Advantages and Disadvantages of Twelve-Hour Shifts: A Balanced Perspective

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CIRCADIAN™
24/7 WORKFORCE SOLUTIONS

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INTRODUCTION

Twelve-hour shifts are still one of the most frequently debated topics in shift work management. Managers, shiftworkers, union representatives, federal regulators, corporate policy-makers, and academic experts continue to question and debate how 12-hour shifts compare to 8-hour shifts. Are they safe? What is the impact on performance, productivity and quality? What effects do they have on shiftworker alertness, health and family life? Do they cause problems for management or shiftworkers?

In our role as the leading consulting firm in shiftwork management, CIRCADIAN is frequently asked whether the concerns about 12-hour shifts are justified and whether the enthusiasm of the proponents of 12-hour shifts is merited. We are also frequently asked to help plants solve the wide range of practical issues surrounding the successful implementation and management of 12-hour shifts, not the least of which is what schedule out of the myriad of 12-hour shift schedule possibilities, is the best one for their site.

CIRCADIAN consultants have gathered a great deal of first-hand information from surveying organizations who use 12-hour shifts, to learn about the practices, policies, results and impacts. Over the last two decades, CIRCADIAN has also collected considerable data on the benefits and complications of 12-hour shifts through our work with utilities, chemical plants, oil refineries, pulp and paper mills and other industries running 24 hours, 7 days a week. During this process, we have surveyed tens of thousands of shiftworkers and conducted interviews with thousands of managers, superintendents, supervisors, shiftworkers, regulators and shift schedule specialists.

Other than laboratory studies on alertness, sleep and human performance, there has been very little scientific research to evaluate 12-hour shifts in actual industrial operations. Full scale simulation studies that we have conducted at the Institute for Circadian Physiology indicate that fatigue and loss of alertness are not increased with 12-hour schedules, as compared to 8-hour schedules. However, in reality it is almost impossible to recreate all of the variables of the workplace in a laboratory setting. Therefore, the experience and data from the workplace is the most important to consider.

We are often asked if we know of any places where 12-hour shifts failed and people returned to 8-hour shifts – and the answer is yes. In the few cases where this has occurred, it was usually a result of management making decisions without a careful consultation with the employees. As a result, the employees misunderstood and distrusted the motive for the change and did not provide the needed support to make the 12-hour shifts work. Employee support is required for any scheduling change to fully succeed, and this is true for 12-hour shifts as well, particularly when it comes to ensuring coverage for vacations and other absences. The other cause for returning to an 8 from a 12-hour shift is the use of excessive, mandatory overtime usually due to understaffing, which negates the advantage of 12's (i.e. more days and weekends off).

ADVANTAGES OF 12-HOUR SHIFTS:

A Management Perspective

The major advantages of 12-hour shifts from the management perspective, as experienced by Human Resource Managers, Shift Supervisors, Department Superintendents and Plant Managers are the following:

- **Increased productivity, reduced errors.** There are only two shift turnovers per 24-hour day instead of three. Thus, there are fewer opportunities for miscommunication when there is a changeover in shiftwork personnel. There is less disruption of ongoing operations and reduced potential for errors. Because productivity often drops significantly and error and accident rates increase in many operations during shift transition times, this simple difference between 8-hour and 12-hour shifts has been found to have a significant impact on productivity and error rates. Reducing these "high risk" low productivity and high error periods by one-third can have significant financial and efficiency benefits for the operation.

- **Increased continuity and accountability.** On most days, crew A turns the plant over to crew B at night, and then crew B turns the plant back to crew A the next morning. No one finding a problem can "pass the buck" to a third crew, as may occur with 8-hour shifts. Crews are motivated to "do as they would like to have done to them" which is to hand over and receive the plant with the problems fixed or at least identified and communicated.

- **Reduced adaptation time.** Many shiftworkers need a ramp-up period to get adjusted to each shift, i.e., adjusting monitors and organizing tools, etc. Many state that they are "in the groove" at the 8-hour point, and would rather continue than having to readjust to getting started again the next day. Twelve-hour shifts minimize the percentage of adaptation time as compared to 8-hour shifts because there are 91 fewer shifts one has to work each year.

- **Higher project completion rates.** A greater number of long tasks and projects can be completed within a shift, such as extended maintenance tasks. On 12-hour shifts, several more hours remain to accomplish the work plan; crews are able to complete more of the procedures that they begin. Most maintenance tasks require extensive lock out/tag out procedures. If the tasks are not completed by the end of the shift, substantial time is lost in preparing for a safe crew change over. This can occur 3 times a day with an 8 hour shift and only twice a day with 12 hour shifts.

