

ALASKA LEGISLATURE COMMITTEE FILES 1995-1996 8672

8678 HOUSE LABOR & COMMERCE

**HB**

**300**

HOUSE COMMITTEE REPORT

(7)

Date Referred: April 5, 1995

FURTHER REFERRALS:

Finance

Date of Committee Action: 7/21/95

The LABOR AND COMMERCE Committee considered:

HB 300

HOUSE BILL NO. 300

APPROP: MONETARY TERM LOCAL 71 CONTRACT

"An Act making appropriations for the monetary terms of the collective bargaining agreement with Public Employees Local 71, Labor, Trades and Crafts Unit; and providing for an effective date."

recommends it be replaced with the following committee substitute \_\_\_\_\_  the same title  a new title

additional referral to \_\_\_\_\_ Committee  
 attached amendment(s)

ADOPTS: \_\_\_\_\_ Letter of Intent

ATTACHES NEW FISCAL NOTE(s): (Dept) \_\_\_\_\_ APPROVES PREVIOUS: (Dept/Date) \_\_\_\_\_  
 fiscal note(s) \_\_\_\_\_  fiscal note(s) \_\_\_\_\_  
 \_\_\_\_\_  
 zero fiscal note(s) \_\_\_\_\_  zero fiscal note(s) \_\_\_\_\_  
 \_\_\_\_\_

SIGNING WITH RECOMMENDATIONS	DP	DNP	NR	AM
<i>John Kotick</i>				<input checked="" type="checkbox"/>
<i>John Sander</i>			<input checked="" type="checkbox"/>	
<i>Beverly Masek</i>			<input checked="" type="checkbox"/>	
<i>Richard Porter</i>			<input checked="" type="checkbox"/>	
<i>Pete Felt</i>			<input checked="" type="checkbox"/>	

CHAIR'S SIGNATURE *Pete Felt*

# FISCAL NOTE

STATE OF ALASKA  
1995 LEGISLATIVE SESSION

BILL NO. HB 300

Revision Date: \_\_\_\_\_  
 Title: "An Act making appropriations for the monetary terms ... with Public Employees Local 71, LTC..."  
 Sponsor: (H) Fin  
 Requestor: (H) L&C

Department Affected: Administration  
 BRU: All  
 Component: All  
 COMPONENT SERIAL NO. \_\_\_\_\_

**EXPENDITURES/REVENUES:** (Thousands of Dollars)

OPERATING EXPENDITURES	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
<b>TOTAL OPERATING</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

<b>CAPITAL EXPENDITURES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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<b>CHANGE IN REVENUES ( )</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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**FUND SOURCE:** (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1006 GF/MHTIA						
OTHER						
<b>TOTAL</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

Estimate of any current year (FY 95) cost: \$ -0-

**POSITIONS:**

FULL-TIME						
PART-TIME						
TEMPORARY						

**ANALYSIS:** (Attach a separate page if necessary.)

The appropriations set out in the bill represent all of the costs associated with this measure.

Prepared by: Beverly Reaume, Director  
 Division: Division of Personnel

Phone: 465-4430  
 Date: \_\_\_\_\_

Approved by Commissioner: Mark Boyer  
 Agency: Department of Administration

Date: 4/18/95

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TONY KNOWLES, GOVERNOR

## DEPARTMENT OF ADMINISTRATION

OFFICE OF THE COMMISSIONER

P.O. BOX 110200  
JUNEAU, ALASKA 99811-0200  
PHONE: (907) 465-2200  
FAX: (907) 465-2135

January 24, 1995

The Honorable Gail Phillips  
Speaker of the House  
Alaska State Legislature  
State Capitol  
Juneau, AK 99801-1182

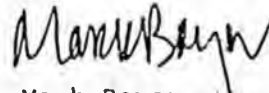
Dear Madam Speaker:

Pursuant to Alaska Statute 23.40.215, I am submitting the monetary terms of the collective bargaining agreement between the State of Alaska and the Labor, Trades and Crafts unit represented by Public Employees Local #71.

The enclosed memorandum from me to Ms. Annalee McConnell identifies the specific monetary terms applicable to this unit. Spreadsheets are enclosed projecting the estimated cost of the monetary terms. Funding for these terms will be formally requested by the Office of Management and Budget. The monetary terms of a collective bargaining agreement are subject to funding by appropriation by the Legislature; if funding is not appropriated, the terms are considered disapproved and the parties to that agreement may resume negotiations or explore other options.

In accordance with AS 23.40.215(b), we respectfully request that the Legislature advise the parties by concurrent resolution of its approval or disapproval of this submission within 60 legislative days of receipt.

Sincerely,



Mark Boyer  
Commissioner

MB/nl

Enclosure

cc: Annalee McConnell  
Director  
Office of Management and Budget

Pat Pourchot  
Legislative Liaison  
Office of the Governor

Division of Personnel  
Labor Relations Section

# MEMORANDUM

# STATE OF ALASKA

Department of Administration  
Office of the Commissioner

To: Annalee McConnell  
Director  
Office of Management and Budget  
Office of the Governor

Date: January 18, 1995  
Tele: 465-2200

From: Mark Boyer *M. Boyer*  
Commissioner  
Department of Administration

Re: Monetary Terms of Labor,  
Trades and Crafts Agreement

The State of Alaska has concluded negotiations with the Public Employees Local 71 representing employees in the Labor, Trades and Crafts Bargaining Unit. The following monetary terms are provided so that the appropriate budget amendment requests may be made to the legislature. I will be providing the legislature with the monetary terms as required by AS 23.40.215(b).

## Monetary Terms

Monetary terms of an agreement are defined in AS 23.40.215(4) as changes that will require an appropriation for their implementation, changes that will result in a change in state revenues, or changes that will result in a change in productive work hours for state employees. These provisions apply to 1,294 positions.

- I. Require Appropriation.
  - A. Effective July 1, 1995, the standard workweek will increase from 37.5 hours to 40 hours per week. This will result in an additional two and one-half hours of compensable work time each week for each full-time employee.
  - B. Effective July 1, 1995, the State will make a lump sum payment of two hundred twenty thousand dollars (\$220,000) to the Public Employees Local 71 Health and Welfare Trust.
  - C. Effective July 1, 1995, the tool allowance for qualified employees will increase by ten dollars (\$10) per month.
  - D. Effective July 1, 1995, the reimbursement rate for employees using privately owned aircraft for state business will increase to 45 cents per mile.

E. Effective July 1, 1996, the State will make a lump sum payment of two hundred twenty thousand dollars (\$220,000) to the Public Employees Local 71 Health and Welfare Trust.

II. State Revenue.

There are no provisions in the tentative agreement that would change state revenues.

III. Productive Work Hours.

The change in the standard work week will increase the productive work hours of all full-time employees.

**Other Terms**

There are other terms of the collective bargaining agreement which will not require an appropriation but may have a budgetary impact.

- Overtime provisions have been modified to provide payment at the rate of time and one-half for all work performed in excess of eight (8) hours of work per day or 40 hours of work per week. This change is expected to result in an overall savings.
- Travel and per diem provisions have been modified. This change is expected to result in an overall savings.

**Conclusion**

Funding of certain monetary terms will be required. Please prepare and forward to the legislature the necessary documents. Please feel free to call on the staff of the Labor Relations Section for any assistance desired.

cc: Michael P. McMullen  
Acting Director  
Division of Personnel/OEEO

Sharon Barton  
Director  
Division of Administrative Services

## LTC

### Monetary Terms

Monetary terms of an agreement are defined in AS 23.40.250(4) as changes which will require an appropriation for their implementation, that will result in a change in state revenues, or that will result in a change in productive work hours for state employees. These provisions apply to 1,294 positions.

#### 1. Require appropriation

##### FY 96

- A. Effective July 1, 1995, the standard workweek will increase from 37.5 hours to 40 hours. This will result in an additional two and one-half hours of compensable work time for each full time employee. \$5,903,447.00  
<\$600,290.00>

CY 94: \$635,212.09 Straight-time OT  
CY 93: \$664,369.88 Straight-time OT  
CY 92: \$603,605.01 Straight-time OT

- B. Effective July 1, 1995, the State will make a lump sum payment of two hundred twenty thousand dollars (\$220,000) to the Public Employees Local 71 Health and Welfare Trust. \$220,000.00

- C. Effective July 1, 1995, the tool allowance for qualified employees will increase by ten dollars (\$10.00) per month. \$21,120.00

In CY 94, tool allowance payments totaled \$97,795.00 to the FTE of 176 employees.

##### FY97

- A. Effective July 1, 1996, the State will make a lump sum payment of two hundred twenty thousand dollars (\$220,000) to the Public Employees Local 71 Health and Welfare Trust. \$220,000.00

#### 2. State Revenue

There are no provisions in the tentative agreement that would change state revenues.

#### 3. Productive Work Hours

The change in the standard work week will increase the productive work hours of all full-time employees.

### Other Terms

There are other terms of the collective bargaining agreement which will not require an appropriation but may have budgetary impact.

- Overtime provisions have been modified to provide payment at the rate of time and one-half for all work performed in excess of eight (8) hours of work per day or 40 hours of work per week. This change is expected to result in an overall savings.
- Travel and per diem provisions have been modified. This change is expected to result in an overall savings.

Labor Trades and Crafts  
FY 96 - 97 Monetary Terms

Summary

Funding Source	① FY95 Authorized	② FY 96 Hickel	③ FY 96 Monetary Terms	Total FY 96	④ FY 97 Monetary Terms
General Funds	54,051,756	53,697,701	3,463,484	57,172,780	3,463,484
Other Funds	43,698,263	44,026,162	2,659,963	46,695,641	2,659,963
⑤ Adjustments			-579,170		-579,170
Total Funds	97,750,019	97,723,863	5,544,277	103,368,430	5,544,277

- ① FY 95 Authorized amounts based on FY 95 Authorized PACS file (scenario 66). Amounts shown are the vacancy adjusted amounts from report of 1-16-95
- ② FY 96 Hickel amounts based on FY 96 Hickel PACS file (scenario 67). Amounts shown are the vacancy adjusted amounts from report of 1-16-95
- ③ See Schedule A (attached) for FY 96 calculations
- ④ All FY 96 contractual provisions apply to FY 97. There are no new monetary terms taking effect in FY 97. Accordingly, assuming no change in the workforce, FY 97 costs are the same as FY 96.
- ⑤ Adjustments: This shows amounts which have not yet been broken out by funding source. It includes an increase in tool allowance costs and a reduction in overtime costs. (See Schedule A.) The bulk of the savings are expected to be non-general funds.

Labor Trades and Crafts  
FY 96 - 97 Monetary Terms

Schedule A - FY 96 Cost

Funding Sources	① 40 Hr Workweek	② Adjustment for current OT	Net 40 Hr Workweek	Tool Allowance	Health Trust	TOTAL
General funds	3,243,484		3,243,484		220,000	3,463,484
Other funds	2,659,963		2,659,963			2,659,963
③ Adjustments		-600,290	-600,290	21,120		-579,170
Total funds	5,903,447	-600,290	5,303,157	21,120	220,000	5,544,277

① Based on FY 96 Hickel PACS (scenario 67). All amounts are adjusted for budgeted vacancy.

② Adjustment for current OT: This amount is the average annual straight-time overtime paid to LTC members over the past three calendar years. Since 1/2 hour per day straight-time overtime has been paid when employees work an eight hour day, this cost will no longer be incurred. This offsetting cost reduction has not yet been broken out by funding source, however it is expected that the bulk of the savings will be in non-general funds.

③ Adjustments: Costs (savings) which have not yet been broken out by funding source.

