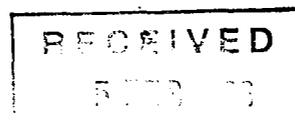


Working paper

CONDI/T/WP.7/1996

Stress prevention in the offshore oil and gas exploration and production industry

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ISBN 92-2-110093-6

First published 1996

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Preface

Occupational stress can no longer be considered an occasional, personal problem to be remedied with palliatives. It is becoming an increasingly global phenomenon, affecting all categories of workers, all workplaces and all countries. This trend — coupled with its rising cost to the individual, to industry and to society as a whole — has greatly heightened awareness of the need for effective and innovative ways of tackling stress.

Stress prevention at the workplace has proved particularly effective in combating stress, by attacking its roots and causes, rather than merely treating its effects. In line with such an approach, this series of working papers is aimed at providing concrete advice on how to prevent stress in specific occupations particularly exposed to stress. For each occupation considered, the paper indicates a number of preventive measures targeted to the elimination of the causes of stress, rather than the treatment of its effects, and how these measures can become an integral part of the necessary organizational development of a sound enterprise and eventually pay for themselves.

The series includes the following working papers:

- Dr. V.J. Sutherland and Professor C.L. Cooper,
University of Manchester, United Kingdom
Stress prevention in the offshore oil and gas exploration and production industry;
- Professor G. Costa, University of Verona, Italy
Occupational stress and stress prevention in air traffic control
- Professor T. Cox and Dr. A. Griffiths, Nottingham University, United Kingdom
Professor S. Cox, Loughborough University of Technology, United Kingdom
Work-related stress in nursing: Controlling the risk to health
- Professor M.A.J. Kompier, University of Nijmegen, Netherlands
Occupational stress and stress prevention for bus drivers
- Dr. S. Kvanström, Asea Brown Boveri, Sweden
Stress prevention for blue-collar workers in assembly-line production

As the series is intended to stimulate action at enterprise level, its primary audience will consist of managers, supervisors, workers, workers' representatives and engineers who have a concrete interest in introducing anti-stress programmes within their enterprise and an open approach to improvements and change. The series is also directed at policy-makers, as well as government officials and workers' and employers' organizations with a direct interest in this area.

Acknowledgement

The authors wish to express their gratitude to the sponsors of this research programme, the Dietsmann Group of Companies, Belgium.

1. Introduction

This working paper is directed towards the prevention of stress in the offshore exploration and production industries. Many recommendations are given to reduce work stress, but it must be acknowledged that on any mobile drilling rig or fixed production platform there exists a great diversity of occupations and skill levels. This means that a step-by step-guide for stress prevention for each specific occupational offshore group is beyond the scope of this paper.

The paper is aimed at providing information on how to identify stress among different groups of offshore workers on various types of installations or in varying locations; and identifying and selecting the options that are available to prevent or minimize the problems of stress offshore.

It is suggested that the "Triple A" approach to stress management be adopted in the offshore environment. It incorporates:

**AWARENESS
ANALYSIS
ACTION**

We believe that **awareness** about stress arises from a reliable, systematic **analysis** of the problem, and on the basis of an accurate diagnosis, **action** can be taken with confidence. This approach has the added advantage of ensuring commitment to a subsequent stress prevention initiative, and resistance to change is minimized.

Three essential components are necessary to the success of stress management and stress prevention initiatives.

- It is essential that the costs of mismanaged stress are recognized.
- It should be acknowledged that stress can only be successfully dealt with if it is considered from both a preventive and a curative perspective. It is the responsibility of the organization and the individual to prevent stress whenever possible. However, since not all stress can be eliminated, it is also necessary to find effective ways of coping with stress when it occurs.
- The prevention of stress demands that the source or cause of stress be accurately identified.

These three issues are presented first in this working paper before the options available for stress prevention and stress control are presented.

1.1. Offshore stress — A costly problem

Successful performance and productivity in the extraction of offshore oil and gas reserves are of vital importance to the economies of all countries with interests in this unique, but potentially, hazardous and dangerous industry. However, the financial benefits can be seriously eroded by

the costs of mismanaged stress. The offshore employees and the organizations involved suffer adverse impacts in many ways,¹ including —

- physical and/or psychological ill-health
- premature death
- forced early retirement
- absenteeism
- high labour-turnover
- poor job performance
- poor productivity
- unsatisfactory employee relations
- job dissatisfaction
- increased rate of accidents
- alcohol problems
- drug abuse
- marital disharmony and divorce
- increased insurance premiums
- cumulative stress trauma litigation

The offshore environment is potentially stressful because the workforce live and work in one restricted location for a significant period of time without a break. A wide range of hazardous duties are carried out in a confined space and in an environment which has the potential for the rapid escalation of hydro-carbon-related incidents. Life offshore has been described as dangerous, arduous and socially isolating;² the environment is characterized by constant noise and activity, in sometimes crowded and unnatural living conditions. Indeed, added pressures exist because of the element of uncertainty which is inherent to the industry,³ as each new discovery area brings previously unencountered problems, and the market is characterized by price instability of the oil and gas commodities.

Such factors combine to make the task itself a challenge, but can also create optimal stress producing situations which have implications for productivity and safety performance offshore.⁴

1.2. Stress control — Prevention or cure?

Increasingly, public and private sector organizations are acknowledging the unacceptable costs of stress by providing stress management programmes for employees in an attempt to combat

¹ V.J. Sutherland and C.L. Cooper: *Stress and accidents offshore* (Houston, Gulf Publishing Co., 1991).

² ILO: *Safety and related issues pertaining to work on offshore petroleum installations* Tripartite Meeting on Safety and Related Issues Pertaining to Work on Offshore Petroleum Installations, Geneva, 1993, document no. TMPOI/1993.

³ ILO: *Manpower planning and development in the petroleum industry*, Report III, Petroleum Committee, Tenth Session, Geneva, 1986.

⁴ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

the problem of stress. Typically this type of programme teaches the individual to cope with stress rather than tackle the problem at source; that is, finding the cause of the stress. We describe this approach as “reactive” rather than “proactive”, because it seeks to cure the symptoms of exposure to stress rather than to prevent a stress problem from arising. It means that the burden or responsibility for change is placed on the employee. Although this method of managing stress has a certain appeal and can be effective, it has also been suggested that stress control can only be really successful if it is tackled at the level of the individual and the organization (i.e. to teach the individual to cope with stress offshore, and to identify and eliminate or minimize stressful situations).⁵

1.3. Using a stress audit in the offshore environment

Many organizations begin to tackle the problems of stress by conducting a stress audit. The aim is to increase the understanding of human behaviour in a particular working environment. Since it is likely that different groups of offshore workers will experience different problems, it is important that a stress audit identifies specific problems and any high risk and vulnerable personnel. A stress audit is a very effective way of helping to understand why some individuals seem to cope and thrive in a demanding environment, while others clearly do not prosper or survive.

Some of the results of a stress audit among personnel working in the British sector of the North Sea are presented next to show how this information might be used to prevent stress in the offshore environment and to minimize the impact of the stress that cannot be eliminated.

Personnel working on 97 offshore drilling and production installations took part in the audit, and it included 146 staff working for 14 of the major oil companies, and 164 contractor status personnel who were employed by 18 “contractors” (i.e. those who supply services to the operator company on a contractual basis). A questionnaire was designed on the basis of information obtained from interviews with offshore personnel.⁶ Personnel were asked about aspects of their job, accident involvement, lifestyle behaviours (smoking, alcohol consumption, exercise), and leisure. Measures of job satisfaction, psychological health and social support were also obtained.

From the information provided, the following was noted:

- the workforce was experienced and technically qualified;
- 92 per cent of respondents were British;
- nearly 45 per cent of the respondents worked a “14 days on, 14 days off” tour, with a mixture of day and night working, usually in 12-hour shifts;
- ages ranged from 21 to 60 years;
- only 10 per cent of respondents were less than 25 years; 3 per cent were over 50 years old;

⁵ R.S. DeFrank and C.L. Cooper: “Worksite stress management interventions: Their effectiveness and conceptualisation”, in *Journal of Managerial Psychology*, Vol. 2, No. 1, 1987, pp.4-10.

⁶ V.J. Sutherland and C.L. Cooper: *Man and accidents offshore: The costs of stress among workers on oil and gas rigs* (London, Lloyd’s List/Dietsmann, 1986).

- 74 per cent of the offshore workers were married;
- 12 per cent were either divorced or separated;
- 8 per cent of personnel were educated to degree standard, and 18 per cent reported that they had no formal education qualifications;
- 34 per cent of personnel were tobacco smokers;
- 16 per cent of respondents reported that they consumed more than the recommended 21 units of alcohol per week while onshore (i.e. not when working).

Potential sources of stress in the offshore oil and gas industry were then identified. A technique known as “factor analysis” was used to identify common patterns, known as “stress factors”. These, and the stressor items that make up each factor, are listed in Table 1.

