

GOOD ASSET MANAGEMENT EQUALS SMART SCHEDULING

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ABSTRACT

Demanding work schedules are a fact of life in our society today; this is highlighted by broadcast stations the must operate 24-hours a day simply to serve their audience properly. The work schedules required for operations like this can create quite a strain on the entire staff and can affect a worker's safety and health. Mistakes by an employee that is tired can also affect the public's safety and health.

DEAL!

How does one deal with the stress of being in a difficult profession like police officer or working the graveyard shift in a 24-hour broadcasting station? The reality of these professions is shiftwork and the related stress. If this comes as a surprise to anyone entering the career field, then they should run away from this work as quickly as possible. We can assume anyone entering either of these, or similar careers, must know to expect some shiftwork and realize there are other challenges involved.

In our profession, many cannot avoid night or rotating shiftwork. Without invading anyone privacy, we will examine some ways today's supervisor can work with their people to ensure that the work schedule and work environment is minimized as a contributing factor in any health or safety issue. A night-shift worker's concerns may begin with safety when entering the building at midnight and end with falling asleep at the wheel while driving home. In between are problems with alertness, social isolation and physical distress.

According to the Bureau of Labor Statistics, in 2001 almost 15 million Americans worked evening shift, night shift, rotating shifts, or other irregular schedules. In 2003, The International Labor Office reported the amount of hours worked in the United States exceeded Japan's and most of western Europe. Both shift work and extended work hours have long been associated with health and safety risks.

In the May, 2005 Bureau of Labor statistics survey, there were almost 1.7 million employed in the arts, design, entertainment, sports and media industry. The industry groups are based upon the Standard Occupational Classification system which is used by federal agencies to classify workers into occupational categories in order to collect, calculate, or disseminate data. Everyone in the workforce can be classified into

one of hundreds of occupations according to their job. To make this system easier to work with, there are 23 major groups, 96 minor groups, and 449 broad occupations which cover all Americans. Each broad occupational group includes detailed occupations that have similar duties, skills, education, and/or experience. In the same , we found that the mean annual salary of our major occupational group was \$44,310; averaging a 3 percent increase per year; that would give us an annual salary of \$47,008 in 2007. We can safely assume there will be a difference in annual earnings by a master control operator in Ottumwa, Iowa and someone working in Manhattan. By the way, some of the other professions also grouped with us include, painters, sculptors, window trimmers, actors, umpires and referees, and public address system announcers and fashion designers.

In many of the industries mentioned above, the work is performed generally on weekdays; yes, some weekends are included, but few are limited to round-the-clock work schedules; radio and television broadcasting are some of the professions.

TO YOUR HEALTH

Shiftworkers and night workers are often tired due to their work schedule. Being tired makes it difficult to concentrate, which increases the possibility of errors or accidents. This can be a risk both to the worker and to the public. The stress of shiftwork can also aggravate health conditions; such as heart disease or stomach disorders.

Working at night makes it difficult to get enough sleep. Sleep after night work usually is shorter and less refreshing or satisfying than sleep during the normal nighttime hours. Brain and body functions slow down during the nighttime and early morning hours. The combination of sleep loss and working at the body's low point can cause excessive fatigue and sleepiness. This not only makes it more difficult to perform well, but it increases the risk of accidents. Also, shiftwork can be stressful because of frequent switching from a day to night schedule and because of separation from family and friend. These stressors can be harmful to anyone's health.

According to the Bureau of Labor Statistics Census of Fatal Occupational Injuries, over 13,300 workers died

in roadway crashes between 1992 and 2001. If we did the math, we would find that approximately four people, per day, died from these accidents. Of all causes for work related deaths, roadway crashes; this represented 22 percent of all the deaths, and was the number one cause. In 2000 alone, it cost society \$61 billion in lost wages and benefits for crash victims in work and non-work related incidents. An additional \$4 billion in costs was passed on to employers in the form of lost productivity. For employers and victims, a workplace crash can have additional financial, medical, and legal consequences for year to come.

