
The Janus face of the 'New Ways of Work'

Rise, risks and regulation of nomadic work

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Working Paper 2013.07

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european trade union institute

Jan Popma is a senior researcher at the Hugo Sinzheimer Institute (University of Amsterdam). Contact: J.R.Popma@uva.nl

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Introduction

A spectre is haunting Europe —the 'Gestalt' of the virtual, invisible worker working digitally anywhere and everywhere.¹ And ever more companies of 21st century Europe have entered into a holy alliance to promote this spectre of time- and place-independent working, or 'New Ways of Work' (NewWoW).²

One of the main forces driving the rise of NewWoW has been the revolutionary increase in all kinds of mobile technologies and communication media, particularly smartphones and tablets. It is estimated that more than a billion smartphones and tablets will be sold worldwide in 2013,³ while the number of smartphone users is expected to double by 2015.⁴ Almost half of all Europeans have the world at their fingertips more or less wherever and whenever they want. Europe's workers too are making extensive use of the possibilities offered by mobile technologies,⁵ enabling them to keep in contact round-the-clock, or to obtain information from the internet or company networks. There are many tasks that no longer require a specific workstation: technological developments are making it possible to work place-independently, and often time-independently too. Mobile ICTs are the platform on which 'NewWoW', or 'place- and time-independent working', is based, and as a result NewWoW has expanded enormously in recent years. In 2005 7% of all EU workers spent at least a quarter of their time working in a different location from their regular office (or other permanent workstation), known as 'teleworking with a PC' (Welz and Wolf 2010). Five years later, the number of 'e-nomads'⁶ had risen to 25% (Parent-Thirion 2012).

There is a good reason for this increase. The benefits are obvious, and the advocates of NewWoW are quick to highlight them. Modern ICTs offer better and quicker access to information for work. The fact that information is accessible *any time and anywhere* also enables a more rapid response to

1. For a typology of the worker as a 'Gestalt' see Jünger 1932. Also Popma 1991.
2. Microsoft is a good example here, <http://www.microsoft.com/presspass/emea/presscentre/pressreleases/NWOW.msp> and <http://nwow.getronics.be/>.
3. <http://techcrunch.com/2012/11/06/gartner-1-2-billion-smartphones-tablets-to-be-bought-worldwide-in-2013-821-million-this-year-70-of-total-device-sales/>.
4. <http://finance.yahoo.com/news/number-smartphones-around-world-top-122000896.html>.
5. In the five biggest EU countries alone smartphones number over 130 million. http://www.comscore.com/Insights/Press_Releases/2012/12/EU5_Smartphone_Penetration_Reaches_55_Percent_in_October_2012.
6. The term 'e-nomads' was coined in the 5th European Working Conditions Survey, defined as follows: "E-nomads are people who do not work all the time at their employers' or their own business premises and habitually use computers, the internet or email for professional purposes." Eurofound 2012, p. 95.

questions from clients, colleagues and managers. Being able to work from home also helps to reduce travel time/traffic/CO₂ emissions⁷ and to promote a better work-life balance.

However, the drawbacks of this trend are also clear. Homeworking can blur the division between work and private life, at the cost of private time. And although the 'wireless' worker has the world at his fingertips, it also becomes increasingly difficult to keep that world at arm's length. Some mobile workers seem to find the constant lure of the digital world hard to resist. Smartphones may enable workers to contact anyone they want, but this can then lead to the idea that every worker has to be directly contactable round-the-clock, or at the very least as quickly as possible, wherever they are. Thus an excellent innovation becomes a serious source of psychosocial occupational stress, often described as 'high-tech anxiety' (McFedries 2003) or 'techno-stress'.

The phenomenon of techno-stress is not completely novel, to be sure – the term was first introduced in the mid-'80s (Brod 1984). But the increasing technological possibilities have probably only added to the problem. In any event the forecast trends have given the European trade unions cause for concern about the impact of the digital revolution on Europe's workers, and particularly their health and well-being. The concern here is not just about techno-stress, but also about the possible effects of radiation from mobile phones and poor ergonomic conditions at many 'atypical' workstations (at home, for example).

This report has been written at the request of the European Trade Union Institute, which feels that it is important for Europe's workers to be alerted to the drawbacks of NewWoW. It updates and adds to previous studies commissioned by and conducted in cooperation with the FNV union in the Netherlands. The nucleus of the report is based on a study of the risk of 'techno-stress' which appeared in December 2012 (Popma 2012). It also contains information from an earlier FNV study (Popma 2009) on the first signs of possible harm to workers' health as a result of radiation from mobile phones. A third source of information was a study of the labour legislation governing 'NewWoW' in the Netherlands, commissioned by the Dutch Ministry of Social Affairs and Employment (Knegt *et al.* 2011). The earlier studies have been partly updated and partly also scaled up to a European level (particularly as regards the relevant provisions of legislation on working conditions).

Chapter 1 gives a rather more detailed picture of the main developments in the ICT field, and the benefits that new technologies can bring for businesses and workers. Chapter 2, the key section of the study, contains an overview of the possible negative (health) effects of these developments. Chapter 3 looks at the most relevant legislation, while chapter 4 sets out a number of recommendations.

7. The Dutch consultancy Ecofys estimates that New Work reduces CO₂ emissions by ± 2%. Hoen and Meindertsma 2012.

1. The rise of 'New Ways of Work'

'New Ways of Work' (NewWoW) may be defined as place- and time-independent working, with place-independence perhaps the most striking aspect. That independence, advocates of NewWoW claim, also means that workers have greater control over the work they do and how they divide their time.⁸ The commonest forms of "agile working" are working from home, in shared occupancy buildings or in flexi-offices⁹.

Contrary to what its name suggests, NewWoW isn't actually entirely new. In the 19th century and earlier most workers also regularly worked at home, even if they were employed by a large undertaking. In the textile industry in particular work was done according to a decentralised production system known as the *Verlagssystem* or *putting-out system* (Berg 2002; Braudel 1995). This was used by centrally run companies making large-scale use of decentralised (home)workers. The 'manufacturer' supplied the raw materials and sometimes also the machinery, and instructed the workers about the requirements that, say, the material to be woven had to meet. Viewed in this light, working in centralised offices and factories is a relatively recent development.

However, 'NewWoW' is also not really new in the light of the more recent past: the phenomenon of 'teleworking' has existed since the 1980s, and has been on the European Commission's agenda since the mid-'90s (European Commission 1998). The European Framework Agreement on Telework (2002) defines telework as "a form of organising and/or performing work, using information technology, in the context of an employment contract/relationship, where work, which could also be performed at the employer's premises, is carried out away from those premises on a regular basis."¹⁰ This definition more or less sums up what is nowadays acclaimed as 'New Work'. So as we have said, NewWoW isn't so new after all.

8. In addition, the advocates of NewWoW consider that the concept also, and perhaps primarily, refers to new forms of collective work. This is an aspect which we do not go into here.

9. A shared occupancy building is a (large) office building in which several enterprises have rented working spaces for their respective employees, while sharing various facilities such as printing facilities, catering facilities and toilet areas. "Flexi-offices" are office buildings in which individual workers or their employers can rent a desk or work station (mostly consisting of a desktop computer with internet connection/Wifi) for a (very) short period of time.

10. Framework Agreement on Telework, July 16 2002, EU agreement between ETUC, UNICE/UEAPME and CEEP.

This does not alter the fact that the number of employers making extensive use of NewWoW has increased considerably in recent years and this rise is set to carry on doing so in future. As we said earlier, in 2010 around 25% of workers could be described as ‘e-nomads’, or at least as having the possibility of mobile working. In late 2012 the IT market research bureau Gartner predicted that by 2016 mobile working would be an option for some 40% of workers.¹¹

This trend has been largely caused by the widespread availability of internet access (even for ‘ordinary’ laptops), but in recent years has also been caused by the explosive growth in the number of mobile phones¹² and tablets with applications allowing people to work anywhere. Estimates are going up in leaps and bounds: in 2012 the number of smartphones worldwide topped a billion¹³ and is set to double by 2015.¹⁴ ‘Market penetration’ in a number of European countries is around 50%, which means that half of all adults living in those countries have a smartphone.¹⁵ This also illustrates a shift from computers to smartphones as the main medium for processing information. Around 45% of internet users in the Netherlands access it via a smartphone – twice as many as a year earlier (Cbs 2011b). 94% of mobile workers have a smartphone or tablet (iPass 2011).¹⁶ The figures are probably not much smaller for workers in other European countries, and where they are those will soon catch up. Some publications are already talking about a post-PC era (Bloem 2012).

Alongside this ‘technology push’, and as a result of it, there is also a ‘demand pull’, from both employers and workers. Employers can cut costs substantially: by letting their workers work from home one or more days, for instance, they can reduce the amount of office space they need considerably. In addition, if workers need to commute less, their travel costs fall. Workers too, however, have every reason to want to work from home occasionally: home working saves a lot of travel time. Roughly one in five of Europe’s workers complains of finding it difficult to balance work and private life (Parent-Thirion 2012). The Dutch report “Tem de Tijd” [Taming Time] acclaims ‘NewWoW’ as the answer to this time pressure: a quarter of all workers affected themselves see ‘working from home from time to time’ as the solution (Van der Lelij and Ruysenaars 2012). In situations where workers have the dual burden of work and care responsibilities, working from home or reduced travel time can certainly be a

11. <http://www.gartner.com/it/page.jsp?id=2227215>.

12. Worldwide growth in the number of smartphones in 2010 to 72%, <http://www.gartner.com/it/page.jsp?id=1543014>.

13. <http://blogs.strategyanalytics.com/WDS/post/2012/10/17/Worldwide-Smartphone-Population-Tops-1-Billion-in-Q3-2012.aspx>; <http://www.gartner.com/it/page.jsp?id=2227215>.

