrobras (from 10 to 25 years in the company). As of 2004, oil workers in the groups were mainly from outsourced contractors, put on a leave due to accidents after 5 to 20 years of professional activity. They were mainly probers, platform operators, tower operators, inspection technicians, crane operators and welders.

The material presented here has its origin in these discussions. Due to limited space, we have selected only a few passages of the “meetings on the work” with the group from the permanent staff, and passages of two individual interviews, with a production operator and with a human resources (HR) professional. The selected meetings and interviews took place in the first stage of the research, between 2002 and 2004.

### 3. Results

#### 3.1 *Articulating outsourcing and other organizational innovations: from the polyvalent operator to...*

One of the major problems in the studied sector, with a direct impact on the activity, is the reduction of a permanent staff among offshore operators.

According to Pessanha [20], the number of boarded operators in offshore activities has notably decreased between the end of the 1980s and the beginning of the 1990s, with a cut-down of approximately 30% in the largest fixed platforms. He mentions the document resulting from the seminar “Technology, Health and the Environment”, organized in May 1991 by Sindpetro, which states that this reduction of personnel took place in spite of the opinion of engineers from different platforms. The engineers formally stated that the number of employees left after the cut-downs were only enough to operate within safety patterns. On the other hand, the company insisted that there were too many

<sup>1</sup> These were the researchers Milton Athayde, from PPGPS/UERJ and Jussara Brito, from CESTE/ENSP/Fiocruz, due to the supervision of the project coordinators’ postdoctoral research.

employees in several units. According to the engineers, this might happen in a few cases, but they strongly opposed to the employee lack of participation in establishing criteria for personnel reduction and consequently for the creation of the “polyvalent operator”—also designated “multifunction operator” by Lucena [4]—in the beginning of the 1990s, at Paulinia Refinery. In general terms, proposed changes were that the operator should be able to work in any of the four areas, namely, the two areas in the *production operations* sector (oil and gas), and the two areas in the *utilities* sector (electrical and systems, including water, sewer, air compression systems etc.). Nowadays, this latter is known as the “facilities” sector. In the beginning, performance in the first two and in the last two areas were combined in a segmented way, so as to allow capacitation in the four areas (fully-developed polyvalent operator). This decision favored the tendency to reduce permanent staff due to automation developments, once it increased employee’s scope of functions and opened the way for the intensification of work. Therefore, if automation, specially in modern units of that time, reduced the need of human intervention, changing work contents in higher or lower levels, it also increased the demand, on the company’s part, for an employee who had fully developed the new skills. It’s then possible to see polyvalence as an initiative that aimed at the realization of this tendency. It’s important to remember that the state-of-art platforms of that time (the first half of the 1990s) belong to the “3<sup>rd</sup> family”, already equipped with the ECOS system, which automatizes the control of the process and radically changes system’s supervision.

Also according to Pessanha [21], the company established a program to offer a Polyvalence Course to all operators so as to change their status of specialists into that of multi-skilled professionals. The courses were structured to receive groups of 35 operators from different platforms for 600 hours distributed along 75 week days (a little more than 3 months), including both basic and specific contents associated with the four areas (2 for production and 2 for utilities). At the end of the course, they started an on-site training process (on-the-job training), according to a follow-up system known as “Cosmas and Damian” (in a reference to the twin saints Acta and Passio). The oil operator, for example, followed for a while the work of the gas operator, then he followed the work of the systems utilities operator, and finally that of the electrical utilities operator.

According to the same author, a lot of the operators opposition as to this full unification process was due to the inclusion of actions and decisions concerning the electrical sector among their duties. Some of them also pointed out that the period of preparation was too short, as seen in the report from an operator that had taken a four-year course in his area and could not understand how the company wished to form a polyvalent operator in four months. Not all operators have had the on-the-job training, and among those who have, not all have gone through the training stage in the three areas other than his own. After a request of the operators, the last groups had a mandatory practical stage in the end of the course, in one or two boardings, preferably not in the platform they used to operate on [20].

