Stress, Strain and Demands of Traffic Control Operators in Public Urban Transportation

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Background

The risk-assessment at work (according to the European Law, e.g. Framework-Directive 89/391/EWG) is obligatory since years but almost done in a technical way. The psycho-mental and psycho-social dimensions of working conditions are decisive for occupational health and safety but almost faded out.

There is no risk assessment framework for psychosocial and psycho-mental strain in the EU except the aspect of mental workload in the ISO 10075-2 (1996) "Ergonomic Principles Related to Mental Workload - Part 2: Design Principles".

Aim and population

The Management of a medium sized public urban transport enterprise asked for interpretation of supposed and alarming stress-symptoms of 4 out of 6 control operators: 2 with skin-diseases (no toxic-chemical reasons - controlled by the occupational physician), 1 with kidney colic, 1 with asthmatic complaints at the same time.

The managers counted on proposals for new organisation of work because of pressure of sick-leave and concentrated symptoms. And they agreed with our interpretation of symptoms as the second- or third-best solution of a problem of the organisation

Methods

We used a method based on the action regulation theory (Handlungsregulations-Theorie), developed by Hacker and Volpert (see Oesterreich) in East- and West-Germany in the 70th. The method aims on the "objective" analysis of strain and demands and is called VERA/RHIA (method for recording regulation demands and regulations hindrances, Leitner 1993).

The results of VERA/RHIA-task-analyses are containing

- a clear picture and description of the working place,

- the organisational and technical work environment and
- the description of the most important (time consuming) single tasks.

The method instructs in proposals for improvements based on the analyses and the description of working conditions, the quantitative valuation and there explanation.

An example: Missing information is an possible obstacle and a psychic stressor. In the VERA/RHIA process You will get clear description about the missing information: Which information in which concrete step of the analysed single task and which correctional measures could be taken.

The method is based on participating observation. The observation procedure brings single tasks/job orders into the focus of the observer. These single tasks will be analysed in respect to challenges and hindrances (see below) in a stepwise algorithmic procedure to find out

- work contents with or without effects for the development of personality
- hindrances and/or work overload and - as a consequence - additional time expenditure and therefore a higher possibility of risky behaviour

Positive Demands	***Objective Psychological Stress Factors***			
	Hindrances		***Capacity overtaxing factors***	
	Difficulties/ Handicaps	**breaks**	**In the single task**	**Independet of the tasks**
• Decision latitude • Communication • Co-operation	• Informatory • Motorial	• Persons • Technol. Functions • Blockings (no material, to few printers ...)	• Monotonous work • Time pressure	• Noise, • Climate, • toxic hazards, • poor ergonomics

Before the observation we conducted semi structured interviews.

Results

The system "operaters work"

The system is to describe on three dimensions:

Identities	**Interfaces**	**Tasks**
Contradictions in the way the operators see themselves and the drivers and the management see them	Co-operation with • Repair-shop • Drivers • Administration is highly non-obligatory	Very good fulfilment of the single tasks

Identity-problems

We found contradictions as follows:

- The operators see themselves as the "heart of the services".
- The drivers experience the operators "sometimes arrogant".
- The management want the operators as supporters because "the drivers are the interface to the customers and we and the operators have to deliver our services to them".

Therefore all operators have to present themselves as busy and under pressure every time. They show this in different ways like

- Lunch in the operating tower nearby the telephone and the transmitter
- No breaks for relaxation
- Sharp in the communication

Interface-problems

In the co-operation with other professions in the enterprise e.g. the repair-shop the question is: Who has to announce/ask if busses are ready after repair? Until the correctional measures the procedure was as follows:

A driver has to get Bus No 510. 510 is in repair. The driver walks to the repair shop (and looses time). The craftsman found new problems and the bus is not ready. The consequences are:

- The driver has a good deal of trouble with the craftsman and the operator and he is almost late
- The operator has immediately to check a new bus for the driver

All are under time pressure. The whole system is stress producing and unhealthy and non-productive.

The operating work tasks

The operators are working around the clock in an eight-hours shift schedule with changes at 4.00 am, 12.00 am and 8 pm. From Monday to Friday in the morning and afternoon shift two persons are working. In the night and weekend shift only one person is working. The main single tasks/job orders are as follows:

- Key and time table hand over and taking back
- Dispatching the busses
- Dispatching the accident car
- Troubleshooting and Information of drivers because of new traffic jam, accidents ...
- Support of drivers in case of questions of passengers or also unskilled drivers
- Information for customers
- Information for drivers about future schedules
- Seeking substitute drivers for short-term drop outs of drivers

The operating tower is also a

- Lost property office and sometimes
- Telephone exchange

In case of e.g. accidents of the company drivers or other road users almost both operators are busy on telephone or transmitter at the same time. In this case the drivers have to wait for the keys and time tables and they are almost joking and laughing in front of the hatch. So the noise is an additional stressor for the operators especially if sometimes the transmitter is not so good understandable.