14. <http://blogs.strategyanalytics.com/WDS/post/2012/10/17/Worldwide-Smartphone-Population-Tops-1-Billion-in-Q3-2012.aspx>.

15. http://www.comscore.com/Insights/Press_Releases/2012/12/EU5_Smartphone_Penetration_Reaches_55_Percent_in_October_2012. For the Netherlands, see <http://www.telecompaper.com/research/dutch-smartphone-user-q4-2011>.

16. iPass (2011), The iPass Global Mobile Workforce Report. The iPass report is a survey of 3 700 ‘mobile workers’, i.e. “Any worker using any mobile device (including laptop, netbook, smartphone, cellphone, or tablet) who accesses networks (other than the corporate LAN or WLAN) for work purposes.”

solution. Collecting the children from school at lunchtime and working in the evening is one form of self-management of working time and workload.

All in all it is clear that new technologies, and particularly the rise of smartphones and tablets, offer greater scope for finding flexible answers to a number of things that businesses and workers want and are concerned about. This scope is set to increase further in the next few years. On the other hand NewWoW also has a number of drawbacks, which have become increasingly obvious in recent years. For instance, there has been an increase in psychosocial work stress, partly as a result of the blurring of the division between work and leisure time. There are also indications that more than occasional use of smartphones or tablets as data processing tools has an impact on physical health. It is therefore conceivable that the ergonomic conditions in which mobile workers perform their work do not meet the requirements of legislation on working conditions in particular.

The following chapter looks in more detail at recent scientific findings about these risks.

2. Risks of 'New Ways of Work'

This chapter looks at recent scientific studies of a number of risks that (may) result from 'New Ways of Work' (NewWoW). In many cases the research is still in its infancy, partly because the technologies used are relatively new. For epidemiological studies in particular the population at risk was, until recently, still fairly small. It is difficult to conduct soundly based epidemiological research with small cohorts, but the reports we have found do point to the first signs of a growing risk. These are early warnings, from which the trade union movement hopes to learn lessons. The costs of ignoring early warnings in the past have been far too high (Harremoës 2001; EEA 2013). The main risks are techno-stress (section 2.1), techno-addiction (section 2.2), the blurring of the boundary between work and private life (section 2.3), overtiredness (section 2.4), safety risks (section 2.5), radiation/electromagnetic fields (section 2.6) and ergonomic problems (section 2.7)

2.1 Techno-stress

The existence of ubiquitous techno-stress is like a soldier in the camp. Even if he is not working his shift, he still feels the stress from intangible sources all the time as long as he is there.

W.-S. Hung *et al.* (2011)

Obviously, new technologies can be seen as adding to the modern worker's arsenal: information is available any time and anywhere, communication is easier with colleagues and clients, and the technology is also becoming faster and faster. The downside is that this can also increase psychosocial work stress when the *possibilities* that the new technology offers Dutch workers become *pressure* – both in terms of what bosses, colleagues and clients expect, and of individually experienced pressure in the form of 'techno-addiction' (section 2.2).

One of the most worrying side-effects of the intensive use of smartphones and tablets is probably the experience of 'techno-stress'. In one of the first publications on the subject, 'techno-stress' is described as "any negative impact on attitudes, thoughts, behaviors, or body physiology that is caused either directly or indirectly by technology" (Weil and Rosen 1998). Examples include acute stress over ICT breakdowns (Riedl 2012), but also, in particular, information overload and problems arising from permanent connectivity. In a later study the concept of techno-stress is broken down into five elements,

chief of which as far as psychosocial work stress is concerned are 'techno-overload' (too much information) and 'techno-invasion'.¹⁷

The term 'information overload' refers to the fact that workers are inundated with too much information, and can no longer sift out important or useful information from the rest. Having too much useful information can result in a sort of indecisiveness and uncertainty about whether decisions are correct, thus leading to stress (Himma 2007). Research cited by the European Commission states that 58% of workers indicated having feelings of often or always being overloaded with information (European Commission 2009). In addition, it is always possible to find more information, so that there can be a permanent feeling of 'information hunger' (information addiction).

Technology is also helping to increase the workload. Not only is there too much of the 'raw material' for work, but being permanently reachable also tends to mean that workers are eventually expected to be permanently available too. This last factor is one of the crucial elements of 'techno-invasion': technology takes up more and more of the worker's time, so that his rest periods become increasingly short. Work is frequently interrupted by the incessant ping of email alerts on the computer or smartphone, for instance. The number of workers complaining of frequent interruptions to their work has almost doubled in the last 10 years (Parent-Thirion 2012). This leads not just to poorer productivity (see section 2.5), but there is a constant threat of overload as a result of increased work demands and fewer possibilities for 'time out' (Cox 2000).

According to the literature studied for this report, little research has yet been conducted into the effects of techno-stress (Tarafdar 2011a). Also, most studies refer to each other, and the empirical basis is fairly limited (small populations, and in some cases rather poor methodology – few actually explain what they mean by 'stress').¹⁸ However, the preliminary findings are fairly conclusive: generally speaking, techno-stress leads to work stress (Hung 2011). Not only are workers experiencing techno-overload, there is also a general intensification of work: the new technology increases the pressure of work (by optimising working processes) and reduces the opportunities for recovery because the technology takes up more and more of the worker's time (techno-invasion).

Techno-stress is thus a risk that must be taken seriously, its effects being not much different from those of work stress in general: chronic fatigue, listlessness, muscular tension and other vague physical complaints, lapses of concentration, mood problems and burn-out (Derks and Bakker 2012). More specifically relating to information overload, there are also possible neurological effects, collectively known as 'Attention Deficit Trait': workers find it increasingly difficult to keep organised, set priorities and manage

¹⁷. Tarafdar 2007. Cf. also Wang 2008.

¹⁸. Hair *et al.* too say that "while many authors talk of email stress, it is by no means clear what this means and no scale has yet been devised to measure it." Hair 2007, p. 2799.

their time. Knowledge workers operate in a state of permanent mild panic (Hallowell 2005). In extreme cases they experience ‘brain-freeze’: there is so much information that the brain becomes paralysed, as it were, and stimuli to take action no longer get through (Bloem 2012). This pithy description of Attention Deficit Trait spells out what the effects of techno-overload can be:

“ADT isn’t an illness or character defect. It’s our brains’ natural response to exploding demands on our time and attention. As data increasingly floods our brains, we lose our ability to solve problems and handle the unknown. [...] Some sufferers eventually melt down.” (Hallowell 2005)

2.2 Techno-addiction

Het goede nieuws is dat de hele wereld verslaafd begint te raken aan mobiele schermdevices. [The good news is that everyone is starting to get addicted to mobile screen devices.]

Jaap Bloem *et al.* (2012)

In addition to techno-stress (information-overload and techno-invasion) a further phenomenon is undermining workers’ health: techno-addiction (Billieux 2012). The criteria for addiction include:

- compulsive use,
- finding it difficult to stop harmful activity even when harm is manifest,
- withdrawal symptoms upon stopping after chronic use,
- increasing intolerance,
- considerable chance of relapse (Brenner 1997, Park 2005, James 2012).

Various publications give clear indications that this techno-addiction too can lead to serious health effects as a result of the use of mobile technologies. There may as yet be little research into app or internet addiction on the shop floor (Eysink 2008), but various studies have been conducted on students. Qualitative and quantitative research among Australian students provides clear indications of withdrawal and feelings of being lost without a mobile phone. Behavioural salience and compulsive behaviour are also reported (Walsh 2007). Research among secondary school students in New Zealand showed that 8% were addicted, though this involved very small populations (n=75) (Vacaru 2010). Out of 548 Korean students 2.9% said that they were ‘addicted’, while 8.4% said they were ‘heavy users’ (Koo and Park 2010).¹⁹

A figure of around 10% of excessive users is probably a reasonable estimate among workers too, particularly among younger workers. The iPass study of 3 700 workers shows that one in eight respondents aged between 22 and 34 appear to check their mobile phone more than 10 times an hour during

¹⁹ In a Swiss study 30% of respondents said they were “addicted to the mobile phone”. Cited in Billieux 2008, p.24.

'downtime', in other words when they were not working (iPass 2011). Addictive behaviour is also evident in the apparent habit of as many as one in three workers (35%) of checking their email immediately when they wake up, i.e. before they get dressed or have breakfast. And only one in three younger workers thinks it inappropriate to check their smartphones during a meal or when they are out with friends.

7% of respondents in the iPass study admit to checking their mobiles 'obsessively' for new mail.²⁰ Around 25% of workers check their smartphones more than 5 times an hour during downtime.

It is questionable whether addiction to mobiles should be labelled 'good news', as app fan Jaap Bloem does in the passage quoted above from *Het App Effect*. Of course it is wonderful that the 400 000 or more apps now available make life easier or just more enjoyable in some respects. However, it is clear that for a considerable proportion of users addiction can have serious consequences. A study of 1 000 students who were prepared to spend one day without their mobile and keep a diary about it showed that media addiction among students has many features of a genuine physical addiction, including depression and withdrawal symptoms.²¹

How often do you check your mobile during downtime?	age 22-34	age 35-44	age 45-54	age 55-64
Never	3%	3%	4%	6%
1-2 times an hour	30%	34%	41%	47%
3-5 times an hour	28%	31%	31%	27%
5-9 times an hour	26%	23%	19%	16%
> 10 times an hour (obsessively)	12%	9%	4%	4%
	100%	100%	100%	100%

Source: iPass 2011

All in all it may be concluded that around 8-10% of smartphone users have issues with techno-addiction. This is a signal that must not be ignored.