As in many other contexts, it is possible to state that polyvalence could call the attention of the employees as it meant more qualification and could be interpreted as an improvement of his set of skills. On the other hand, workers also noticed that, in reality, an increase of duties and responsibilities due to the conjugation of such distinctive functions did not have a financial counterpart. On the contrary, it opened the way for the company’s strategy concerning the intensification of the work. In other words, it is possible to say that, although the expansion of interfaces management and the consequent expansion of the managerial dimension of the work were at stake, there were significant gaps as to the conditions upon which these changes were carried out and to the counterpart concerning recognition of the efforts made by workers to internalize them.

It is also important to consider the report made to us by an operator who had worked in the utilities area for thirteen years before being hired by Petrobras, where he had a further experience of six years in the same area before the implementation of the innovation. He pointed out that after so many years in a certain area it is difficult to acquire the same ability in the operation of the equipment that has become part of the scope in his (new) work functions: “*of course it is not impossible, but there will always be something missing*”. In this context, quality and safety issues are seen as obstacles that need to be overcome. He added that, after such a long time working with some equipment, more than expertise, people develop a certain feeling of possession over it, “*they feel that they are somewhat like the owners of the equipment*”. Therefore, people develop abilities not pertaining to the scope of formal qualification, but that still represent a differential in

terms of skills. For example, the ability to identify the meaning of noises and other subtle details that would remain unnoticeable for those who had not developed a closer relation with a given part of the technical device or by those who have not had the necessary experience to be able to identify certain nuances, such as the “music” of the device or a noise that could be interpreted as the sound of “out-of-tune instruments” among the various other sounds of the equipment’s parts:

*“We feel a little bit as if we owned the equipment. After such a long time dealing with the it, we can start or stop it [he refers to the necessary procedures to start or stop equipment’s operation]. You clean it and everything, and when one day you notice a different noise, you can tell. Those who are not specialists may not notice it. For example, I have a good ear, so I know how a bearing sings, you understand? It is the same with musical instruments when they are out of tune, in a rough comparison, ok?...”*

### 3.2 ...to the operator-maintainer

In this context, we later realized that, even though difficulties concerning the polyvalent operator proposition had not been properly overcome yet, the company decided to implement another organizational innovation: the operator-maintainer. Whereas the first proposition intended to combine four distinctive functions in the areas of production and utilities, the second one aimed to articulate the functions of production/utilities operator with those of the maintenance worker (the maintainer), creating the operator-maintainer. In this case, according to what we could get from some employees and from a HR specialist at Petrobras, opposition among employees has also been noticeable. A senior operator has pointed out that one of the problems the company had to deal with was the loss of quality in maintenance works:

*Interviewee: “Then, it happened that on a certain occasion Petrobras said that we were operator-maintainers: the electrician was an operator and the operator was an electrician. So, in case anything went wrong, everybody gave it try to solve it, you know. Later, they recognized that there were serious losses. The unit didn’t have the proper maintenance anymore, the right thing, you know. This happened also because the maintenance people were relocated into the operation sector.*

Quality is also mentioned in the informal words of another operator with more than thirty year of employment: *“we are like ducks. We can not fly well, we can not swim well nor we can run well, nothing goes well”*. He understands that, in order to obtain quality performance and satisfactory safety levels it is important to define people’s major responsibilities. Focusing on either operation or maintenance could be the basis of a commitment that makes you *“have that special ‘feeling’ in your area”*, something that would go against the proposition of performing in the two fronts, as this threatens the necessary implication for the solution of less frequent demands.