Shiftwork involves most any work performed outside normal daylight hours. In a 1997 publication from the Department of Health and Human Services called "Plain Language About Shiftwork," daylight hours are generally considered to be from 7 a.m. – 6 p.m. where one has to work a 7-8 hour shift, though many in Alaska would argue that with you. Those working a shift may work in the evenings, late nights, early mornings or a combination of them. Workers might also work regular days at one time or another. Many shiftworkers simply rotate around the clock, constantly changing work times from day to evening or day to night. The rotation may occur daily, weekly or monthly and is a classic scheduling technique still used today by police, firefighters, and the military. Waiters and waitresses may be assigned to a permanent shift but can only work a night, while a night watchman may only work the graveyard shift. The need for shiftwork is understandable and if we are in the position of scheduling our staff to cover many shifts, it is important to consider the needs of the company against the needs of the job at hand and the needs of the workers. It's a paradox that since there are so many more shiftworkers these days, we also need more shiftworkers to provide services that were once only available during the day.

ANY VOLUNTEERS?

Why would an employee want to work on a shift? Some actually prefer non-day work, but most do not go looking for shiftwork. Some of the reasons for choosing shiftwork include better pay (night differential), more time during the day for child care, more daylight for personal pursuits, and more time to attend school. Some prefer shiftwork because there is less activity at work and fewer managers around; nonetheless, most of those workers would not choose shift work but do it as a requirement of the job.

Personnel and Human Resource managers are constantly asked, "What is the best schedule?" There is no perfect schedule that fits every situation. The most common schedule is five consecutive days of work followed by two consecutive days away from work for a traditional weekend break. In a rotating schedule, the employee will normally start a new shift after their

weekend break. It is not unusual for workers on offshore oil rigs though to work 14 days in a row then return home for a 14 day break. With each schedule comes its good and bad points; it is always hoped the good points outweigh the bad and that there is little affect upon safety, health and productivity.

One technique many managers and supervisors use is 'creative scheduling' in order to ensure there is enough staffing for every daily requirement. Creative scheduling is simply another name for looking beyond the norms and coming up with a way to satisfy the needs of the company and the employee, especially when extraordinary circumstances force scheduling outside normal methods. For example, scheduling weekend coverage with a full time employee working 10-hours a day for 4 days with a 3-day weekend, or even three 13-hour days; there are many mixtures of schedules that can be accommodated when both employer and employee are willing to work together. These shorter work periods are also examples of compressed work weeks. A warning about creative scheduling though: About three years ago a company had an employee work a split shift for a number of months. With the employee's approval, they worked 4 hours in the morning and 4 hours in the evening. The shift was scheduled and went on for months. Soon the employee changed back to a full 8-hour shift daily. Unbeknownst to the employee and the employer, labor laws guaranteed the employee extra pay for each day worked on the split shift. Years later, when the problem was realized, the company paid the extra money.

To entice employees into working unusual, or off-hour shifts, many companies use shift differentials, or shift premiums. Most companies with non-stop operations generally rely on three shifts to maintain on-site staffing. Employees working the overnight shift, or grave shift, are the most likely recipients of extra money per hour for working the least popular work hours. Some of the normal questions that must be asked before establishing any shifts are:

- Will there be overtime allowed?
- How long should each shift last?
- How much time will be allowed between shifts?
- How much rest will be allowed during shifts?
- How many days will be worked before a weekend break?
- How many days will comprise the weekend break?

Some ways to improve the morale and health of the crew are:

- Provide time for exercise while at work.

- Have extended hours of service for HR and Finance.
- Make sure healthy snacks are available in vending machines.
- Subsidize extended hour child care.
- Subsidize secure parking when possible.
- Allow music and television during breaks.
- Eliminate shift premiums by increasing base pay.
- Be tolerant and flexible during family emergencies.
- Keep security personnel on site.
- Install emergency call boxes in secluded areas.