2.3 Combining work with private life

Although in some cases mobile technologies enable people to combine work and private life better (one of the presumed benefits of NewWoW), this actually mainly applies to workers who do not work excessively long hours (Axtell 2011). For workers who do not manage to complete their work in normal working time, mobile technologies lead to an unwelcome form of 'techno-invasion', in which the boundary between work and private life disappears. The most extreme example here is that some workers even carry on working during their child's school performance. An on-line survey from 2008 showed that one third of workers found the interaction between work

²⁰. iPass 2011, p.7.

²¹. <http://theworldunplugged.wordpress.com/>.

and private life problematical (Paridon and Hupke 2009).²² It seems to be increasingly difficult particularly for managerial staff to maintain the work/private life boundary because of the (perceived) obligation to be permanently contactable. The same applies to workers who have regular contacts with clients (see box).

A study by the German trade association for the telecoms sector (Bitkom) in 2011 showed that 88% of professionals were accessible to clients, colleagues or bosses outside office hours. 29% of workers even said they would answer business telephone calls at any time. (http://www.bitkom.org/de/markt_statistik/64054_68489.aspx)

Regardless of the extent to which being permanently contactable affects people's private relaxation, according to the iPass study one in three mobile workers finds that using mobile technology creates strains in their personal relationships (particularly with their spouse). It is also clear from scientific research that a conflict is being created between work and private roles – a conflict that is contributing to the psychosocial stress of those concerned (Tarafdar 2011a). Research also shows that role conflict may be even more stressful than role overload, and can contribute to a whole range of health problems.²³

Combining work with private life also reduces the opportunities for workers to recover, since being permanently contactable can create a feeling that work never actually stops. The idea of being able to work at any time and anywhere can mean that workers can no longer mentally distance themselves from their work and do not take adequate rest. For managers this situation takes longer to recognise if they have less direct contact with staff.

2.4 Overworking, overtiredness, burn-out

For many, smartphones and tablets keep us up at night, with gentle pings letting us know that the rest of the world has not gone to sleep.

iPass (2011)

Techno-stress, techno-addiction and the techno-invasion of people's private lives are problems in themselves, but also present risks from the recovery point of view according to accepted stress/recovery models. Technological advances are leading not just to an increase in (mainly mental) stress, but also to a lack of recovery. Adequate recovery from work requires both physical and psychological disconnection: being physically removed from work and no longer thinking about it. However, there are clear signs that for mobile workers the chances to recover at various times are gradually being eroded: there is not just pressure on the opportunity to relax in their private lives, but even their sleep quality is suffering from the omnipresent smartphone. Dependence on

²². The number of respondents in this survey was very small (n=200).

²³. For an overview, see Cox 2000, p. 70

the mobile phone is leading to irregular and disturbed sleep patterns, which are again linked to various health effects. Adequate sleep (both the number of hours and the sleep quality) is essential for physical and mental health, and inadequate sleep is linked to a wide range of health problems.

A large-scale study of over 4 000 respondents showed that intensive use of mobile phones is linked to sleep disorders and symptoms of depression (Thomée 2011). Research among 350 students showed that there was not a particularly significant link between 'pathological texting' (addiction to texting) and the *number of hours* sleep, but there was between the 'problematic' use of smartphones and sleep *quality* (White 2011). The same study also showed a clear connection between 'pathological' texting and psychological effects such as mood disorders.

The poor sleep quality of those addicted to mobile phones might be explained by the fact that most smartphone owners take them into their bedroom or, in many cases (43%)²⁴, even put them by their bed. Regardless of whether this is sensible in view of the possible radiation risks (see section 2.6), it certainly results in frequently interrupted sleep. Around 5% of respondents in the iPass study were woken every night by their smartphones, particularly because these emit signals even at night if new mail arrives. Another explanation for the poor sleep quality is that many mobile workers work late at home, after they have put the children to bed, for example. By failing to allow enough time between stopping work and going to bed they may find it difficult to get to sleep and their sleep quality may decline. Sleep deficiency is the main link between the intensive use of ICTs and tiredness (Punamäki 2007).

Still, smartphones are not entirely to blame for the reduction in sleep quality. In some cases this is simply down to excessive workload or workaholism (generally speaking e-nomads worker harder than 'normal' workers).²⁵

It is clear, however, that the possibilities offered by the new mobile technologies make it even more difficult, in such situations, to distance oneself from work, resulting in chronic overwork and overtiredness. It is also known that chronic and/or serious overtiredness are linked to all sorts of health effects such as lower resistance, mood disorders and an increased risk of heart conditions and neurological effects. It has also long been known that overtiredness leads to safety risks, including an increased incidence of occupational accidents (Swaen 2003; Dembe 2005).

24. iPass 2011. According to the Nielsen marketing bureau 60% of iPad users also take their iPads into the bedroom. http://blog.nielsen.com/nielsenwire/online_mobile/in-the-u-s-tablets-are-tv-buddies-while-e-readers-make-great-bedfellows/.

25. "On average, e-nomads work longer hours, more often on Sundays and more often in the evenings than other workers. They also report having to work during their free time more often than the average; 1 out of every 10 e-nomads does so in order to meet work demands nearly every day, compared with only 3.7% of those working all the time in their employers' or own premises." Eurofound 2012, p. 96.

Finally, overtiredness as a result of chronic techno-stress is harmful for productivity (Hung 2011; Tarafdar 2007). Research among students shows that sleep quality is strongly linked to students' cognitive performance (Lund 2009). The same naturally also applies to workers. Given that the problematic use of mobile phones leads to poorer sleep quality (White 2011), as mentioned earlier, it is likely that knowledge workers who make liberal use of mobile information technologies are more exposed than average workers to information overload, potentially leading to overtiredness and reduced capacity to process information correctly.

2.5 Safety and productivity

It is not just through (chronic) tiredness that mobile telephones contribute to safety risks or lower productivity. Various studies have shown that the distraction of mobile phones can have an impact on the safety of drivers and cyclists in traffic. During a network breakdown (Blackberry) in Abu Dhabi the number of traffic accidents is said to have fallen by 40%.²⁶ The dangers resulting from the use of mobile phones relate not just to hand-held devices but also to hands-free calls (Caird 2008; Strayer 2011; Goldenbeld 2010), and are largely down to lack of concentration (in this case attention to the road) (Chittaro and De Marco 2004). Although no research has been done on the subject, it seems obvious that lack of concentration as a result of 'multi-tasking' on the shop floor will also have a negative impact on workplace safety, just as it already does for pedestrians using their phones in traffic.²⁷

An impact on productivity also cannot be ruled out. Although various studies have indicated that production increases with NewWoW or, more generally, thanks to the possibilities of new technologies, those technologies can also lead to significant stress and, as a result, *lower* productivity. According to a number of studies the effect of (techno-) stress on productivity is clearly negative. Techno-stress has a negative impact on productivity and staff turnover among workers (Tu 2005). A high turnover suggests a lack of commitment from workers (Ragu-Nathan 2008; Tarafdar 2011b). Other studies too indicate a clear negative effect on productivity (Hung 2011; Tarafdar 2007).

One explanation (in addition to overtiredness) is that frequent interruptions to activities by (compulsively) reacting to signals from mobiles (or to emails on normal desktop computers) have a negative effect on workers' concentration and thus on the quality of their work (Tarafdar 2011b). A 2005 study showed that 28% of working time is wasted on interruptions (Spira 2005). According to research by Microsoft it takes approximately 24 minutes after an email interruption for a worker to return to a work task properly (Hemp 2009). In addition, information overload generally leads to disturbed concentration and

²⁶ <http://www.thenational.ae/news/uae-news/blackberry-cuts-made-roads-safer-police-say>.

²⁷ Pedestrians using their mobiles noticed fewer objects than those not on the telephone, and pedestrians using their mobiles stepped out dangerously into oncoming traffic more often than those not on the telephone. Stelling and Hagenzieker 2012.

a lack of focus: evolution has not designed our processing system to be able to give the ever more rapidly growing stream of information sufficient attention, and without careful processing of that information we end up with little *meaningful* information. A lack of attention means that information is not stored properly. Also, working hurriedly leads to a lack of contemplation and thus, certainly in the knowledge economy, to poorer product quality (Himma 2007). This description of Attention Deficit Trait sums it up:

“As data increasingly floods our brains, we lose our ability to solve problems and handle the unknown. Creativity shrivels; mistakes multiply.” (Hallowell 2005)

Or as the Dutch philosopher Joke Hermesen puts it:

“Our brains do not have a moment’s rest. They are constantly having to process information, jump from one thing to another and decipher images. Yet people need rest in order to be able to come up with ideas and be creative.” (Bakker 2011)

2.6 Radiation/Electromagnetic fields

One of the other health risks associated with the frequent use of smartphones is exposure to electromagnetic fields. The fear that ‘radiation’ from mobile phones could be harmful to health has been going around for some time. In 2009 the Dutch FNV trade union commissioned a study of the literature on the risks to workers who regularly used mobile phones (Popma 2009). The study showed that in 2009 there were already indications that the intensive use of mobile phones was associated with an increase in the number of tumours (particularly acoustic neuroma), but that the statistical basis for this was still small. However, the FNV said that precautionary measures were advisable.

Two years later the International Agency for Research on Cancer (IARC) classified radiofrequency electromagnetic radiation, including radiation from mobile phones, as ‘possibly carcinogenic’ (group 2B) (IARC 2011; Baan 2011). So even if it has not yet been proved that exposure to mobile phones is carcinogenic, it has certainly not been ruled out, particularly not with intensive use, which is likely to be the case with workers operating from atypical workstations who need to be in frequent contact with clients or colleagues (Harremoës 2001).