**HB**

**305**

# HOUSE COMMITTEE REPORT

(7)  
 Date Referred: April 11, 1995 FURTHER REFERRALS: Finance

Date of Committee Action: 4/21/95

The LABOR AND COMMERCE Committee considered: HB 305

HOUSE BILL NO. 305 APPROP: UNIV. OF AK LABOR AGREEMENTS

"An Act making appropriations to satisfy the agreed upon monetary terms of a collective bargaining agreement for certain employees of the University of Alaska; and providing for an effective date."

recommends it be replaced  the same title  
 with the following committee substitute \_\_\_\_\_  a new title

additional referral to \_\_\_\_\_ Committee  
 attached amendment(s)

ADOPTS: \_\_\_\_\_ Letter of Intent

ATTACHES NEW FISCAL NOTE(s): (Dept) APPROVES PREVIOUS: (Dept/Date)  
 fiscal note(s) \_\_\_\_\_  fiscal note(s) \_\_\_\_\_

zero fiscal note(s) \_\_\_\_\_  zero fiscal note(s) \_\_\_\_\_

SIGNING WITH RECOMMENDATIONS	DP	DNP	NR	AM
<i>Steve Pateky</i>			X	
<i>James Sanders</i>			✓	
<i>Robert Mack</i>			✓	
<i>William Porter</i>			✓	
<i>Ken Felt</i>			✓	

CHAIR'S SIGNATURE *Ken Felt*

Marylou Burton  
 Director  
 Statewide Budget Development  
 211B Butrovich Building  
 P.O. Box 755380  
 Fairbanks, Alaska 99775-3380  
 (907) 474-6490  
 (907) 474-3140 FAX



University of Alaska  
 Statewide System of Higher Education

DATE: March 6, 1995  
 TO: Nancy Slagle, Director  
 Division of Budget Review  
 Office of Management and Budget  
 FROM: Marylou D. Burton, Director  
 Statewide Budget Development  
 SUBJECT: New Legislation - Collective Bargaining Agreement

The University of Alaska requests that the Governor introduce legislation on its behalf to fund the monetary provisions of a newly established collective bargaining agreement between the University of Alaska and the University of Alaska Classified Employees Association (CEA). This contract, which is retroactive to January 1, 1995, was not in effect when the FY95 supplemental and FY96 budget request were developed. Furthermore, under AS 23.40.215(a) and the terms of the agreement the monetary provisions outlined in the agreement are not effective without separate legislative action.

This agreement has two basic monetary provisions. First, it approves a one-time payment of \$600 to each CEA member employed as of the date of the signing. Second, it establishes a grade/step wage schedule for CEA positions similar to the wage schedules used by the State and non-unionized University employees. This schedule provides for an orderly and equitable method of compensation, as well as "capping" the salary for any given grade.

The general fund impact of this agreement for FY95 is \$333,330 (\$338,229 total funds) and for FY96 is \$543,199 (\$551,221 total funds). This was calculated by evaluating and "placing" current employees on the new schedule, and then computing the costs of implementing the new wage schedule. Note that the FY95 calculations are based on the effective date of January 1, 1995, and that both FY95 and FY96 estimates include incremental costs only.

A cost worksheet (based on PACS data) is attached. Also attached is suggested language for the legislation. Please let me know if I can provide any further information.

Post-It™ Fax Note	7871	Date	# of pages
To: (George Demaris)		From: Marylou D. Burton	
Co/Dept: Rep. Kott		To: UofA SW Budget	
Phone #		Phone #	
Fax # 465-2819		Fax #	

**Cost of UAWCEA Collective Bargaining Agreement**

Source	PTPS Income		Other Add'l Total		PTPS Income	Other Add'l Total		Total
	Current	Proposed	Current	Proposed		Current	Proposed	
Source	81,041.7	104,115	10,760	17,000	91,803.4	121,115	27,760	119,355.4
Benefit	3,811,000	5,000	0	0	3,814,811	5,000	0	3,819,811
Total Source of Funds	3,892,041.7	109,115	10,760	17,000	3,906,615.4	126,115	27,760	3,934,490.4

**Increases by MAU**

Source	PTPS Income		Other Add'l Total		PTPS Income	Other Add'l Total		Total
	Current	Proposed	Current	Proposed		Current	Proposed	
Source	1,000,000	1,000,000	0	0	1,000,000	1,000,000	0	2,000,000
Benefit	0	0	0	0	0	0	0	0
Total Source of Funds	1,000,000	1,000,000	0	0	1,000,000	1,000,000	0	2,000,000

**Existing UAWCEA Collective Bargaining Agreement**

Source	PTPS Income		Other Add'l Total		PTPS Income	Other Add'l Total		Total
	Current	Proposed	Current	Proposed		Current	Proposed	
Source	1,000,000	1,000,000	0	0	1,000,000	1,000,000	0	2,000,000
Benefit	0	0	0	0	0	0	0	0
Total Source of Funds	1,000,000	1,000,000	0	0	1,000,000	1,000,000	0	2,000,000

**PTPS**

Source	Current	Proposed	Total
Medical Benefits	1,244	1,244	2,488
Dental Fund	371,000	371,000	742,000
Life Agency Benefits	365	365	730
Auxiliary Benefits	357	357	714
Retirement	780	780	1,560
University Benefits	344	344	688
Total PPS	1,825	1,825	3,650

**Other Required Funding Items**

Source	Current	Proposed	Total
A) Academic - Mandatory/Alternative Dispute Resolution Training	0	0	0
B) Academic - Mandatory/Alternative Dispute Resolution Training	0	0	0
C) Academic - Union	0	0	0
D) Academic - Mandatory/Alternative Dispute Resolution Training	0	0	0
E) Academic - Health/Disability	0	0	0
F) Academic - Health/Disability	0	0	0
Total Other	0	0	0

"An Act making appropriations to satisfy the agreed upon monetary terms of a collective bargaining agreement for certain employees of the University of Alaska; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

\*Section 1. The sum of \$338,229 is appropriated to the University of Alaska to satisfy the monetary terms of the collective bargaining agreement entered into with the University of Alaska Classified Employees Association bargaining unit for the period January 1, 1995 through June 30, 1995, from the following sources:

SOURCE	AMOUNT
Federal Receipts	\$ 1,744
General Fund	333,330
Intra-Agency Receipts	266
Auxiliary Receipts	1,253
Student Fees	787
University Receipts	849

\*Section 2. The sum of \$551,221 is appropriated to the University of Alaska to satisfy the monetary terms of the collective bargaining agreement entered into with the University of Alaska Classified Employees Association bargaining unit for the fiscal year ending June 30, 1996, from the following sources:

SOURCE	AMOUNT
Federal Receipts	\$ 2,681
General Fund	543,199
Intra-Agency Receipts	433
Auxiliary Receipts	1,869
Student Fees	1,411
University Receipts	1,628

\*Section 3. The unexpended and unobligated balance of the appropriation made by Section 1 of this Act lapses into the funds from which it was appropriated, June 30, 1995.

\*Section 4. The unexpended and unobligated balance of the appropriation made by Section 2 of this Act lapses into the funds from which it was appropriated, June 30, 1996.

\*Section 5. This Act takes effect immediately under AS 01.10.070(c).

**FISCAL NOTE**

**STATE OF ALASKA**  
**1995 LEGISLATIVE SESSION**

**BILL NO. HB 305**

Revision Date: \_\_\_\_\_ Department Affected: **University of Alaska**  
 Title: An Act making appropriations to satisfy the agreed upon monetary terms of a \_\_\_\_\_ BRU:  
 collective bargaining agreement for certain employees of the University of Alaska Component: **ALL**  
 Sponsor: \_\_\_\_\_  
 Requestor: \_\_\_\_\_ **COMPONENT SERIAL NO.**

**EXPENDITURES/REVENUES: (Thousands of Dollars)**

OPERATING	FY95	FY96	FY97	FY98	FY99	FY00
PERSONAL SERVICES	338.2	551.2				
TRAVEL						
CONTRACTUAL	0.0	0.0	0.0	0.0	0.0	0.0
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
<b>TOTAL OPERATING</b>	<b>338.2</b>	<b>551.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

<b>CAPITAL</b>						
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<b>REVENUE FD SOURCE</b>						
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<b>FUNDING: (Thousands of Dollars)</b>						
1002 FEDERAL FUNDS	1.7	2.7				
1003 GF MATCH						
1004 GENERAL FUND	333.3	543.2				
1006 GF/MHTIA						
OTHER	3.2	5.3				
<b>TOTAL FUNDING</b>	<b>338.2</b>	<b>551.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

<b>POSITIONS:</b>	0	0				
FULL-TIME	0	0				
PART-TIME	0	0				
TEMPORARY						

Estimate of current year impact: Retroactive to January 1, 1995

ANALYSIS: (Attach a separate page if necessary.) <p align="center">SEE ATTACHED</p>
--

Prepared by: Wendy Matheny, Budget Analyst Phone: 463-3086  
 Division: Statewide Budget Office Date: 4/18/95

Approved by:  Marylou Burton, Director  
 Agency: Statewide Budget Office Date: 4/18/95

Distribution (by preparer): Legislative Finance, Legislative Sponsor, Requestor, OMB, & Impacted Agency(ies).

The University believes the UA/CEA collective bargaining agreement is effective, efficient and affordable and supports funding it for the following reasons:

### Wages

- Effective 12/26/94 CEA members will be placed on the same salary scale as other UA classified staff
- New hires will be hired at an entry step, which is *10% below* the current "A" step
- Separate classification created for custodians with entry salary at \$7.36/hrly
- Step movements do not start until 1/1/96
- Geographic differentials are the same as for non-represented employees

### Holidays and Leaves

- One fewer paid holidays than non-represented employees,
- Same annual leave as non-represented employees
- Same sick leave as non-represented employees

### Benefits

- Same benefits as non-represented employees except for no dependent charges through 6/30/96 with the requirement for exploration of a flexible benefit program

### Contracting Out

University rights absolutely protected in both Management Prerogatives (Art. 1.1) and Contracting Out (Art. 1.9).

### Grievance Procedure

Emphasizes Alternative Dispute Resolution processes with mandatory training requirements.

### Work Teams

Joint University - Union work teams replace CEA participation in University Governance

**HB**

**311**

# FISCAL NOTE

STATE OF ALASKA  
1996 LEGISLATIVE SESSION

BILL NO. HB 311

Revision Date: \_\_\_\_\_  
 Title: An Act repealing limitation on hours  
may be employed in a mine  
 Sponsor: Representative Vezey  
 Requestor: House Labor and Commerce

Department Affected: Labor  
 BRU: Labor Standards & Safety  
 Component: Occupational Safety  
and Health  
 COMPONENT SERIAL NO. 970

**EXPENDITURES/REVENUES:** (Thousands of Dollars)

OPERATING	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
<b>TOTAL OPERATING</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

<b>CAPITAL</b>						
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<b>CHANGE IN REVENUE</b>						
<b>FUND SOURCE #</b>						

**FUNDING:** (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipt						
1006 GF/MHTIA						
Other						
<b>TOTAL</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

**POSITIONS:**

FULL-TIME						
PART-TIME						
TEMPORARY						

Estimate of current year (FY96) impact: \$ 0.0

**ANALYSIS:** (Attach a separate page if necessary)

HB 311 would repeal the limitation on the hours a person may be employed in a mine. Current law allows a person to perform work not more than 8 hours within any 24 hour period under ground.

Prepared by: Al Dwyer, Director Phone: 269-4914  
 Division: Labor Standards and Safety Division Date: 1/23/96  
 Approved by Commissioner: Tom Cashen, Commissioner  
 Agency: Department of Labor Date: 1/23/96

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### J. C. Duchon Consulting

6017 Chowen Ave. S.  
Edina, MN 55410

(W) 612/725-4593 (H) 612/929-3683



# FACSIMILE COVER SHEET

DATE: 2-28-96

TIME:

TO: House Labor and Commerce

Telephone #

Fax#

FROM:

James C. Duchon

(612) 725-4593  
Telephone #

or  
(612) 929-3683

COMMENTS:

As per your request, I have faxed  
my testimony for H.B. 311.

I will be glad to take any further  
questions regarding extended workdays.

Jim Duchon

**J.C. Duchon Consulting**  
6017 Chowen Ave. S  
Edina, MN 55410

To: House Labor and Commerce Committee  
Alaska  
From: James C. Duchon  
Re: Testimony for House Bill 311  
Date: February 27, 1996

My name is James C. Duchon. I received my Ph.D. in Experimental Psychology from the Illinois Institute of Technology in Chicago, IL. I am currently employed as an independent consultant and serve on the Board of Examiners for the Minnesota Quality Awards Council. My areas of expertise are in the areas of shiftwork consulting and training, safety, organizational effectiveness and quality improvement.