In their most recent report called *Workers on Flexible and Shift Schedules*, the US Bureau of Labor Statistics said that as of May 2004 over 27 million full-time wage and salary workers had flexible work schedules letting them vary the time they started or ended work. These workers made up 27.5 percent of the full-time work force, which was down from 28.6 percent three years earlier. The proportion who usually worked a shift other than a daytime schedule remained close to the 2001 level of 14.8 percent. With the increase of shiftwork needed for production and support services, these numbers are expected to jump. In the past, it was safe to claim that shiftworkers were generally limited to the manufacturing, mining and transportation industries. Now shift workers are found in customer service call centers, retail establishments, information technology monitoring and support centers, hospitals, hotels, casinos, emergency response services, and broadcast operations.

As the need for extended operating hours grows, more and more organizations are adopting work schedules that require longer and/or multiple shifts. If you find yourself faced with this problem, ask for assistance from your Personnel or Human Resources Department; they can help develop and implement any new work schedules. With their support, most schedules will see few problems.

Shift Length

Understandably, the majority of employees prefer to work shifts longer than eight hours in order to get a longer weekend. The benefits can be a substantial morale booster. For example, in a company that must run a 24/7 schedule, the employee that works five 8-hour shifts willing receive on average 91 days off each year. Those working four 10-hour shifts receive 146 days off per year, and those working 12-hour shifts will normally receive 182 days off per year. On average, 10-hour shifts are preferred by workers because they are easier to tolerate than 12-hours shifts while still allowing for more time off over the 8-hour work schedules.

While 10-hour shifts are great for the employee, they do not make good management sense for any 24/7 operation. When scheduling people on 10-hours shifts it takes three shifts to cover an entire day but in stead of 3 shifts of 8-hours each to cover the 24-hour day, 3 shifts of 10-hours each have workers on-site for 30-hours daily; an overage of 6-hours of double coverage per day. Assuming the workload is static throughout each workday, the overlapping hours can very well constitute wasted manpower and in the long run, cost a great deal of wasted money. As long as the workload of a 10-hour shift can fluctuate to accommodate increased staffing, then it may make very good sense, but the solution is to schedule overlaps only when work levels fluctuate to make the staffing levels match the workload. This will increase customer service levels and boost morale as staffing levels will consistently meet the demands placed upon the workers. An option to consider is possibly putting a few select people on 10-hour shifts, especially for those that must work every Saturday and Sunday as a perquisite to missing out on many of the standard weekend activities we take for granted.

If you are working in a company with consistent work loads, then consider 12-hour shifts over 8-hour shifts. There are not many that will enjoy the long work days, but that is usually forgotten when they realize how much free time they will earn. Before you launch into a new 12-hour work schedule, there are some considerations.

As long as total numbers of hours worked remains the same, most work can be accomplished as well on either shorter or longer shifts. Some jobs involving a great deal of tedium are best left to shorter shifts.

If the shiftworkers will be exposed to extreme heat, noises, or other physically draining work, it may be too much even for the best worker to endure for more than 8-hours.

Lastly, consider what your specific staff prefers. Longer shifts are generally preferred, but they may not be acceptable to everyone. Help yourself and the employees by helping them understand what will be expected of them and what shifts are available. The informed worker with the ability to have some influence on their future work schedule will be a happier worker.

THIS REQUIRES SHIFTWORK

You have considered the information above and realize that your new schedule requiring shiftwork is the best way to go. Will you stick with stable schedules or rotate people? If you rotate, will it be a forward or backwards rotation? With a stable schedule, the hours and days worked will remain predictable. An employee can remain on the shift and yet work different days of the week in order to fairly distribute the work on

weekends and holidays too. This could be considered a lite version of a rotation schedule, but it does let the employee maintain a more regular schedule. Certainly, employees prefer a static, predictable shift schedule, but sometimes that is not possible, especially when trying to fairly schedule the rest of the staff. The advantages of stable shifts are:

- Every facet of the shift is learned by all.
- Employees are happier, thus morale is higher.
- Greater team building with a known group of co-workers.
- Where one shift has more work than another, the work, or the shift personnel can be redistributed to equalize all things.

The disadvantages of stable shifts are:

- Shift ownership and turf wars.
- Apathy due to familiarity.
- Personal and professional growth stymied due to a lack of challenges.
- Those on the overnight shift can feel forgotten.