However, more research is needed. One point to bear in mind is that “lack of scientific certainty” comes into play with many newer technologies, particularly when health effects come to light only in the longer term (as with radiation and carcinogenic substances). Tumours can take years to develop, so it could be a long time before the first signs appear that something might be wrong. Until then advocates of new technologies can hide behind scientific uncertainty or methodological inadequacies, and carry on promoting them

undeterred. Early warnings are ignored, possibly with serious consequences in the longer term.

Pending further research the FNV study recommended a number of precautionary measures relating to the possible risks of electromagnetic fields, such as the use of earpieces instead of holding the mobile phone itself to the head (Popma 2009). It is striking that various European countries have completely different approaches to dealing with what is known about the possible risks of electromagnetic fields. France, for instance, has banned advertising for mobile phones aimed at children aged under 14,²⁸ in order to limit children's exposure to radiation. The Belgian Minister for Public Health also aims to ban advertising aimed at young people, as well as the sale of GSMs specifically designed for young children.²⁹

As far as the effects of electromagnetic radiation from wireless networks are concerned, it is still assumed that this radiation only becomes harmful if the source is held close to the body (such as with smartphones held to the ear). The intensity of the electromagnetic radiation declines considerably the greater the distance from the body. Despite this, various social organisations have drawn attention to the risks of DECT base stations, and NGOs talk about the phenomenon of 'electro-hypersensitivity', in other words oversensitivity to electromagnetic fields well below the current exposure limits. Scientific research into the relationship between electromagnetic fields and hypersensitivity has still not identified any causal link, according to the World Health Organization.³⁰ Furthermore, 'normal' offices are now also increasingly using wireless connections, so that any radiation problems may not just be linked to place-independent working.

2.7 Ergonomics

Although the most recent apps offer all manner of interfaces involving touchscreen operation (app gurus say that there could eventually even be direct operation through brain interfaces) (Bloem 2012), the main smartphone applications for business use are still predominantly key operated (and then mainly for emailing and information gathering). Frequent use of the often tiny keys could lead to strain on the fingers.³¹ Type-operated tablets also do not meet ergonomic requirements.

Many workers consequently have musculoskeletal disorders, including of the fingers, wrists and the neck/shoulder area. Although these disorders are now

²⁸ Code de la Santé, Article L5231-3.

²⁹ This is also included in legislation in France, in the Code de la Santé, Article L5231-4.

³⁰ "Research has not been able to provide support for a causal relationship between exposure to electromagnetic fields and self-reported symptoms, or 'electromagnetic hypersensitivity'", <http://www.who.int/mediacentre/factsheets/fs193/en/index.html>.

³¹ This applies not just for workers working with a smartphone, but also for users of laptops in unconventional places, such as on the train, or in internet cafés or service stations. Cf. Knegt 2011, p. 25ff.

often referred to in the medical literature as CANS (complaints of the arm, neck and shoulder), in practice they are often still called RSIs (Repetitive Strain Injuries).³² It is now undisputed that these sorts of complaints can be caused by screen work. It is also certainly not impossible that the intensive use of mobile phones and similar devices will be accompanied by an increasing number of complaints. In popular literature people are already using the term 'Blackberry thumb'³³, and not just in provocative magazines (Hewlett and Luce 2006). The first signs of 'Blackberry thumb' date back to 2005, in early case descriptions in scientific literature (Menz 2005; Ming 2006; Storr 2007; Ashurst 2010; Williams and Kennedy 2011). Complaints include damage to the joints and arthritis in the fingers and wrist (Ming 2006), tenosynovitis (inflammation of the tendon sheath) (Storr 2007), tendinitis (inflammation of the tendon), and fibromyalgia (Sharan and Ajeesh 2012). Neck and shoulder complaints are also mentioned (including thoracic outlet syndrome) (Berolo 2011; Gustafsson 2012). In addition to the case reports there are a small number of laboratory studies into the mechanisms that could cause these disorders (Gustafsson 2012).

So although there is every cause for concern, very little epidemiological research has yet been conducted into the prevalence of the disorders mentioned above in relation to working with mobile technologies.³⁴ However, there have been a number of preliminary investigations, particularly among secondary school and university students. A study of 1500 college students showed that 18% of respondents had physical complaints linked to the intensive use of mobile phones (Eapen 2010). An exploratory study of 140 staff and students at a Canadian university revealed a significant link between the degree of use of mobile phones and the prevalence of RSIs. Average use of mobiles was a good four hours a day, of which roughly one hour a day was spent emailing and texting, and a good hour gaming. The strongest link with complaints of the *thumb* was found not with text processing, but with gaming. However, there was also a strong link between emailing/texting and neck and shoulder complaints (Berolo 2011). Research among 320 South African students indicated, according to the researcher, an 'epidemic of Blackberry thumb': 52% of the students interviewed reported RSIs as a result of frequent texting (Karim 2009).

Although the epidemiological studies have some methodological limitations, the findings seem fairly clear: the frequent use of mobile phones (whether for work or private purposes) leads to damage to the fingers, arms and neck/shoulder area. Whether recent technologies such as swiping³⁵ have a positive

32. For a more detailed description of the complaints see Gezondheidsraad 2000.

33. "Blackberry Thumb" refers to a form of repetitive strain injury, notably aching and throbbing pain in the thumb or sometimes other fingers and in the wrist, due to excessive use of the thumb while using the smart phone (e.g. Blackberry).

34. A 2009 study by the European Commission also concluded "On the basis of the data found, no thorough assessment of the [ergonomic] risk factors can be provided. It is possible only to make assumptions regarding their impact", European Commission 2009.

35. Swiping is brushing a finger over the screen of a tablet or smartphone in order to navigate or even process text (in contrast to typing).

or negative effect on the risk of musculoskeletal disorders has not been researched (or at least no studies on the subject have been found).

In addition to RSIs resulting from the frequent use of mobile phones, complaints may also be caused by poor work posture. No studies on this subject have been found, except on the use of laptops in suboptimal ergonomic conditions, which will be relevant for many home working situations (European Commission 2009). Very little scientific information has also been found on the effects on eyesight and/or any tiredness resulting from poor screen ergonomics. Experimental research suggests that the legibility of mobile screens may be poorer than that of desktop screens or hard copy, but that this does not lead to greater tiredness, though reading from a screen does lead to more irritation and dry eyes (Kundart 2010).

3. OSH regulation

The main piece of European legislation on safe and healthy working conditions is Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work.³⁶ Directive 89/391/EEC is what is known as a Framework Directive, in two senses.

First of all it provides a general framework for OSH policy within businesses. Employers have a duty of care to prevent harm to workers' health (Art. 5). They are required to adopt an OSH policy (Art. 6), based on risk assessment (Art. 9(1)). They must also consult workers' representatives about their OSH policy (Art. 11).

Secondly, the Framework Directive provides a framework for what are known as individual directives; the key directives in connection with 'New Ways of Work' (NewWoW) being the VDU Directive, the Use of Work Equipment Directive and the Workplace Directive. These individual directives lay down more specific rules governing screen work and how the workstations of 'New Workers' must be equipped.

Alongside the OSH directives already mentioned, the Working Time Directive 2003/88/EC is also relevant.³⁷ This directive protects workers against excessively long working hours, in particular by regulating rest periods and breaks (Arts. 3-5) and the maximum weekly working time (Art. 6).

This chapter gives an overview of the relevant legislation. Section 3.2 discusses a number of general provisions from the Framework Directive. Section 3.3 looks in more detail at the requirements governing the arrangement of (VDU) workstations and equipment. Section 3.4 looks briefly at the working time of 'New Workers'. First of all, however, section 3.1 examines whether the legislation actually applies to NewWoW.

³⁶ Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work, OJ 1989 L 183.

³⁷ Directive 2003/88/EC of the European Parliament and of the Council of 4 November 2003 concerning certain aspects of the organisation of working time.

3.1 Applicability of OSH legislation to 'place- and time-independent working'

The question whether legislation on working conditions and working time applies to place- and time- independent workers must be answered with a resounding 'yes'! The reason for such an unequivocal answer is provided by three different types of legislation.

ILO

The first relevant piece of legislation here is Convention 177 of the International Labour Organisation (ILO). The ILO is a tripartite United Nations agency which lays down international guidelines on social justice and decent work. These guidelines take the form of conventions which, if ratified by the affiliated member states, have to be transposed into national laws and regulations. Convention 177 concerns legal protection for *homeworkers*, and dates from 1996.³⁸ This Home Work Convention aims to provide the same protection for workers working in their own homes (homeworkers) or "in *other premises of his or her choice*, other than the workplace of the employer" (Art. 1(a) (i), emphasis added). Article 4 of the Convention also talks expressly about equality of treatment between homeworkers and 'normal' workers.

It is clear from the definition that NewWoW, which therefore does not have to mean only working from one's own home, comes under the Convention, even if *workers themselves* elect to work in premises other than the workplace of their employer. New Workers thus obviously enjoy the same protection as workers working on their employer's premises. Homeworkers' working conditions therefore need to comply with the same rules as those that apply to 'normal' workers.

The only time when this is not the case is if the work is performed at a different workplace only 'occasionally'. What 'occasionally' means is not defined in detail. Where workers fairly regularly work one or two days from home, as many New Workers do, however, then the Convention clearly also applies to them. Article 7 provides that national laws and regulations on safety and health at work also apply to homeworkers.