From 1986 to February of this year I have worked for the Safety Division of U.S. Bureau of Mines in Minneapolis, Minnesota. As many of you may know, we were a federally funded research arm of the mining industry. The focus of our research was to explore and study methods to reduce the risk of accidents in mining. My particular expertise was in the area of nights and shiftwork, fatigue, extended workshifts and job analysis.

As a result of our research we learned a great deal about the use of extended workdays in mining. This research appears to be of direct relevance to deliberations by the state of Alaska, regarding lengths of workshifts in underground mines. To illustrate I will discuss the results of a study at an underground copper lead and zinc mine that went from an 8-hour 3 shifts per day to a 12-hour 2 shifts per day schedule.

### EXECUTIVE SUMMARY

"The Use of Extended Workshifts in Underground Mining: Are they Safe?"

#### I. Purpose of this summary

The purpose of this summary is to present in an objective way some of the relevant research on safety issues regarding extended workdays and to offer my recommendations regarding the use of extended workshifts in underground mining.

#### II. Extended Workshifts - What are they?

Extended workshifts, workdays or compressed workweeks are workshifts longer than 8-hour in length, typically 10 or 12 hours, while still retaining an approximate 40 hour week. There are at least five theoretical factors that could make a difference in a worker's tolerance to the shift.

First and the most obvious is the length of workday. While it seems intuitive that the longer someone works the more likely he or she will make some sort of human error. However, our data show that the frequency of accidents is more or less equal for each hour into shift. In other words the first hour of work is associated with the same number of accidents as the fifth, sixth, seventh and so forth.

Second is the shortened time between shifts. This would have an impact on sleep length and afford less time for physical recovery between shifts.

Third is the length of the workweek. Extended workdays often are associated with shortened workweeks of two to four days. This could create a desirable situation for two reasons. First, our circadian rhythms would not have the time needed to adjust as we rapidly go from say the night shift to an off day. This could to some degree offset the negative health effects of working nights. In short "occupational jet lag" is kept at a minimum. Second, with short workweeks there would be less cumulative fatigue across the workweek.

Fourth, with more days off time for recovery from fatigue or sleep deficit is enhanced.

The Fifth factor is time-of-day. Both extended workdays and regular 8-hour shift work patterns can involve working night shifts, where work capacity is lessened.

### III. Safety in mining today

When discussing the idea of using extended workdays in mining, it is useful to put safety in mining in perspective with other industries.

Accident rates in mining have dropped drastically since the 1940's and earlier. We no longer count fatalities in the thousands, as we once did (over 2,000 each year in the 1920's). Fatalities have in fact decreased steadily from over 300 fatalities in 1973 to only 115 in 1991.

However, mining in general still has one of the highest injury and fatality rates of any industry. For example latest figures show 43 fatalities per 100,000 employed in mining, as compared to 40 and 32 in Agriculture and construction, respectively. However, it may be an unfair comparison to lump all types of mining into one statistic. For instance incidence rates for metal/nonmetal mining, including underground mines, are roughly half of those in coal mining. This sort of breakdown indicates an incident rate for metal and nonmetal mines less than other high rate industries.

### IV. Studies in all industries regarding safety in extended workshifts.

It is noteworthy to mention that earlier studies of human endurance and sustained

operations were conducted by the U.S. Army. They were interested in how long soldiers could work before their performance was degraded. These studies clearly show that under certain conditions humans could work longer than eight hours without a loss of efficiency. However, while it is enlightening to know our limitations under these conditions, it is more important to look at research associated with actual modern working conditions.

In my review of extended workday research literature, published in 1994, I looked at over 50 published reports. Of those reports there were only 10 studies that actually looked at 10 or 12 hour shifts. The rest related, primarily to the issue of overtime and safety. Interestingly, while most of the analyses indicated more frequent accidents related to overtime, extended workshifts did not. Specifically, in a survey study of 716 12-hour workers in the processing, oil refinery, chemical and fertilizer industries, self-reports of job performance, ability to concentrate, amount of sleep and health either remained the same or improved. Also, over 90 pct were satisfied with the schedule. Managers indicated that they perceived less absenteeism, less tardiness, and no effects on health and safety. Likewise the results of interviews with managers of 50 U.S. and Canadian chemical and petroleum plants indicated similar health and safety results, including improved morale. However, both studies warned of the effects of 12-hour shifts on older workers, but did not provide objective data on this topic.

In a study of 8-hour versus 10 hour shifts in a manufacturing plant, performance and physiological measures indicated no difference.

In a study of English policemen performance and physiological measure either stayed the same or improved on 12-hour shifts.

However, there are some studies have shown performance decrements with 12-hour shifts. For instance in a study conducted by NIOSH on extended workdays in a nuclear power plant, some measures indicated a decrease in performance.

#### V. Studies in underground mining, including the Bureau of Mines Study.

I am aware of only one published study that looked at extended workdays in underground mining. This was conducted by researchers at the Bureau of Mines. I was principal investigator of this study. We studied an underground copper, lead and zinc mine in British Columbia that changed from an 8-hour rotating shift schedule to a 4 on 4 off 12-hour schedule. We were invited by the mine and the Provincial Ministry of Energy, Mines and Petroleum Resources to evaluate their change to the new 12-hour schedule. Our recommendation following the study would be taken into account by the ministry when evaluating the exemption given to the mine for the introduction of 12-hour shifts.

Before and 10 months after the 12-hour schedule was introduced, we took measures of behavioral performance, cardiopulmonary functioning, air contaminant levels, and

a variety of self-report measures. The entire production crew was measured. These measures were directed at assessing possible effects of 12-hour shifts on behavioral function, fatigue, air contaminant exposure and job satisfaction.

Survey results indicated an overwhelming support for the new extended workday schedule. The 12-hour schedule was not associated with a decrease in most measures of performance across the shift. Most of the physiological and pulmonary data indicated few differences between 8 and 12 hour shifts.

Based upon the overall acceptance of the new schedule by the workers and lack of evidence to suggest serious performance decrements, we recommended that the mine retain the 12-hour schedule with certain precautionary measures to ensure the safety of the workers. These were

- 1) maintenance of on-site lodging for 12-hour workers.
- 2) periodic observation and measurement of the workforce
- 3) customized work tasks and work breaks to accommodate longer work hours.

#### Conclusions and Recommendations

In conclusion based upon the evidence of the studies of extended workdays, including my own, it is my informed judgement that extended workdays can be safely used in underground mining under certain circumstances. These are:

1. Extended workdays should not be considered for jobs that require extremely high physical workloads. For example the American Industrial Hygiene Association recommends a workload not to exceed 1/3 VO<sub>2</sub>max for an 8-hour workday. Our data and others have shown that underground miners work well under this standard, today.
2. Job sharing and cross training should be considered for 12-hour shifts. Changing jobs may alleviate certain physical and psychological stressors.
3. Workers should not be expected to work overtime beyond the 12-hour shift.
4. Regular evaluation and assessment are strongly recommended. Surveys have been developed for this purpose.

I would like to thank the committee for allowing my testimony on this critical issue that could affect so many workers. I would gladly take any questions that you might have. Thank you.

3/5/96

Marc Livingston  
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(360)-738-3855 Voice and Fax

Representative Kim Elton  
Juneau, AK  
FAX 907 465 2108

Dear Representative Elton,

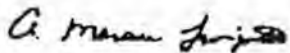
As someone who has worked in both the Sheep Creek Mine and in power tunnels on two dams in Southeast, I would like to urge a cautious and compassionate look at the situation before overturning laws meant to protect miners, for instance the eight hour work day. Being a construction worker myself as well as a commercial fisherman I have often worked long hours at physical and dangerous work, and sure, I like overtime pay.

However, I would like to point out that if you are concerned about jobs for Alaskans that if you support giving fewer workers more hours you will in effect be reducing the total number of jobs available. We must keep circumspect priorities in mind. Certainly many people would encourage industries to come to Alaska to help the economy, but most people would agree that worker safety should be paramount. Our natural resources are not going to go anywhere by themselves, and they will last only so long once they are tapped. And if a corporation finds that it is to their economic advantage to harvest these resources they should be made to do so in a socially acceptable way, keeping worker safety as a high value. Why allow some corporation to take the State's natural resources while bolstering their profits by cutting on worker safety? Many people fought long and hard for the eight hour workday.

One factor which should cause us to look closely at overturning the eight hour day for miners is that miners often have to spend several hours coming and going to their work, for which they are often not paid. For instance, those who work at Greens Creek have a long boat ride before they even start their shift, and another boat ride at the end of their shift before they can go home to rest. When I worked at the Sheep Creek mine there was also a fairly long and dangerous drive to work which was the first of the strenuous and tiring tasks before I even went on the payroll.

I have great respect for miners and I believe them to be some of the hardest working people on earth. Like John Henry many miners will not turn down a challenge or long hours, even if it means working themselves into the ground. I hope that those who make laws and vote on laws will take their jobs as seriously as miners do and consider the effect of their actions on the people affected by the laws.

Sincerely,



A. Marcus Livingston

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**Clynt Nauman**  
General Manager

**Kennecott**  
Minerals

**Before the State House Labor Committee  
Peter Kott, Chair**

**Testimony by Clynt Nauman, General Manager, Kennecott Greens Creek Mining Company, Regarding the Need to Amend Alaska Statute 23.10.410 to Increase the Number of Hours a Person May Work in an Underground Mine to 10 Hours at the Face**

Chair Kott and Committee members, my name is Clynt Nauman. I am the General Manager of Kennecott Greens Creek Mining Company (Greens Creek). While I have only been in this job since April, I lived in Fairbanks for 12 years during the 1970's and 1980's and am really glad to be back in Alaska.

Greens Creek is offering this testimony today on behalf of itself and the Council of Alaska Producers. The purpose of the change in law proposed here today is to improve the economics of those companies which are operating in the State and to improve the investment climate for those companies which are considering whether or not to come to the State. The Minerals Commission recognized this in recommending that the law be changed from 8 hours to 12 hours. The discussion regarding Greens Creek, below, should be viewed as an example of how changing the law could benefit individual mining companies by enhancing operation economics and could benefit Alaska by providing year-round, high-paying jobs.

Greens Creek plans to reopen its mine on Admiralty Island this summer. This reopening provides an opportunity to create jobs for Alaskans throughout the State. In Southeast Alaska there are numerous workers trained in construction work and heavy equipment operation who have been laid off as a result of job losses in the timber industry. These workers may be ideal employees for Greens Creek because appropriately qualified workers could be quickly trained to perform similar tasks at the mine.

To facilitate hiring workers from Southeast Alaskan communities, we are considering a mechanism to underwrite the cost of their travel to Greens Creek. We also propose to house them at the site for reasonable working periods. For example, Greens Creek could have workers spend twenty days on site and ten days off.

In addition to providing jobs for appropriately qualified workers from timber dependent communities, this proposal would prevent friction with the housing-short Juneau community. Our figures show that while the rest of Southeast has experienced an employment loss of 4.1% between 1990 and 1995, Juneau has experienced a 7.1% job growth. Adding another 100 workers or more at Greens Creek would put added pressure on Juneau's housing market.

To proceed with this plan, we would need to have underground employees work 10 hours at the face instead of the 8 hours limit presently provided in the law. The Company would pay overtime for the extra two hours.

The overall benefit to the Company of revising the 8-hour statute and of housing workers at the site is increased operating efficiency which improves our competitive position in the global metal markets into which we sell our products. Increased operating efficiency has the additional benefit of reducing the economic exposure of the mine to the inevitable fluctuations in metal prices, helping to ensure that the mine will continuously operate over the long-term (17 years with current ore reserves and plans.)

I cannot stress how important this is to the mine's economics. It should help us avoid being a "swing producer" which must close when metals prices plummet. We can avoid "boom/bust" impacts on Alaska with this proposal.