Table 1. Factor analysis of the stressor questionnaire

<p>Factor 1: Career prospects and reward</p> <ul style="list-style-type: none"> • Depressing or bleak future prospects • Lack of job security • Low rate of pay • Pay differentials • Lack of training opportunities • Lack of promotion opportunity • Lack of paid holidays • No sense of belonging, I'm just a number • The business has changed, it's not what it was • Its impossible to make changes concerning the job • Safety training courses are not updated regularly enough • No recognition for doing a good job
<p>Factor 2: Safety and insecurity at work</p> <ul style="list-style-type: none"> • Feeling inadequate when someone has an accident • Damaging equipment because of my mistake or error • Sometimes I feel I don't have time to do the job properly • Long periods of intense concentration • Not getting cooperation at work • Poor working relationships on the installation • Inconsistent/unpredictable workload • Inadequate instructions to do the job • Having a near-miss accident • Having to discipline people • I feel that my own and others' safety is at risk if I make a mistake • Having to think about the safety of other people

Factor 3: Home/work interface

- Leaving a wife/partner to cope and make decisions
- Knowing my wife/partner is unhappy because I work offshore
- Problems unwinding when I return home
- Risk of marriage/relationship breakdown because I work offshore
- Disruption to social life
- The constant change from one environment to another
- Difficulties with my children because I work offshore
- Unable to get involved in the community at home (clubs and organizations)

Factor 4: Understimulation — low demand

- The job is not a challenge
- Lack of variety
- Lack of job satisfaction
- Boredom, not enough to do
- The boredom of working on one installation for a long time
- Deterioration in relationships after intensive periods of time together
- Not being used to my full potential — skills and ability

Factor 5: Physical conditions — working and living

- Unpleasant working conditions due to vibration, noise and cold
- Disturbance in living accommodation due to vibration, noise from machinery, noise from other people, and heat and cold

Factor 6: Unpredictability of work pattern

- Last-minute change in crew relief arrangements or relief delayed
- Short notice recall to rig
- Staying overnight to meet early check-in
- Travel from home to check-in
- Delay in crew change due to weather conditions

Factor 7: Living conditions

- Inadequate leisure facilities to occupy free time
- Sharing living and sleeping accommodations
- Inadequate facilities for physical exercise
- Lack of privacy

<p>Factor 8: Physical climate and work</p> <ul style="list-style-type: none"> • Feeling unsafe in bad weather • Not knowing how safe an installation really is • Working in a hazardous or dangerous environment
<p>Factor 9: Organization structure and climate</p> <ul style="list-style-type: none"> • Lack of union recognition offshore • Dissatisfaction with onshore management • Onsite management that is incompetent and ineffectual • Reduced manning levels • Lack of knowledge about rights/legislation when offshore • Inadequate compassionate leave policy • Using contract versus “direct” labour • Feeling that one is wishing one’s life away
<p>Factor 10: Physical well-being</p> <ul style="list-style-type: none"> • Unhealthy diet offshore • No “quiet” room to unwind in when off shift • Deterioration in catering standards • Concern about job-related diseases and disorders • Lack of leisure areas for non-smokers
<p>Factor 11: Work overload</p> <ul style="list-style-type: none"> • Pay cuts due to the recession • Working excessive periods of time offshore with only a short break between trips • Extra responsibility when personnel do not turn up for shift
<p>Factor 12: Transportation</p> <ul style="list-style-type: none"> • The safety of helicopter travel • Increases in the number of mechanical failures on helicopters flying to rig • Fixed-wing travel

Further analysis of the questionnaire revealed differences between the various groups working offshore, in particular between:

- operator and contractor personnel;
- personnel working on mobile drilling rigs versus fixed platforms;

- personnel employed on the small versus the very large installations (according to number of sleeping quarters available);
- differences between the people working on installations in various locations;
- personnel who had been involved in a personal injury accident while working offshore compared to those who had remained accident free.

This is not surprising. A variety of circumstances have an effect on our expectations, needs and values, and these all have some impact on the way stress is perceived in the offshore environment. It confirms our assumption that the introduction of a global stress prevention/stress management strategy is not the most effective way of dealing with work-related stress offshore.

A targeted programme instead is needed, which seeks to identify and eliminate sources of stress through organizational change. Complementing this, stress management training, which helps the individual cope with the pressures of a job that cannot be removed or minimized, is also required. For example, one of the most commonly reported sources of stress offshore is the need to travel by helicopter. Crew change by sea is generally disliked, but another efficient way of transporting offshore workers to and from the offshore environment has yet to be discovered. Thus, the offshore worker must learn to cope with a source of stress that cannot be eliminated.

In summary, we suggest that a stress audit should:

- identify the potential sources of stress;
- assess which of the sources of stress have the greatest negative impact;
- identify which, if any, of the individuals' and/or groups of workers on the installation have a particular stress-related problems, i.e. to reveal the stressor (the source or cause of the stress); symptoms of exposure to stress; whether it is possible to eliminate the stressor, or whether personnel should be trained to cope with a pressure that cannot be changed.

In Section 2, some of the options available for the prevention of stress are described, while in Section 3, individual strategies for stress coping are considered.

2. Preventing stress in the offshore environment

Although the unique nature of offshore working has been acknowledged,⁷ we can see from Table 1 that the personnel working offshore at the time of the stress audit reported many of the

⁷ A. Alvarez: *Offshore: A North Sea journey* (United Kingdom. Hodder and Stoughton, 1986); O.H. Hellesøy et al.: *Work environment Statfjord Field: Work environment, health and safety on a North Sea oil platform* (Bergen, Universitetsforlaget AS, 1985); ILO, *Manpower planning and development in the petroleum industry*, op. cit.; ILO, *Safety and related issues pertaining to work on offshore petroleum installations*, op. cit.

same stressors identified in onshore occupations.⁸ Therefore, many of the recommendations for stress prevention onshore may also be applied to jobs on offshore installations.

However, in order to provide specific indications on stress prevention offshore, the factors of stress identified in the audit (see Table 1) have been categorized by major sources of stress, as suggested by Cooper and Marshall.⁹ They noted that, across a wide variety of different occupations, many of the same stress factors tended to emerge, and suggest that it might be useful to use these categories in the planning of stress management programmes. Figure 1 illustrates this process.

Figure 1. Categorizing stressors by major sources of stress

Factors of stress (Cooper and Marshall, op. cit.)	Major sources of stress (Sutherland and Cooper, <i>Stress and accidents offshore</i> , op. cit.)
Stress intrinsic to job	<ul style="list-style-type: none"> • Understimulation, low job content • Physical conditions of working and living • Living conditions • Physical well-being offshore • Work overload • Transportation
Role stress	<ul style="list-style-type: none"> • Safety and insecurity offshore • Unpredictability of work pattern • Physical climate and work
Career stress	<ul style="list-style-type: none"> • Lack of career prospects and reward
Being in the organizational structure and climate	<ul style="list-style-type: none"> • Organizational structure and climate
The home/work interface	<ul style="list-style-type: none"> • The home/work interface

Stress prevention options in respect of each of the major sources of stress indicated by Cooper and Marshall are presented in the following sections.

⁸ Sutherland and Cooper, *Man and accidents offshore*, op. cit.; Sutherland and Cooper, *Stress and accidents offshore*, op. cit.; Hellesøy et al., op. cit.

⁹ C.L. Cooper and J. Marshall: *Understanding executive stress* (London, Macmillan, 1978).

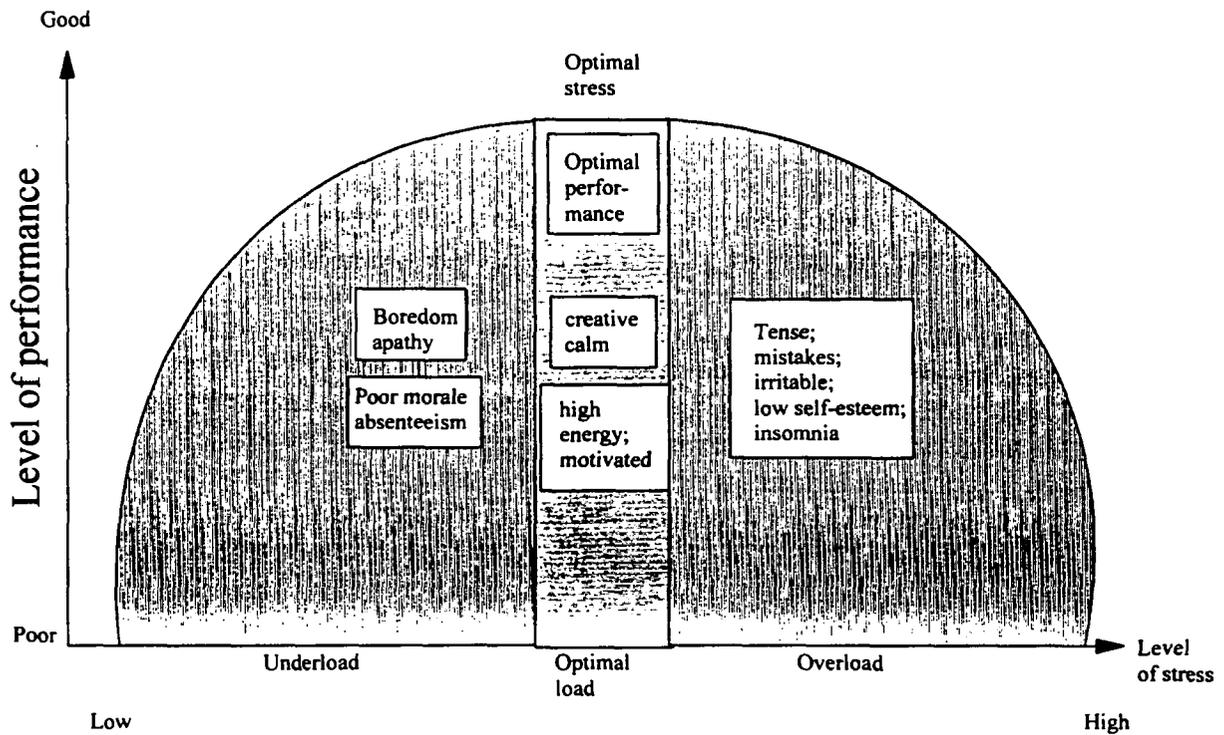
2.1. Stress intrinsic to the job

Difficulties intrinsic to the offshore environment may compound the stress associated with the task requirements and the physical demands of a particular job. These special characteristics of offshore working have important implications for safety in the environment. It is also necessary to acknowledge that it is often a combination of stressors, rather than one sources of stress operating alone, which results in negative consequences for the individual.

2.1.1. Understimulation

Task demands of a job include both work overload and underload as acknowledged sources of stress. The relationship between workload and health and performance may be explained by the illustration presented in Figure 2.