- **Reduced absenteeism.** Shiftworkers often "think twice" about taking a shift off, because doing so uses 12 hours of leave time. They also tend to feel more accountable to their crew or to the person who may need to be called in on a day off for 12 hours of relief. Thus, in plants

where absenteeism is a problem, the introduction of 12-hour shifts can have a significant beneficial impact. (However, the downside of this is that supervisors have noted that some shiftworkers who should stay home because of sickness will report for their 12-hour duty shifts.) However, with more days off, there are fewer conflicts with personal and family issues that might promote absenteeism. There is more time to take care of personal needs such as doctor's appointments or a sick child. There is also a 50% chance that sickness will occur on days off, further decreasing absences and unscheduled overtime coverage, because people are only scheduled to work half the days of the year as compared to working 75% of the days with a standard 8 hour shift schedule.

- **Lower attrition and turnover.** Shiftworkers usually have less interest in transferring to other plants, to non-shiftwork positions or to other occupations. Experienced employees are usually more readily retained. The increased number of days off is too compelling an incentive to encourage a return to 8-hour workdays. In an industry-wide survey of chemical plants, 96.5% of the employees working 12-hour shifts reported no interest in changing back to an 8-hour schedule.
- **Improved morale.** Twelve-hour shifts typically prove more popular with both shiftworkers and their families. Stress is reduced, and the quality of work and home life is improved greatly.
- **More "dedicated" employees.** During their three to four consecutive days on duty while working 12-hour shifts, shiftworkers tend to concentrate more on their jobs. There is little time for much else besides working, sleeping, meals, and travel to and from work. On 12-hour workdays, employees are more likely to avoid major social events, excessive alcohol consumption or physically taxing activities in their fewer hours of free time.

A Shiftworker Perspective

Major advantages from the perspective of shiftworkers and other employees working 12-hour schedules are:

- **More days off.** On a typical 4 crew 12-hour shift schedules, shiftworkers can virtually double the number of days off per year, as compared to an equivalent 8-hour shift schedule. Thus the standard 2,184 work hours per year (42 hour average per week before factoring in vacations) can be accomplished in 182 work days instead of 273 work days with 8-hour shifts, and with 183 days off instead of 92 days off with 8-hour shifts.
- **Longer and better quality breaks.** There are typically 3 or 4 days off between blocks of work days instead of 1 or 2. Since there are so many more days off, the possibility increases of clustering them to provide extended time off without using up vacation days. It is even possible,

with some 12-hour shift schedules to provide as many as thirteen 7-day breaks per year. In some situations, we even find shiftworkers "selling back" vacation days to the company, because a substantial portion of their needs for vacation time are satisfied by the long breaks built into the schedule.

- **Fewer consecutive days worked.** Shiftworkers on 12-hour shifts typically work 2, 3 or 4 days in a row. The problems of stress and cumulative fatigue are thereby reduced, as compared to typically working 6 or 7 days in a row on 8-hour shifts.
- **Less commuting required.** Fewer days at work mean fewer days of driving to and from work. This represents substantial time saving and reduced transportation costs for employees with long commutes. For example, a 90 minute (82.5 mile) round trip commute and 91 fewer days to work per year means 136.5 fewer hours of commuting time annually (or the equivalent of seventeen 8-hour work shifts) and 7,500 fewer commuting miles. This represents $3,338 (at 44.5 cents per mile - official government rate) in reduced transportation pre-tax costs per year. This translates into the equivalent of $4,172.50 of gross earnings.
- **Twice as many weekend days off.** Shiftworkers typically have 2 out of 4 weekends off when working 12-hour shifts, vs. only 1 weekend off per month for most 8-hour schedules. Survey data shows that more weekend days off is a very high priority for shiftworkers and having only 1 weekend off per month keeps the shiftworkers further isolated from the rest of the Monday-to-Friday, daytime working world and his or her family.
- **Improved family and social life.** Shiftworkers often report improved family life because there are more "quality" days off to spend at home. Shiftworkers on 12-hour schedules report less irritability, more communication and better planning of family activities.
- **Improved morale.** Having more days off relieves stress and improves shiftworkers outlook and attitude. Family members can often become more supportive, further helping morale.
- **More home study time.** Shiftworkers have greater blocks of time in which to prepare for license and requalification exams, or to take extension courses. This can help shiftworkers advance their careers and speed their qualification for better paying positions.
- **More frequent "recuperation" or "recovery" days.** These recovery days occur after blocks of scheduled shifts, so shiftworkers feel more alert and energetic both on and off the job. Many shiftworkers need a recovery day, particularly after working nights, to catch up on sleep. With an 8-hour schedule these recovery days can consume most of the days off, leaving too little quality time for family and friends and preventing the shiftworker from feeling well rested and energetic.