The "8-hour rule" now embodied in AS 23.10.410(a) was originally introduced in 1917 to protect worker health and safety, largely because most mining was done by hand labor and because the industry was not subject to state or federal regulatory control. Miners' health was also threatened by respiratory diseases, fatigue, cave-ins, and other adverse underground environmental conditions.

Today, however, ore from underground mines is produced in large part by the use of modern machinery rather than hand labor, and stringent state and federal laws and regulations are in place which control industry labor practices and provide a high degree of protection for employees' health and safety.<sup>1</sup> In light of these and other innovative changes in the mining industry, the 8-hour rule has become obsolete.

Provided with my written testimony are studies prepared by representatives of the U.S. Bureau of Mines advocating expanded work shifts for underground mining operations. Several substantial benefits for expanding the work shift are recognized in these studies:

---

<sup>1</sup> See, for example, the Federal Mine Safety and Health Act of 1977 (30 U.S.C. § 801 et seq.).

- ✓ No increase in safety incidents in moving from an 8 to 10 hour shift
- ✓ increased employee morale and job satisfaction due to longer periods of off-work time
- ✓ lower absenteeism
- ✓ fewer health problems
- ✓ increased efficiency and continuity in mining operations
- ✓ increased mineral production

The change proposed for the current law will not increase safety incidents for underground mine employees. Travel time to and from the mine site, as well as travel time to and from the mine's portal to the mining face, will not be calculated as part of the 10 hour shift. In Greens Creek's case, the rotation of shifts will eliminate the need for the daily commute from Juneau.

Many states have already amended their mining laws to account for these benefits and for advancements in industry technology and health and safety conditions. Although several states establish an eight hour base, many have provided exceptions to that requirement. Some states, such as Washington, Texas and New Mexico, do not even impose a limitation. Attached to my written testimony is a table providing a comparison of the status of laws in several states, including Alaska, regarding the number of hours employees may work in an underground mine.<sup>2</sup>

As has been recognized in several states and in various studies conducted on the issue, underground mine workers and mine operators such as Greens Creek will benefit substantially by the implementation of a 10 hour work shift. Therefore, I urge the Committee to support a change in the 8 hours rule to allow 10 hours at the mining face (exclusive of travel time to the face). A draft copy of our proposed legislation is attached.

Thank you for your consideration.

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<sup>2</sup> Copies of these state statutes are provided for your reference in this notebook (in alphabetical order by state name).

<i>State</i>	<i>Hours Limitation</i>	<i>Exceptions to Application of Limitation on Hours</i>
Alaska (ALASKA STAT. § 23.10.410(a) (Supp. 1990))	8	No
Arizona (ARIZ. REV. STAT. ANN. § 23-282) (1995))	8	No
California (CAL. LABOR CODE §§ 750-752) (Deering Supp. 1996))	8	Yes → pursuant to majority consent or collective bargaining agreement; no cap on hours <sup>3</sup>
Colorado (COLO. REV. STAT. § 8-13-102) (Supp. 1995))	8	Yes → provided mine operator gives reasonable notice to employees of expanded work shift or pursuant to collective bargaining agreement; no cap on hours
Idaho (IDAHO CODE § 44-1104 (Supp. 1995))	8	Yes → up to 10 hours w/ permission of the Director of the Idaho Department of Labor and Industrial Services when there is a majority consent by employees; however, may not exceed 40 hour work week
Missouri (MO. REV. STAT. § 290.020 and § 290.050 (1994))	8	Yes → individual employee's consent; no cap on hours
Montana (MONT. CODE ANN. § 39-4-103 (1995))	8	No

<sup>3</sup> Formerly, California law had provided a 12-hour cap on expanding hours under collective bargaining agreements. In 1995, legislation was passed which repealed the 12-hour cap. (CAL. LABOR CODE § 750.5.)

<p><b>Nevada</b> (NEV. REV. STAT. ANN. § 608.200 (Michie 1995))</p>	<p>8</p>	<p>Yes → pursuant to majority consent or collective bargaining agreement; no hourly cap</p>
<p><b>North Dakota</b> (N.D. CENT. CODE §34.06.03 (Supp. 1995))</p>	<p>No hour limitation; however, the Commissioner of Labor is given the authority to regulate the number of hours to be worked</p>	
<p><b>Utah</b> (UTAH CODE ANN. §34-21-2 (1994))</p>	<p>8</p>	<p>Yes → If Utah Industrial Commission approves longer work period; no cap on hours</p>
<p><b>Wyoming</b> (WYO. STAT. § 27-5-102 (1994))</p>	<p>8</p>	<p>Yes → By mutual agreement between employee or employees' representative and employer; cannot exceed 16 hours.</p>

Sec. 1 is amended to read:

Sec. 1. AS 23.10.410(a) is amended to read:

(a) A person may not be employed in an underground coal mine, underground lode mine, underground placer mine, underground coal, lode, or placer workings, or other underground mine, or workings for more than ten hours in 24 hours, except on a day when a change of shift is made. The ten hour limitation applies only to work actually performed at the mining face and excludes the intermission of time for meals, traveling to the mine site, traveling between the mine's portal to the face, or otherwise going to or from the place where the work is actually carried on, whether in going on or off shift, or in going to or returning from meals.

Sec. 2 is amended to read:

Sec. 2. AS 23.10.410(b) is amended to read:

(b) It is the purpose of this section to limit the hours of employment in 24 hours to ten hours of actual labor at the face, or other place where the work or labor to be done is actually performed.

Sec. 3 is deleted.

**TESTIMONY ON HOUSE BILL 311  
REPEAL OF THE 8-HOUR WORK DAY**

**Presented by Eric Klepfer,  
Manager of Environmental and Regulatory Affairs,  
Coeur Alaska, Inc.**

Mr. Chairman, members of the committee, good afternoon, my name is Eric Klepfer with Coeur Alaska, Inc. I would like to thank the committee for giving Coeur the opportunity to testify today during these hearings.

Coeur is the owner and operator of the Kensington Project which is located approximately 45 miles north of Juneau. The Kensington Project is an underground gold mine with an ore reserve of approximately 1.95 million ounces of gold. Capital costs for the project are estimated at \$195 million and will have an annual payroll of about \$28 million dollars. The project is expected to employ approximately 300 people during operation and produce approximately 200,000 ounces of gold per year. Coeur is presently in the process of permitting the operation and expects to be in a position to make a construction decision by fourth quarter of 1996.

The Kensington Project is a remote mine operation accessible only by plane or boat. Due to the remote nature and limited access, a personnel camp will be built to house employees during their off-hours. It is Coeur's intent to provide both an environment in which our employees can safely and productively work while having a place to relax during their off shift hours.

Coeur is committed to local and Native hire and employment. Recently, we entered into an agreement with 3 Native Corporations in Southeast Alaska to that end. Our goal: to develop local human resources as part of the mineral resource development effort at Kensington. In order to accomplish this, we have been working with the State Department of Labor, University of Alaska and the Native groups to set up mine training programs in Southeast.

The best alternative Coeur can provide employees that work at a remote site is a schedule that will provide extended time home with their families. Coeur needs a modification of the present 8-hour work day restriction for underground mines to provide employment opportunities and schedules that allow flexible work shifts. With an extension of the 8 hour work day, Coeur could consider schedules such as two weeks on, two weeks off, rather than the 8 hour alternative of 2 weeks on, four days off.

Coeur is working with local Southeast communities including Juneau and Haines to develop a "local community project concept." This can be achieved only if there is flexibility in the current law which allows us a similar flexibility in scheduling.

The majority of Alaska's extensive natural resources are located in remote area. Development of these resources will require companies to establish remote camps and use innovative work schedules to meet project objectives and employee needs. Remote operations, by their nature, are well suited to the extended work day and, more importantly, dictate different work schedules.

It is important for this committee to recognize that the 8 hour underground law must be changed in some manner that permits Coeur to use alternative schedules to meet production and employee needs for the Kensington Project while remaining competitive in a world market. Without change, Coeur is restricted in its ability to provide flexible work schedules that benefit the project and most importantly, our employees, Southeast Alaska and the State as a whole. Alaska is one of the last active mining states that has not changed this law in some manner.

Numerous reports and studies have been completed by organizations such as the US Bureau of Mines and other knowledgeable groups regarding extended shifts and safety in mining. James C. Duchon, former U.S. Bureau of Mines Safety Division research analyst and expert on shiftwork and safety training in mining is here today via teleconference to testify on the results of these studies and answer any questions this committee may have.

To be competitive and attract quality employees, Coeur's operations must be able to:

- provide a safe work environment;
- offer reasonable work schedules which provide the employee opportunity to spend quality time with families;
- meet project objectives and goals; and
- minimize costs.

There are several inherent benefits that Coeur and its employees gain by extending the 8 hour underground work day. These are:

- high paying jobs with work schedules that meet both project and employee needs;
- employment opportunities in communities such as Haines and Juneau;
- minimizes the need for families from outlying Alaska communities to relocate to Juneau;
- reduces the number of helicopter flights to and from the site (safety and environmental conservation); and
- provides much needed job opportunities to Southeast Alaska communities.

As you can understand, the remote location of the project, limited access and other considerations make it imperative that the 8-hour underground restriction be changed. This is extremely important to the project and will play a pivotal role in the final decision for project development. Coeur must be able to operate the underground mining operation beyond the 8 hour work day. We urge the committee to support a bill that changes this restriction. By doing so, Alaska is moving in concert with other states in removing work day restrictions for underground mining operations that other industries in Alaska enjoy. Anything less will hinder the future of mining in Alaska.

Coeur is committed to Alaska and the Kensington Project and will assist the committee in anyway to change the existing 8-hour day restriction imposed upon the mining industry. Thank you Mister Chairman and Committee members for the opportunity to testify.

February 16, 1996

Representative Pete Kott  
Alaska State Legislator  
State Capitol, Room 432  
Juneau, AK 99801

**SUBJECT:** House Bill 311

Dear Representative Kott:

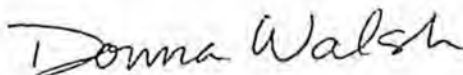
As you may be aware, Coeur Alaska, Inc. (Coeur) is in the process of permitting to reopen the Kensington Gold Mine Project, 45 miles north of Juneau, Alaska. Coeur is optimistic that we will be in a position to begin construction in late 1996, and go into operation early 1998. During construction, we expect to employ approximately 500 persons, including support. During operation, we plan to employ approximately 350 workers. The Kensington project is an underground mine, with a current mine-life of 12 years.

Given this overview, as you might expect, we have been anxiously watching the developments in regard to House Bill 311. At the February 14, 1996 hearing, the question was asked if there was any information on the psychological effects of a person working underground. Attached is a report by James C. Duchon, former U.S. Bureau of Mines research analyst, that explains in some detail the effects of working underground. In addition, Coeur has contracted Duchon to write an executive summary on extended shiftworks, safety in mining, etc. Coeur has also asked Duchon if he would be willing to testify at the next hearing. The outline for Duchon's executive summary is attached. If you are interested in additional items not listed on the attached outline, please let me know as soon as possible, and we will add it to the list. We hope to have Duchon's report by the end of next week.

I hope the attached information is useful. Unless I hear otherwise from you or your staff, I will continue forwarding information I receive on the subject of extended underground workdays to your office. I can be reached at: (907) 463-5425.

Also, I wanted to thank you for finding time in your busy schedule to meet with Dennis Wheeler, President and CEO of Coeur during his visit to Juneau next week.

Sincerely,



Donna Walsh  
Community Affairs Coordinator

Enclosures



**C O E U R**  
THE PRECIOUS METALS COMPANY

**ALASKA GROUP**

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Proposal for an Executive Summary entitled "The Usage of Extended Workshifts in Underground Mining: Is it Safe?"

