Shift work

What is shift work?

According to the ILO (1990), working in shifts is "a method of organization of working time in which workers succeed one another at the workplace so that the establishment can operate longer than the hours of work of individual workers" at different daily and night hours. Within the broad category of shift work, we can make a distinction between a fixed shift system and a rotating one. Under a fixed shift system, working time can be organized in two or three shifts: the early, late and/or night shifts. This means that one group of workers might work during the morning and early afternoon; another group will work during the late afternoon and evening; and the third group (in a three-shift system) will work during the night. Under a rotating shift system, workers might be assigned to work shifts that vary regularly over time; these are called "rotating shifts" because they rotate around the clock (e.g. from a shift in the morning, to one in the afternoon, to one at night). If the firm's equipment is running non-stop the whole week, we can speak of "continuous" shift work with 24 hours of work, seven days a week (i.e. 168 hours of firm operating time). There is a virtually unlimited number of potential shift work patterns.

How is shift work regulated?

Shift systems are commonly regulated by collective agreements in many countries. They are also shaped by the overall legal framework on working time in the country. In particular, limitations on the length of daily and weekly working time; opportunities for averaging hours over longer periods of time; and regulations on overtime, night work and week-end work influence the design of shift systems.

In which shift schedules do shiftworkers work?

Twenty-two per cent of the workers in the European Union worked in some type of a shift system in 2000. The design of shift schedules varies with the legal and institutional framework of the country. For example, in the United States, where there is no general limitation on maximum working hours and where the possibility of averaging hours over a number of weeks is generally unavailable, extended shifts and permanent shifts are more widespread than in Europe, where there are regulations on maximum working hours and many possibilities for averaging hours exist. Figure 1 shows typical continuous rota (continuous operations) four-shift systems in the United States and in the European Union. At the end of each period, each worker switches to the next shift (from A to B, from B to C, from C to D, or from D to A).

Figure 1. Common four-shift systems with continuous rotas in the European Union and the United States

Europe

Shift	Mon	Tue	Wed	Thu	Fri	Sat	Sun
A	m	m	a	a	n	n	n
B			m	m	a	a	a
C	n	n			m	m	m
D	a	a	n	n			

United States

	Week 1							Week 2						
Shift	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
A	m	m	a	a	n	n				m	a	a	n	n
B	a	a	n	n			m	m	m	a	n	n		
C	n	n			m	m	a	a	a	n			m	m
D			m	m	a	a	n	n	n		m	m	a	a

m: morning shift a: afternoon shift n: night shift

Source: J. Gärtner and S. Popkin: "Influence of law on shift schedule design", in S. Hornberger et al.: *Proceedings of the XIV International Symposium on Night and Shiftwork* (Frankfurt, Peter-Lang-Verlag, 2000).

Shift work is also common in other countries. In Chile, for example, around one-quarter of employees were working in shift work arrangements in 2000.[1] In Asia, it was also reported that discontinuous and semi-continuous shift systems were widely introduced in mining, construction and manufacturing. A general tendency has been that continuous shift systems are spreading to different sectors, with increasingly diversified shift rotation patterns.[2]

As regards the gender composition of shiftworkers, female workers are less likely than their male counterparts to work in shift work, sometimes due to the existence of legal prohibitions against night work for women. Nonetheless, there are substantial (and often increasing) numbers of female shiftworkers. In Brazil, for example, 21.3 per cent of workers on rotating shifts in 1994 were women, and the number was increasing.[3]

Advantages and disadvantages

Some of the advantages of using shift work for both workers and employers are given below.

Advantages for employers

- More intensive use of facilities and equipment via extended capital operating time.
- Increases in production to cope with higher demand or to deal with perishable goods.
- Effective operation of continuous and semi-continuous production processes.
- Optimal use of energy or other resources during the night or other slack periods.

Advantages for employees

- Higher total earnings where premium wages are paid for certain types of shifts (e.g. shifts involving night work).
- Longer periods of free time if paid time off is granted in lieu of shift work payments.
- May potentially save existing jobs and/or reduce precarious employment.

While its application depends on various factors and takes a variety of forms, shift work may also result in disadvantages for both employers and workers, especially when night work is involved.

Disadvantages for employers

- Additional administrative costs resulting from having more workers (because more shifts are in operation).
- Complexity and difficulty in ensuring adequate supervision, especially at night.
- Higher labour costs due to shift premiums, provision of welfare facilities and training.
- Potential negative effects on workplace safety and health, especially where night work is involved.