- **Better use of vacation time.** Although there are technically fewer vacation days on 12's versus 8's, by taking only 2, 3 or 4 vacation days at the appropriate time in the cycle, it is possible to have up to 12 consecutive days off. Thus extended vacations are possible several times per year. With 8-hour shifts it takes 5 vacation days to get a week off.
- **Increased utilization of personal time.** With 12-hour shifts, shiftworkers have more consecutive days off and more total days off. They report that they are able to get more done at home, take care of more personal business and shopping during the week, and schedule more family and social events. With 8-hour schedules, there are seldom enough consolidated blocks of time for extended home projects and social activities.
- **Elimination of double shifts and/or holdovers.** Sixteen-hour shifts on short notice (back-to-back 8 –hour shifts) to cover for absences can be eliminated. On 12-hour shifts, shiftworkers usually know exactly how long they will be working, and they can prepare and pace themselves accordingly. This benefit is offset by the degree to which workers get called in unexpectedly on their days off to cover a 12-hour shift, which in turn depends upon the success of their voluntary overtime sign up list as well as overall plant staffing levels.
- **Little effect on overtime opportunities.** For continuous operations, 12-hour shift schedules do not add to or reduce the amount of real overtime required. In 24/7 operations, overtime is a function of staffing level rather than the shift schedule, since all positions have to be filled regardless of shift length.
- **Elimination of evening shifts.** The least desired shift on an 8-hour schedule is usually the evening shift which keeps the shiftworkers isolated from family and friends for extended periods of time. 12-hour shifts minimize this problem because shift changeover times usually allow more contact with the family in the evenings. For example, a typical 8-hour evening shift runs between 3-11 p.m. and provides little to no family time in the evening. In comparison, a typical 12-hour schedule has shift start times between 6-8 a.m. and 6-8 p.m. Thus, most shiftworkers can spend some amount of quality time with their family either before or after the shift.

DISADVANTAGES OF 12-HOUR SHIFTS:

A management perspective

The major disadvantages of 12-hour shifts from a management perspective are:

- **Greater challenge to sustain vigilance.** Twelve hours may simply be too long for someone on monitor duty to maintain constant vigilance. A machine or console operator whose sole responsibility is to monitor a process for 12 hours may be approaching or going beyond the limits of his or her ability to maintain complete effectiveness. However, this is an intuitive concern, and there is actually no hard scientific data that substantiates this perception. Moreover, survey and anecdotal feedback to date do not indicate any problems for most jobs, the exception being for extremely physically demanding jobs with high task repetitions. Possible solutions in these cases include introducing less physical tasks or rotating job assignments during shifts between crew members, or re-engineering the job or work station.

- **Extended exposure to work-related stress.** For certain shiftworkers on control room duty, the day shift often provides high demands of work related activity and distraction, and involves a high number of interactions with maintenance, instrumentation engineers, contractors and other support staff who work straight day shifts. This is especially true on week days. Twelve continuous hours may be a long time for a control room operator to deal with the stress associated with these conditions. While 4 consecutive 12-hour day shifts could be particularly fatiguing and stressful, reports to date have indicated only isolated problems in this area despite widespread conversion to 12-hour schedules.

- **Diminished communication and/or personal interaction.** Management personnel have less opportunity for interaction with crews working 12-hour shifts. Rotating 12-hour shiftworkers may only be on day shift duty for seven days during each 28 day cycle, thus decreasing exposure to day management. Shiftworkers' contacts with training staff and their availability for meetings involving management, human resources, medical and other personnel may also be reduced. Management may have to be more flexible with their own work hours in order to achieve the desired employee interaction.

- **Unequal distribution of work hours.** Over each 7-day pay period 12-hour schedules vary between 48-and-36-hour work weeks. Since Federal Law requires overtime pay for more than 40 hours work in a week, an adjustment in payroll structure and base pay rates may be required to maintain cost neutrality. Existing collective bargaining agreements can complicate this process, although this has been readily resolved with provisionary amendment letters based on mutual agreement.