- I. Purpose of this summary
- II. Extended Workshifts-what are they? What are the factors associated with them such as a) long work days, b) short workweeks, c) night shifts
- III. Safety in mining today
- IV. Studies in all industries regarding safety in extended workshifts.
- V. Studies in underground mining, including the Bureau of Mines Study.
- VI. Conclusions and Recommendations



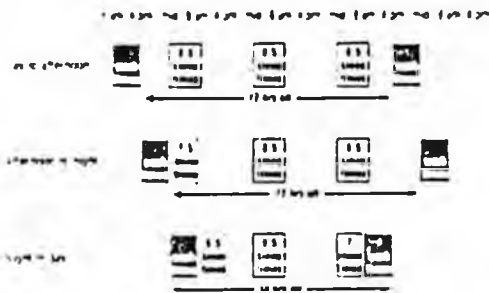
# **BULLETIN**

*August 1995*

**INSIDE:**  
*Shiftwork*  
*Lubricity*  
*Reminder for blasters*  
*Prostate health*

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The Holmes Safety Association Bulletin contains safety articles on a variety of subjects: fatal accident abstracts, studies, posters, and other health and safety-related topics. This information is provided free of charge and is designed to assist in presentations to groups of mine and plant workers during on-the-job safety meetings.

PLEASE NOTE: The views and conclusions expressed in "HSA Bulletin" articles are those of the authors and should not be interpreted as representing official policy or, in the case of a product, represent endorsement of the Mine Safety and Health Administration.

**KEEP US IN CIRCULATION—PASS US ALONG**

# 2

## Shiftwork: a guide for schedule design

By James C. Duchon<sup>1</sup>

### Abstract

Based upon the perturbed performance, increased or more serious accidents, lowered production, higher absenteeism, health problems, familial problems, low morale, and job dissatisfaction due to working nights and shiftwork, the U.S. Bureau of Mines has analyzed shiftwork schedule design at mining operations. The purpose of this paper is to discuss in practical terms what mining companies can do if they are considering changes in their shiftwork practices. It is not the intent of this paper to persuade management or any workers that they should change their shiftwork schedule.

This paper discusses various design considerations or dimensions that may vary. These dimensions are (1) fixed versus rotating schedules, (2) speed of rotation, (3) direction of rotation, (4) length of shift, and (5) starting time of shift. Also, extended workdays and other management considerations, such as training and evaluation, are discussed.

### Introduction

In the mining industry, the proportion of employees working shiftwork is increasing. Data from the U.S. Bureau of Labor Statistics indicate that in 1991, 28.4 pct of all mine employees worked evening, night, or rotating shifts, as compared with 21.9 pct in 1985. Further, the percentage of

miners working shifts other than straight days is considerably larger than the combined average of all U.S. industries (17.8 pct).

There are several practical reasons why shiftwork in mining is prevalent, including (1) the increased demand for goods and services combined with limited overhead; (2) the need to maximize costly equipment for quick capital recovery; (3) the need to take advantage of lower utility costs at offpeak-hour utility rates; and (4) the need to keep equipment running continuously because of high startup costs.

It has been demonstrated in published studies that workers in various industrial groups, such as mining, power, chemical, nursing, factory, and oil refineries, have displayed perturbed performance, increased or more serious accidents, lowered production, higher absenteeism, health problems, familial problems, low morale, and job dissatisfaction due to working nights and shiftwork (1-10).<sup>2</sup>

An excellent review of these effects can be found in a recent document completed by the U.S. Congress, Office of Technology Assessment (1). It is easy to understand, therefore, why there is a growing interest among all industries, including mining, to examine shiftwork interventions.

A discussion of alternative work schedules provided other reasons why there is a recent trend in the United States toward

new and better schedules (11). For instance, an increase in relative affluence creates a climate where many of life's privileges and comforts have become necessities. Employees are examining alternative schedules consistent with this. Also, cultural changes, changes in employment rates, an aging work force, labor force participation, and a shift to service work all contribute toward this move to seek alternative schedules.

For these reasons the U.S. Bureau of Mines (USBM) has been involved in research on various shiftwork issues to enhance the safety of the mine worker. The purpose of this paper is to discuss in practical terms what mining companies can do if they are considering changes in their shiftwork practices. It is not the intent of this paper to persuade management or any workers that they should change their shiftwork schedule. In many cases, current work scheduling practices are used successfully. Changes in such situations may, in fact, worsen their situation in spite of all good intentions.

### Ergonomic considerations of schedule design

The perfect shift does not exist. Figure 1 illustrates that there are three ergonomic considerations for any schedule that are associated with various causes and effects, such as production, absenteeism, accident rates, worker fatigue, and morale. These considerations include

<sup>1</sup> Engineering research psychologist, U.S. Bureau of Mines, Twin Cities Research Center, Minneapolis, MN.

<sup>2</sup> *Italic numbers in parentheses refer to items in the list of references at the end of this article.*

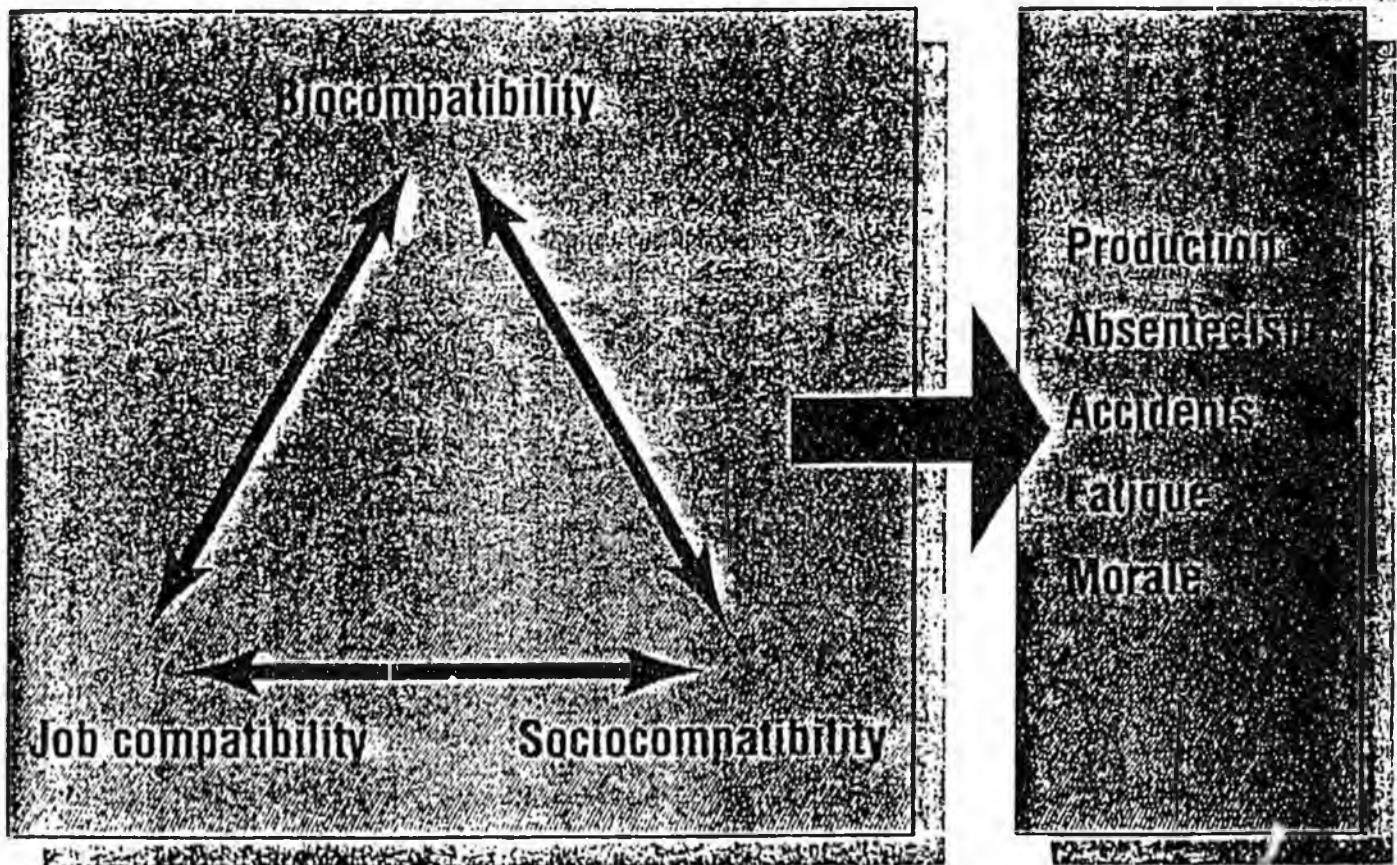
biocompatibility, sociocompatibility, and job compatibility. A comprehensive assessment of any schedule, therefore, must consider each of these components. While each of these considerations are interrelated, they will for the sake of simplicity be discussed and treated independently.

Biocompatibility refers to how a schedule conforms or does not conform to human physiology that may affect performance. It is well known that humans have innate "biological clocks" that control certain physiological functions. Circadian rhythms are those functions that have an approximately 24-hr cycle, such as the excretion of human growth hormone and cortisol potassium, variation of body temperature, and sleep-wake cycle. The sleep-wake

cycle refers to the body's natural tendency to maintain wakefulness during the daylight hours and sleep during the night. There are two observable consequences that can occur as a result of disrupting the sleep-wake cycle. First, remaining awake at night results in fatigue or a feeling of being tired. This fatigue occurs even when "enough" sleep is taken prior to the night shift. Fatigue occurs at night because of a physiological push for sleep manifested by sleepiness, performance deficiencies, lowered body temperature and heart rate, and other signs associated with a need for sleep. When body temperature is used as an indicator of alertness, the trough of this cycle tends to occur at approximately 3:00 am for an individual who is not adjusting to a different

schedule or time zone.

A second situation related to circadian rhythms is referred to as occupational jet lag. Just as our bodies adjust to different time zones during travel, so too must our bodies adjust to rotations from day or evening shifts to night shifts. Fatigue, malaise, disturbed sleep, and general flu-like symptoms occur as a result of circadian rhythm desynchronization and physiological adjustment to the new shift (time zone). Such a biological adjustment to new time zones may take from 3 to 10 days, whereas adjustment to a night shift may take longer or may never occur because of conflicting day-night cycles, i.e., working during the night and sleeping during the daylight hours, as well as conflicting social and family cues on workdays and



Ergonomic considerations

Effects

Figure 1.—Ergonomic considerations and effects of shiftwork schedules.

off days.

Sociocompatibility refers to a compatibility between work schedule design and social-family life schedules. This design consideration is perhaps the most critical aspect from the perspective of the shift worker. The norm in our society is an 8-to-5, Monday-through-Friday schedule. Deviation from this could potentially create social conflict. For many workers, the most disliked shift in this respect is the evening shift. Working between 3:00 pm and 11:00 pm precludes a satisfactory family-social life. Working weekends, an unavoidable consequence of continuous operations, is a major source of social incompatibility.

Job compatibility refers to how a schedule conforms with or competes with job or organizational demands. For instance, certain companies or industries require training days to be built into a schedule. Some underground mining companies have blasting periods that should be considered in a schedule. Such things as need for weekend work, need

for equal personnel across the 24-hr day, commuting times for employees, union regulations, exposure to harmful environmental agents, etc., should be considered in the choice of schedule design. Any schedule that involves evening, night, or rotating shifts will create problems for some people.

**Management-labor differences**

The focus of "important" schedule considerations can be different depending upon one's perspective. Figure 2 illustrates the concerns management and labor typically consider critical in a "good" schedule. Traditionally, management tends to emphasize issues of job compatibility, while labor tends to emphasize issues of sociocompatibility. This is not to say that management ignores the welfare of its employees or that employees do not consider the job considerations that are necessary for company survival. In fact, insight into each position is ultimately necessary for a successful and workable schedule. Until recently, biocompatibility issues in schedule designs were often ignored.

However, research in the past 10 years has evaluated human sleep, biological rhythms, nutrition, etc. in relation to shiftwork schedules and has offered important considerations that should be of value to all parties.

**Recommendations**

While there are virtually unlimited schedule designs, there are limited dimensions of the schedule that can vary. These dimensions are (1) night and evening shift, (2) fixed versus rotating shifts, (3) slow or fast rotation schedules, (4) forward or backward rotation, (5) early or late shift start times, and (6) length of shift. The following is a discussion of each of these.