Disadvantages for employees

- Potential negative effects on workers' health and safety, especially where night work is involved. These potential effects include disruption of sleep, increased fatigue, cardio-vascular and gastro-intestinal troubles, effects on reproductive health, increased risk of breast cancer (for women on night shifts).
- Disruption of workers' family and social life, especially due to "unsocial" and irregular hours of work.
- Difficulties in transport to and from work, especially for night workers.
- Work intensification, for example, through the suppression of breaks.
- Reduced access to training or other opportunities for workers on non-day shifts.

In order to limit the potential negative impacts of shift work, it is recommended that a shift system should be structured with the following aspects in mind:

- a short cycle period with regular rotas should be used;
- individual workers should work few nights in succession;
- individual workers should have some free weekends with at least two full days off;
- short intervals between shifts should be avoided;
- flexibility regarding shift change times and shift length is needed.



Case example

The American multinational corporation 3M, acting in the chemical industry, produces personal and care-related products. 3M's German subsidiary employs more than 3,000 workers. In the biggest German factory, the management decided to introduce a new flexible, continuous four-shift-system (including weekend working) providing 24-hour services to better match increasing customer demand. A collaborative effort involving management and groups of workers ended in the elaboration of a new rotating shift system, based on four working groups and running over four-week intervals. The first group of shiftworkers works early, late, and at night, whereas the fourth group of shiftworkers is off-duty. The entire shift work system is elaborated in Figure 2 below:

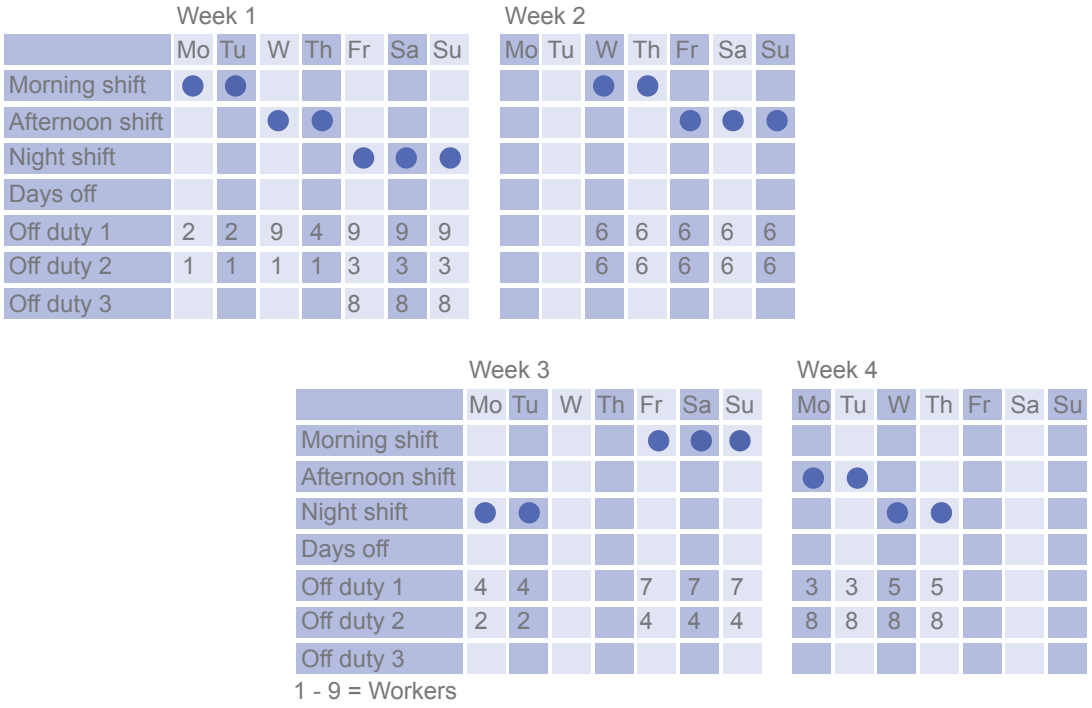

Figure 2: Extended four-shift-system with flexible attendance time

The workers' experiences with this new rotating continuous shift system indicate that this type of system can be considered "worker-friendly" only if the following criteria are implemented:

- there are no long shifts and no short shift rotation;
- the shifts should be in the following order — early, late, night;
- there are no more than three consecutive night shifts; and
- there are at least two consecutive days off after working a set of consecutive night shifts.

Source: '3M Deutschland GmbH: Ein Schritt zu mehr Zeitautonomie in der Produktion: Das flexible Zeitfenstersystem im Vollkonti-Betrieb', in http://www.bmgs.bund.de/de/asp/arbeitszeitmodelle/dokument1.asp?id=4, 21 September 2003.

1 ILO unpublished national report on working time in Chile.
2 ILO: *Asian tripartite workshop on working time arrangements: Proceedings*, document no. PIACT/1994/2 (Geneva, 1994).
3 ILO unpublished national report on working time in Brazil.

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