- **Increased risk of getting out of touch.** Long breaks away from the plant may be good for shiftworker's personal life, but not necessarily for plant operations. Too many consecutive days off may result in decreased familiarity with changes in the operation, and shiftworkers may need a period of readjustment after returning from a long break. They may need to re-familiarize themselves more often with the "big picture" of plant operations after long breaks to ensure operational "continuity."
- **Potential compromise in alertness and performance.** Shiftworkers may be willing to compromise their alertness and performance on the job in order to get more consecutive days off. Some shiftworkers can lose their objectivity concerning the potential drawbacks of 12-hour shifts, although there are few reports to date of reduced performance with 12-hour schedules.
- **Increased "moonlighting".** The concern that some shiftworkers will use the extra days off provided by 12-hour shifts to take second jobs, especially physically demanding construction and farming jobs, has created the perception that this will undermine the advantage of recovery days. The reality is that only 7 – 10% of shiftworkers engage in this practice, and that they tend to be the most productive workers because they are highly motivated individuals.
- **Increased ergonomic risk.** Potential injury problems may occur with shiftworkers who have physically demanding jobs. Although these 'hands on" jobs now comprise only 16% of the total workforce, the strain of working such jobs on a 12-hour shift instead of an 8-hour shift could potentially increase physical complaints, such as back trouble and carpal tunnel syndrome. Job processes and job rotation might have to be reexamined and altered in order to reduce the physical strain on employees. Ergonomics issues need to be identified and addressed. Again, this has rarely been reflected in actual experience, but represents a legitimate concern for some jobs.
- **More difficult absence coverage.** Since it is not advisable to assign shiftworkers overtime hours on scheduled work days, and thereby lengthen the work days beyond 12 hours, it is necessary to establish procedures to cover unexpected absences. Depending upon the effectiveness of methods such as a volunteer overtime list supported with a scheduled (annual) call-out list, coverage for vacations and absences can become more difficult, as can scheduling for training and planned overtime.
- **Difficulties of change.** The selection and conversion to any new schedule is complex and time consuming. Effort by management to educate shift workers on the many issues associated with 12-hour shifts is often necessary to ensure informed decision-making, help ease the transition, and improve worker morale.

A shiftworker perspective

- **Limited family and social time during working days.** Shiftworkers may have less opportunity to see their spouses and children on working days. Child care and day care conflicts may also occur, since many babysitters may be unable to extend their hours and the hours of child care facilities do not correspond with shift schedules. Single workers may find it more difficult to schedule dates and activities with friends.

- **Sleep schedule inflexibility.** Hours away from work during a work day are limited, so a shiftworker's optimal timing and amount of sleep may be a challenge to achieve. Sleep schedule disruption can potentially occur because of the reduced flexibility for sleep time. In contrast, on an 8-hour schedule, night shift workers can choose to sleep in the morning when they return home or stay up in the morning and sleep later in the day, depending on their sleep physiology. Twelve-hour shiftworkers do not have this flexibility, and when working nights they need to condition themselves to sleep in the morning and into the early afternoon.

- **Irregular pay weeks.** Most 12-hour schedules have alternating pay weeks of 36 and 48 hours. This can make it more difficult for a worker to budget his or her finances, since most people plan their finances based on a 40 hour week.

- **Concerns of older workers.** Older shiftworkers respond less favorably toward 12-hour shifts than younger workers. Many older workers are less enthusiastic about making any schedule changes, because this may disrupt their established work and social routines. They may also feel that 12 hours is simply too long for a regularly scheduled work period. In fact, it is physiologically more difficult for someone in their mid 50's or 60's to sustain vigilance for longer periods of time than it is for someone younger. There also may be fewer reasons for the older shiftworker to want to compress the work week by working longer hours; i.e., they no longer have children living at home, and frequent vacations or long breaks may be less important

- **Reduced tolerance of long commutes.** With a 1-hour commute to work (each way), the actual time away from home for the shiftworker may approach 14 hours or more. This leaves time for sleeping and meals and little else. Daily recreational activity and exercise regimens may be compromised. Distance from home to the plant may thus become more important on 12-hour shifts.