The thrust of the Convention is thus, broadly speaking, that homeworkers enjoy the same protection as 'normal' workers and that national OSH legislation applies to them in exactly the same way. However, the Convention has been ratified by just a small number of EU Member States,³⁹ which means that it has only limited direct effect. It does have some effect indirectly, however, albeit only that Member States have to report to the ILO regularly on the subjects mentioned in the Convention. ILO Conventions can also play a part in the

³⁸. *Trb.* 1996, 329.

³⁹. Belgium, Bulgaria, Finland, Ireland and the Netherlands. The (potential) candidate countries of Albania, Bosnia-Herzegovina and the Former Yugoslav Republic of Macedonia have also ratified the Convention.

interpretation of legal requirements in any legal disputes between employers and workers.

European directives

Regardless of whether or not Member States have ratified the ILO Convention, which has force under international law, it is clear from the European OSH directives themselves that NewWoW falls within their scope. The definitions in the Framework Directive and the Working Time Directive make it clear that the concept of worker is very broad. The directives concern the protection of workers or “any person employed by an employer, including trainees and apprentices but excluding domestic servants”. Where that employment takes place makes no difference to the legal protection.

Of course, if a New Worker is carrying out his activities on the basis of a contract of employment, then his employer obviously has to comply with the provisions of the Framework Directive. But other forms of ‘employment’ are covered by the directive too. The individual directives also do not exclude any particular groups of workers from the legal protection provided (except domestic servants). Even if some derogations do apply as regards the specific workplace, as will be examined in section 3.3, as long as the New Worker falls under the definition of ‘worker’ he generally falls within the scope of EU OSH legislation.

The Working Time Directive too has a very broad scope and contains no derogations for workers depending on their workplace (apart from seafarers and offshore work, for instance). Derogations are possible for “managing executives or other persons with autonomous decision-taking powers” (Art. 17). Generally speaking, however, the directive applies to “any period during which the worker is working, at the employer’s disposal and carrying out his activity or duties” (Art. 2(1) of the Working Time Directive). This definition also applies to activities which a worker carries out at premises other than the ‘normal’ workplace, and therefore also to place-independent working. The implications for ‘time-independent’ working are examined in more detail in section 3.4.

Framework Agreement on Telework

With teleworking beginning to take off from the end of the 1990s, and particularly in view of the possible drawbacks which were even then being recognised, the European workers’ and employers’ organisations signed a Framework Agreement on Telework on 16 July 2002.⁴⁰ We can see from Section 2 of the Agreement that the definition of ‘telework’ almost exactly

⁴⁰. ETUC/UNICE/UEAPME, http://ec.europa.eu/employment_social/dsw/public/actRetrieveText.do?id=10418.

describes what is now acclaimed as NewWoW: “a form of organising and/or performing work, using information technology, in the context of an employment contract/relationship, where work, which could also be performed at the employer’s premises, is carried out away from those premises *on a regular basis*.”

The Framework Agreement was concluded on the basis of Article 139(2) of the EU Treaty (now Art. 153(2) TFEU). Even if the agreement between the social partners is not legally binding, it may be regarded as “binding in a contractual sense” (Ramos Martín and Visser 2008). The social partners undertook to implement the Agreement at national level, although not directly in laws or regulations. The points agreed are, however, given effect through national agreements, including collective labour agreements.

Even if the degree to which the Agreement is directly legally binding varies from country to country⁴¹, it is clear that the core points laid down in the Agreement imply that teleworkers deserve the same legal protection as ‘normal workers’: “Regarding employment conditions, teleworkers benefit from the same rights, guaranteed by applicable legislation and collective agreements, as comparable workers at the employers’ premises” (Art. 4).⁴² Telework covers not just *home* working with smart technologies, but also “nomadic or mobile telework” (Ramos Martín and Visser 2008).⁴³ There is no question that mobile workers enjoy the same protection as their colleagues working from a fixed (office) workplace.

All in all it can thus be said that, in principle, workers doing place- and time-independent work enjoy exactly the same legal protection as their colleagues working in an office or other fixed workplace. This has particular implications for the organisation of the (VDU) workstation (see section 3.3), but it also means that employers have a duty of care more generally towards New Workers.

3.2 Framework Directive 89/391/EEC

Framework Directive 89/391/EEC is designed to protect workers against risks that may be associated with work. It imposes a number of requirements on employers. Article 5 and particularly Article 6 provide that employers must *prevent* risks or, if risks cannot be prevented, *combat* them as far as is reasonably possible. Art. 6(2)(d), which states that the work must be adapted to the individual as regards the design of workplaces and the choice of work equipment, is particularly relevant and applies in full to the workplace and work equipment of New Workers. Employers are also required to give workers

41. For an overview of implementation, see Ramos Martín and Visser 2008, p. 524ff. Also Social Dialogue Committee 2006.

42. It should be pointed out here that self-employed teleworkers are not covered by the Agreement.

43. In Italy, two different types of telework are defined: the teleworker working from home and the teleworker working at a distance. Social Dialogue Committee 2006, p.15.

information on any remaining risks (Art. 6(2)(i) in conjunction with Art. 10) for “each type of workstation and/or job” – so the Directive is intended to have a broad application.

Art. 9 of the Framework Directive, which requires employers to assess the risks at work, is also relevant. This obligation applies to all work activities, and therefore includes the risks of NewWoW, as has also been confirmed by a judgment of the European Court of Justice, which ruled, as regards the scope of the risk assessment, that there is a “general obligation [...] to evaluate *all* the risks to the safety and health of workers”.⁴⁴ This may also be inferred from Article 5(1) of the Framework Directive, which states: “The employer shall have a duty to ensure the safety and health of workers in *every* aspect related to the work.”

All of this means that the subject of ‘NewWoW’ and the risks associated with it must explicitly be included in the risk identification and assessment. This certainly also applies to the risks described in Chapter 2. Workers and/or their representatives must be consulted about the outcome of the risk assessment (Art. 11 of the Framework Directive). This consultation must examine not just the risks identified, but also the measures being taken to limit those risks. Employers must take account of the OSH strategy (combating risks at source, with the emphasis on collective measures). It is also important for employers to take account of ‘technical progress’ (Art. 6(2)(e)): if new knowledge is obtained about any risks of working in atypical workplaces associated with NewWoW, employers must take this into account and adapt their risk assessment accordingly.

3.3 The workplace and work equipment of ‘New Workers’

Framework Directive 89/391/EEC not just contains a number of general policy obligations (see above), but also provides a framework for individual directives to protect workers against specific risks. Our discussion here will focus only on the directives that are the most relevant for working with new technologies.

Workplaces

The requirements to be met by workplaces in general are laid down in Directive 89/654/EEC concerning the minimum safety and health requirements for the workplace.⁴⁵ The directive contains provisions on, *inter alia*, safety arrangements (exits/emergency exits), technical maintenance and hygiene at the workplace. The annexes mention, more specifically: electrical installations,

⁴⁴. ECJ, Case C-49/00 (*European Commission v Italy*).

⁴⁵. Directive 89/654/EEC of 30 November 1989, OJ 1989 L 393, 30 December 1989.

temperature, lighting, lavatories and another ten or so subjects. The question, however, is whether these requirements all apply to workplaces other than fixed workstations. To answer this we need to look at the definition of ‘workplace’.

The directive defines workplace as “the place intended to house workstations on the premises of the undertaking and/or establishment and any other place within the area of the undertaking and/or establishment to which the worker has access in the course of his employment” (Art. 2). This appears to suggest that the definition of workplace is restricted to places that are actually on the premises of the undertaking or within the area of the undertaking. So at first sight home workplaces or other atypical workplaces do not seem to be covered, which is understandable, given that employers will have little or no control over many different atypical workplaces, particularly not internet cafes, service stations, and so on. Employers also cannot expect homeworkers to adapt their homes to include escape routes, emergency exits or safety signs, for example.

On the other hand, Framework Directive 89/391/EEC does require employers to evaluate all the risks involved in the fitting-out of workplaces (Art. 6(3) of the Framework Directive). The Framework Directive itself does not define ‘workplace’ or, consequently, (flexible) workplaces outside the undertaking. It may be assumed, therefore, partly in the light of the recitals to the Framework Directive, which repeatedly use the term ‘workplace’, that ‘workplace’ is to be understood in a broad sense. The risk assessment must therefore also devote attention to the subject of “the safety of home workplaces or other place-independent workplaces”.

Finally, it may be pointed out that the definition of ‘workplace’ is not unequivocal (it is clearly narrower in the Workplace Directive than in the Framework Directive), and it might be argued that a more detailed definition is needed of workplaces *outside* “the premises of the undertaking and/or establishment”. At least it must be determined how the definition in the directive relates to atypical workplaces. In any event the recitals should state to what extent the employer has control over the ‘workplace’. On the basis of the employer’s duty of care, however, it may be assumed that a workplace (in the broad sense) where there is a risk of harm to the worker’s health does not satisfy the requirements, and that in such situations the employer must prohibit work in that location. In any event the employer must be required to ascertain where the worker is actually working. If that workplace does not meet general health and safety requirements (e.g. ergonomically, but also in terms of fire safety), the worker should not be allowed to use it.

VDU workstations

This last requirement, that a workplace must satisfy health and safety requirements, applies particularly for VDU workstations. Place-independent screen work is *the* characteristic element of NewWoW, not just with home working and working in other atypical locations, but also for flexible workstations within undertakings.

Screen working is regulated by the VDU Directive.⁴⁶ The purpose of the directive (Art. 1(1)) is to protect the safety and health of workers who use display screen equipment “habitually [...] as a significant part of [their] normal work” (Art. 2(3)(c)). However, there is no further definition of what ‘a significant part of [their] normal work’ or ‘habitually’ means. The Member States have a very broad discretion to determine the number of hours’ working time per day.⁴⁷ The question whether the amount of time which a worker habitually spends in front of a screen is significant must be determined, according to the European Court of Justice, in relation to the normal working time of the worker concerned. Given that almost half of all Europe’s workers regularly work with computers, with a quarter or more working with them almost all the time (Parent-Thirion 2007)⁴⁸, it is to be assumed that a considerable proportion of New Work must be classified as screen work, particularly where workers work from home one or two set days a week.