Description of "Key and time table hand over and taking back"

About 200 times the operators have to hand over or to take back keys and time tables. It is about 15% to 25% of the whole working time of one operator. This is an unsatisfying task for single persons especially under time pressure because of urgent operating activities. For the three younger operators it is the job of each day because of the experience of the elderly in troubleshooting. So the

younger operators have a double burden: they have to accomplish this less demanding task and they are only the second men in troubleshooting.

Correctional Measures

The results of a longitudinal study of the Berlin school of "action regulation theory" show no significant correlation between improving challenging demands and less psycho-somatic or other symptoms. Less symptoms are shown as effect of lower strain; higher demands are strongly correlated with more active behaviour in the leisure time (AIDA-study, Leitner, 1999). These findings require a double strategy for health promoting interventions - to higher the demands and to reduce or eliminate the stressors. We tried to translate this orientation into action:

1. <u>New organisation of work and division of labour (obligatory rules), two examples:</u>

   "Key and time table hand over and taking back":

   This job will be sourced out to the drivers. Each driver can take ore take back his key and time table in combination with a touch screen system. Only troubleshooting - substitute drivers, late busses ... - is left behind in the operators duty.

   Instead of the old job the operators shall organise breaks for relaxing and for reflecting the day ore single ocurrences with regard to improvements of the own job and the whole system. (see 3.)

   "Interface-problem: repair-shop":

   The craftsman are the only one who know if and when the bus is ready for action. They have to deal themselves with the problem of late detection of damage or defects. Only in case of no substitute for the broken bus they are allowed to inform an operator. And they have to inform the operators a certain amount of time before: So the operator have enough time to deal with the unexpected situation. The drivers have in this respect nothing to do anymore with the repair-shop.

2. <u>TRT (Team-Resources-Training)</u>

   Above we wrote about the unsatisfying division of labour in the operators team and the lack of breaks. In our workshop we collected the different wishes for and considerations about

improvements in work organisation and working conditions. The most urgent needs for action have been:

- Division of labour and co-operation with the transport officers
- Time for planning new projects
- Compensation for gaps in knowledge (especially data processing)
- Uncertainty relating to the future of the operators tower (deregulation in the public transport sector)
- Information for the following shift-team

We could not implement the breaks as a consequence of the workshop. Therefore we organised during the shift a break-training on the job in each team and with the soloists.

3. Breaks and new ergonomic environment

The outsourcing of the former single task "Key and time table hand over and taking back" saves time and make the following changes in work organisation possible:

- Participative planned and trained short breaks in and with the concrete team to support high alertness
- Time for reflection belonging the whole system (e.g. improvements and requirements for information, acknowledgement for single or all drivers ...)
- New workroom for the operators with ergonomic working conditions.

The outsourcing of the "Key and time table hand over and taking back" was also the solution of the noise problem on the hatch.

Conclusions

The VERA/RHIA-method was very helpful in analysing complex working conditions and gave hints for the new design of the operating work, e.g. to decrease single low demanding tasks. But because of the profoundness of this special task analysis it is a time-consuming method: The analysis of each task requires about 6 to 8 hours including documentation and interpretation.

The work of operators is mainly men-men-interaction and primarily a communication job not a technical or an organising job. Therefore a burnout risk is to discuss also for these and comparable professions.

Communication, information and work primarily with persons is not to analyse with the VERA/RHIA method until now. But there are further developments for participating observation in classes and for observation of information and communication tasks.

References

Leitner, K., Lüders, E., Greiner, B., Ducki, A., Niedermeier, R.,-Volpert, W. (1993) *Analyse psychischer Anforderungen und Belastungen in der Büroarbeit. Das RHIA/VERA-Büro-Verfahren.* Handbuch. Göttingen-Bern-Toronto-Seattle Hogrefe Verlag

Leitner, K. (1999) *Kriterien und Befunde zur gesundheitsgerechter Arbeit - Was schädigt, was fördert die Gesundheit? In Psychologie gesundheitsgerechter Arbeitsbedingungen. Konzepte, Ergebnisse und Werkzeuge zur Arbeitsgestaltung*. Hrsg.: Rainer Oesterreich und Walter Volpert. Bern: Huber-Verlag, S. 63-139

Oesterreich, R. (1999) *Konzepte zu Arbeitsbedingungen und Gesundheit - fünf Erklärungsmodelle im Vergleich. In Psychologie gesundheitsgerechter Arbeitsbedingungen. Konzepte, Ergebnisse und Werkzeuge zur Arbeitsgestaltung*. Hrsg.: Rainer Oesterreich und Walter Volpert. Bern: Huber-Verlag, S. 141-215