- **Difficulties in scheduling meetings.** Twelve hours is typically as long as most workers want to be on-site. Thus, if shiftworkers are asked to stay over after the night shift for training or plant meetings, the workday may be unacceptably lengthened. Consequently, many employers with 12-hour schedules conduct training and other meetings on "scheduled days off." Survey data and anecdotal information suggests that the majority of shiftworkers prefer coming in on days off for meetings (rather than staying after a shift), as long as the meetings are

planned well in advance, don't last more than four hours, and occur no more than once during a four week period.

- **Reduced tolerance to physically demanding jobs.** Such jobs can be more difficult on 12-hour shifts. Unless countermeasures are taken to alleviate the problem, there may be an increase in work-related injuries and a rise in general discomfort, such as aching feet and backs. Solutions include reworking certain job processes or rotating jobs during a shift, and many physical complaints are mitigated by the increased number of recovery days.
- **More pay lost when a day is missed.** On occasions when shiftworkers take an unpaid day off, they may lose the equivalent of 33% more pay during their absence as compared to 8-hour shifts. This magnifies their personal financial loss from absences. However, the increased number of days off means that sickness has a better than 50% likelihood of occurring during a day off, instead of on a work day.
- **Driver fatigue returning home.** Drowsiness when driving is always a concern, since it is not uncommon for workers on any type of schedule to feel drowsy or to "fight" sleep while driving home. The already difficult task of staying awake while driving home after working an 8-hour midnight shift might be assumed to be even more difficult after working a 12-hour shift. However, this concern is linked much more strongly to the time of day of commuting than to the length of the shift. Thus alertness training and other precautions can help reduce the risk of driver fatigue.
- **Fast-rotating 12-hour schedules.** Certain schedules can cause sleep problems when "flip-flopping" from nights to days, because it's hard for one's body to adjust to frequent changes. This problem can be minimized with a well-designed, biocompatible schedule that provides for sufficient recovery time between rotations.
- **Longer hours away from home in the evenings.** Extended work hours may be undesirable from the standpoint of family and home security. Watchdogs, alarm systems, and networks of telephone friends can alleviate these concerns.
- **Increased percentage of night shifts.** Instead of only one–third of work shifts being night shifts on an 8-hour schedule, one-half of the shifts are night shifts on a 12-hour schedule. This is of course counterbalanced by the reduced number of shifts worked, and also by the fact that half of the work time will occur during the day shift.

SUMMARY OF FEATURES FOR 8 AND 12-HOUR SHIFT SCHEDULES

Feature	8-Hour Shift	Combination 8 & 12	12-Hour Shifts
Consecutive shifts	5, 6, or 7	5, 6, or 7	2, 3, or 4
Length of breaks	1-4 days	2-6 days	2-8 days
Frequency of breaks	Every 5-7 days	Every 5-7 days	Every 2-4 days
Direction of rotation	Forward/Reverse	Forward/Reverse	Many
Speed of rotation	Fast or Slow	Fast or Slow	Many
Fixed shift possibilities	Few	Few	Many
# of shifts worked a year	274	248	182.5
Total days off a year	91	117	182.5
# of days worked/cycle	21/28	19/28	14/28
# of days off/cycle	7/28	9/28	14/28
Weekends off/year	6-13	26	26
# of days between weekend time off	25-91	18-40	11-35
Total hours worked a year	2184	2184	2184
Average hours worked a week	42	42	42

CONCLUSION

The assessment of the merits of 12- vs. 8-hour shift schedules is a complex issue that does not have a simple answer. Clearly, there are compelling advantages for 12-hour schedules such as more time off and more weekend days off, but these are balanced by the longer working days and the questions of mental and physical fatigue. Nevertheless, the growing trend towards conversion to 12-hour schedules in most continuous, round-the-clock operations has had positive results. In fact, 12-hour shift schedules have proven to be safe, productive, and agreeable to most shiftworkers who have made the conversion from conventional 8-hour shifts. For example, in an industry-wide survey of chemical plants in the US, 96% of all shiftworkers who have converted to 12-hour schedules reported that they would not want to return to an 8-hour schedule.

Nevertheless, 12-hour shift schedules are not for everybody and not for every situation. Jobs that require heavy physical labor may not be desirable due to the possibility of fatigue and ergonomic injuries. Similarly, 12-hour schedules may be harder on older work groups and those who have to commute long distances. Moreover, there are certain types of 12-hour schedules that are extremely difficult to adapt to in terms of circadian (sleep/wake) physiology. All 12-hour schedules are not created equal, so it is extremely important to take the time and effort necessary to determine the best possible schedule for your given shiftwork population. In the final analysis any schedule (8, 10's or 12's) is most effective when "owned" by the employees who have to work it.