That being so, display screen workstations involved in place- and time-independent working also have to meet the requirements of the directive (and particularly its annex) (see box). The definition given of ‘display screen workstation’ makes no distinction according to the location of the workstation. This implies that display screen workstations in places other than “on the premises of the undertaking and/or establishment” and where workers use display screen equipment “habitually [...] as a significant part of [their] normal work” also need to satisfy the directive (and meet the requirements of the annex on “Minimum requirements” (Articles 4 and 5)).

As for what a ‘display screen workstation’ involves exactly, the first point to be made is that it is more than just the type of computer (desktop, laptop or other devices with a screen) on which the work is being done. The directive defines a display screen workstation as “an assembly comprising display screen equipment, which may be provided with a keyboard or input device and/or software determining the operator/machine interface, optional accessories, peripherals including the diskette drive, telephone, modem, printer, document holder, work chair and work desk or work surface, *and the immediate work environment*” (Art. 2).

It involves – and this is worth underlining here – the workstation *including the immediate work environment*. Adding the ‘immediate work environment’ implies that not just the computer, chair, desk and/or work surface have to meet the requirements in the annex, but also the *environment* around them.

46. Directive 90/270/EEC of 29 May 1990, OJ 1990 L 156, 21 June 1990.

47. “The concept of habitual use of display screen equipment as a significant part of normal work, which is used in Directive 90/270 [...] in order to identify the workers who are to be entitled to the protective measures for which it provides, must, in the absence of any specification in the directive, be defined by the Member States, which enjoy a broad discretion for that purpose, when adopting the necessary national implementing measures”. ECJ (Fifth Chamber), Joined Cases C-74/95 and C-129/95 *Procura della Repubblica presso la Pretura Circondariale di Torino v X*.

48. More recent figures (Fifth European Survey) point to a further increase in the number of VDU workers.

The annex to Articles 4 and 5 of the directive lays down rules relating to, among other things, general lighting and the prevention of glare and reflections: “Workstations shall be so designed that sources of light, such as windows and other openings, transparent or translucent walls, and brightly coloured fixtures or walls cause no direct glare and, as far as possible, no reflections on the screen. Windows shall be fitted with a suitable system of adjustable covering to attenuate the daylight that falls on the workstation.” These are also generally accepted ergonomic principles and should thus reflect the current state of scientific knowledge.

The key section of the VDU Directive is its annex, which contains a wide range of general provisions concerning the ergonomic design of display screen workstations. The ‘minimum requirements’ in the annex relate, inter alia, to:

- the size and sharpness of the characters on the screen,
- lighting and the prevention of glare and reflections,
- the work chair (height-adjustable and with a footrest if desired)
- the work desk (“sufficiently large”)
- software (ergonomic requirements of data processing in design of human/computer interfaces).

These general requirements need to be fleshed out with more technical rules, and employers are obliged to keep themselves informed of “the latest advances in technology and scientific findings concerning workstation design so that they can make any changes necessary so as to be able to guarantee a better level of protection of workers’ safety and health” (sixth recital).

In addition to the ergonomic requirements applicable to workstations, the directive also sets out general rules for the work environment:

- The workstation must be dimensioned and designed so as to provide sufficient space for the user to change position and vary movements.
- Room lighting and/or spot lighting (work lamps) must ensure satisfactory lighting conditions and an appropriate contrast between the screen and the background environment, taking into account the type of work and the user’s vision requirements
- Workstations must be so designed that sources of light, such as windows and other openings, transparent or translucent walls, and brightly coloured fixtures or walls cause no direct glare and no reflections on the screen. Windows must be fitted with a suitable system of adjustable covering to attenuate the daylight that falls on the workstation.

The directive thus imposes strict demands on place-dependent work. Not only must it be possible to adapt shared workstations *in open-plan offices* to the characteristics of the various users, but also VDU workstations of workers who work from *home* for a significant proportion of their time have to comply with the rules of the directive, since there are no restrictions depending on where the work is carried out. In some Member States like Finland, Belgium and the Netherlands there are explicit rules that home workstations too need to meet the requirements of the VDU Directive. In other countries, however, it is still not clear whether the directive applies to home working (De Broeck 2008). Ideally, it should be spelled out in the directive that it also covers place-independent screen work.

The rules also need to be spelled out on a further point. The directive does not apply to “‘portable’ systems *not in prolonged use* at a workstation” (Art. 1(3)(d)), but it does not describe what ‘prolonged use’ or ‘portable systems’ are. This restriction of the directive’s scope could mean that frequent (but not prolonged) work on a laptop, tablet or smartphone is not covered. However, this seems hard to reconcile with the fact that working on laptops, and particularly on tablets and smartphones, probably involves greater health risks than working on an ergonomically sound desktop workstation. On the other hand, employers cannot reasonably be expected to provide their workers with an ergonomically sound workstation if they make only *occasional* use of mobile equipment.

This suggests that it needs to be made clear what “prolonged use” and/or “a significant part of [a worker’s] normal work” is. The European Court of Justice judgment cited earlier is inadequate and could lead to arbitrary and unequal legal protection for workers in different countries. The legislation tends to vary between the Member States, but there is a common denominator: in Denmark a minimum of two hours per day is required before screen work comes under the provisions of the national regulations, and in Spain workers working with a VDU for less than 2 hours a day or 10 hours a week are excluded from the scope of the directive (De Broeck 2008). In the Netherlands too a two-hour rule is applied (Art. 5:8 of the Working Conditions Decree).

A rule of two hours a day or 10 hours a week seems realistic. A derogation for ‘less than two hours’ would also allow sufficient scope for workers doing place-independent screen work genuinely occasionally, but would still mean that workers regularly working on VDUs for more than two hours a day at home (or in other external locations) must be given the protection which the directive is intended to provide. This would also have to apply to workers regularly working on a laptop, tablet or smartphone.

To sum up, if workers (have to) work at home regularly, they must not just be provided with an appropriate desk and ergonomically sound chair, but also their lighting and/or light screening must comply with health and safety rules, where appropriate. If it is not possible to create an ergonomically sound VDU workstation, for example because the homeworker’s home lacks the space to allow this, the employer cannot then fulfil his duty of care and the home workstation is not suitable for the worker to work there.

The costs of fitting out an appropriate (home) workstation should be paid by the employer. The worker’s health and safety is, after all, part of his duty of care. NewWoW, which is often introduced in order to save the employer money, must not mean that workers have to spend their own money in order to be able to work in safe and healthy conditions.

Work equipment

The requirements to be met by work equipment are mostly based on the Work Equipment Directive.⁴⁹ This requires employers to ensure that “the work equipment [...] is suitable for the work to be carried out or properly adapted for that purpose and may be used by workers without impairment to their safety or health” (Art. 3). The definition in Art. 2 describes work equipment as “*any* machine, apparatus, tool or installation used at work.” This is a very broad definition and thus covers all tools, including those used for place- and time-independent work.

What ‘at work’ means is not defined in detail in the directive. However, the definition intended here is clearly broader than the one used in the Workplace Directive discussed earlier. Employers are obliged under their general duty of care to provide work equipment that complies with the current state of scientific knowledge and technical progress. There is no reason to assume that the duty of care is any less if the worker works at a location other than in the undertaking itself.

The Work Equipment Directive takes an all-encompassing approach, referring in Article 4 to other relevant directives (work equipment must comply with “the provisions of *any* Community directive which is applicable”, emphasis added⁵⁰). For NewWoW Article 7 is particularly relevant: “The workplace and position of workers while using work equipment and ergonomic principles shall be taken fully into account by the employer when applying minimum health and safety requirements”. Most of the ergonomic rules applicable to mobile technologies such as laptops, tablets and smartphones are to be found in a wide range of technical standards adopted by the CEN (European Committee for Standardization) and the International Organization for Standardization.⁵¹ This is not the place to give a detailed overview of these standards, but generally speaking the equipment used has to meet ergonomic requirements and be ‘suitable’ for the work. We might wonder whether the intensive use of smartphones and tablets is ‘suitable’ for the work done with them. This is something that must, in any case, be determined as part of the undertaking’s risk assessment.

Radiation/electromagnetic fields

One of the risks associated with the frequent use of mobile devices and particularly mobile phones is radiation, or rather electromagnetic fields (see section 2.6). The risk to workers of exposure to electromagnetic fields is dealt

49. Directive 2009/104/EC concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive).

50. For example, the Machinery Directive (2006/42/EC) and a number of its ‘daughter directives’.

51. E.g. standards from the series EN/ISO 9241 Ergonomics of human-system interaction (particularly series EN/ISO 9241-300 Electronic visual display requirements, EN/ISO 9241-400 Physical input devices, and EN/ISO 9241-500 Work place ergonomics).

with in Directive 2004/40/EC.⁵² However, this directive has still not been transposed into national legislation in the Member States and, even more importantly, it is limited to the *known* risks of harm in the *short* term, while any harm resulting from the intensive use of phones may materialise in the *longer* term and the risks are still *uncertain*. Consequently, the possible long-term effects of the use of mobile phones are not covered by this directive.