The other point to make here is there are definite benefits to shift rotation, as there are deterrents. Many companies manage their productivity and operations quite well with a rotating shift schedule, while others would never consider a rotating schedule. The choice is really up to company management and what seems to work best for the company the industry and the employees. This is a good point to note that so much of the research available about rotating schedules and shiftwork leans towards providing work hours that are best for the employee. The bottom line is if you can keep the employee happy in the work place and in their personal life, then they will likely produce far and above the standard of the person who is unhappy. Schedules that are selected as part of a process where employees are involved are likely to remain in place nearly twice as long as any duty schedule that is dictated by management. The key to a successful partnership between labor and management is a collaborative labor relations program based on mutual trust and respect. These principles apply in commercial business and in government today. With rotating shifts, personnel move from on shift to another. The advantages of rotating shifts are:

- A balance of expertise on each shift.
- Everyone gets equal exposure to the most desired shifts.

- Limited training resources can be used during one shift that will eventually touch all personnel as they rotate.

Many companies go the extra mile by holding training sessions during every shift so it is accomplished during normal hours of the shiftworker and not on overtime. Some real benefits of this gesture is that workers will be more attentive and alert during their shift and will also view this effort by the company in a very positive way. When its impossible to provide training during the shift, at least schedule it when the shift begins, that way you are not trying to train workers at the end of a shift when they are their most tired.

Set The Pattern

So you have decided on whether rotation is best for your company; now you need to consider what the standard 'days on' and 'days off' pattern will be for the staff. Most prefer to work Monday through Friday with Saturday and Sunday off. With shift work, this can be extremely hard to accommodate. There are many different variations, and while the standard is 5 days-on and 2 days off, the preferred method is 4 days-on followed by 3-days off as it provides one more day of 'rest and relation time' in the employee's mind. When it comes time for you to choose the pattern of days to work for the crew, consider when they will have their weekends, give consecutive days off if at all possible, which in turn means working people for consecutive days. Working for a long stretch of time, followed by a one day break may not be acceptable to anyone; be flexible and work with people as much as possible.

STRESS AND SHIFTWORK

The stress of shiftwork can be reduced by movement from one shift to another. Given the regular chance to move off of an undesirable shift will help reduce the hours spent anxiously worrying about negative aspects of any shift. Conflicts between work and non-work related duties can be addressed through flexible scheduling or rotating schedules. Given this flexibility, people assigned to the least desirable shifts will know they can leave the shift eventually and have a fair shot at working the shift, or shifts, they prefer. As someone that must create a duty schedule for a 24/7 operation, it is important to note it is impossible to make everyone happy; nonetheless, efforts must be made towards accomplishing just that!

Common sense tells us that with any schedule, especially one requiring shiftwork, all must be treated fairly with no discrimination or favoritism. Determining what is best for the company and the employees leaves many questions to be answered. Which type of schedule is truly best for the

organization? Is it truly the best for all the workers? If not, which is?

In the workplace, there are finite resources available to complete the work at hand; they are personnel, money, materials and machines, and time. The one resource difficult to quantify is that of personnel and the specific skills each employee possesses. How they are scheduled and used on the job will have dramatic effects upon the success of operations and the employee turnover rate. When faced with a 24 hour operation, someone must be working around the clock; how those personnel are scheduled can result in dramatic outcomes. For a clearer understanding, we must recognize some of the challenges and hazards of shiftwork.

Shiftworkers are often tired and sleepy because of their work schedule. Being overly tired makes it difficult to concentrate, which increases the possibility of errors or accidents. This can be a risk both to the worker and to the public. The stress of shiftwork also can aggravate health conditions, such as heart disease or digestive disorders.

Working at night makes it difficult to get enough sleep. For a shiftworker, sleep is usually shorter and less refreshing than sleep taken during normal nighttime hours. Additionally, brain and body functions slow during the nighttime and early morning hours. The combination of sleep loss and working at the body's low-point can cause fatigue and sleepiness. This makes it difficult to not only perform well but it also increases the risk of accidents. For anyone that must work a rotating schedule, shiftwork can be even more stressful because of frequent switching from a day to night schedule. When you add to that the inherent separations from family and friends, you have the makings for a greater number of stressed employees.

