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### **Publication Date**

1998-06-01

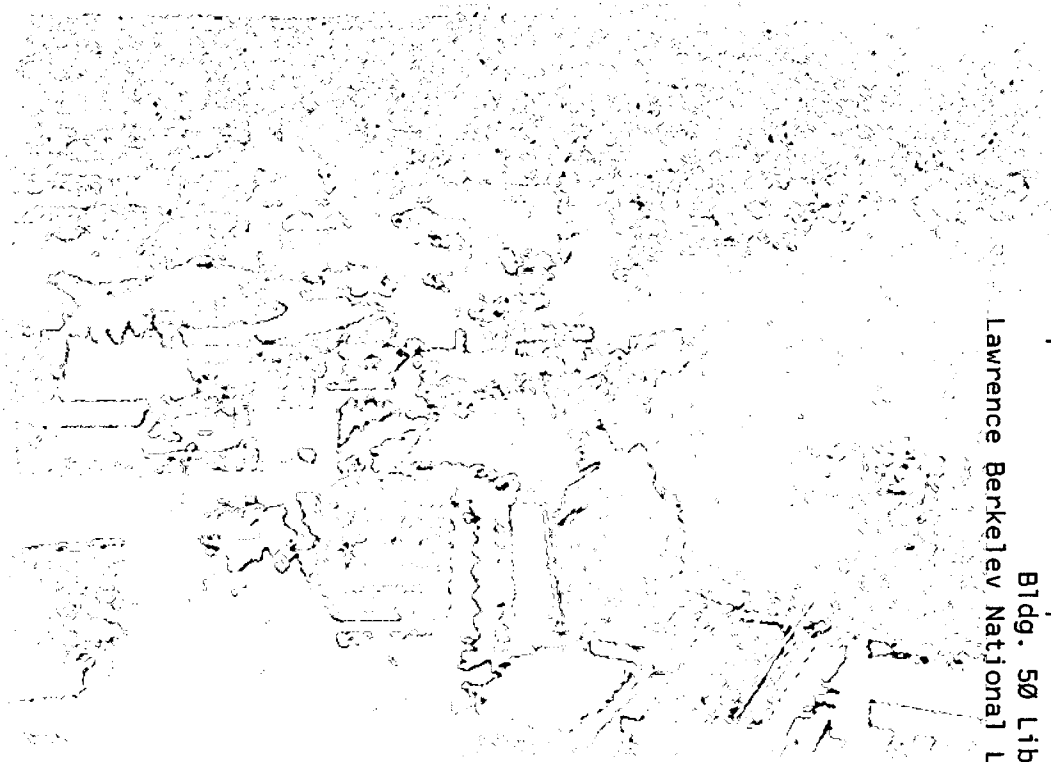
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## Operator Scheduling at the Advanced Light Source

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Advanced Light Source Division

June 1998



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# OPERATOR SCHEDULING AT THE ADVANCED LIGHT SOURCE

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**\*This work was supported by the Director, Office of Energy Research, Office of Basic Energy Sciences, Materials Sciences Division of the U.S. Department of Energy, under Contract No. DE-AC03-76SF00098**

# OPERATOR SCHEDULING AT THE ADVANCED LIGHT SOURCE

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## Abstract

Scheduling Operations staff at the Advanced Light Source (ALS) has evolved from 5 shifts / week for commissioning operations in 1992 to the present 24 hour / day, 21 shift coverage as the ALS went to full operation for users. A number of schedules were developed and implemented in an effort to accommodate changing ALS shift coverage requirements. The present work schedule and the lessons learned, address a number of issues that are useful to any facility that is operating 24 hours / day, 7 days / week.

## INTRODUCTION

The current work schedule for operators at ALS has evolved to provide the necessary shift coverage for facility operations while addressing the issues of time reporting, shift overlap, communications, 2 persons / shift to provide vacation and sick leave backup and a shift rotation that addresses operator "burn out" and other quality of life issues.

## ALS STAFF SCHEDULING

ALS operations have evolved from early commissioning activities that initially took place weekday evenings from 4 to 11:30 p.m. for commissioning the injection system. The operations staff at that time consisted of two operators who worked with the accelerator physics group and were supervised by the physics group leader.

By October 1992, the operations staff had increased to 6 operators covering two shifts, 5 days per week with no weekend coverage.

January 1993 marked the beginning of 3 shift operation with Owl shift working 4 / 10 hour days and the other shifts working 5 / 8 hour days with each operator rotating through all three shifts with weekends off.

In the Summer of 1993 the schedule was changed so that Day and Swing shifts rotated weekly but Owl, still working 4 / 10 hour days became a straight shift with no rotation. This schedule continued until mid February 1995.

Due to budget constraints ALS went to a 2 shift 7 day / week operation and the operators, now totaling 9 went to a 21 day schedule working 7 days, off for 4 days, work 7 swing, off for 3 days. All shifts were 9.5 hours.

In April 1995, the operator job category at LBNL changed from an "exempt", monthly salaried, to a "non-exempt", hourly paid bi-weekly as a result of an internal Fair Labor Standards Act compliance audit. This presented a new set of challenges since:

1. Any hours worked over 8 / day and over 40 / week must be paid overtime.
2. The weekly time reporting period is Sunday through Saturday.
3. Pay periods are bi-weekly and not synchronized with the beginning or end of any month and the paydays are 6 days after the end of the pay period.
4. The operations work schedule is on a 21 day cycle which is also not synchronized with any of the above.
5. Daily overtime is required on this work schedule so that the proper number of hours are worked in a month ( 1/2 hour / day overtime ).