Under the OSH regulations, therefore, there are no specific legal rules in force for mobile devices. Obviously, equipment has to meet the relevant product requirements for telecommunications equipment.⁵³ It is also important that the strength of the electromagnetic fields passing from mobile phones into the body must not exceed a medically recommended ceiling (in technical terms the Specific Absorption Rate, SAR). In its recommendation on limits for EMFs⁵⁴ the European Council also sets SAR values for mobile phones. For local head exposure an SAR value of 2 W/kg is recommended (used by mobile phone suppliers, but also by the German Bundesamt für Strahlenschutz [Federal Agency for Radiation Protection], for example⁵⁵).

Most mobile phone manuals refer to this Council Recommendation and use it as a basis for claiming that the devices present no health risks. A number of social organisations point out, however, that the recommendation is only relevant for already proven health effects, and not for any long-term damage. In the European Parliament a huge majority of Members (559 to 22) voted in favour of a review of the exposure limits for electromagnetic fields, following a number of studies into the health effects of mobile phones (see section 2.6).⁵⁶ Since the Parliament adopted the resolution, however, there has not been any progress on this point.

Until the limits are tightened up, *employers* purchasing mobile phones for their workers must, in any case, ensure that they are properly informed about the radiation levels of those phones. Mobile phones with a lower SAR value than in the recommendation may be assumed not to present any health risks. The Agentschap voor Zorg en Gezondheid (Agency for Care and Health) in Flanders, for instance, advises that children can safely use mobile phones with an SAR below 0.6 W/kg.⁵⁷ For greater transparency the SAR could be accompanied by a quality mark for safe mobiles. One example here is the *Blaue Engel* quality mark in Germany, which also requires an SAR of under 0.6 W/kg.

52. Directive 2004/40/EC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from electromagnetic fields.

53. Particularly Directive 1999/5/EC of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

54. Council Recommendation (1999/519/EC) of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).

55. <http://www.bfs.de/en/elektro/oekolabel.html>. This website also provides an overview of the SAR values of upwards of 1 700 models of mobile phones.

56. European Parliament Resolution INI/2007/2252 (4 September 2008). European Parliament Resolution INI/2008/2211 (2 April 2009).

57. Leaflet 'Uw kind loopt wel/geen risico door te bellen met een GSM' ['Your child is/is not at risk from using a mobile phone'].

In any case, employers are obliged, on the basis of Article 9 of the Framework Directive alone, to take account of the possible risks of frequent phoning, which must be included in their risk assessment. It would also be useful if the risk assessment had to include the SAR values of the equipment used. Obviously, employers are also required to inform workers about the possible risks (including any uncertainty about the risks) and may recommend a number of simple safety measures. Even assuming that the risk of mobile phones may be small, employers still have an important responsibility to restrict any health risks to a minimum, particularly where protective measures are relatively easy to introduce, such as the use of landlines or headsets, or sending texts instead of phoning (although this then involves the risk of repetitive strain injuries) (Popma 2009).

3.4 Working hours and rest periods of 'New Workers'

One of the advantages of place- and time-independent working is that it gives workers the chance to have more control over how their working time is organised. This is an important plus point for some workers who have to combine work and care responsibilities: they can look after their children during the day, then catch up the lost hours in the evening. The disadvantages of this independence are obvious, however. First of all, there is the risk that some workers work too long in the evenings, reducing their rest time, or, even if they do not need to make up time spent on care during the day, simply work too many hours in general. There is nothing to stop workaholics if the office never closes. Secondly, some workers may feel that they always have to be contactable, and in some cases this is also actually expected of them. So mentally they are never able to escape from their work, which has a negative impact on their recovery.

Both of these risks are, in principle, addressed in the Working Time Directive (2003/88/EC). In view of the risks associated with working too many hours, Article 6 provides that workers must not work more than 48 hours a week, including overtime. The 48 hours are calculated over a reference period not exceeding four months (Article 16(b)), so that in some weeks more than 48 hours may be worked, provided that compensatory rest periods are offered in the other weeks. This does not alter the fact that an overenthusiastic worker who is doing his job away from his employer's supervision could quickly exceed the limit. The only way to deal with this risk is to have regular consultation between the worker and his manager, so that the manager can monitor whether the rules are being obeyed.

The rules on the maximum working time in Article 6 are far from watertight, however. Article 17 allows a number of derogations from Article 6, including for managing executives or other "persons with autonomous decision-taking powers" whose "duration of [...] working time is not measured and/or predetermined or can be determined by [...] themselves". Which workers

are covered by this derogation varies from one Member State to another⁵⁸, but “autonomous decision-taking powers” are precisely one of the characteristics of NewWoW. It is possible that employers may put pressure on workers here: “you’re now free to decide how to organise your time, so the rules don’t apply to you any more”. It should be noted that the European Court of Justice supported workers on this point by ruling that the phrase whose “duration of [...] working time is not measured and/or predetermined or can be determined by [...] themselves” must be understood to mean that the derogation applies only for workers who are *entirely* free to organise their own working time, and not workers who are only partially free to do so.⁵⁹ The possibility of derogating from the rules thus applies only for workers whose entire duration of working time is not measured or predetermined, or workers who have full control over their own working time.

Another loophole in the system of worker protection is Article 22, which allows employers to obtain individual workers’ agreement that the 48-hour rule should not apply to them (the ‘individual opt-out’). Individual opt-outs are now possible in 15 of the 27 Member States (European Commission 2010), and while it is true that the Labour Inspectorates in the countries in question should be able to monitor any abuse of the rules (Art. 22(1)(d)), the Labour Inspectorates across Europe are severely undermanned and probably not in a position to do this properly. It is quite possible that employers pressurise workers into agreeing to the opt-out, although it is probably not so much to do with the maximum number of hours worked and more about being permanently reachable outside normal working hours.

This brings us to the second risk mentioned, that of not having an adequate boundary between work and private life, and particularly the danger of workers having to be contactable at all times (including evenings and weekends). This risk is, in principle, covered by a number of provisions relating to workers’ rest periods, and particularly Articles 3 and 5 of the directive. Article 3 provides that workers are entitled to a minimum rest period of 11 consecutive hours per 24-hour period. In theory this should restrict the phenomenon of working late in the evenings and then starting again early the next morning. For example, a worker who works until 11 p.m., after the children have gone to bed, should, according to the rules, not start work again until 10 a.m. the next morning. The intrusion of work into the weekend is to a certain extent limited by Article 5, which entitles workers to an uninterrupted rest period of 35 hours once a week – though this need not, as such, be at the weekend.

If a worker is contacted by colleagues or even clients in the evening or at the weekend, this should be considered to be *work*. In such circumstances

⁵⁸ In the Netherlands, for instance, the interpretation of “managerial” or “autonomous decision-taking powers” is simply replaced by an earnings criterion, so that a wage of three times the statutory minimum automatically qualifies a worker for the derogation laid down in Article 17 of the directive.

⁵⁹ Case 484-04 *Commission v UK*: SI 2006/99 the Working Time (Amendment) Regulations 2006.

it is tempting to invoke the judgments in *SIMAP* and *Jaeger*, where the European Court of Justice ruled that the time that a worker spends on call must in principle be regarded in its entirety as working time.⁶⁰ However, these judgments concern on-call activities for which the worker is deemed to be present *in the undertaking* (and therefore not activities he is carrying out at home). Stretching the term “on call” to include activities for which a worker must be contactable *at home* is not consistent with the judgment in *SIMAP*: if workers are occasionally contacted but remain at home, as is the case with time spent on stand-by, for instance, this is not the same as being on call.⁶¹ Nevertheless, it may be argued that the interruption to the consecutive rest period at home should, in principle, result in compensatory rest time. An employer who requires his workers to be permanently contactable is immediately contravening the provisions and particularly the spirit of the Working Time Directive. There are no opt-outs on the question of rest periods: employers and workers cannot simply reach agreement to shorten them. However, the rules on rest periods do not apply to ‘autonomous’ workers (Art. 17(1)). But here again, as was stated earlier, a worker is only ‘autonomous’ if he is *entirely* free to organise his own working time.

The above observations suggest that there needs to be agreement on what employers are entitled to expect in terms of their workers’ working time and contactability. In a number of cases large companies have now proactively introduced policies to implement their duty of care. German companies such as Puma, BMW and Telekom have ordered that workers are not expected to answer emails at weekends, and Volkswagen Germany has the policy that half an hour after workers end their shift emails are no longer automatically forwarded to their smartphones.⁶² Companies embracing NewWoW need to have a clear policy on contactability and observance of rest periods.

60. ECJ, 3 October 2000, Case C-303/98 *Sindicato de Médicos de Asistencia Pública (Simap) v Conselleria de Sanidad y Consumo de la Generalidad Valenciana*. Idem ECJ, 3 July 2001, Case C-241/99 *Confederación Intersindical Galega (CIG) v Servicio Galego de Saúde (Sergas)*. Also ECJ, 9 September 2003, Case C-151/02 *Landeshauptstadt Kiel v Norbert Jaeger*, in particular para. 65. Cf. also ECJ (Second Chamber), 1 December 2005, Case C-14/04 *Abdelkader Deltas and Others v Premier Ministre and Ministre des Affaires Sociales, du Travail et de la Solidarité*.

61. According to Advocate-General Saggio in his Opinion in *SIMAP* (point 37). Cf. J. Kenner (2004), Re-evaluating the concept of working time: an analysis of recent case law, in: *Industrial Relations Journal* 35 (6), p. 593ff.

62. <http://www.bild.de/digital/handy-und-telefon/arbeitsrecht/firmen-stoppen-handystress-24604238.bild.html>.