One point to consider with shifts is ownership, or turf wars. This is protection of one's territory within an organization, whether this territory is perceived or real. Allowed to stay on one shift, it is only natural the employees will bond and work to protect their work zones. It is not unusual for many to identify with their coworkers and to pride in the identification they give to their crew, but it can also lead to arguments with the people from other shifts. There is a line from the old Mac Davis song that goes: "Walk a mile in my shoes; before you abuse, criticize and choose; walk a mile in my shoes." This axiom can be applied to work schedules too. You cannot empathize with, or understand what another group is doing or thinking until you experience it for yourself, right? One way to solve the problems between different work crews is to rotate them so each benefits from the different hours. To many, the clear answer is to rotate individuals or entire teams. In this case, the person setting the

schedule must also help set a schedule of when and where people work.

Absenteeism costs companies more and more each year. If an employee only makes \$7 per hour and there are 99 other employees in the same situation, it costs the company \$33000 a year to give them all 6 days of sick leave. It doesn't take into account the cost of other benefits, the cost of contractor or temporary help, overtime pay, lost productivity, impact on morale, and more. Absenteeism overall is on the rise. To keep this under control, companies must realize that helping workers stay satisfied with their jobs is of the utmost importance.

FORWARD OR BACKWARD?

How to handle rotating schedules? First of all, all humans have a built in tendency to resist change. When we feel we have reached a level of competence and confidence with our work, we want to hold onto the position; to change is to risk becoming less competent. Change not only causes us to lose the routine we have come to know, but it can also be a bit frightening to move onto something new. One of the worse things a scheduler can do is to make a significant change in someone's life and give them little or no time to adjust.

To start a rotating schedule, plan it out, know what schedule every person will move to next and do not forget to give appropriate breaks to those going from an extreme shift to another. Consider whether moving forward or backwards will have any negative effects too. When announcing changes, give the staff at least 3-months advanced notice; 90-days to adjust one life is certainly better than anything less. If you care to make adjustment to the change easier, then make the new schedule effective after 6-months. Again, people will still be shocked at the change, but you have now given them months to mentally and physically prepare for their new routine. Also provide employees sufficient outlets for voicing their concerns and lastly, remain flexible where possible. Concerns that go unexpressed lead to resistance that is difficult to overcome. For example, someone may not be able to work a shift due to the financial burden caused by the costs associated with finding a babysitter.

In general is it best to rotate backwards; the staff on the overnight shift starts earlier in the day on the mid-shift; the mid-shift moves backwards to the dayshift and the day shift crew moves backwards to the overnight shift. Studies have shown the backward rotation is easier on a body's circadian rhythms than a forward rotation. When forward rotation is used, people are then working at a time that was likely used for their sleep; it is a much more difficult adjustment on everyone's part.

ROOTS & TRENDS

The history of rotating shifts has its roots dating back to 1879 when Thomas Edison invented the light bulb. When we conquered the night, it let industries continue operations well beyond sunset. At the turn of the 20th century industrialization grew dramatically; manufacturing could literally continue around the clock with new crews coming in after so many hours to continue the process.

In the 1980's computer technologies took hold and the demand for employees with technical skills jumped. As with manufacturing, computer industries found many needs for round-the-clock operations. In the 1990's the booming economy drove increases in productivity. The key was to maximize the use of all assets while continuing to provide customer service. Just a few years ago, 24/7 operations have taken a foothold in retail too. You can shop online or by phone with Sears, JC Penny and others no matter what time of day. This trend is also highlighted by Wal-Mart opening up their 1500th 24-hour store just a few short years ago. Here in the 21st-century, the current trend is to consolidate and centralize global control and monitoring of employees and facilities. Current trends also show that the education level of today's workforce in the industries with round-the-clock operations is on the rise. In 1988, 33% of shiftworkers had some college education. In 1991 40% of the workforce had some college education and by 2001, 51% of shiftworkers had some college education. The higher education of our society reflects not only the computerization of our society but also the rapid pace technological change and automation has been accepted throughout our culture.

