

Offshore working time in relation to performance, health and safety

A review of current practice and evidence

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This report details the offshore working time arrangements in operation in the UK North Sea sector, and reviews evidence of their effects on the performance, health and safety of offshore personnel. The report also includes information obtained in interviews with occupational health and safety specialists in the oil/gas industry.

- 1 The initial chapters outline the work patterns currently in use on North Sea installations, the legal framework of the working time regulations as applied offshore, and the physical and psychosocial demands inherent in offshore work.
- 2 A review of the effects of long work hours and shift work on health and safety outcomes in onshore settings is followed by a detailed presentation of findings from offshore research into work/leave schedules, day/night shift rotation, overtime hours, and their effects on performance, fatigue, alertness, sleep, and health.
- 3 The views expressed by health and safety specialists when asked about offshore work/leave schedules, shift rotation, issues of cumulative fatigue and rest offshore, and other aspects of working time arrangements, are reported.
- 4 The final chapter presents an overview and conclusions; it identifies optimum work patterns where possible; it notes the gaps that exist in the research literature; and it makes some general recommendations.

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EXECUTIVE SUMMARY

This report documents the working time patterns currently in operation on North Sea oil/gas installations, outlines the legal judgments that have sought to clarify the application of the EU Working Time Regulations (WTR) offshore, and reviews research findings and other evidence of the effects of working time patterns on the performance, health and safety of offshore personnel. In addition, drawing on interview material, the report outlines the views and attitudes expressed by senior oil industry personnel with direct experience of offshore working time issues. The report thus brings together a wide range of current information, intended as a guide for the industry and regulatory authorities.

Chapter 1 outlines the work/leave schedules currently in use on UK North Sea installations, noting recent moves towards longer shore breaks, specifically 2-3 schedules (i.e. 2 weeks offshore alternating with 3 weeks shore break). However, many offshore personnel, particularly those on drilling rigs, continue to work regular equal-time patterns (i.e. offshore weeks and shore breaks of the same duration). This chapter also sets out the shift duration and day/night shift rotation patterns currently worked offshore, and the incidence of overtime hours. The regulation of offshore working time is described, including the EU Working Time Regulations (which provide the legal framework governing offshore working hours and schedules), the role of guidance notes prepared by the UK Health and Safety Executive, and the Vantage system for monitoring offshore working hours and personnel competencies.

Chapter 2 describes the more general context of North Sea work, particularly the physical and psychosocial stressors to which offshore workers are exposed (e.g. noise, vibration, cramped workspace, steep stairways, and heavy work tasks). These conditions may act to accentuate fatigue associated with long work hours. Offshore accommodation standards, and issues relating to travel to and from the installation, are also noted. In addition, this chapter includes demographic information about the North Sea workforce, comparing the UK and Norwegian sectors in terms of gender and age distributions, and notes the medical requirements for offshore work.

Chapter 3 draws on published studies of long work hours to review findings that, although obtained in onshore work settings, nonetheless provide information relevant to offshore working time arrangements. The balance of evidence suggests that extending the normal onshore shift duration from 8 hrs to 12 hrs (as routinely worked offshore) does not significantly impair performance or health. Systematic studies of personnel working 12 hr shifts over 1-2 weeks in onshore settings also indicate that day-to-day recovery from fatigue occurs, although some survey research suggests that performance, sleep quality and health may be impaired among workers exposed to long work hours for extended periods. However, in these studies, the long work hours were not offset by extended breaks as applies offshore. Finally, this chapter considers factors affecting rest and recovery from fatigue.

Chapter 4 reviews the limited available evidence relating to the effects of offshore work/leave patterns on health and safety outcomes. Although a small-scale study of UK personnel showed no clear evidence of adverse effects of a third week offshore on alertness, mood or sleep, survey data demonstrated markedly low satisfaction ratings for 3-3 schedules relative to 2-2 schedules (particularly for personnel working on production platforms). On Norwegian installations, 2-4 work/leave schedules are now operated, instead of the previous 2-3 pattern; no differences in injury incidents on return to the installation were found between the two shore break durations. However, some concern was expressed that the longer break might make readjusting to normal work routines more difficult. As compared with the work/leave schedules used in the North Sea, in more remote oil-producing areas worldwide, offshore tours tend to be longer (typically, 4 weeks or more) but there appears to be no research into the health and safety implications of these extended tours.

Chapter 5 examines findings from research into the shift patterns used on offshore installations, with particular reference to day/night shift rotation. Consistent with onshore research, over a two-week offshore tour, alertness, cognitive performance and sleep are generally found to be relatively stable with little change from the first to the second week. However, night shifts pose the additional problem of circadian disruption; adapting to night work typically takes 5-6 days. Personnel working ‘fixed shift’ rotations (alternating tours of 14 day shifts and 14 night shifts) are fully adapted to night work by the second week offshore. However, many installations operate ‘rollover’ rotation systems with a mid-tour shift change, usually from nights to days. Although preferred by many offshore personnel, this pattern is the least favorable in terms of sleep, performance and alertness, as night-shift adaptation during the first week is reversed during the second week. Thus, optimum performance and alertness is attained for only a few days during the tour. This chapter also reviews studies of interventions designed to facilitate the circadian adjustment of night workers offshore.

Chapter 6 brings together findings from research into accident and illness risks in relation to offshore work patterns. Evidence suggests that the circadian disruption associated with offshore night work, and ‘rollover’ shift patterns in particular, leads to increased injury rates relative to offshore day work. However, there are marked differences between occupational groups in the extent to which night work acts as a risk factor for accidents, maintenance and construction workers being particularly at risk during night work. Sleep problems and gastric problems are also strongly associated with night work but musculo-skeletal disorders, headaches and psychological distress appear to be linked to job demands rather than offshore working time patterns.

Chapter 7 summarizes the views about working time arrangements expressed by key oil/gas industry personnel (health and safety specialists, human resources managers, and occupational physicians) who participated in the present study. The main topics covered in

the interviews included work/leave schedules; long work hours, cumulative fatigue, rest and recovery; shift rotation; medical aspects of offshore work schedules; the Vantage system for tracking personnel movements and competencies. Some concern was expressed about fatigue (especially in relation to three-week tours), about shift rotation issues, and about the work patterns of *ad hoc* personnel who do not have regular schedules. Moves towards the use of 2-3 work/leave schedules were broadly welcomed (especially in relation to the recruitment and retention of skilled personnel), and the Vantage system was seen as a valuable resource (although perhaps not always used to full advantage). In general, offshore working time arrangements did not appear to be a primary source of concern to the industry at present; other health and safety matters (asset integrity, in particular) were seen as more important.

Chapter 8 considers current information about offshore working time arrangements in the light of the constraints and demands that the limit options for work scheduling on North Sea installations; optimum work patterns are identified where possible, and attention is drawn to gaps in the existing literature. In particular, the potential risks associated with tours involving three consecutive weeks offshore (or more in some parts of the world), the long hours worked by offshore installation managers and supervisors, and the irregular work patterns of some service personnel, are identified as gaps in the research literature. Finally, two general suggestions are made, that brief surveys are used regularly to monitor the well-being and work conditions of offshore personnel, and that the Vantage database is analyzed and the findings published to provide information about offshore work patterns and to track changes from year to year.

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