Figure 2. The relationships between work overload/underload and performance



As the stress level increases, overload is experienced and performance begins to deteriorate. This is often described as “burnout” and is associated with tension, irritability and low self-esteem. At the other end of the scale, where the individual feels under-utilized or not challenged, it is known as “rustout”. Although work overload is a significant source of stress in the offshore environment, it was the stress of underload (or rustout) rather than overload that caused the greatest concern to offshore staff in the British sector of the North Sea.¹⁰

Offshore workers tended to report more stress from qualitative underload rather than quantitative underload. This meant that personnel felt bored because they were not being used to their full potential and because the job was not a challenge, rather than having too little work to do while offshore. Dissatisfaction with these aspects of the job offshore were also reported by Norwegian offshore workers on the Statfjord Platform.¹¹

Rustout is characterized by feelings of boredom and apathy resulting in lapses of attention, which are potentially very dangerous in a hazardous environment, especially if the individual fails to respond appropriately in an emergency situation. This may be more significant during the night, when the offshore worker faces the prospect of an unstimulating 12-hour shift while also trying to adjust to the change of sleep pattern. As one roustabout declared,

it [working as a roustabout] was getting depressing after a while, you could actually do it [the job] blindfolded ... The only time we are busy is when the rig shifts, or we are getting drill pipe sorted out ... It depends on how fast the drilling is ... if it is slow, that's when you start switching off and dreaming about winning the [football] pools.

The stress associated with understimulation and low demand offshore is also linked to dissatisfaction with the job. Reported levels of job satisfaction offshore were found to be significantly lower than for comparative onshore blue-collar workers.¹² Ultimately, job dissatisfaction can lead to absenteeism, labour turnover and poor performance, which means the industry is exposed to reduced productivity and the costs associated with the recruitment and training of new staff. Induction into the offshore environment is also costly because new personnel are more vulnerable to injury and mistakes. Both contractor and operator personnel on exploration and production installations reported understimulation and low job demand as a source of stress, suggesting that a major problem exists offshore which could be alleviated or prevented by job redesign.

¹⁰ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

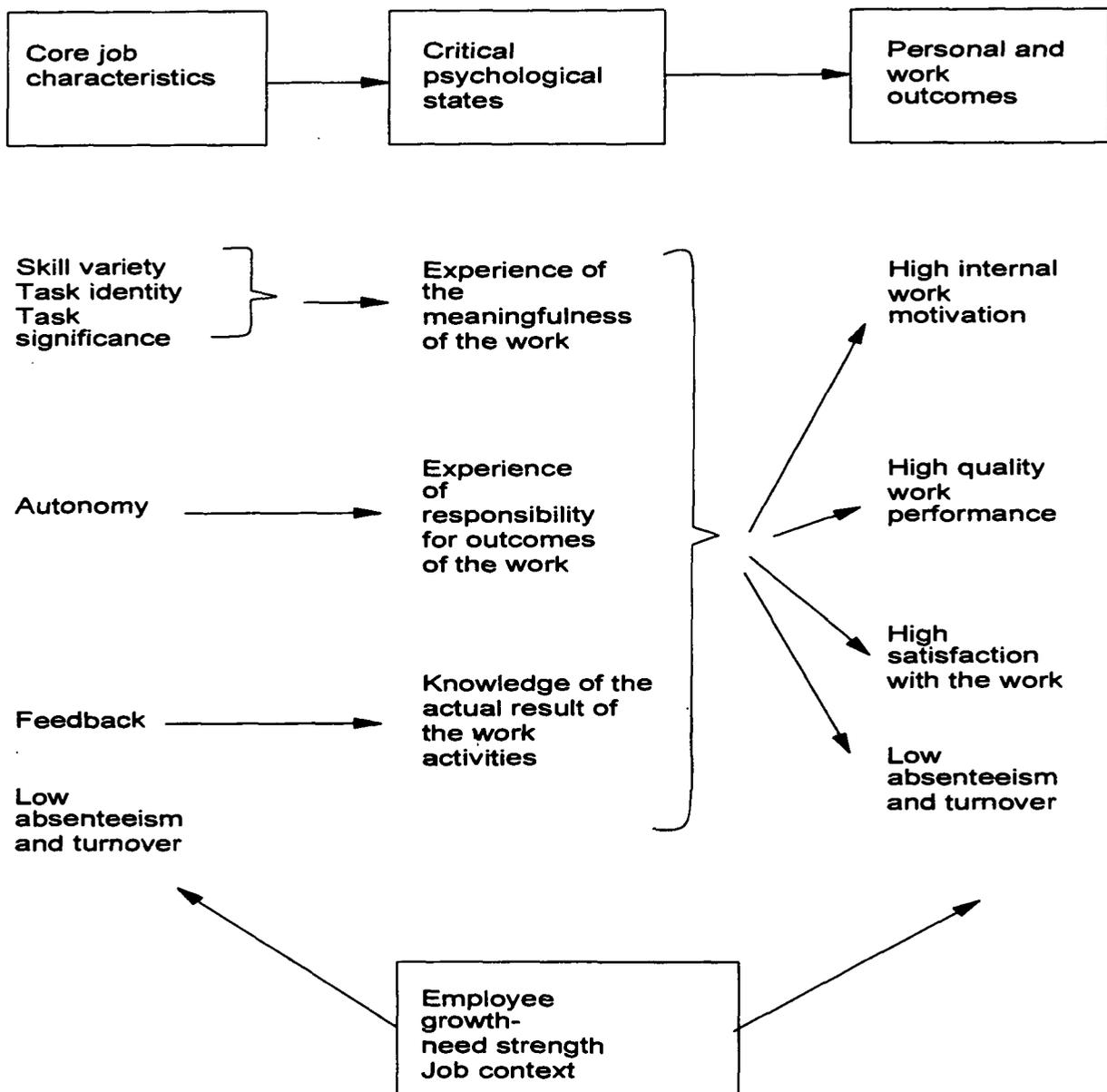
¹¹ Hellesøy et al., op. cit.

¹² Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

Preventing the stress of understimulation

Hackman-Oldham¹³ have explained how the core nature of a job influences one's attitudes and behaviour and how it affects both personal and work outcomes, such as motivation, job performance, job satisfaction and labour turnover. Their ideas are illustrated in Figure 3. It is suggested that any job can be described according to five core dimensions, and these influence certain critical psychological states.

Figure 3. The job characteristics model



¹³ J.R. Hackman and G.R. Oldham: *Work redesign* (Reading, MA, Addison-Wesley, 1980).

The first three core job characteristics help us to understand how meaningful we perceive our job to be. **Skill variety** means the number of different activities, skills and talents the job requires. The more varied the skills we use, the more meaningful the job is seen to be. **Task identity** means the degree to which a job requires completion of a whole, identifiable piece of work: doing a job from beginning to end with a visible result. Task significance describes the job's impact on the lives or work of other people, whether within or outside the workplace.

The second psychological state which is known to influence both personal and work outcomes is our perception of the level of responsibility we have for the outcomes of the work. This is influenced by the amount of autonomy we have at work or in the job. **Autonomy** is the degree of freedom, independence and discretion in scheduling the work and in determining procedures and practices.

Finally, "knowledge of work results" is known to have both personal and work outcomes. This is assessed by measuring the amount of feedback received from doing the job. **Task feedback** means the degree to which carrying out the activities required results in direct and clear information about the effectiveness of performance. This includes feedback from other people (that is, receiving clear information about one's performance from supervisors and co-workers), and dealing with others (referring to the degree to which the job requires the employee to work closely with other people in carrying out work activities).

By redesigning or enriching the job to improve the amount of skill variety, task identity, task significance, autonomy and feedback, it is possible to improve both motivation and job performance. Decisions to make this type of change are usually made on the basis of a job analysis and discussions with the workforce and the job holder. Changes might be made which increase feelings of autonomy, job variety and levels of feedback in a variety of ways, including:

- **Job rotation.** Offshore workers should be able to rotate through a set of different, but similar, jobs in order to provide more variety and to reduce the boredom that might exist offshore when people are exposed to the same rig location for a long period of time and work a 14-day tour, or more, without a break. Since the offshore worker is also denied the opportunity to socialize with a different set of friends or colleagues after completing the work shift, this is probably more significant as a stress prevention measure for the offshore worker than for those in onshore occupations.
- **Job enlargement.** Additional tasks are included within the scope of the job to increase the variety and diversity of the job. The relatively flat hierarchy of an offshore installation does not provide many promotion opportunities, and these are virtually non-existent for personnel employed as contractors. Job enlargement is a method of providing more variety and challenge in a job, especially for older workers who realize that they have reached a career plateau.
- **Job enrichment** entails assigning more important and challenging duties (for example, additional decision-making responsibilities). This has potential for increasing autonomy, variety and task identity, as well as improving production and reducing absence and turnover. Some managers and supervisors are reluctant to delegate work to their subordinates, and so fail to fully utilize their staff. Inability to delegate is often a problem for individuals newly

appointed to management from the shop floor, because they do not receive the necessary training in this skill and often continue to work with the same group of employees, thus making it difficult to adopt the new role. An intervention to reduce role ambiguity and to improve role clarity should also be included into this type of job redesign.

- **Semi-autonomous work groups** are based on criteria similar to those of job enrichment, but are introduced at the level of the team rather than the individual. A group of employees is empowered to make decisions which affect their work activities. Groups might also be established to work on specific problems, including safety offshore or continuous quality improvement.

The stress prevention initiatives described above will help to alleviate the effect of understimulation in offshore operations. However, it is important to note that this type of job redesign rarely occurs in the absence of other changes, such as pay rates and staffing levels.¹⁴ There is also a need to remember that the effects of these changes will not be limited to the job holder. For example, the nature of the supervisory and managerial roles will be altered when the workforce is given more autonomy.

2.1.2. Work overload

The offshore worker in many parts of the world tends to work a longer day than most onshore personnel; that is, they usually work a shift of 12 hours and then have 12 hours off. However, they can often be on duty for a much longer time than this. The actual rotation pattern (i.e. the tour of duty) is more variable around the world, and personnel can work for seven, 14, 21 or 28 days without a break (even longer for long-distance locations), and then are entitled to a similar amount of time off, although field-break periods also vary considerably.