When considering a rotating shift schedule, it is important to know what trends currently exist in the US. As of 2002, 48% of all companies with shiftwork use 12-hour shifts; 37% used 8-hour shifts while the remaining companies use a combination of 8-hour, 10-hour and 12-hour rotating shifts. For those companies using the 8-hour shift schedule, 21% rotated their employees backwards. While there can be different names for each shift, we will identify backwards rotation as moving from the day shift to the graveyard shift, then to a midday, or late afternoon shift. 32% of the companies used a forward rotating shift schedule while the majority, 47% used fixed, or stable, shift schedules.

While rotating, an employee is bound to feel tired at one time or another. Over 35% of companies prohibiting any napping during a break also had at least one fatigue-related incident in 2001. Typically, people who work graveyard shifts and have difficulty sleeping are diagnosed with shiftwork disorder. The effects of this disorder can be a combination of headaches, problems staying focused and of course, insomnia.

While some doctors are prescribing drugs to aid those diagnosed with this disorder, it is still an issue that needs further study. An issue is determining whether it is ethical to prescribe anti-sleeping drugs to those employees who choose to stay awake when their body wants them to sleep. Companies that allowed napping during a break times had no reported incidents. If we use this data alone, we can deduce that allowing naps during breaks is good for the employee's safety and therefore good for the company. As we all know, employers have a duty to provide a safe and healthy workplace for their employees. Knowing that good health and fitness promote a safe environment in the workplace, many companies provide clinics or financial assistance for smoking cessation classes, stress management, and other wellness or lifestyle training.

Another issue to consider when opting for rotation in duty schedules is the age of the employees. When we are younger, there is usually no problem working on different shifts; our bodies seem to handle the changes better. But once a person reaches their forties or fifties, they traditionally find it more difficult to handle changes from one shift to another. This is mainly due to the constant changes in a person's sleep patterns. As we get older, we tend to wake up and go to sleep earlier than we did when we were younger. Circadian rhythms, or our body clocks, simply become less flexible and make it very difficult for older employees to make it through a graveyard shift. In a 2001 study by Business & Legal Reports, older workers did not perform as well as their younger co-workers during a simulated 12-hour graveyard shift schedule. This further confirmed what other studies have found, that the older the employee, the more likely that shiftwork will have a negative effect on the employee's quality of sleep, length of sleep, and their ability to fall asleep and stay asleep.

The Answer is Clear

Your mind is already made up. You have decided that rotation of duty schedules is the best for the company. How does one continue to promote good employee relations? Productivity, retention, morale, and the ability to implement changes and new projects are all affected by the morale of the employees. If their attitudes towards the company and their job are poor, this will likely have long term effects on all you do. Companies with round-the-clock operations have many challenges to deal with when working with their employees. Decisions that are made for the benefit of one crew may make another upset. Work-life programs can help ease the stress associated with shiftwork or even for those on stable shifts too. Working with the employee to help them meet their work and family obligations can benefit the company and employee in many ways. When a company works to provide childcare, flexible schedules, and more, the benefits are

reduced absenteeism and turnover, increased productivity, and retention of customers through more satisfying contact with the company's employees.

Let us look at some of the advantages and disadvantages of rotating shifts. The advantages to rotating shifts are:

- They provide a balance of skills and work knowledge on every shift. Since all crews rotate fairly through all shifts, both the desirable and undesirable shifts, there is no motivation for the more senior workers to gather into a single crew.
- Prevent boredom and stress from repetitive work.
- Everyone is given a fair chance at being on the dayshift. As crews rotate through the day shift, they are given equal exposure and 'face time' with managers and company support personnel.
- Employees assigned to night or graveyard shifts usually qualify for shift premiums as an incentive to work during non-daytime hours.
- Training resources can be consolidated into one shift; that shift usually being the day shift. Since every employee must rotate through every shift, training specialists can concentrate their efforts on one shift without duplicating them on all shifts.
- Production standardization goes up. As a result of equitable training, exposure to management and support personnel, and equal work skills, all employees should perform their duties in a more uniform manner.