Overtime pay does not count as wages for determining compensation for retirement purposes so a special pay category had to be created to report the regularly scheduled overtime so it could be paid at the overtime rate and be accepted as eligible compensation by the University of California Retirement Plan.

To try and overcome these scheduling and pay problems a modified work schedule was tried for a short time which only required 1 hour overtime / week to achieve 100% time and 5 days worked each time reporting period. This schedule had a several disadvantages:

1. Short work cycles ( 3 and 4 days )
2. Short periods off between cycles ( 1 or 2 days )
3. Work 2 out of 3 weekends.

In the Fall of 1995, the operators as members of a 3000+ member bargaining unit that includes many technical classifications and encompassing the entire UC System became represented by United Professional and Technical Employees.

Beginning in January 1996, The ALS went to our present 21 shift schedule, as shown on Fig. 1.

### SCHEDULING LESSONS LEARNED

1. Rotating on to all three shifts with 5 days on 2 off caused fatigue and "burn out" for everyone working the schedule. Rotation onto Owl shift is difficult because most people do not adapt to a daytime sleep pattern in a short time.
2. The 3 / 4 / 4 / 4 / 3 schedule provided 5 working days in each time reporting week but had only 1 or 2 days off between work periods and only 1 weekend off every 3 weeks. This was considered a very tiring schedule to work.
3. The 4 / 10 hour Owl shifts worked well because it provided a good overlap with Day shift each work day so the Owl shift operators could stay in touch with the rest of the accelerator staff, during commissioning and early user operations.
4. Owl shift assignment should be voluntary as much as possible and long term.
5. Don't rotate Owl shift. If Owl shift must rotate, consider a four months or longer rotation period.
6. The present work schedule is the best we have found for providing 21 shift coverage with minimum staff, without fatigue and "burn out".
7. Rotating between Day and Swing allows a larger group of operators to be involved in support and development activities than would be possible if they were working straight shifts since most meetings occur during the day.

### PRESENT ALS SCHEDULE

Figure 1.

ALS OPERATIONS CREW SHIFT SCHEDULE																															
Shift Codes: 1= DAY, 2= SWING, 3= OWL																															
Shift #1 is from 0745 to 1615, Shift #2 is from 1545 to 0015 Shift #3 is from 2345 to 0815																					1,2,3 is a 9 hour shift										
Jun-98	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	
NAME	1	2	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	
A1	3	3	3	3					3	3	3	3	3	3					3	3	3	3	3	3	3	3					3
B1	2				1	1	1	1	1	1	1					2	2	2	2	2	2	2					1	1	1	1	1
C1		3	3	3	3	3	3	3				3	3	3	3	3	3	3				3	3	3	3	3	3	3	3		
C2		2	2	2	2	2	2	2				1	1	1	1	1	1	1				2	2	2	2	2	2	2	2		
B2	3				3	3	3	3	3	3	3					3	3	3	3	3	3	3					3	3	3	3	3
A2	1	1	1	1					2	2	2	2	2	2	2				1	1	1	1	1	1	1					2	
A3	1	1	1	1					2	2	2	2	2	2	2				1	1	1	1	1	1	1					2	
B3	2				1	1	1	1	1	1	1					2	2	2	2	2	2	2					1	1	1	1	1
C3		2	2	2	2	2	2	2				1	1	1	1	1	1	1				2	2	2	2	2	2	2	2		

Note that there are 3 operators assigned to each of the three possible shift rotations.

Owl shift does not rotate, Day / Swing do rotate weekly.  
During routine operations, one operator can run the machine and do the scheduled refills. There are two operators scheduled per shift. One or both are usually working on user support, control applications or displays. That work is delayed when only one operator is available. Physics group staff and other operations staff are available on call to assist as needed. Work shifts followed by 3 (Tues. - Thurs.) and 4 (Fri. - Mon.) day blocks off. Shifts are 1 @ 9 hrs. and 6 @ 8.5 hrs. Operators receive shift differential pay, 7.5% for Swing and 15% for Owl. Overtime pay is calculated at the appropriate differential rate. Operators work 1 to 3 fewer days / month than Monday thru Friday staff. Overtime 2.5 to 3 hours / week ( 0.5 or 1 hour / day ) makes up the for the fewer days worked so that each of the 3 possible rotations is within 4 hours of 2088/yr. Shifts are scheduled so there is 0.5 hour overlap between shifts For time reporting, operators work 4 or 5 days in any Sunday through Saturday time reporting period. Shift transitions Owl / Day 0745 - 0815, Day / Swing 1545 - 1615 and Swing / Owl 1145 - 0015.

### **COMMUNICATIONS**

Communications are always difficult when operations staff are working different days and shifts. To address this problem a number of different methods are used.

1. Status Board in Control Room. This board has current information about machine configuration limits or changes for required for planned operations, safety notices, current radiation survey data, and maintenance and installation job list. This board is reviewed by each operator when they arrive on shift
2. Scheduled 1/2 hour overlap period at each end of each shift to allow time for discussion about machine status and any instructions to be passed to the oncoming shift.
3. E-mail.
4. All crafts working in the complex check in and out with the Control Room.
5. Control Room Operations Log Book.

### **SUMMARY**

The ALS operations schedule in it's present form addresses many issues that are faced by any facility that is or plans to operate on a 24 hours / day, 7 days / week.

### **ACKNOWLEDGMENTS**

Ben Feinberg, Head of ALS Operations and Jim Gregor, Supervisor of the ALS Electronics Maintenance Section both were heavily involved in development of the different work schedules that have been used at ALS from commissioning to the present and in helping solve the issues implementing each new schedule presented.

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