**Night and evening shift**

As mentioned earlier, working night shifts has been associated with a variety of health and performance measures. It is the night shift that is incompatible to our body's natural rhythms. The night shift is also disliked by many workers because of social factors. There are situations, however, where individuals prefer working nights because of certain

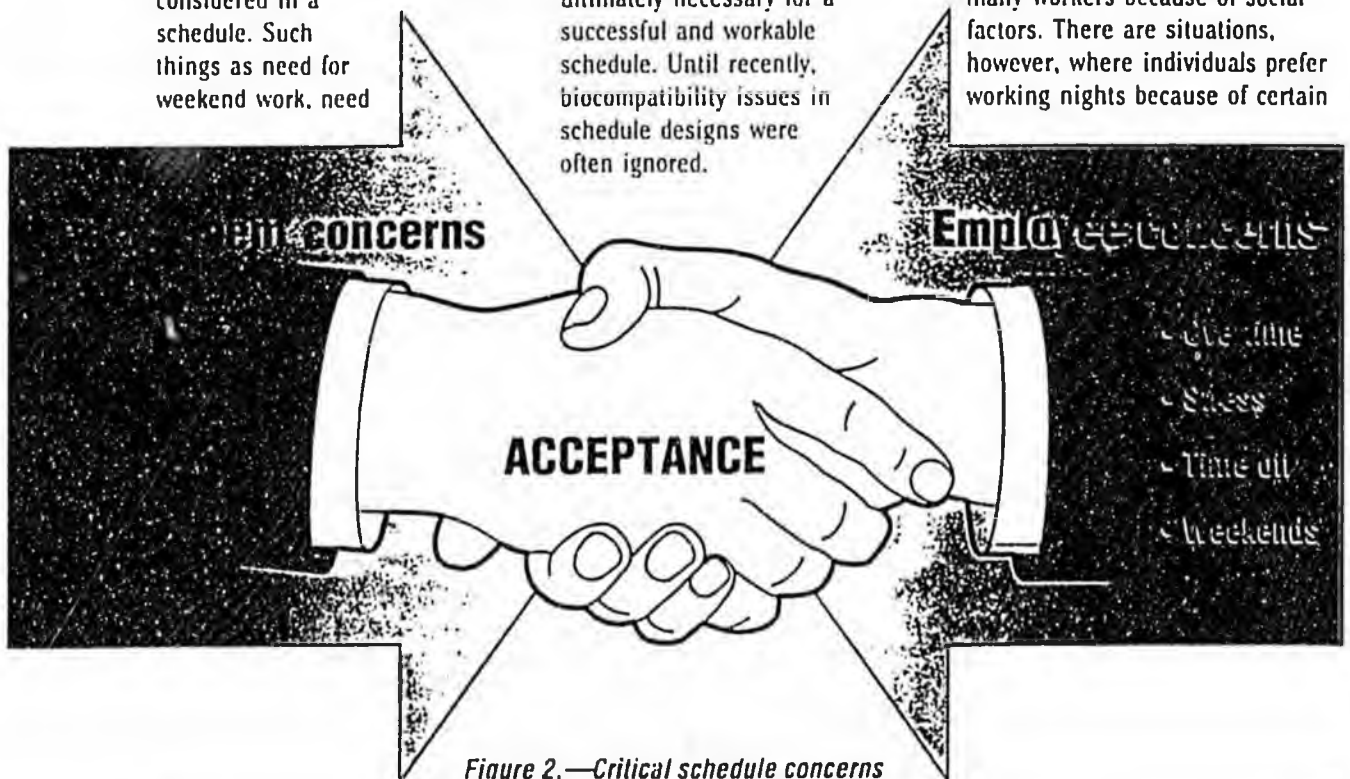


Figure 2.—Critical schedule concerns

benefits, such as pay differentials and less pressure or less supervision at work. Working nights also allows for more parental involvement in child care and the associated cost savings.

Considering only the criteria of adequate sleep, the evening shift is for most people the perfect shift. Virtually all studies have indicated that the evening shift is associated with the greatest sleep length when compared with the day or night shift. Nevertheless, it is the evening shift that is the least preferred by workers. Clearly, this dislike for the shift is due to issues of sociocompatibility.

**Recommendations:**

1. Before anything else, an employer should consider the possibility of decreasing use of night shifts.
2. The use of overtime should be avoided for workers on night shifts. Many workers nap prior to the shift and begin sleep immediately following the night shift. Therefore, any overtime may eat into the worker's total sleep length, which is already shortened.

the day or evening shifts.

c. Ample opportunity for a hot and healthful variety of foods via machine or food cart should be made available to these "offshift" workers.

d. Lunch breaks should occur at a consistent time of the night shift, i.e., meals should be eaten at approximately the same time each night.

**Fixed versus rotating shifts**

Fixed or permanent shifts are more common in Monday-through-Friday, 24-hr operations. In these 5-day operations, three crews each working day, evening, or night shifts can cover a 24-hr operation with either permanent or rotating shifts. However, in continuous operations, utilizing 8-hr shifts, where each job totals 168 hrs per week (24 hrs/day times 7 days/wk), a minimum of four crews is needed to cover all three shifts. Therefore, at least some shift rotation is typically required. The question then becomes, Should the use of permanent shifts be minimized or maximized when possible? Table 1 shows one of

using fixed shifts, such as permanent days, evenings, and nights, is to allow workers on the night shift to "adjust." However, research has consistently shown that night workers never completely adapt to that shift. Nearly all night permanent shift workers revert to a "normal" day schedule on their days off. They are, therefore, constantly rotating their work-sleep cycles in spite of having a fixed shift. Several studies have indicated that permanent night workers, as do rotating shift workers, tend to sleep several hours less before the night shift than any other shift. Working consecutive night shifts, therefore, may result in a cumulative "sleep debt." A summary of the pros and cons of fixed versus permanent shifts is as follows:

**Advantages of Fixed Shifts:**

1. Often allows workers to choose the evening or night shifts. These shifts are actually more sociocompatible for some workers.
2. Allows a large percentage of employees to avoid the night shift altogether.

3. Less disorienting since rotation among the other shifts is not required.

**Advantages of Rotating Shifts:**

1. A "fair" schedule. No preferences given to individuals for the favored shifts.
2. Minimizes the exposure to the night and evening shift to any particular group of employees by "spreading out" the exposure among all employees.
3. If rotations are fast (see next section) then there may be less physiological disruption of

Table 1.—Schedule consisting of four-crew, 8-hr, 7-day backward rotating "Southern Swing" pattern

Crew-week	Mon	Tues	Weds	Thurs	Fri	Sat	Sun
1	—	—	E	E	E	E	E
2	E	E	—	M	M	M	M
3	M	M	M	—	—	G	G
4	G	G	G	G	G	—	—

E = Evening shift G = Night shift M = Morning shift Dashes indicate off days

3. When night shifts are used, several special precautionary measures should be taken. These are:

- a. Longer or more frequent mandatory rest breaks when work is between midnight and 6:00 am.
- b. Physically or mentally difficult assignments should be left for

the most commonly used schedules in continuous operations. This schedule maximizes rotating shifts by requiring all workers to rotate on a weekly basis. In contrast, table 2 shows a schedule that utilizes three fixed crews (1, 2, and 3) and one rotating or "grasshopper" shift (crew 4). One argument in favor of

6

circadian rhythms, i.e., occupational jet lag would not be an issue.

**Recommendations:**

1. The primary consideration

shorter stretches of nights to avoid a cumulative sleep deprivation that may occur with too many contiguous night shifts (12). On the other hand, it can be argued that a slower rotation has the

and (4) sleep quality. Results indicated that on the second week of the night shift, workers reported significant improvements in all four mood descriptors for the second half of their shift. Also,

Table 2.—Schedule consisting of 6-day-on and 2-day-off pattern, repeating every 8 days.

Crew-week	Mon	Tues	Weds	Thurs	Fri	Sat	Sun
1 <sup>1</sup>	M	M	M	M	M	M	—
2 <sup>1</sup>	—	—	E	E	E	E	E
3 <sup>1</sup>	G	G	—	—	G	G	G
4 <sup>2</sup>	E	E	G	G	—	—	M

E = Evening shift G = Night shift M = Morning shift Dashes indicate off days  
<sup>1</sup>Fixed <sup>2</sup>Grasshopper shift, rotating every 2 days

sleep quality as measured by awakenings during sleep improved on the second week of the night shift. None of the variables showed a worsening on the second week

should be the possibility of the reduction of the work force on the night shift.

2. Unless the night shift and the evening can be filled by workers voluntarily choosing to work permanent shifts, rotating shifts are recommended.

advantage of letting workers adjust to night shifts, thereby lessening the negative effects of night work (13).

The USBM conducted a study to determine whether or not there is an advantage to working the second week of a 2-week cycle, as would be indicated by reports of more positive health, mood, and sleep items on the second week as compared with the first week

of nights. These results do not support a "cumulative trauma" effect for the schedule studied in this paper. On the basis of this study, it could be recommended that 2-week cycles are superior to 1-week cycles.

However, a truly fast rotation schedule, rarely used in U.S. industries, is common in European countries. Table 3 shows a typical fast rotating schedule.

**Slow or fast rotation schedules**

Rotating shifts can differ with respect to how quickly workers rotate from one shift to another, or the number of contiguous days on each shift. In U.S. mining operations, rotations tend to be as short as 1 week and as long as 2 or more weeks on the same shift. It is not typical to find "rapid" rotations of 1 or 2 days, as is found in some service industries or as is typical in the European community. The rapid rotation will be discussed below.

There are reasonable hypotheses for suggesting either the 1 week, or the slower rotation cycles of 2 or more weeks. On the one hand, it can be argued that it is more advantageous to work

(14). Forty-two workers at a surface mine in the Midwest filled out the work, food, and sleep diary for 4 to 6 weeks. They rotated every 2 weeks, going from days to nights to evenings with all weekends off. The dependent measures were defined as (1) health, the daily frequency of reported symptoms; (2) mood, based on a self-evaluation of four descriptors—alert, sleepy, grouchy, and relaxed; (3) total sleep length;

Experts agree that there are several advantages to fast rotating shifts (15-17). First, individuals do not have time enough on any shift to adjust his or her circadian rhythms, thereby avoiding the physiological dyschrony associated with working stretches of night shifts. Second, working only two or three consecutive nights does not allow a sleep debt to occur, which is associated with working several consecutive nights. Third,

Table 3.—Rapid rotation schedule often used in European work systems<sup>1</sup>

Crew-week	Mon	Tues	Weds	Thurs	Fri	Sat	Sun
1	M	M	E	E	G	G	G
2	—	—	M	M	E	E	E
3	G	G	—	—	M	M	M
4	E	E	G	G	—	—	—

E = Evening shift G = Night shift M = Morning shift Dashes indicate off days  
<sup>1</sup>This schedule requires four crews working a repeating 2-2-3 pattern. For instance, crew 1 works 2 days, 2 evenings, 3 nights, 2 off days, 2 day shifts, 2 evening shifts, etc.

short stretches of nights allow for more regular social contacts.

**Recommendations:**

1. On a rotating schedule, it is

to night to evening shift (table 1). Unfortunately, there are virtually no published studies that have systematically reversed ONLY the direction of the shift rotation in a

pattern: (1) a forward rotation produces a 72-hr-off period between a day and evening shift, a 72-hr-off period between an evening and night shift, and a 48-hr-off period between a night and day shift, and (2) a backward rotation produces a 56-hr-off period between a night and evening shift, a 56-hr-off period between an evening and day shift, and an 80-hr-off

Table 4.—Crewless schedule consisting of 2 contingent weeks of nights'

Crew-week	Mon	Tues	Weds	Thurs	Fri	Sat	Sun
1	—	M	M	M	M	M	M
2	M	—	—	M	M	M	M
3	M	M	M	—	—	M	M
4	E	E	E	E	E	—	—
5	—	G	G	G	G	G	G
6	G	—	—	G	G	G	G
7	G	G	G	—	—	E	E
8	E	E	E	E	E	—	—

E = Evening shift G = Night shift M = Morning shift Dashes indicate off days  
 This schedule requires eight shift workers covering two positions around the clock. The shift workers are placed at 1-week intervals in an 8-week cycle.

recommended that schedules have 2 weeks of a particular shift (with days off), as compared with 1 week. Table 4 shows an example of a schedule for an eight-worker continuous operation, utilizing 2-week rotations.