The same operator also noticed that in many cases, keeping a distance from the process makes a difference. Stopping for a while, leaving the tool aside so that one has time to think of a suitable alternative, discuss with his colleagues about the best solution, or work on (and maybe improve) the current outline [a generic, non-detailed schematic representation of the pieces from a part of the system in which a intervention is to be made] is a routine that may suffer when people’s attention is divided due to the his duties in another area. It’s assumed that this is a strategy to favor the emergence of certain perceptions and sensible intuitions, both essential for the mobilization of the astute intelligence [6]. Cru [9] had already noticed the importance of this behavior in the context of French Civil Construction, pointing out that the apparently lost time, often seen by the management as the consequence of bad behavior, is not at all fruitless in terms of health and safety. In some situations, it may have an important role in the self-regulation of the work load, and although this regulation models are distinctive and customized, it is possible to assume in a legitimate way that such spontaneous procedures may have a role in protecting employee’s health and safety. In a way, an alternative for the solution of a problem or the overcoming of any difficulties throughout the process could emerge precisely from the interlocution established between the members of a collective and seen as a manifestation of its synergetic capacity. According to another operator, in extraordinary cases in which the best alternative is not always easy to find, *“the tool in your hands doesn’t help much”*. Making the right decision in face of extraordinary situations depends on the presence of certain conditions to favor the emergence of this kind of mobilization. In this way, all the hustle about performing multiple tasks, with the *“tool in hands”*, may not only be unsuitable but also obstruct such emergence, often a result of considerable cognitive and subjective efforts.

Nevertheless, he openly stated that he would not oppose to the adoption of a system in which, instead of performance in more than one area at the same time, the operators were assigned for duty in other areas for longer periods, for example, a production operator can be relocated to the maintenance sector for one or two years, then he can be assigned to a new function in facilities for a similar period and so it goes on.

With the problems that arose, the strategy was reviewed as of the beginning of 2002, with those who had migrated to the function of operator-maintainer having a chance to go back to their original position. It's important to note that those who chose to go back to the previous position as maintainers had a cut down of 13% in their salary, once they would not get the shift bonus (12x12h) paid to operators anymore, but an on-call bonus—even though their badge kept their classification as operators. These are today's maintenance operators. The salary cut down partly explains why so many had chosen not to go back to maintenance. Later, the implementation of the shift regimen to all of the boarded maintenance personnel ensured salary equity for both groups

#### 4. Discussion

##### 4.1 Technological and organizational innovations and the point of view of the activity

It is not the purpose of the present article to discuss the reasons for the unexpected course of such organizational innovations, but it is possible to affirm that one of the reasons for the employee's resistance towards it is due to the fact that such initiatives have been created in a unilateral way, on the behalf of the company's directorship, most probably with the help of an external consultant. It's as if automation developments alone, as a technological innovation seen as inexorable, could force the operators into the course of organizational innovations implemented by the company. It's possible to consider that giving the benefit of choice in the case of the operator-maintainer—as to his return to the maintenance sector—is to a certain extent the recognition of this mistake. According to the HR specialist, an arbitrary decision could lead to the risk of “*making the same mistake twice*”.

With regard to the limits of this kind of comparison, this situation as to the environment of the Bacia de Campos offshore confirms what has

been demonstrated in distinct sectors, i.e., an improved performance in the use of a given technological innovation depends on work organization and on a modification in the production management conception adopted by the company along the process of change [1].

In face of these procedures, it is possible to automatically ask if there is room to the “point of view of work” [14] in face of such proposition of change. Allegedly, in a situation such as that of work on platforms, considering inherent risks, it is necessary to increasingly encourage automation so as to keep employees away from the area, avoiding their exposition to hazardous environments. It is possible to agree with Rodrigues [22] when he affirms that this is a good measure. According to him, this can be easily noticed if we consider the employees' preference for modern sea drilling units, where physical work has decreased and technological developments (automation and robotics) allowed the unmanned performance of hazardous tasks. In this way, it not just a question of denying, for example, the use of wireless technologies to allow remote monitoring of variables such as oil tank's temperature and pressure. But the question lies on the criteria that support the measure, seen as appropriate. What are the real conditions for dispensing with the operator? In what situations would his presence be necessary? Is there a careful assessment on the implications of such measures as to the reliability of the system? The problem is not the technological innovation itself, but the use made of it, or the way it is taken by the capital. The testimony of an experienced operator is quite illustrative of what has just been said:

*And there [on the platform where he had worked] lots of things were operated from the control room, like opening or closing a valve, for example... There were a few things which were not done directly from the room. Now, there are a few valves that sometimes... It's important that the operator be there. Then you can see it in loco, you understand?*

When questioned about the same issue, another widely experienced operator was straightforward:

*P1: “... So, just to close, with your experience plus the experience of your work mate, would you ever stand for the point of view which says that it's necessary to clear the area” [keep employees away?]*

*T1: No, I wouldn't do so because, as I have said, with the environment being so hostile and the equipment being so delicate, you cannot, for example, just keep it inside an acrylic box and leave*

*the terminals there... Sometimes, the control room shows that a valve is open, but down there it is closed. 'Why, it says that it's open here!' Then you go and check and you see that salt, which is a conductor, has closed the contact and you get a modified signal. What to do then? (...) Then you have to go there to clean it up and reestablish the contact..."*

In this way, Dejours [8] is clear-cut when he states that giving up the reference to real work carries an important advantage as it dissimulates the problems exposed by the hazardous nature of some elements used in technical systems of risk processes:

*"...In fact, the analysis of the work shows that facilities not always work well. Using the reference to work is to reveal a number of impairments, breakdowns, incidents, unclear phenomena and accidents which, to be precise, the work compensates for, and on top of all, it represents a continuous effort for prevention, thanks to the attentiveness of technicians—that is, to the work that is not given in rules, predicts and prescriptions. Real work is a victim of an institutional denial, as, whenever carefully analyzed, it reveals the deficiencies of prediction and of the production facilities conception." (p. 74)[5]*

The argument presented here understands that the technical device has developed into a stage to make this offshore exploration and production system independent of human intervention as it was seen in older units. For sure, in a few functions, observation (monitoring) and communication tasks have increased, but that does not necessarily mean a decrease of their importance. In this way, it is also assumed that there should be a sensible agreement on that this (human) intervention is still indispensable at a certain level, even in state-of-art platforms. After all, coming to the conclusion that tacit knowledge has lost its "mystery" does not authorize anyone to say that it is now totally destitute of its ability to "make a difference" in certain cases, in certain "slings<sup>2</sup>", on the "table mouth piece<sup>3</sup>", and that the mobilization of its physical, cognitive and subjective components would be fruitless when dealing with the enigmatic dimension of work, as currently presented. Therefore, the remaining question is: when introducing technological innovations that allow the reduction of staff, what are the criteria that support this decision? Moreover, among these criteria, what is the status of the "work point of view"?

<sup>2</sup> Manouvers to lift or bring down materials with the help of a crane (or of a bridge crane, for example).

<sup>3</sup> One of the main devices in oil drilling.

## 5. Final considerations

From a methodological point of view, the experiment with the device "meetings on the work" allowed the identification of a few problems regarding the implementation of polyvalence in the company. Having called the attention of the "enlarged research community", the "meetings" also brought about a debate on work situations, giving different voices a chance to contribute to a better understanding of such problems and their impact of the activity. The "meetings" also helped with the operator's perception of the uses being made of himself after the implementation of the organizational innovation.

The discussion shown in this paper also reopened the debate proposed by Wisner [2] on the representation conflicts resulting from the different levels of understanding and knowledge of system's performance by different agents (project developers, operators, supervisors). According to this author, technical device developers tend not to properly consider the possibility of the implementation of the system in a real situation resulting in a distortion of current models and the calculations carried out for the project. In face of that, some adaptation to be introduced by the operators will be required to adjust the process within suitable parameters. Changes, however, tend to not be uniformly assimilated. Operators' closer contact with the process give them a deeper understanding of the technical system's functioning and malfunctioning, as compared to the representation of supervisors. Aulicino e Salerno [20], after a case study carried out in an multiprocess oil refinery (a typical case of continuous process), highlighted the importance of aiming not at the traditional, static interface between the three decisive areas in continuous process industries (operation, maintenance and engineering) but at its interpenetration and operation action. In this way, they have contributed for the creation of references and criteria for integrated projects, helping to meet a demand for organizational projects in this area.

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