Improved management and planning of crew change arrangements can reduce the stress associated with this form of work overload. Indeed, it is also necessary for us to understand more about the actual shift and tour arrangements worked offshore (i.e. 12-hour work shifts for seven, 14 or 21 days). Despite considerable research efforts among onshore workers, it is difficult to make generalizations regarding the best shift system, but it is clear that the need to work shifts represents a major source of stress among offshore workers. A variety of complaints have been identified, including fatigue and gastro-intestinal troubles. It is likely that individuals do habituate to shift work and it becomes physically less stressful with time, but some work patterns, such as offshore working, might prevent habituation occurring. A study of offshore workers in the Norwegian sector of the North Sea found that sleep problems were indicative of the strains of the offshore environment. Personnel reported that they wake up tired and/or wake up and have trouble going back to sleep.¹⁵

¹⁴ T.D. Wall and R. Martin: "Job and work design", in C.L. Cooper and I.T. Robertson (eds.): *International review of industrial and organisational psychology* (London, Wiley, 1987).

¹⁵ Hellesøy et al., op. cit.

Disturbance of nocturnal sleep leads to daytime fatigue and sleepiness impairs motivation and vigilance, perhaps affecting safety performance at work. Individuals required to work a night shift or an early morning shift suffer from sleep disturbance in that the quantity and quality of the sleep differs as a consequence of shiftworking. Daytime sleep is more fragile and more unstable than nocturnal sleep. Although the night shiftworker may be able to take catnaps to catch up on sleep loss, a sleep debt accumulates over a seven-day period, to the extent that the worker has effectively lost the equivalent of at least one night's sleep.¹⁶

The stress audit showed that offshore workers tended to report less somatic anxiety than onshore workers (somatic anxiety is associated with tiredness, fatigue and sleep disturbance). However, getting insufficient sleep while offshore was reported as a high stress situation. However, work-shift patterns and length of tour as a source of stress offshore require more detailed examination before guidelines for the industry can be set down. We do not know the extent to which the work pattern for offshore workers is an independent source of pressure, or the degree to which it exacerbates other stressors in the environment; for example, irritability with the constant company offshore, tolerance of noise and physical conditions.

However, building a climate and culture which encourages staff to be more supportive of each other will facilitate team working and reduce some of the problems which occur when an individual fails to report for duty and thereby leaves his counterpart offshore for an extended period of time, thus exposing him or her to a work overload situation. The topic of social support in the work environment offshore is discussed further in Section 2.5. This might be an important stress prevention mechanism, because certain external forces prevent us from removing some of the sources of pressure and strain offshore. For example, the harsh North Sea weather conditions cause delays and flight cancellations and so the individual must learn to cope with this source of stress by becoming more flexible and having realistic expectations of the working environment. Strategies to help the individual deal with this type of strain and pressure are discussed in Section 3. This will also apply to the stressful nature of transportation for offshore personnel, that is, the need to travel by helicopter.

2.1.3. Transportation — Helicopter travel

The safety of helicopter travel was identified as one of the top ten sources of stress in the British sector of the North Sea,¹⁷ and was associated with poor mental ill-health among contractor status personnel. One production operator said:

At the moment I feel under strain offshore ... since changing platforms which involves a longer helicopter flight ... and the strain of learning a new job.

Some individuals reported that they preferred a 14 days on, 14 days off rotation pattern to a seven on/seven off, because it entailed less helicopter travel.

¹⁶ A.J. Tilley, R.T. Wilkinson, P.S.G. Warren, B. Watson and M. Druid: "The sleep and performance of shift workers", in *Human Factors*, Vol. 24, No. 6, 1982, pp. 629-641.

¹⁷ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

Within the last year the company has changed from a 7/7 work cycle to a 14 days on, 21 days off. It has taken a lot of stress out of flying to and from work and I am able to get on with my job and the surroundings a lot better (Production operator).

In the Norwegian sector on the Statfjord Platform, Hellesøy¹⁸ reported that 36 per cent of respondents felt unsafe about the transportation of people by helicopter, and Sunde¹⁹ indicated that the risk and stress of helicopter travel was the most common reason cited for resignation from offshore employment in Norway. This is costly to the industry in terms of selection, recruitment and training.

As already mentioned, we do not yet have any means of beaming people through space, and so helicopter travel is a reality which must be faced by the individual (this is discussed in Section 3). However, education about the nature of the risk and safety performance might help to overcome any irrational fears which are held. These tend to be magnified during the inevitable and intensive media coverage of a helicopter incident offshore which would probably go unreported in other industries.

2.1.4. Physical demands in the working and living environment

In this section, prevention of stress associated with the physical conditions of working and living (second factor in Table 1), the living conditions (third factor in Table 1), and the physical well-being offshore (fourth factor in Table 1) is considered.

The offshore environment must provide satisfying physical conditions for both working and living because the workforce is confined to one location for an extended period of time without respite. A clean and orderly place of work and living is important for both safety and hygiene reasons, and has implications for the morale of the workforce, especially in an environment where the work situation is acknowledged as hazardous.

Surveys of stress in the offshore environment suggest that living and working conditions are not satisfactory. This included disturbance in the living accommodation, and was attributed to heat and cold, vibration, noise from machinery and from other people. Similarly, working conditions were regarded as unpleasant because of the noise, heat and vibration.²⁰ As one maintenance electrician observed:

It's continuous drone ... accommodation machinery, air conditioning units running all the time ... You sleep because you have to ... but when I come home the first thing I do is go to bed ... I sleep because I know I can sleep. I only sleep for two hours but those two hours is the best sleep I've had in two weeks ... On the platform you keep waking up ... you are conscious of noise ... People are in and out because the night shift is on ... doors open ... you hear a door open right at the end of a corridor.

¹⁸ Hellesøy et al., op. cit.

¹⁹ A. Sunde: "Psychological aspects of offshore work", *International Symposium Proceedings, Safety and Health in the Oil and Gas Extractive Industries, Luxembourg, April 1983* (London, Graham & Trotman, 1983).

²⁰ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

The stress of physical conditions of living and work was associated with the tendency to report obsessional behaviours offshore. Indeed, one person in five exhibited this extreme behaviour, which might include excessive meticulousness and adherence to routine, dislike of sudden change, a need to control the environment, a tendency to overcheck and a dislike of dirt. Operator personnel reported higher levels of stress related to the physical conditions of working and living, and were also more concerned about job-related disease, an unhealthy diet, the lack of leisure areas for non-smokers, or a quiet room for relaxation when off duty. An electrician technician on a production platform said:

I think that better accommodation and amenities, such as a gym and recreation rooms, would help people to have a better and healthier life offshore ... Being able to sleep in comfortable accommodation would help.

and,

It's very important to have enough to do ... especially when you work there for a long time ... It's important to have good facilities for relaxation after work ... accommodation enough for two people, at most ... to have some privacy is important ... and to have non-smoking areas in accommodation rooms (Radio operator).

Although all personnel were concerned about the lack of privacy offshore, the operator personnel in the southern sector of the North Sea in the United Kingdom felt most strongly about the inadequate facilities for physical exercise and leisure, presumably because these smaller installations are less likely to have the facilities found on the larger installations elsewhere. The larger platforms tend to be equipped with exercise rooms, saunas, libraries, a cinema and/or video monitors. However, this luxury is rare on mobile drilling rigs, for example.

In the Norwegian environment, Hellesøy²¹ found that 20 to 25 per cent of workers (a sample of approximately 450 respondents) were dissatisfied with noise, heat, ventilation and humidity aspects of the environment. Noise in the sleeping quarters was unsatisfactory for nearly 30 per cent of the respondents, but cleanliness and lighting were generally regarded as satisfactory. Indeed, Hellesøy also found that dissatisfaction with the physical work environment was linked to ill-health.

The impact of noise offshore is a cause for concern, especially if the individual is denied the opportunity to recuperate during off-duty times. Some of the effects of noise can be summarized as follows:

- A narrowed focus of attention which has detrimental effects on performance of complex tasks.
- Noise that is unpredictable and uncontrollable reduces one's overall perception of control over the environment. This is often accompanied by a depressed mood and a decrease of one's motivation to initiate new response. This is described as "learned helplessness".
- Research evidence suggests that performance remains impaired after exposure to noise, which reduces one's tolerance to everyday frustrations.

²¹ Hellesøy et al., op. cit.

- Physiological arousal to noise includes increased blood pressure and other stress-related hormones (adrenalin and cortisol).
- Exposure to noise levels of 85db(a) or greater at work for three to five years is associated with an increased prevalence of a variety of specific non-auditory diseases, such as cardiovascular disorders, gastro-intestinal complaints and infectious diseases. Disease prevalence seems to be greater when the noise is unpredictable or intermittent.²²
- Exposure to noise is associated with reported fatigue, headaches, insomnia, irritability and inability to concentrate. Social behaviour is also influenced in that there is a reduction in helping behaviour, a more extreme or negative attitude to others, more open hostility and overt aggression.²³ Thus there are implications for impoverished relationships and team working in a noisy offshore environment.

Preventing the stress of the physical demands of working and living offshore

Clearly, many opportunities for the prevention of stress associated with the physical demands of working and living offshore exist at the design stage of the installation and, of course, in the provision of adequate personal protection equipment. However, if staff are included in the discussions about the arrangements for rest and recuperation offshore, if they understand the nature of stress in the environment and the adverse consequences of mismanaged stress, and if these issues are re-examined on a regular basis, the degree of personal control in the environment will be increased with a resulting improvement in psychological indicators of stress.

The practice of more open discussion and debate about the issues that directly affect the working and living arrangements for offshore personnel should also extend to include the policy related to accommodation on rigs and platforms. Arrangements need to be made which are perceived to be equitable for all offshore personnel: protect one's "personal space"; provide some element of privacy if required; enhance compatibility between people if there is a need to share accommodation; and reduce the sense of confinement and remoteness from normal life.

Thus, the living environment must provide suitable conditions in which the employee can relax and recuperate from the demands of the job, and which includes:

- the ability to get adequate sleep; that is, undisturbed sleep of a quality and quantity necessary to restore physical and mental equilibrium;
- a balanced and adequate diet;

²² B.L. Welch: "Extra-auditory health effects of industrial noise: Survey of foreign literature", in *Aerospace Medical Research Laboratory, Aerospace Medical Division, Air Force Systems Command*, June 1979.

²³ D.M. Jones: "Noise", in R. Hockey (ed.): *Stress and fatigue in human performance* (London, Wiley, 1983).