In any rescheduling endeavor, the key objective is to achieve the "best" schedule. This requires providing appropriate education to the workforce to ensure that informed decisions can be made, and than involving your employees in the selection process. It is also critical that all options and alternatives (i.e. 8's, 12's, and combinations of 8 and 12-hour shifts) be thoroughly evaluated by both management and the hourly employees who have to work the new schedule. With employee involvement, it is possible to achieve a win-win situation in which the company can achieve a positive improvement in employee morale, performance and operating efficiency, while shiftworkers can enjoy the benefits that an "optimum" shift schedule can provide for their health, safety, and quality of life.

Circadian Technologies, Inc. has been helping 24/7 operations and their workers resolve these scheduling issues for over 25 years. Over that period Circadian has developed a proven approach for determining the best schedule for any given workforce. If you are interested in learning more about shift scheduling, please visit www.circadian.com, email us at info@circadian.com or call Circadian at 1-800-284-5001.

ABOUT THE AUTHORS:

Dr. Martin Moore-Ede is recognized as a world leading authority and visionary on how businesses can compete successfully, and assure their employees thrive, in the emerging 24/7 economy. As a professor at Harvard Medical School he pioneered the research on how to adapt the human body to working around the clock. As founder and CEO of Circadian Technologies, Dr. Moore-Ede lectures and consults business leaders and managers around the world on the extraordinary rewards that can be gained by executing 24/7 operations with excellence.

He has published over 145 scientific articles and 10 books on the human aspects of 24/7 operations. Dr. Moore-Ede's best-selling book *The Twenty-Four-Hour Society: Understanding Human Limits in a World That Never Stops*, has been published in the United States, United Kingdom, Germany, Australia, Japan and China.

He has appeared on the CBS Evening News, Good Morning America, Today, CNN Business News, 20/20, Dateline, Oprah, and BBC-TV and PBS documentaries. He has also received numerous academic honors and awards, including recognition as one of the outstanding teachers at Harvard Medical School. Dr. Moore-Ede received his medical degrees from the University of London and Guy's Hospital Medical School, and his Ph.D. in Physiology from Harvard University.

William (Bill) Davis joined Circadian Technologies as a former client and now serves as Vice President of Operations. He is an industrial safety manager with a broad-based and unique operational background that spans nearly 20 years. This has included production experience at the facility, divisional and corporate levels at International Paper and other leading pulp & paper companies.

Beginning as a shiftworker in the Pennsylvanian steel mills, Bill has held both plant management and corporate safety positions in the paper and specialty board industries. He has extensive experience working with a variety of unions and governmental safety and health regulatory agencies, as well as first-hand experience with high performance & self-directed work environments. His real-world industrial background affords a natural rapport with managers, union representatives and employees at all organizational levels.

William (Bill) Sirois is Senior Vice President and Chief Operating Officer for Circadian Technologies. Bill has a Chemical Engineering and Ergonomics background, with more than three decades of industrial management and consulting experience in the areas of health, safety and productivity. He has published numerous articles on shiftwork and is internationally recognized as an expert in workforce management. Bill is a frequent speaker at national and international conferences, and is often quoted in the Wall Street Journal and a wide range of industrial trade publications.

Having been a former shiftworker in chemical and plastic plant operations, Bill is well acquainted with the effects of shiftwork and shift schedules on fatigue, human error, and impaired performance.

ABOUT CIRCADIAN™

CIRCADIAN™ is the global leader in providing 24/7 workforce performance and safety solutions for businesses that operate around the clock. Through a unique combination of consulting expertise, research, software tools and informative publications, CIRCADIAN helps organizations in the 24-hour economy optimize employee performance and reduce the inherent risks and costs of their extended hours operations.

Working from offices in North America, Europe and Asia, CIRCADIAN experts ensure that over half the Fortune 500, and other leading international companies, thrive in the global 24/7 economy. CIRCADIAN's core expertise is the staffing, scheduling, training and risk management of their most vital asset – the 24/7 workforce.

Founded in 1983 by Dr. Martin Moore-Ede, a former professor at Harvard Medical School and author of the best-selling book "*The Twenty-Four Hour Society*", CIRCADIAN has led the development of innovative new technologies and tools to enable employees to successfully adapt to today's high performance 24/7 workplace.

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