2. A fast rotation, such as the one shown in Table 3, may be considered as an alternative for those groups of workers wanting

mining or industrial setting that would show the benefit of such an intervention. There are, however, a few studies that have made shift changes, which have included direction of rotation as one part of the total change. For instance, the most widely cited study is the intervention study at Great Salt Lake Minerals (10). In this study, the group that changed to a

period between a day and night shift. The shorter the off period, the less time for rest and recovery. Therefore, they conclude that since a forward rotation produces only one short, between-shift interval and a backward rotation produces two short, between-shift intervals, the forward rotation is recommended.

Premise 2: A second and more popular reason for prescribing the forward rotation relates to circadian rhythms that are disrupted during phase advances or delays. Since humans have

Table 5.—Schedule consisting of four-crew, 8-hr, 7-day forward rotating pattern

Crew-week	Mon	Tues	Weds	Thurs	Fri	Sat	Sun
1	—	—	M	M	M	M	M
2	M	M	—	E	E	E	E
3	E	E	E	—	—	G	G
4	G	G	G	G	G	—	—

E = Evening shift G = Night shift M = Morning shift Dashes indicate off days

to avoid long stretches of night shifts.

**Forward or backward rotation**

One popular suggestion offered by shiftwork experts is to prescribe schedules that rotate in a forward direction. Rotating from a day to evening to night shift (table 5) is preferred over rotating from a day

forward direction AND went from a weekly to a 21-day rotation schedule improved on measures of health, production, and turnover.

There are two viewpoints as to why there may be benefits using a forward rotating schedule: Premise 1: First, Knauth and Rutenfranz (16) state that for a discontinuous three-shift system with a five-shift, two-days-off

circadian rhythms that are over 25 h, it is easier to phase delay than to phase advance. Phase advances merely refer to adjustment of our circadian rhythms to earlier clock times. Phase delay refers to adjustment to later clock times. Research has shown that transmeridian air travelers have a much easier time adjusting to westward travel ("phase delay" or

forward rotation) as opposed to eastward travel ("phase advance" or backward rotation) (18-20). Based on this research, many authors have recommended that shift rotation schedules take advantage of this finding by constructing schedules with forward rotations to hasten adjustment to each new shift (10, 16, 21-22). Unfortunately, no single study has compared the patterns of adjustment or completeness of adjustment for a group of shift workers who have rotated in each direction with all other factors being equal. In fact, no study has demonstrated complete circadian adjustment for shift workers rotating in either direction.

The USBM challenged these viewpoints using an analysis based upon sleep times taken from survey data and attempted to evaluate the argument that forward rotations are BETTER than backward rotations. The primary concern in rotating shiftwork is rotating onto and off of the night shift. Therefore, each between-shift interval prior to or subsequent to a night shift was scrutinized. This paper is based on sleep timing only. Other factors that could influence adjustment, such as eating and social behaviors, internal biological functions, and rhythms should not be ignored.

Night shifts are typically considered either the first or third

shift, depending upon the placement within the overall schedule. For instance, in a Monday-through-Friday workweek, a night shift is the first shift if it begins at or about Sunday night and ends Monday morning. However, a night shift is considered the third shift if it begins late Monday night and ends early Tuesday morning.

It was shown that when nights are the third shift, the recovery interval after the night shift on

When nights are the first in the series, the recovery intervals after a night shift are relatively long for both forward and backward shifts. However, the backward rotation contains a potential for three full night's sleep, as opposed to only two full night's sleep for the forward rotation.

Therefore, when primary importance is placed upon recovery from night shifts, if nights are the third in the series, the backward rotation is the most

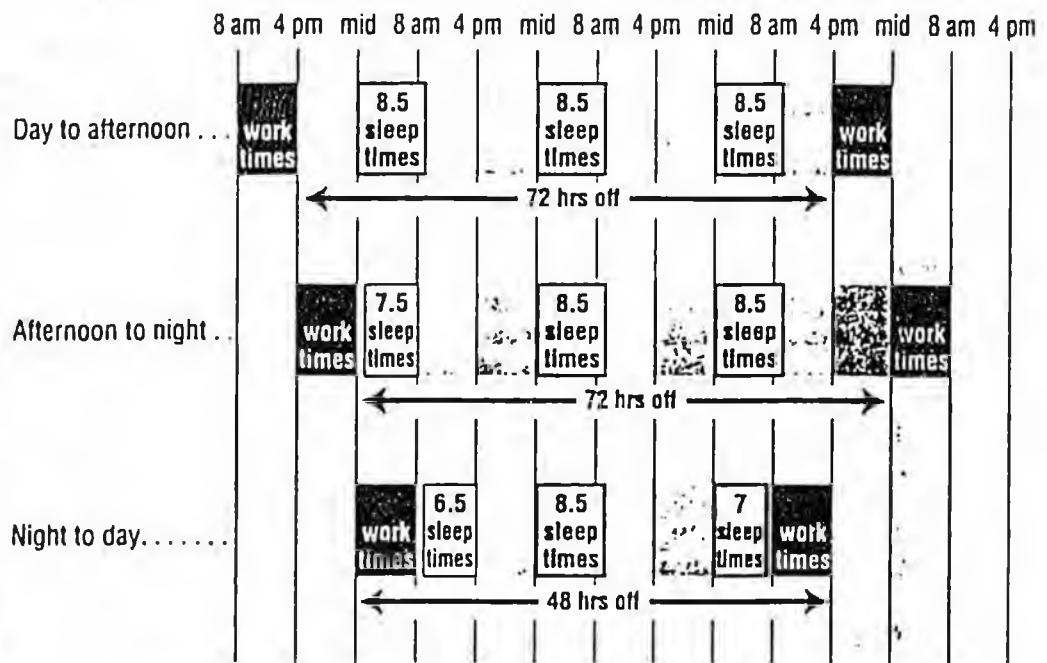


Figure 3.—Forward rotation with night as third shift. mid = midnight

both the forward and backward rotations are "short" intervals (figs. 3-4). However, the forward rotation contains only one full night's sleep and two shortened sleep times. Further, the day shift follows this, which could itself contribute to sleep deprivation. On the backward rotation, the recovery interval after a night shift contains two full night's sleep, following a shortened day sleep. The next afternoon series could actually help in recovery since these shifts are associated with the longest sleep lengths of any shift.

desirable.

The amount of sleep and time off prior to working a series of night shifts was also inspected (figs. 3-4). Ideally, individuals who are well rested will have a better chance of adjusting and coping with their night shifts. Where nights are the third in the series, both the forward and backward rotations have a long between-shift interval prior to the night shift, 72- and 80-hr, respectively. Both allow three separate sleep periods to recover from the night shift.

Where nights are the first in

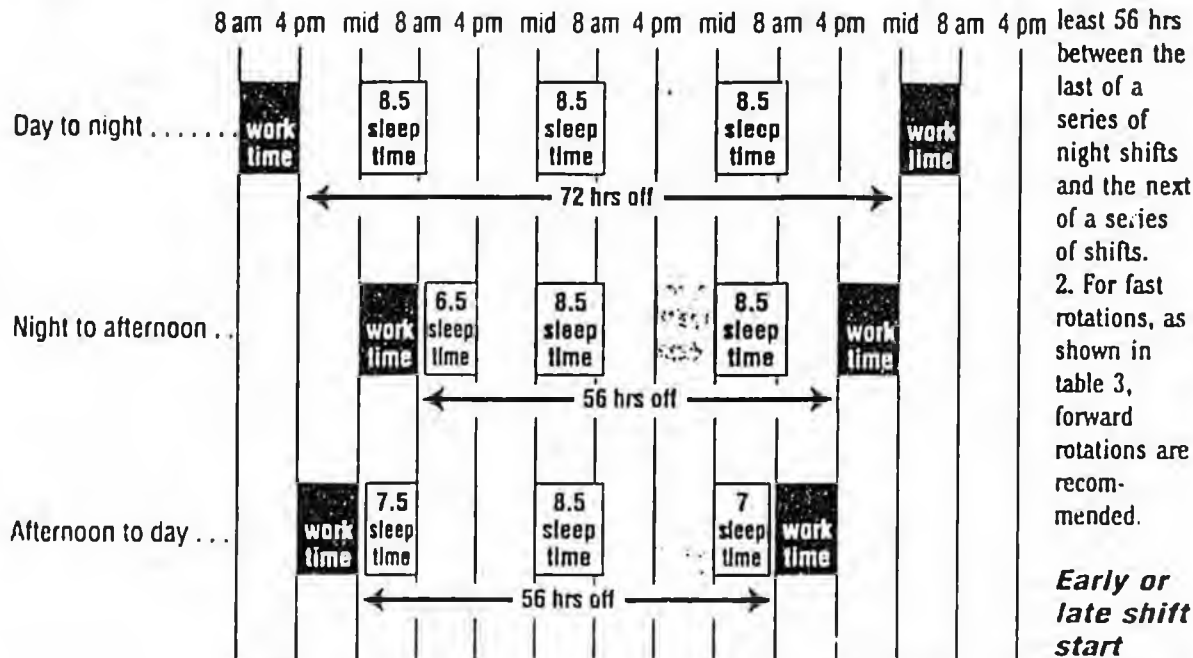


Figure 4.—Backward rotation with night as third shift. mid = midnight

least 56 hrs between the last of a series of night shifts and the next of a series of shifts.  
 2. For fast rotations, as shown in table 3, forward rotations are recommended.

**Early or late shift start times**  
 Various

the series, both the forward and backward rotations have a "short" between-shift interval, 48-hr and 56-hr, respectively. The day-to-night shift change on the backward schedule and the evening-to-night shift change on the forward schedule have only two nighttime sleep periods.

Therefore, when analyzing sleep behaviors prior to night shifts, having nights as the third shift for both forward and backward shifts are more desirable than having nights as the first shift.

Perhaps the more popular reason for promulgating the forward rotation is its apparent consistency with the idea that it is biologically quicker to adjust when rotating in the forward direction than in the backward direction. Forward rotations have been compared with east to west travel, where sleep-wake cycles are phase delayed; i.e., sleep occurs later than what has been typical for an individual. Just looking at work start times, it appears that workers are phasing in a forward direction; i.e., day to

evening to nights. However, when looking at the sleep-wake cycles of actual workers, they are not consistently rotating forward.

Based upon typical sleep times, the number of phase advances and phase delays are exactly equal for forward and backward rotating shift workers. Adjustment, therefore, should be the same for both conditions.

**Recommendations:**

1. Where the speed of rotation is relatively slow (i.e., 1 week or more), the preferred direction of rotation is linked to the amount of time off between changes. The amount of time off is related to the position of the night shift, first versus third. An analysis of time off and typical sleep periods indicates that the backward rotation with nights as the first shift may be more conducive for recovery from a stretch of nights. However, a backward rotation with nights as the third shift offers the best opportunity for sleep in preparation and recovery from the night shift. In general, it is suggested that there should be at

factors can influence a preferred start and end time. In the realm of job-compatibility, certain factors should be considered. For instance, daily blasting schedules are often coordinated with shift start times for underground mines, since evacuation of the mine is necessary. Sociocompatibility issues involve such concerns as driving through rush hour and being home at particular times to coincide with meal times or child care. Biocompatibility issues include such concerns as sleep quality and sleep length, as well as individual differences such as morning and evening types. Morning types or larks are those individuals who tend to prefer to go to bed early and wake up early. Evening types or owls are those individuals who prefer to go to bed late and wake up late. This factor may be an important consideration as the work force ages. Older workers are associated with being morning types.

In general, research has shown that when working a day shift, sleep length decreases with earlier work start times. Also, sleep taken

between night shifts are of shorter duration the later the work times start and end. Therefore, to maximize sleep length before the morning shift, the shift should not start too early. However, to maximize sleep length after a night shift, the shift should not end too late.