- leisure and recreational activities to take reasonable account of the varying needs for exercise, entertainment, maintenance of links with outside society (communication links, news, etc.), and the opportunity to maintain some interests and hobbies. The importance of exercise and physical fitness as a method of stress control cannot be overstated. It has a positive impact on both physical and psychological well-being and reported organizational benefits, which include reduced sickness absence and job turnover and stronger commitment to the organization.²⁴ For these reasons, the provision of exercise facilities offshore is highly recommended. The introduction of a health and fitness club would also help to create a more supportive environment and would encourage offshore personnel to use the facilities provided. Education about the links between stress and ill-health and the role of fitness and exercise in reducing the risk of cardiovascular diseases should be included in this health care programme;
- the opportunity to live in pleasant and comfortable surroundings that are conducive to rest and relaxation;
- a living environment which is perceived as comfortable, hygienic and satisfying; and
- feeling safe and secure (this is discussed further in the next section).

However, the processes of selection and recruitment also play an important part in stress prevention offshore due to an improved person-job fit. Clearly, it is preferable to avoid the problem of “square pegs in round holes” in the working and living environment.

2.2. Role stress

Within the organization, each individual has a role to fulfil and certain sources of stress exist which are role-related. Among offshore workers, role stress appears to be due to the perception of safety and insecurity offshore (sixth factor in Table 1); the unpredictable nature of the job (seventh factor in Table 1); and the physical climate and work offshore (eighth factor in Table 1).

The prevention of stress associated with these stress factors is considered next.

2.2.1. Safety and security offshore

Physical and psychological safety is a basic human need,²⁵ and having a predictable and non-threatening environment is fundamental to this. Indeed, the audit showed that the sources of stress associated with safety and insecurity offshore were perceived more acutely during winter months by personnel working offshore on the North Sea Continental Shelf.²⁶ The stressors associated with

²⁴ V.J. Sutherland and C.L. Cooper: “Exercise and stress management: Fit employees — healthy organisations”, in *International Journal of Sport Psychology*, Vol. 21, 1990, pp. 202-217.

²⁵ A.H. Maslow: *Motivation and personality* (New York, Harper, 1954).

²⁶ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

the physical climate (eighth factor in Table 1) were expressed by concerns of not knowing how safe the installation really is, having a near-miss accident, feeling unsafe in bad weather and worrying about inadequate instruction to the job. Some of these worries are about what could happen rather than the reality of the situation, and so education to establish realistic expectations is fundamental to stress prevention in this area. One experienced roughneck explained:

It was my first trip out to this particular rig ... They were tensioning the anchors ... the actual anchor winches, and that causes a big clunking noise ... It rattles the whole rig ... but it sounded different on this rig and it frightened me because I didn't know what they were doing.

The difference between a ship at sea and an offshore installation was expressed by a chef working on a semi-submersible drilling rig:

I felt safer in the Navy. [Safer] on a ship than on the rig ... We had terrible weather last Sunday ... I think we have eight anchors on these rigs, I'm not quite sure, but the way that rig moved in that weather, I admit I was frightened during the night ... It takes you a long time to get to sleep ... With a ship you can ride the waves or go into a storm and you can sleep ... it's not comfortable, but you sleep, and with no fear.

Although it is not possible to change North Sea weather, unrealistic demands made under such conditions are a "real" source of stress. On some installations, the atmosphere is more relaxed and individuals are allowed to take extra breaks when conditions are bad. But this is not always the case, as one roustabout and roughneck explained:

If you start at 12:00, you are not supposed to get a coffee break until 3:00. If the weather is bad, I think it's ridiculous ... especially on casing ... when it's snowing and raining ... The last rig I was on, the first week was OK, but the second week, I certainly did wish I'd gone home ... The guys were all scared [extremely bad weather].

and,

The only thing I complain about is the cold ... So if I get sent off because I went for a cup of tea after two hours on deck because I was cold! ... Well, we were painting in snow blizzards ... We were actually cleaning and it was blowing a gale and snowing ... you couldn't feel your fingers ... I said "You lot are nuts!", so I walked away for a cup of tea and then came back ... It's stupid, we shouldn't be doing this at this time of year ... it's summertime work.

According to Hellesøy,²⁷ a safe environment involves being able to prevent critical situations arising; recognize unsafe or dangerous situations before they develop further, and while the situation is still under control of the individual, avoid the worst consequences of an accident if a critical situation has developed; reduce the consequences of an unavoidable incident by emergency training and contingency planning.

Therefore, three components of safety-oriented behaviour are important: knowledge, behaviour (skills, routine, practice and motivation), and material and organizational support (including training and the facilities necessary to be prepared for contingencies).

²⁷ Hellesøy et al., op. cit.

As Hellesøy suggests, "for a safety measure to be effective it is essential that these components mutually support each other and whenever possible, that they should be included as 'natural' components in the production system itself".

Prevention strategies to reduce stress associated with safety and security offshore

(a) Understanding the perceptions of safety and risk and improving knowledge

Realistic and reliable knowledge is needed about the environment, the organization, the technology, the job itself, and the systems and practices. Raising awareness about activities on the rig (i.e. what is happening and why) is particularly important for the personnel who are not directly involved in the operations, for example, the catering personnel. Indeed, Hellesøy found that catering personnel felt the least safe compared to the other groups offshore (i.e. operators, drillers and flotel crews).²⁸ This group maintained a reactive, rather than a preventive, attitude towards safety, and tended to view safety and risk mainly as a matter of escape under emergency conditions.

In the British sector of the North Sea, Sutherland and Cooper²⁹ found that operator personnel reported significantly more stress associated with perception of safety and security than contractors. The problem was more acute for those working in the northern sector of the North Sea, irrespective of whether the work was on a mobile drilling rig or a fixed-production platform.

Therefore, it is necessary to understand perceptions of risk and safety offshore in order to market safety, and to design safety measures and training programmes and safety policies. Hellesøy³⁰ identified a wide range of potential sources of risk in the Norwegian offshore working environment, including evacuation facilities; escape routes; helicopter transportation; fires, explosions and blow-outs; reliability of alarm systems; safety measures and safety equipment; safety instruction and training; effects of rust and corrosion on the installation; sabotage and surveillance; the presence of oil on the platform; availability of first aid and adequacy of medical services; wind and weather conditions; and falling objects.

It is important to know how safe personnel feel about these potential sources of risk, and to ensure that they have a realistic and healthy perception of real risk in their work environment. That is, does the subjective experience of risk match the reality of the situation? A state of stress will usually exist if there is a mismatch between real and perceived expectations. Although denial is often used as a coping mechanism among people working in high-risk occupations, it is vital to ensure that this does not prevent the individual from taking part in the training and drills necessary for effective offshore working.

²⁸ *ibid.*

²⁹ Sutherland and Cooper, *Stress and accidents offshore*, *op. cit.*

³⁰ Hellesøy et al., *op. cit.*

(b) Training and rehearsal

Instead of presenting information in a standardized package, it is suggested that information programmes be tailored by finding out what employees already know and expect, what they want to know, and how the information should be presented and is best received.

The transmission of information tends to be more effective if:

- the message is presented in more than one medium, that is, using both sight and sound. This explains why a poster campaign or news bulletins have only limited impact, and the recent success attributed to interactive video as an instruction technique;
- the receivers are active rather than passive during the communication of the message. A safety meeting which requires the workforce to be actively involved in a small group, two-way discussion rather than a briefing or lecture, will have more impact;
- the message carrier should have credibility with the audience/receiver(s). Information from an untrustworthy or unbelievable source will not be accepted;
- resistance to change is reduced by permitting the audience to participate in the planning of a programme or initiative, thus they have ownership of the problem and the solution.

However, knowledge alone does not guarantee that it will be used when needed. In collaboration with the workforce, specific, observable and measurable behaviours need to be identified to enable a suitable training programme to be designed. The skills and procedures necessary to handle a critical situation should be imprinted and memorized through training and rehearsal, so that they become part of the routine which can be reproduced automatically when the individual is under stress. Realistic simulation exercises, drills and refresher training are vital for the maintenance of the skills and procedures necessary to maintain a safe environment and deal with emergencies when they occur.

In a recessionary climate, training budgets tend to be reduced and might limit access to up-date training. This will exacerbate stress levels because the workers recognize that they have not been allowed the opportunity to up-date their training, or fear that the people around them will be not trained adequately enough to deal with an emergency if it arises.

(c) Knowledge about material and organizational support

A poor understanding about the risks of fire or explosions, and a lack of confidence about evacuation facilities, may dwell on the mind of an individual, resulting in the manifestation of undesirable, obsessional or phobic behaviours which adversely affect performance, productivity and safety behaviours. This includes the knowledge that both material and organizational support are available if required. Confidence in and about the availability and effectiveness of survival suits, lifeboats, alarm devices, fire-fighting equipment and medical help are crucial to the safety and security needs of the offshore worker. Indeed, the perception that an organization is only paying lip service to safety will be a significant source of stress for the offshore worker.

Organizational commitment to safety, compliance with legal requirements and safety rules, and an on-going training programme are integral components of safety-oriented behaviour offshore because they have an effect on the attitudes and behaviour of the workforce.

2.2.2. The unpredictability of work patterns

Unpredictability of the work pattern was a significant source of stress for the contractor-status personnel offshore, particularly on the mobile drilling rigs in the southern sector of the North Sea in the United Kingdom. As one derrickman observed:

I don't feel restricted or confined if I know that I'm going offshore for 14 days, but if I'm told five [days] and then it is increased, it is harder to deal with.

Many offshore workers describe the disruption and instability caused to their home life. As one communications technician stated:

My wife is going into hospital on Wednesday ... I've just been called offshore ... going tomorrow [Tuesday], so I cannot go with her now ... These sort of things get on her nerves ... but I know that I could not settle for a 9-to-5 job ... so ...

Uncertainty is an acknowledged source of stress, and thus attempts to improve this situation should be made by the planners in order to minimize this source of pressure as much as possible.

