

ROTATING 12-HOUR SHIFTS

How does one handle the problem of rotating 12-hour shifts? How do you stop him from going from a night shift directly into a 24hour work period? If the rotation is to another shift then he the objective is to go from one short week to another short week. The following schedule shows the solution:

		M	Tu	W	Th	F	Sa	Su
Group 1	Week 1	x	D	D	x	x	D	D
	Week 2	D	x	x	D	D	x	x
	Week 3	x	N	N	x	x	N	N
	Week 4	N	x	x	N	N	x	x
Group 2	Week 1	N	x	x	D	D	x	x
	Week 2	x	D	D	x	x	D	D
	Week 3	D	x	x	N	N	x	x
	Week 4	x	N	N	x	x	N	N
Group 3	Week 1	x	N	N	x	x	N	N
	Week 2	N	x	x	N	N	x	x
	Week 3	x	D	D	x	x	D	D
	Week 4	D	x	x	D	D	x	x
Group 4	Week 1	D	x	x	N	N	x	x
	Week 2	x	N	N	x	x	N	N
	Week 3	N	x	x	D	D	x	x
	Week 4	x	D	D	x	x	D	D

Shift Transitioning

The illustration above illustrates how shift rotations are used in the example.

- Groups One and Three transition between shifts during the three-day off duty period that runs from Saturday through Monday
- Groups Two and Four transition between shifts during the two-day off duty period between Monday and Thursday.

A hypothetical schedule for the illustration on the previous page could like the one shown below.

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M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

All shifts

Group 1, Spec Ass G-1	187191	*	D	D	*	*	D	D	D	*	*	D	D	*	*	*	N	N	*	*	N	N	N	*	*	N	N	*	*
Group 2, Spec Ass G-2	110980	N	*	*	D	D	*	*	*	D	D	*	*	D	D	D	*	*	N	N	*	*	*	N	N	*	*	N	N
Group 3, Spec Ass G-3	110848	*	N	N	*	*	N	N	N	*	*	N	N	*	*	*	D	D	*	*	D	D	D	*	*	D	D	*	*
Group 4, Spec Ass G-4	116703	D	*	*	N	N	*	*	*	N	N	*	*	N	N	N	*	*	D	D	*	*	*	D	D	*	*	D	D

Facts Relating to Shift Scheduling

- Fact 1: There are 168 hours in a week. If your organization is developing a schedule to provide 24/7 coverage, then this number is critically important, since it is the number of hours you must cover each week. If your organization does not need to provide 24/7 coverage, then you should calculate the number of “coverage hours” you will be working with. The formula for coverage hours is as follows.

$$\text{Weekly Coverage Hours} = \text{Daily Coverage Hours} \times \text{Covered Days per Week}$$

Using this formula, if you have to provide 16 hours of coverage for 6 days per week, then your Weekly Coverage Hours = $16 \times 6 = 96$.

- Fact 2: Another critical number to determine is the number of hours each employee will work per week, referred to hereafter as Hours in Workweek. In many cases, this number is 40, but not always. Most of the examples in this book will use a 40 hour work week, but the techniques presented here work well even if your employees work a different number of hours per week.

The formula for the number of full-time employees needed to provide one unit of coverage for a full week is $\text{Weekly Coverage Hours} \div \text{Hours in Workweek}$. In the case of 24/7 coverage the number of employees required to provide one unit of coverage with a standard, 40 hour week would be $168 \div 40 = 4.2$ employees. This formula is useful for assessing how many employees will be needed to meet your coverage goals.

Coverage Goals

When launching on the journey to create a new schedule design the first order of business is to establish your coverage goals. “Coverage goals” means that you should decide how many employees you determine are needed to be working during each of the 168 hours of a typical work week. Depending on your situation, you might be establishing your coverage goals based on factors such as production requirements or workload. You may decide how many employees you need based on the number it takes to meet your coverage goals. In other cases, the number of employees is a fixed number, and the objective of your coverage goals is to make optimal use of the available resources.

It is not very likely that you will find a shift schedule that produces *exactly* the coverage you want. The purpose of establishing your coverage goals is to have a baseline against which your various scheduling options can be evaluated. After all, if you don't know what you want, it is going to be very hard to know if you have found it.

1. The grid on the next page shows coverage goals for a hypothetical situation
2. Each cell in the grid represents a single hour of a single day of the week
3. The number in each cell is the number of employees that the organization would like to have working at that time
4. In this example, the organization is trying to make the best use of the 30 employees that it already employs
5. In order to cover fluctuations in workload, some hours of the week have more employees working and others have less

An example of coverage goals for 30 employees working 40 hours per week

In order to create realistic coverage goals, it is important to know how many total employee work hours you have to work with. Since there are going to be 30 employees working 40 hours per week, we know that we have $30 \times 40 = 1200$ hours to allocate across the 168 cells of our grid. You should be sure that your coverage goals match your available resources by making sure that the sum of the numbers in all cells equals the number of employee work hours you have available. In this case, the sum of all cells adds up to 1200, which is what we have calculated as our available work hours

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
2400-0100	5	7	7	7	7	7	5
0100-0200	5	7	7	7	7	7	5
0200-0300	5	7	7	7	7	7	5
0300-0400	5	7	7	7	7	7	5
0400-0500	5	7	7	7	7	7	5
0500-0600	5	7	7	7	7	7	5
0600-0700	5	9	7	9	9	9	5
0700-0800	5	9	7	9	9	9	5
0800-0900	8	9	7	9	9	9	8
0900-1000	8	9	7	9	9	9	8
1000-1100	8	9	7	9	9	9	8
1100-1200	8	9	7	9	9	9	8
1200-1300	8	9	7	8	7	7	8
1300-1400	8	9	7	8	7	7	8
1400-1500	8	7	7	8	7	7	8
1500-1600	8	7	7	8	7	7	8
1600-1700	6	7	7	7	7	7	6
1700-1800	6	7	7	7	7	7	6
1800-1900	6	7	7	7	7	7	6
1900-2000	6	7	7	7	7	7	6
2000-2100	6	7	7	7	7	7	6
2100-2200	6	7	7	7	7	7	6
2200-2300	6	7	7	7	7	7	6
2300-2400	6	7	7	7	7	7	6

Once the grid is finished you can develop the actual employee shift schedule.