4. 'New Ways of Work' as an issue for workers' representatives

What the advocates of 'New Ways of Work' (NewWoW) often acclaim as a revolutionary innovation is in many cases not really so very new or revolutionary, particularly not if it does not involve much more than workers regularly working from home or at flexible workstations in open-plan offices on their company's premises. Screen work is screen work, wherever it is carried out. And the fact that workers often work too hard and have too little rest is also nothing new. However, it is entirely possible that the risks of poor ergonomics, heavy work pressure and mental stress will only increase with the rise of NewWoW. And we have not even mentioned risks such as social isolation and the lack of social support, two issues that also form part of the psychosocial workload.⁶³

Section 2 painted a picture of the risks of techno-stress and techno-addiction, the increased risk of RSIs, and the danger of overtiredness. Section 3 suggested that in most cases the legislation that applies to 'normal' work also applies to New Work. Shared workstations and home workstations have to meet ergonomic requirements. The working time and rest periods of New Workers must offer adequate safeguards against overworking and guarantee sufficient recovery. In any event employers need to take on board the risks of NewWoW. However, workers and their representatives (unions, works' councils) too need to be aware of the developments and the risks.

The introduction of NewWoW, nom@dic working or whatever people want to call it is, at all events, not something that can be imposed unilaterally. It involves a radical change to the way that work is organised, and is thus, by dint of its general nature, already a matter for co-determination and worker involvement. In addition, it is an express requirement that workers' representatives must be consulted about the "planning and introduction of new technologies [...], as regards the consequences of the choice of equipment, the working conditions and the working environment for the safety and health of workers" (Art. 6(3)(c) of Framework Directive 89/391/EEC). It is thus evident that if place- and time-independent working is to be introduced in undertakings, there must first be consultation with the workers, which must itself be preceded by an assessment of the risks associated with such work, and the development of measures to limit those risks as much as possible.

⁶³. "The social dimension of work, as illustrated, for example, by the high level of social support from colleagues and managers, remains very important", Parent-Thirion 2012, p. 128.

When place- and time-independent working is introduced a number of basic conditions must be taken into account.

Voluntary character

First of all, it has to be clear that place- and time-independent working is only possible on a voluntary basis, at least if place-independent is understood to mean ‘telework’ away from the office. Article 3 of the Framework Agreement on Telework⁶⁴ spells this out very clearly: “Telework is voluntary for the worker and the employer concerned.” Telework can be imposed, however, if it is in the worker’s initial job description. The worker can then refuse, but the consequence may be that the employer in turn refuses to employ him. But if telework is not part of the original job description, it can only be introduced with the cooperation of the worker(s) concerned. It is not unusual for the request for telework to come from the worker, because he or she wants to be able to combine work and care responsibilities. There is no obligation on employers to grant such requests, however.⁶⁵

Risk assessment and clear agreements in advance

When introducing new technologies or reorganising work, employers must first assess the risks involved. The risk assessment must make clear how any risks can be prevented or minimised. Without an adequate risk assessment workers’ representatives cannot in principle reach an informed opinion on the pros and cons of NewWoW. The risk assessment must consider both physical and psychological stress. As Article 3(1) of the VDU Directive provides: “Employers shall be obliged to perform an analysis of workstations in order to evaluate the safety and health conditions to which they give rise for their workers, particularly as regards possible risks to eyesight, physical problems and problems of *mental stress*” (emphasis added).

Employers and workers’ representatives will have to reach agreement on a number of potential risks *in advance*. The following topics will have to be discussed in any case:

64. Framework Agreement on Telework, July 16 2002, EU agreement between ETUC, UNICE/UEAPME and CEEP, http://ec.europa.eu/employment_social/dsw/public/actRetrieveText.do?id=10418.

65. Social Dialogue Committee 2006, p.16.

Prevention of techno-stress at work – Risk factors to be considered

- Ergonomically appropriate equipment
 - with frequent use of laptops or tablets: a separate, ergonomic keyboard
 - with frequent data processing other than through a keyboard: an ergonomic mouse or trackball
- Ergonomically appropriate workstation design
 - work surface/desk
 - chair
 - light screening
- Minimal exposure to electromagnetic fields
 - use of landlines is preferred
 - use of mobile phones with the lowest possible SAR value
 - instructions on the safe use of mobile phones (use of earpieces, alternating between left and right ears, keeping calls short or preferably sending texts, phoning in places where range is optimal)
- Observance of working time and rest periods
 - 11 hours uninterrupted rest per day, 35 hours once a week, in principle for all workers
 - prevent excessively long working weeks (max. 48 hours), limit workload if it cannot be completed within 48 hours
 - make it clear which workers are regarded as 'autonomous workers' under the Working Time Directive
 - make any on call/standby requirements clear, and introduce measures to minimise work obligations during private time (e.g. no emails forwarded)
- Reimbursement of costs
 - costs of purchase, installation and maintenance of equipment to be paid by the employer, given that it forms part of his duty of care*
 - work-related communication costs to be paid by the employer
 - make it clear that being on call also implies that the worker is working, and must in principle be compensated for it
 - clear information on any allowances for evening/night or weekend work
- Information and training for workers
 - information on the risks of place- and time-independent work (Art. 10 of Framework Directive 89/391/EC): for an overview see Chapter 2
 - training on safe working to be provided upon recruitment or when changing jobs, and when new technologies are introduced (Art. 12 of Framework Directive 89/391/EC)
- Monitoring of New Workers' health
 - individual workers entitled to have access to health surveillance (Art. 14 of Framework Directive 89/391/EC)
 - analysis of the causes of any health problems by the company doctor or other experts in protection and prevention (Art. 7 of the Framework Directive)
 - feedback of (anonymised) data to workers' representatives in order to identify any structural problems
- Periodic evaluation of efficiency and costs of NewWoW
 - what were the aims, and have they been achieved?
 - what are the side-effects (see the results of health monitoring, for instance)?
 - what do the workers think (worker satisfaction survey)?

* "As a general rule, the employer is responsible for providing, installing and maintaining the equipment necessary for regular telework unless the teleworker uses his/her own equipment." Art. 7 of the Framework Agreement on Telework.

Conclusion

Even if “New Working” is not a totally “new” phenomenon, it is clear that various recent breakthroughs in modern information and communications technology have encouraged the further spread of the concept and practice of ‘New Ways of Work’. Drawn by the promise of lower costs held out to them by business consultants, it is likely that many more employers will try to introduce more New Working in the years to come (even though some businesses are already backtracking on the issue). This is also why New Working is going to be an important issue for workers’ representatives for the next decade, because it is clear from this working paper that the path taken by employers could be strewn with pitfalls.

Although research into the possible health effects of New Working is still in its infancy, it appears from the sources cited earlier that there is genuine cause for concern. Compared with research into the effects of exposure to electromagnetic fields resulting from the use of mobile phones and wireless networks, where there is a great deal of uncertainty because of the long latency period and the fact that tumours may have causes other than radiation, the findings about techno-stress and physical complaints of the fingers/wrists are fairly clear-cut: these complaints are directly related to the intensive use of new communication devices and mostly have short term effects.

Roughly one in ten users of mobile devices reports techno-addiction, and it also seems likely, based on the data collected here, that workers using mobile devices intensively also have health complaints such as burn-out and RSIs more often. For a substantial proportion this is caused by insufficient rest or suboptimal ergonomics. Mental and physical stress are now among the main threats to the health of workers. Neck/arm/shoulder complaints are a particularly serious problem, but mental stress too is a complaint reported by one in five of Europe’s workers, according to the most recent edition of the European Working Conditions Survey. This calls for greater involvement of workers’ representatives and their organisations, employers, public authorities and other societal stakeholders.

It is probably not for workers’ representatives to try to stop the rise of New Working – if only because in many cases workers themselves can benefit from the new opportunities. Although the sometimes problematic combination of work and private life is a major psychological burden for Europe’s workers, as underlined in the 2012 European Working Conditions Survey, the flexibility offered by “New Working” can help to improve working conditions in this

respect. Still, as shown earlier, “New Working” also has several downsides – the blurring of work and private life being just one. And even if the rise of New Working is not to be halted, it does need to be kept on the right track.

Workers’ representatives have a strong say in this. As was stated earlier, it is a clear requirement that workers’ representatives are to be consulted about the “planning and introduction of new technologies [...], as regards the consequences of the choice of equipment, the working conditions and the working environment for the safety and health of workers” (Art. 6(3)(c) of Framework Directive 89/391/EEC). Also, the introduction of New Working may be considered a “substantial change in work organisation” as referred to in Article 4(2)(c) of Directive 2002/14/EC on the information and consultation of employees.

The extent to which workers’ representatives are successful in curbing the unrestricted introduction of technologies that may turn out to be harmful to the health (and safety) of workers depends on the specific powers conferred on them by national legislation on the information and consultation of employees. However, the effectiveness of workers’ representatives also depends on their ability to put forward substantive arguments to support the worker’s point of view. These arguments should not just refer to the possible health effects of New Working described in chapter 2 of this working paper. Other perhaps more compelling arguments may be that (techno-) stress leads to absenteeism, which is in most cases not only a financial burden on business but also leads to disruption of work processes and lower productivity. Lower productivity may also be the result of fatigue (see section 2.5), problems of coordination and collaboration, less functional and social support on the shop floor or simply shirking tasks. Processes may also be disrupted by failures in the technological infrastructure that supports New Working. These failures too should form part of a comprehensive assessment of the pros and cons of introducing ‘New Ways of Work’.

The introduction of New Working should take account of individual differences between workers, their personal preferences as regards their work regime and workplace design, and so on. This means that employers should be sensitive not only to “Critical Performance Indicators” but also to “Social Performance Indicators” such as mental health, psycho-social well-being, job satisfaction, etc. Workers’ representatives and other stakeholders should specifically encourage the well-balanced and socially sensitive introduction of New Working. Without this social sensitivity, the Janus face of New Working will sooner or later show its ugly side.

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