2.3. Career development stress

Fear of job loss and threat of redundancy are common features of contemporary working life. In the offshore environment, the increasing use of a contract labour workforce, continual automation of jobs and de-manning are threats to jobs. Perceived or real pay and job status inequities, lack of job security and limited potential for future career development are sources of stress for offshore workers.³¹ In times of instability poor work conditions are tolerated, and employees endure long hours and arduous conditions, but not without personal and organizational costs.

The threat of job loss is a potent source of stress associated with several serious health problems, including ulcers, colitis, alopecia, and muscular and emotional complaints. Indirectly, fear of job loss and insecurity in times of high unemployment adversely affects both the individual and the organization. A keen, competitive job market can threaten the quality of co-worker relationships at a time when social support is of particular importance. Indeed, the stress of insecurity which can be alleviated by supportive working relationships may be broken down if the workforce perceives that competition is necessary to retain a job.

Personnel may also stay in a job that is unsuitable or disliked because no suitable alternative for change exists, resulting in costs to the organization in terms of poor productivity and performance. One study of personnel working for an offshore contractor showed that 41 per cent

³¹ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

of respondents reported the stress of feeling trapped into offshore work because no suitable onshore alternative was available.³²

In the British sector of the North Sea, Sutherland and Cooper³³ found that contractor status personnel reported significantly higher levels of stress associated with career prospects and reward than operator staff. However, both contractor and operator personnel offshore perceived these pressures.

One operator said:

Concern is expressed at present due to the continuing changeover of contract labour ... The reason for this high turnover is low rates of pay ... It brings a constant worry that we have inexperienced personnel on the platform.

And an electrician:

I now work for an oil company and find this less stressful than working as a contractor ... It is very noticeable that contractors seem to smoke a lot more than company personnel.

A contractor acknowledged the spillover effects of the inequities of pay and status:

Our relationship [contractor-operator] is deteriorating ... Our conditions are vastly inferior ... Company personnel have first priority to flights and accommodation ... This can and does create a lot of unnecessary bad feeling and contributes to a bad atmosphere.

Limited career opportunity can be demotivating and frustrating and might be negatively directed against the organization, the system of authority or against colleagues at work, and/or the family. Perceived inequity of reward or compensation can have adverse consequences for the individual and the industry. In exchange for effort, skill, tenure and education, a person expects pay, recognition and advancement.³⁴ However, perceived inequity might result in disruptive performance, poor morale, psychological distress, and lowered tolerance to other stressors. There is a tendency for personnel to resolve inequity by attempting to increase the magnitude of attained outcomes, for example, by requesting a pay raise or making demands about the environment.

The stress associated with career prospects and reward has a further dimension. There are specific problems which relate to age and which affect the older offshore worker. Personnel who have worked offshore for many years (25 years or more) may view continuing employment as "golden handcuffs". They are reluctant to relocate to a lower paid onshore job because it usually means a reduction in their standard of living. Therefore, there are self-imposed career limitations which are potential sources of stress. Employees who continue to work offshore for many years may begin to feel the strains of increasing age because they are finding it difficult to remain fit

³² Sutherland and Cooper, *Man and accidents offshore*, op. cit.

³³ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

³⁴ J.S. Adams: "Inequity in social exchange", in L. Berkowitz (ed.): *Advances in experimental social psychology: Volume 2* (New York, Academic Press, 1965).

and active in order to cope with a demanding job, the long hours of work and the anxieties of coping in an emergency situation if it should arise.

Preventing career development stress

Although it is difficult to manage this source of pressure in the workplace when it has become ingrained in the organizational climate and culture, it is possible to take certain steps to minimize the problem. These cases include providing realistic job descriptions; providing career development appraisal, including the use of self-assessment tools and psychological testing; offering individual counselling by internal staff or external services; providing retraining opportunities; providing assistance in job search (producing a CV and interviewing skills, etc.); and access to job placement services (i.e. outplacement).

Providing realistic and honest job descriptions which state, for example, that as a contractor you may be employed to work in a team opposite an operator-status employee, doing the same job, but for a lower rate of pay, is most important. If the terms and conditions are discussed openly at the time of selection and recruitment, the individual can make an informed choice and this will help in avoiding career development stress.

It is also possible to reduce the stress associated with uncertainty and ambiguities about the future and career potential through the mechanism of the appraisal interview, which is usually conducted on a one-to-one basis with an immediate boss or supervisor. However, this type of appraisal interview, which is used to discuss career opportunities and training and development needs, should be kept quite separate from any pay review discussions, because individuals are unlikely to reveal any weaknesses and training needs if they perceive that it will detrimentally affect a pending pay award.

The lack of training opportunities and the updating of training are other sources of career-related stress. In times of recession, a certain withdrawal of access to training seems to be common to both onshore and offshore industry. Unless training is fully evaluated, the true worth will not be recognized, and training departments will continue to be regarded as a “step-child” in the organization. Many of the sources of stress identified in the audit could be prevented by training that is targeted, delivered correctly by using a training needs analysis, and then assessed for effectiveness. More effective training of onshore and offshore managers would also help to alleviate some of the problems identified in the next section, the stress associated with the organizational structure and climate.

2.4. Stress from organizational structure and climate

This source of stress results from “being in the organization” and the threat to freedom, autonomy and identity that this imposes.³⁵ For the offshore worker, the stress audit revealed that the concerns were for lack of union recognition, dissatisfaction with onshore management, inadequate compassionate leave policy, the use of contract labour services, the reduction in

³⁵ C.L. Cooper, R.D. Cooper and L.H. Eaker: *Living with stress* (Harmondsworth, Penguin, 1988).

manning levels and lack of knowledge about rights. As one mechanical technician, employed by an operator declared:

Communications are not maintained by poor administration; a conflicts exists between the autocratic type and the informal management practices. As senior management work a different shift pattern the emphasis on all aspects of life and safety change from week to week ... A more formal arrangement under the umbrella of an enlightened union would, in the long run, be of benefit to all.

And a safety officer said:

Management have become completely dictatorial ... The standard answer to most questions is 'if you don't like it you can always leave' ... Due to high unemployment we know we all can be easily replaced.

It can be seen that some of these are discrete problems which require discrete solutions. Some of the concerns cannot be eliminated, and so the individual must learn to manage the stressful situation more effectively.

Preventing stress from organizational structure and climate

(a) Increase the level of participation in decision making

It is suggested that this stress of being in the organization might be caused, in part, by lack of role clarity and/or role conflict offshore. Working for more than one boss and continual changes in the work environment cause these problems, which tend to be magnified because individuals feel that they are unable to take part in the decisions that affect them on the rig or platform. Reduced manning levels and insensitive management compounds this problem. Therefore, the need for training for managers and supervisors should be examined.

Lack of participation in decision making is a primary cause of role conflict and role ambiguity, mediated by one's perceived influence over the situation and the efficacy of communication in the organization. Feeling controlled rather than in control is associated with a state of stress; individuals who feel controlled are likely to perceive their job as a strain rather than a challenge and source of motivation.

The use of small-group discussions or focus groups is recommended, to examine how sources of stress might be reduced. Meetings between offshore workers and between onshore and offshore personnel could be used to reduce or eliminate this source of stress.

Focus groups can take the form of health circles,³⁶ where employees meet to actively discuss health problems and work-related stress, in an attempt to identify workplace stress and the strategies that could be used to reduce or eliminate the stress. It is fundamental that the workers realize that they are the best people to do this task because they are directly involved. However, to be effective they may need some initial help in understanding the process of stress. Participation in health circles can have noticeable positive effects on health, and if the

³⁶ K. Kuhn: "Health circles for foremen at Volkswagen (Germany)", in ILO: *Conditions of Work Digest on Preventing stress at work*, Vol. 11, No. 2, 1992, p. 220.

recommendations put forward are implemented by the organization, they can have positive effects on production.

Health circles usually rely on some expert help. This could include the occupational health doctor or nurse or safety officer, with requests from other experts as required (for example, on a design or engineering issue). In health circles, managers and workers join forces to systematically consider work stress and health.

One of the main problems associated with an increase in worker participation in job design is the threat it poses to managers and supervisors. Foreman and shop stewards have reported that both their competencies and functions are threatened, and so the issue of increased stress among these personnel should not be overlooked when organizational changes are introduced. Indeed, many of the individuals who take part in a health circle, a working party or any small-group discussion in the workplace step outside their normal role, and may initially need help to overcome the stress associated with this situation and to function as an effective member of the group.

- (b) Appoint and train a liaison person to represent the contractor personnel on each installation

Contract workers often feel more isolated offshore and report the strains of being in an organization which is not their own. If they have a problem while offshore, it often must wait for attention until they return to base because they are unwilling to speak to the operator management. For this reason, one offshore contractor has trained a team of people in certain basic skills, including listening, negotiation, and counselling, so that they can act as a representative and liaison for any of their contract workers offshore. The operator company acknowledges this individual, and time and help are afforded to any problems raised that might render the individual ineffective because of worry about a problem while offshore.

2.5. Stress of the home/work interface

Knowledge that a spouse or partner is unhappy may effect performance and safety in a hazardous work environment.

Management often regards this issue as “none of our business”. However, this view is very short-sighted. An important part of the management process is ensuring that there is collaboration with employees in order to remove the barriers to optimal performance and productivity. Distressed employees who are anxious and depressed because of worries about home and social aspects of their lives are likely to be ineffective, potentially unsafe, and often disruptive when they are working.

Indeed, the stress audit showed that the stress associated with the home/work interface was strongly linked to anxiety levels among offshore personnel and was a more acute problem for

operator-status personnel than the contractors.³⁷ By helping the individual to resolve a home-related stress problem quickly and efficiently, the manager regains an effective worker and maximizes human resources potential. In the offshore environment, the individual can be away from home for seven, 14 or 21 days or more, with limited family contact, and so may need extra help to resolve a problem at home. If the employee quits offshore working because he or she cannot manage this source of pressure, the organization suffers the loss of investment in selection, training and experience of the employee.