While this next example is a bit dated, it is important to know that in 1970, Exxon started a fast rotation schedule at its facility in Winnipeg, Canada that was made of 12-hour shifts. The employees worked a 3-2-2 schedule where over a two week time frame. They worked for three days, off for two, worked two more days followed by three days off, two days of work then two more days off. They ended the latter part of their schedule by working two days and then they were off two more days before the next rotation. With this schedule, the employee is guaranteed every other weekend off. Employees and management at Exxon were so happy with the scheduling that they adopted it at 20 other facilities. Monsanto also decided to test the 3-2-2 schedule and found that it increased morale and productivity while it decreased turnover and absenteeism. The disadvantages of rotating shiftwork are:

- The majority of shiftworkers, about 90% in all, prefer fixed shifts to rotating shifts.
- Uneven workloads are harder to manage with rotating shifts. As work crews change they

may find the shift very easy or stressful compared to the shift to which they previously were assigned.

- It is generally more difficult for the body to adjust to rotating shifts. Very fast rotation (3 days or less on a shift) or very slow rotation (7 days are more on a shift) can help lessen the impact on a persons circadian rhythms.
- Stress on the employees family and social life. The additional physical and psychological demands of night and rotating shiftwork can be especially hard on couples with children.

In a case study held in conjunction with a plant that manufactured compact discs, the 3-2-2 monthly rotation of 12-hour shifts was adopted due to the successes of other local companies with the same type of shiftwork. An interview with 30 randomly selected employees revealed problems the company and employees did not foresee. Employees were not adjusting to the rotation as well as hoped. Conflicts arose. 70% of those interviewed stated they were having difficulty adjusting to the fatigue brought on by the rotation. 53% indicated a problem with the short cycle between rotations and over 40% of the employees had some conflicts in their social or family activities.

There are things a company can do to alleviate or reduce problems of rotating shiftwork. According to Circadian Technologies, shift schedules that accommodate a person's circadian rhythm are biocompatible. A biocompatible shift schedule does not rotate backwards, but rotates slowly forward. It lengthens the time between each rotation so there is little need for sleep adjustment. According to Circadian Technologies, this type of schedule meets the personal needs of shiftworkers and meets their preferences. The shift should not only be biocompatible, but it should also be compatible with the employee's family life. This means that shifts should be predictable, flexible and provide enough time off between each shift to allow a worker to recover from the shift change and still have some quality family or personal time.

Since the body tends to go into a shutdown mode at night, there are things we can do to help productivity. Some proven methods are:

- increase lighting.
- provide a variable noise source (radio, TV, machinery).
- lower the inside temperature.
- increase the air flow into the work areas.
- provide more physical activity.
- increase opportunities for social interaction
- vary the daily job routine.
- effectively use breaks.
- if possible, provide nutritional, low fat foods, even if no cafeteria is available.

There are many types of rotating shifts. For example, the traditional rotation of schedules is to change crews from one shift to another weekly. The slow rotation schedule can be a rotation of as little as a week (7 days) but usually a rotation every month or as much as one year between rotations. Others like an oscillating shift where two schedules rotate back and forth while a third shift stays fixed, or a partial rotation where a portion of a crew rotates while the remainder stays on their fixed shift, are used but are less popular than the traditional, or slow rotation, schedules. Fast rotating schedules, those done very quickly over a few days time warrant consideration too. The advantage to fast rotation is that a person's circadian rhythm has little time to adjust to the different shifts and therefore lets the employee stay in a day shift rhythm.

Rotating shift schedules in any 24/7 operation has always presented problems with productivity. Rotating shiftworkers normally suffer from sleep disorders due to changing sleep schedules and circadian rhythms. Attention spans suffer with the results of decreased productivity and an increased risk of fatigue-related incidents. Lastly, employees can suffer gastrointestinal disorders from poor nutrition and higher caffeine consumption.

CONCLUSION

Communicating with employees and letting them be involved in the design of the shift schedule will help ensure the best schedule is implemented for both the company and the employees. While you may not have found all the answers in these papers, it is sincerely hoped you now have some new information to work with and that you will develop the perfect work schedule someday soon. .