Prevention of stress associated with the home/work interface

- (a) Training supervisors and managers in basic counselling skills and encouraging the employee to discuss concerns about home and family life that are causing strain and pressure

Making stress a respectable topic for discussion in the offshore environment is the first step in this process, because a climate of trust and openness is necessary for this exchange of sensitive information. A team leader, supervisor or manager will need training in counselling skills, including, for example, effective listening, using empathy and knowing when to refer a problem to expert help. Arrangements should be made for contract labour staff to have access to this service, although these personnel may resist using it if they perceive that it will jeopardize their employment opportunities offshore. Indeed, some contractor companies have already anticipated this problem and have trained their own staff to fulfil this counselling role for their own offshore personnel.

On some installations, the rig medic fulfils this role on an informal basis because he or she tends to be distanced from the other offshore personnel, and so commands the degree of respect and trust necessary for this sensitive exchange of information. Some formalized training to help these individuals cope effectively with this role would be beneficial. Having a contractor liaison on a rig, as described in the section above, would also help this group of workers, particularly in a macho culture which forbids the open discussion of personal problems because it is seen as a sign of weakness and of being unable to cope.

- (b) Developing and encouraging a more supportive climate in the offshore environment

The value of emotional support in one's social network as a protection against adverse environmental forces or negative life events are well documented. In an environment where individuals live away from home, but work in close proximity with many others for an extended period of time without respite, the perceived availability of social support is most important. Very little difference in the perceived levels of social support was observed among the contractor and operator personnel in the British North Sea, but the lack of social support from one's boss and colleagues was associated with job dissatisfaction and poor mental health.³⁸ Hellesey recorded

³⁷ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

³⁸ *ibid.*

similar observations among personnel working in the Norwegian offshore environment.³⁹ Indeed, links between accident involvement, lack of social support and the perception of stress offshore was also observed in the British sector of the North Sea.⁴⁰

It is common for offshore workers to state that they do not discuss problems at home with anyone on the rig because confidence is not respected. Thus, they talk about the isolation of "being lonely in the company of other people". Hellesøy⁴¹ noted that the greatest positive influence on mental problems was when immediate supervisors or nurses are willing to listen when a person wants to discuss personal problems; the respondent can count on help from co-workers or nurses if things become difficult at the workplace; the respondent can talk to his or her immediate superiors about personal problems.

A more supportive climate could be developed and improved in the following ways:

- *Emphasize the importance of supportive relationships/networks offshore during the selection process in order to promote the desired climate and culture.* The culture of an organization affects the quality of working relationships, and so this supportive image needs to be encouraged, reinforced and acknowledged as a criteria for selection into offshore working. Since social support from the boss seems to be the most significant source of support, affecting both job satisfaction and health, it is necessary that managers and supervisors are selected who understand this need and reflect it in their style of supervision.
- *Developing structures to provide support.* These include counselling services (rig medics and nurses to receive training in counselling skills), social networks (both work and socially oriented), and self-help groups (such as the health circles already described).

On drilling rigs and production platforms on the British Continental Shelf, it was noted that job satisfaction levels and mental health decreased as the installation size increased (measured as number of quarters available).⁴² This highlights the need to create smaller sub-units of personnel on these installations in order to facilitate a more supportive environment. The development of co-worker networks is likely to be more difficult for the highly mobile contact labour workforce, but it is important that this group is not excluded.

Support networks need not be restricted to the offshore environment. For example, the Offshore Women's Link Support (OWLS) states that it is always there to listen, share anxieties, understand each other's fears, and provide support and friendship to all people who have someone working offshore. OWLS was formed by a group of wives in Falkirk, Scotland, following the

³⁹ Hellesøy et al., op. cit.

⁴⁰ Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

⁴¹ Hellesøy et al., op. cit.

⁴² Sutherland and Cooper, *Stress and accidents offshore*, op. cit.

Chinook disaster in 1986. They offer a 24-hour telephone service and during a major crisis, OWLS go into the operator's or contractor's office to provide assistance. The hope is that the offshore worker will have less worry when he or she goes to work, because OWLS is there to support the spouse or partner left behind to cope.

The OWLS concept needs to be developed to include offshore workers, with access to a service while they are onshore as well as offshore. Many companies have begun to offer a formal service in the form of an employee assistance programme (EAP) to their staff. This provides access to a confidential, independent counselling facility. Employees can make contact with a counsellor and discuss work or social problems without any report being sent back to the company. (EAPs are discussed further in Section 3 under individual strategies for stress control.) Although the use of EAPs is spreading, there is still some resistance to the use of counselling services.

- *Raising the levels of awareness about the importance of social support between work and home life.* It is important that the offshore employee and the spouse/partner understands the value and the consequences of lack of support. For example, as one chemist-operator said:

Recovering from a rota of night shift I find most distressing. It takes me a long time to get my system back to days. This stress manifests itself in my being extremely irritable, particularly to my family. Although I know that I'm difficult, I find it hard to be rational. Fortunately my family is very understanding.

(c) Improving opportunities for communication between work and home

The ability to contact home and hold a private telephone conversation is important because the lack of privacy is a commonly reported problem offshore. Ship-to-shore radio links and poor telephone facilities are not conducive to sustaining a satisfactory relationship with one's partner while working away from home. For some people, knowing that this facility is available is as important as actually using it.

- *Creating opportunities for families to visit the drilling rig or production platform.* This helps to overcome the problems related to the lack of understanding about the life and work offshore. Many offshore personnel feel that the burden of offshore working is increased because their families never see their place of work, and so are not able to understand the problems, reactions and moods experienced. One roustabout-contractor said:

I have actually taken my son to Peterhead to show him a rig. I would like to take my wife out and put her in boots and overalls and say, 'right, you work with this casing and see if you can do the job for 12 hours a day ... for 14 days without a break'.

Visits to rigs, video presentations or educational literature would help to improve awareness about life offshore. It is suggested that these should also be distributed to schools in the communities where the children of offshore personnel are educated. This would help the child to understand more about the working life of the absent parent, and the other children would learn something about the industry and the reason why their friends' fathers are away from home for a long periods of time.

- (d) Providing more uninterrupted time for participation in family and local community life

This means not calling the employee back to the installation before the official leave period is complete. This is a particular problem for contract labour staff, who tend to feel that they cannot refuse if they are asked to go back offshore when they have only just returned from a tour of duty. It is also necessary to conduct some research on the optimal tour rotation. Much is known about the problems of day and night shiftworking and performance, productivity and safety, but the optimum for the number of working days offshore and leave days onshore is poorly understood. Patterns vary considerably, but currently the British North Sea Continental Shelf operators are moving towards a 14 days on-21 days off regime, but very little is known about the physical, psychological or social effects of this way of working. As one maintenance electrician observed:

I don't think being in [onshore] for two weeks is compensation ... It probably makes it a lot harder; you come from an environment where you are on your own for two weeks ... you haven't got anybody [the family] ... then you have them around you all of the time ... which is too much ... It just doesn't work

3. Individual strategies for stress control

Although a growing body of evidence supports the view that organizational-level stress control stress and prevention interventions are more effective than individual-level coping strategies because they have a more lasting effect,⁴³ it is clear from the previous discussion that the prevention of all sources of negative stress in the offshore environment is simply not possible. By making changes in the organization, some stress can be prevented and the effects of other stressors can be minimized. But, in some instances (for example, the need to travel offshore by helicopter) changes cannot be made.

Indeed, the reality of offshore working suggests that risk and dangers are inherent in the job because of the nature of hydrocarbons and the locations in which they are found. For these reasons, it is suggested that the effects of exposure to stress could be minimized by the use of techniques aimed at enhancing the capacity of coping with stress at the level of the individual.

It is now common for many organizations to help individuals to either minimize the effects of exposure to stress, or to learn techniques to cope more effectively with stress.⁴⁴ These may be classified under two separate headings, known as "person-based interventions" and "communication pattern interventions".⁴⁵

⁴³ D.C. Ganster, M.R. Fusilier and B.T. Mayes: "Role of social support in the experience of stress at work", in *Journal of Applied Psychology*, Vol. 71, No. 1, 1986, pp. 102-110.

⁴⁴ Cooper et al., op. cit.; V.J. Sutherland and C.L. Cooper: *Understanding stress: A psychological perspective for health professionals* (London, Chapman & Hall, 1990).

⁴⁵ R. Karasek: "Stress prevention through work reorganization: A summary of 19 international case studies", in ILO, *Conditions of Work Digest*, op. cit., p. 23.

3.1. Person-based interventions

These stress management techniques include counselling, relaxation techniques and cognitive reappraisal.

3.1.1. Counselling

Sometimes referred to as employee assistance programmes, these interventions typically provide help to the individual in dealing with a particular personal or work-related problem, and attempt to increase the employee's capacity to withstand the perceived stressor.⁴⁶ However, there are still some reservations about in-house counselling services which need to be addressed, including the issue of confidentiality, location and access to the service (i.e. on a referral or purely voluntary basis). The biggest fear seems to be associated with the use of a counselling service (i.e. being seen as a non-coper) and the impact that this might have on one's subsequent career progression in the company. Nevertheless, there are some benefits of in-house versus external specialist stress counselling services; they are able to identify structures, policies and practices in the organization which might be changed to prevent stress, rather than limiting actions to the more restrictive, reactive and curative techniques of stress management. The trend towards in-house counselling or EAP services is on the increase,⁴⁷ and benefits exist for the individual and the organization.

These include improved psychological health, (less anxiety and depression); improved self esteem; tendency to engage in more adaptive stress coping behaviours, such as yoga, exercise, and deep breathing, rather than the maladaptive behaviours noted prior to counselling, for example, consumption of coffee, alcohol, tobacco and food bingeing; and decrease in absences due to sickness.

3.1.2. Relaxation techniques

The purpose of relaxation training is to reduce the individual's arousal level when exposed to a source of stress, and bring about a calmer state of affairs from both physiological and psychological perspectives.

The psychological benefits of relaxation include a sense of personal control and mastery; a reduction in felt tension and anxiety; and an enhanced feeling of well-being. The physiological benefits of relaxation include a decrease in blood pressure; slower respiration and heart rate; reduced muscle tension; less stomach acid; lower cholesterol in the blood; and alpha and theta brain waves to enhance creative/cognitive processes.

⁴⁶ C.L. Cooper, T. Allison, P. Reynolds and G. Sadri: "An individual-based counselling approach for combating stress in British Post Office employees", in ILO, *Conditions of Work Digest*, op. cit., p. 246.

⁴⁷ L.R. Murphy: "Workplace interventions for stress reduction and prevention", in C.L. Cooper and R. Payne (eds.): *Causes, coping and consequences of stress at work* (New York, John Wiley, 1988).

By learning and using controlled breathing techniques and relaxation, the individual can reduce tension at will and develop the ability to adapt to stressful situations at work or home.

Greco⁴⁸ states that controlled breathing helps the individual to confront sources of stress while maintaining self control, by decreasing the emotional impact of a stressor. The method acts at the mechanical, chemical and nervous levels. It helps the muscles to relax, which results in an immediate reduction of stress and of emotional and mental tension, whereas relaxation allows the individual to discharge emotional tension that has built up in the body. This technique helps one to recover quickly from accumulated psychological and physical fatigue. In time, the individual develops a capacity not only to cope with, but also to resist, stress.

Experience suggests that these techniques are easily learned and have a positive psychological and physical effect on the body when practised regularly. One oil company in the United Kingdom has produced a "health passport", which includes basic health information (weight, nutrition, caffeine, alcohol, smoking, exercise, blood pressure, etc.), in addition to the coverage of stress, relaxation techniques and breathing exercises (with the aid of relaxation cassette tape). This type of self-help information can provide a useful start for individuals wishing to embark on a stress management regime.

Relaxation techniques can vary greatly and include meditation; the progressive, deep muscle techniques; or a brief period of mental and physical relaxation while sitting comfortably in a chair at work or at home.⁴⁹ A wide variety of audio tapes are available to help this process, but these need to be chosen with care, because a voice or music that is irritating is not likely to be an aid to relaxation!

One useful routine requires the individual to tense and relax groups of muscles in turn in a set order. That is, to tense muscles for ten seconds, and then relax each group of muscles for two minutes, using the following order:

- (1) clench fists and then relax
- (2) bend arms to flex the biceps and then straighten; straighten arms tightly to flex triceps and then relax
- (3) shrug shoulders up towards the ears and then drop then to relax
- (4) press head back to tense the neck muscles and relax
- (5) purse lips and relax; press tongue against back of teeth and relax; clench teeth to tense the jaw and relax
- (6) squeeze eyes tightly shut, frown and then relax
- (7) breath in deeply and hold to tense the chest; exhale deeply and relax
- (8) tense stomach muscles as if preparing them for a blow and relax
- (9) clench buttocks together tightly and relax
- (10) keeping legs straight, point the toes downwards and then relax

⁴⁸ N. Greco: "Individual-based training to reduce stress in managers and employees at a Canadian ministry", in ILO, *Conditions of Work Digest*, op. cit., p. 262.

⁴⁹ Cooper et al., *Living with stress*, op. cit.

It is possible to purchase a variety of instruments which allows the individual to monitor the physiological reactions of the body to stress. This means it is possible to monitor the state of relaxation. For example, something known as a “stress dot” (commercially manufactured), which can be applied to a fleshy part of the hand between the base of the forefinger and thumb, responds to body temperature. When a person is stressed or tense, the blood supply is diverted to prepare the body for a fight-or-flight response.⁵⁰ As the person relaxes, the blood supply will flow nearer to the skin surface for cooling purposes and the dot will change colour to indicate this. Therefore, this acts as a visual aid in the stress response. This is known as biofeedback. Other gadgets are available, including watches that monitor pulse or heart rate. It is recommended that this equipment be supplied and supervised by occupational health staff. It should be recognized that the level of sophistication, reliability and cost varies greatly, but these aids can assist in the process of understanding the physiological nature of stress.

3.1.3. Cognitive reappraisal

This involves thinking about stressful events to make them seem less threatening, and the challenging of irrational thoughts (faulty thinking) that the individual holds. Therefore, reactions to a situation are changed by the way in which the circumstances are perceived. A variety of techniques are available to help in the cognitive reappraisal of stressful situations. Individuals are encouraged to examine their beliefs, thoughts, feelings, actions and the consequences of these in order to identify rational versus irrational beliefs. A rational belief is one which sits comfortably with you and your outlook on life. An irrational belief is one which causes discomfort or distress.

We tend to hold distorted or irrational beliefs when we:

- *Jump to conclusions* — that is, when there is no appropriate evidence or fact to justify a conclusion. For example, concluding that someone dislikes you because they fail to turn up for a meeting or an appointment, when in reality it could have been caused by a number of reasons that had nothing to do with you.
- *Ignore important details* — this is minimization and involves focusing on one detail taken out of its context and ignoring the more important aspects of a situation. For example, feeling hopeless and a failure because you did not get a promotion, but ignoring the fact that ten other people on the promotion board were turned down also. In fact, only one person in 12 could have been promoted, and many others did not even reach the short list for consideration for promotion.
- *Overgeneralize* — this means drawing conclusions from one or two isolated events and assuming that it can be applied to all situations. For example, assuming that you are hopeless at everything you do because you found one mistake on a 50-page report to your boss.

⁵⁰ *ibid.*

- *Exaggerate the importance of things* — this is known as magnification when we think that a situation is vital or very significant when in fact it is trivial. For example, imagining that something awful is about to happen because your boss has asked you in for a chat.
- *Take things personally* — this personalisation is the tendency to believe that things happening around us are somehow related to us in an important way, even when there is no evidence for this. For example, the boss asks everyone to take extra care in getting ready for a visit from an important customer, and you assume that the boss is criticizing you alone because your office is untidy, even though the request was presented to everyone at the morning staff meeting.
- *Black and white thinking* — often we may see things only in terms of two extreme ways, with no room for anything in between.

To avoid falling into these traps, it is necessary to examine our thoughts and feelings in order to detect and define the irrationalities. A five-step approach is recommended for refuting irrational ideas:

1. Write down the facts.
2. Write down your thoughts and feelings.
3. Focus on your emotional response.
4. Dispute and change the irrational thought/idea.
 - Is there any support for the idea?
 - What is the evidence for the falseness of the idea?
 - Does any evidence exist for the truth of the idea?
 - What is the worst thing that could happen?
 - What good things might occur if ...?
5. Substitute alternate patterns of thought.

It is also suggested that we engage in a mental monologue and convert our destructive self-talk into constructive self-talk. Flexibility in thinking about situations is necessary to manage stress effectively. By taking a problem-solving approach and reappraising the situation in a rational way, we avoid stress inducing situations.

3.2. Communication pattern interventions

Communication pattern interventions span boundaries and focus on changing the interactions individuals have with their social environment. This includes stress education programmes, the elimination of conflict-inducing communication and building interpersonal trust. These last two have already been discussed, but in the final part of this section, the use of stress education programmes are considered.

3.2.1. Stress education programmes

Typically, these are designed to increase knowledge about psycho-social stress factors and to explain the physiological origins of stress. A combination of brief lectures, video, group discussions and role-play exercises might be used to raise the levels of awareness about stress.

- What do we mean by stress? What is it?
- How does stress affect people (i.e. the physiological nature of stress and how it affects us physically, emotionally and behaviourally)?
- How to identify stress and recognise it in other people:
 - keeping a stress log or diary;
 - group discussion/brainstorm techniques;
 - completing standardised questionnaires.
- How to manage stress using adaptive versus maladaptive coping techniques (that is, understanding the deleterious effects of alcohol, tobacco, drugs, etc.).
- Building a personal stress management action plan.

Thus, this approach is based on awareness, analysis and action. Individuals receive information about the stress process and take part in some analysis (which might be both psychological and physical health screening). On the basis of these results, a personal plan of action is written.

An action plan must always be written and which identifies the individual's objective and/or goal; identifies how he or she intends to realize the set goal, that is, the method to be used; and provides a time-frame for the proposed activity, that is, when the plan will start and finish.

It is also more effective if a "buddy system" is set up so that people share their goals with another person; together they help to monitor and encourage each other. Commitment to a goal tends to be stronger if another person is aware of the intentions.

Organizations which offer this form of awareness-raising, assessment-focused approach to stress management usually offer various action initiatives, such as interpersonal skills building, relaxation training, assertiveness training, keep fit and exercise programmes, and healthy lifestyle management assistance (reducing drinking, smoking and obesity). Eriksson has also noted certain physiological changes which are implicated in the risk for cardiovascular disease, including an increase in the "good" cholesterol HDL (high-density lipoprotein) and a decrease in the "bad" cholesterol LDL (low-density lipoprotein); and a sharp decrease in triglyceride levels not due to changes in dietary, exercise or smoking habits.⁵¹

Workplace stress management programmes are becoming increasingly popular as a means of protecting employees from the deleterious effects of unavoidable worksite stressors. It is clear that there is a role for stress management interventions which are aimed at helping the individual to cope with stress. However, reliance on this reactive approach to stress control will only have limited success and it must be acknowledged that prevention is better than cure.

⁵¹ I. Eriksson, V. Moser, A.L. Undén and K. Orth-Gomér: "Using knowledge and discussion to decrease stress in Swedish public administration officials", in ILO, *Conditions of Work Digest*, op. cit., p. 214.

4. Conclusion

The benefits of conducting a stress audit improves our understanding about individual vulnerability or risk, so that effective manpower development programmes can be implemented. We need to understand the nature of stress at work before we can eliminate or moderate it. Certain stressors would respond to change at the macro level of an organization (e.g. a change in culture), whereas others might relate to the micro environment by dealing with issues of workload and shift patterns.

Indeed, in the offshore oil and gas exploration and production environment, the results of the stress audit show that sources of stress are specific to certain groups of personnel. This means that a stress control programme would be more effective if resources were targeted to specific problems and were aimed at the elimination of the source of stress. Those organizations which recognize the high costs of mismanaged stress in the workplace and seek to achieve enhanced levels of effectiveness and the well-being of their workforce need to adopt an integrated approach to stress management. A stress audit guides this process, which ultimately embraces both individual coping and organizational change to combat the problems associated with stress at work.

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