Knauth and Rutenfranz (16) discussed studies of start times in various industries. In a coal mine, an experimental change on the day shift from a 6:00 am to a 7:00 am start time was associated with a 23.8 pct accident rate decrease. Similar findings of later start times being associated with fewer accidents or error rates have been found with bus drivers and train drivers. The study also suggested that earlier start times on a "late shift," between 1:00 pm and 4:00 pm, was associated with more frequent accidents.

**Recommendations:**

1. On a one-shift system (i.e., a day shift), a 7:00 am to 9:00 am start time is suggested.
2. For 24-hr operations, it is suggested that a 7:00 am, 30 min start time be employed. A later start time will hamper the ability of night shift workers to get adequate sleep.
3. Ideally, a flexible start time should be used

if possible. This allows for individual preferences and differences.

**Length of shift**

There is very little doubt that "extended workdays," regular shifts of 10 or 12 hrs, maintaining an approximately 40-hr week, is a very popular alternative among the work force because of the

significant increase in days off, including weekends, especially when compared with traditional rotation schedules of working seven straight shifts or having only one weekend off every 4 to 6 weeks.

While the popularity of extended workdays has been on the increase, there are some serious concerns by management, workers, unions and various governmental policy-makers that working 10- or 12-hr days may create an added risk of accidents and health problems (23). Unfortunately, there is very little objective information available regarding the nature and degree of safety and health risks associated with the application of extended workday schedules (1, 24-25). As a consequence, when it comes to questions of designing and managing extended workdays, decisionmaking by management must now proceed on limited information.

Health and safety issues are not important considerations for the implementation of 12-hr shifts in relatively safe workplaces such as white collar settings. However, in labor-intensive and environmentally stressful conditions as in mining, where accidents and health are major concerns, or

application of extended workday schedules by U.S. industries will become increasingly widespread over the decade, it is imperative that a careful and comprehensive evaluation of safety and health risks associated with such schedules be initiated. In a report requested by the House Committees on Appropriations; Energy and Commerce; Science, Space, and Technology; Veterans Affairs, and the Senate Subcommittee on Science, Technology, and Space of the Office of Technology Assessment, it was stated that there is "...a compelling need for more studies of the interactions between work schedules and safety in the workplace." (1, p. 18).

The change from an 8-hr rotating shift to a 12-hr rotating shift implies several critical schedule differences (26). Below are the crucial similarities and differences between 8-hr rotating shifts and 12-hr rotating shifts. These are the factors that could make a difference in workers' tolerance to their schedules:

1. Length of the workday.—An extended workday is typically considered a 10- or 12-hr workday, while still maintaining an approximately 40-hr workweek. Table 6 shows an example of "2-3-

Table 6.—Schedule consisting of two-three-two,<sup>1</sup> every other weekend off, 12-hr shift pattern.

Crew-week	Mon	Tues	Weds	Thurs	Fri	Sat	Sun
1 .....	—	D	D	—	—	D	D
2 .....	D	—	—	D	D	—	—
3 .....	—	N	N	—	—	N	N
4 .....	N	—	—	N	N	—	—

D = 12-hour day shift N = 12-hour night shift Dashes indicate off days  
<sup>1</sup> This schedule is the continuous pattern of the days on-days off sequence; i.e., two shifts on, followed by 3 days off, followed by two shifts on, followed by two shifts off, etc.

where safety is a public concern as in the nuclear power industry, the application of long workdays must be carefully analyzed. Since all indications are that the

<sup>1</sup> This schedule is the continuous pattern of the days on-days off sequence; i.e., two shifts on, followed by 3 days off, followed by two shifts on, followed by two shifts off, etc.

2 every other weekend off" extended workday schedule.<sup>1</sup>

2. Amount of time off between workdays.—Extended workdays typically have less off-time between shifts. This would have implications for physical recovery from fatigue and potentially less time for sleep.

3. Length of the workweek.—Extended workweeks typically have shorter workweeks at the expense of longer workdays. This could have implications for adaptation of circadian rhythms or less cumulative fatigue across a workweek (27).

4. Amount of time off, i.e., length of "weekends."—Extended workdays usually allow more days off. This would have implications for recovery from fatigue or sleep deficit.

5. Speed of rotation.—U.S. shift workers usually rotate slowly, 1 week or more on any one shift. Extended workdays usually require faster rotations, 2 to 4 consecutive days, which would have implications for adaptation to circadian rhythms.

6. Time of day.—Both 8-hr schedules and 12-hr schedules can involve around-the-clock operations. Therefore, working the night shift will still be an issue in extended workdays.

The USBM conducted a study designed to examine the safety and health implications of extended workdays at an underground copper, lead, and zinc mining operation (28). Measures were taken before and after a change from the old 7-days-on, 2-days-off, 8-hr continuous schedule to the new 4-days-on, 4-days-off, 12-hr continuous schedule. These measures included (1) behavioral performance measures to analyze perceptual-motor changes, (2) continuous heart-rate monitoring and aerobic capacity to measure

physical fatigue, (3) pulmonary-respiratory measures to examine air contaminant exposure, and (4) a variety of self-report questionnaires to measure perceived adaptation and satisfaction with the new schedule. A control group consisting of 5-days-on, 2-days-off day shift workers at the same mine was also included.

Survey results indicated an overwhelming support for extended workdays at the underground copper, lead, and zinc mine (28). However, self-reported mood scales and the Stanford Sleepiness Scale indicated that workers on the 12-hr night shift experienced more sleepiness and lowered energy-alertness levels after the eighth hour into their shift. The 12-hr shifts did not seem to be associated with a decrease in most measures of performance across the shift. Only on one measure of physical endurance task (tapping lapses) was there a decrease in performance across the shift for the 12-hr night shift. Most of the physiological and pulmonary data indicated few differences between the 8- and 12-hr shifts.

In this study, because of the remote location of the mine, the workers on 12-hr shifts were expected to lodge at the minesite during their 4-day shift week. This undoubtedly had a beneficial effect on the sleep and rest between shifts. This was confirmed by the diary data that indicated improved sleep quality and no lessening of sleep length, as compared with the workers' 8-h schedule.

Based upon the overall acceptance of the new schedule by the workers and lack of evidence to suggest serious performance decrements, it was recommended that the mine retain the 12-hr schedule, with certain precautionary measures to ensure the safety

of the workers. Such measures included maintenance of the on-site lodging for 12-hr workers, continuous observation and evaluation of group and individual adjustment, and customizing work tasks and work breaks to accommodate longer work hours.

In an area fraught with inconsistencies, there are several valid comments that can be safely made: (1) workers tend to embrace the use of extended workdays; (2) in spite of item 1 above, some studies in some industries have shown performance and/or safety decrements associated with extended workdays; and (3) more research on extended workdays is needed, especially for companies and industries considering the use of extended workdays where safety is of major importance. These conclusions underscore the need for caution by companies using or considering the use of extended workdays. Based upon this review, it is recommended that the use of extended workdays be accompanied by special efforts to create safe working conditions. Also, since no *a priori* predictions from prior research can be made with certainty about the probable consequences of introducing 10- or 12-hr shifts into a mining company, evaluation of each miner should be made on a periodic basis.

#### **Recommendations:**

The use of extended workdays is recommended provided that certain precautions are considered. These are:

1. Extended workdays should not be considered where the frequency of accidents or near-miss accidents are at unacceptable levels. The use of extended workdays should not be expected to reduce the likelihood of accidents.

2. Extended workdays should not be considered for jobs that require extremely high physical workloads. For example, the American Industrial Hygiene Association recommends a workload not to exceed one-third VO<sub>2</sub>max (maximum aerobic capacity) for an 8-hr workshift. While similar recommendations have not been made for extended workdays, this standard should be strictly enforced.
3. Job sharing and cross training should be considered where extended workdays are used. Since vigilance, boredom, and mental or physical fatigue can lead to errors, changing job tasks may alleviate these stressors.
4. Workers should not be expected to work overtime on extended workdays. Working on scheduled days off is not recommended.
5. If extended workdays are used, regular evaluation and assessment should be undertaken. For instance, survey methods have been developed by the USBM to evaluate schedules before and after changes are made (29). Also, long-term monitoring of health, accident, and production effects should be considered.
6. Hybrid schedules that utilize both 8- and 12-hr shifts should be considered. Table 7 is an example of a schedule utilizing both 8- and 12-hr shifts.

**Management considerations**

*Changing a schedule:* Equally important to the new schedule itself is how the process of choosing a schedule is carried out. There is not a single method that has been shown to be the best. A prescription for failure is for any one manager to take it upon himself or herself to decide upon a schedule and implement it without consulting those workers who would be affected by the change. This method, although seemingly efficient, sets up the potential for suspicion and inaccurate assumptions that could lead to possible rejection of the schedule, regardless of how good it is.

The following steps are recommended as one way that has proven effective:

1. Construct a company-wide shiftwork committee.
2. Evaluate work problems and worker needs. Social requirements of a schedule can be determined at this time. Focus groups or surveys can be used at this step.
3. Determine operational requirements.
4. Design alternative work schedules that consider the information from steps 2 and 3.
5. Evaluate alternative work schedules. This evaluation is based upon the opinions of the

7. Make the shiftwork change.
8. Evaluate the change 6 months, 1 year, and every year thereafter. If the presurvey was used for evaluation, a postsurvey can be used as a basis of comparison. Inform the work force of the results of the evaluation.
9. Decide to keep or reject the schedule.

**Training and followup:**

Offer training to the shift workers in ways to cope with shiftwork. Involve family members in this training.

**Summary**

For the vast majority of the work force, any schedule that involves hours outside the parameters of a "normal" schedule (i.e., 9 to 5), will involve sacrifice and physical and psychological distress. There seems to be, however, schedules that are better than others. This paper presents various aspects of schedules that have been studied and reported upon. The literature is full of studies and reports of actual work settings that have changed schedules with positive outcomes. Shiftwork practice is an ergonomic consideration, where the fit between the worker and workplace may have serious consequences caused by job, sociological, and biological compatibility.

Table 7.—Hybrid schedule consisting of both 8- and 12-hour shifts.

Crew-week	Mon	Tues	Weds	Thurs	Fri	Sat	Sun
1	E	E	E	E	E	—	—
2	—	M	M	M	M	M12	M12
3	M	—	—	—	G	G12	G12
4	G	G	G	G	—	—	—

E = Evening shift; G = Night shift; G12 = Shifts from 7 pm to 7 am; M = Morning shift; M12 = Shifts from 7 am to 7 pm; Dashes indicate off days

shiftwork committee, experts in the field, and/or other workers.

6. Choose three alternatives for a vote.

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This entire article was reprinted from the 1994 U.S. Bureau of Mines Special Publication 18-94: *Improving Safety at Small Underground Mines*.

## Every move it makes

Underground storage is one disposal option for waste leftover from nuclear weapons research. Engineers preparing to put such materials in the earth are using U.S. Bureau of Mines (USBM) monitoring technology designed to protect workers who take coal out.

The Department of Energy has installed a USBM automated ground control management system at its Waste Isolation Pilot Plant near Carlsbad, New Mexico. The system is monitoring the stability of the underground repository that will someday hold tons of low-level radioactive wastes.

The system, which combines the

latest sensor technology with "smart" computer analysis techniques, can continuously collect and evaluate data from up to 15,000 instruments. It provides an around-the-clock assessment of the structural integrity of the underground rooms, drifts, and shafts at the storage site.

The USBM devised the real-time monitoring system to keep track of ground conditions in longwall coal mines where the rapid pace of mining can quickly create new hazards. Measuring ground pressure changes, strata movements, and other parameters during mining can help engineers detect potential

problems with roof support and identify ways to protect miners from cave-ins.

Use of the system at Cyprus-Amax Coal Company's Foidel Creek Mine in Oak Creek, Colo., allowed mine managers to monitor and respond to changing ground conditions during the development and mining of six longwall panels. USBM scientists are now working with Drummond Coal to install the monitoring system at the company's new Shoal Creek Mine located near Birmingham, Ala.

Reprinted from the May 1995 issue of the U.S. Department of Interior's Bureau of Mines' TIPSHEET.

# ALASKA STATE DISTRICT COUNCIL OF LABORERS

Laborers International Union of North America, AFL-CIO

2501 Commercial Drive, Suite 140  
Anchorage, Alaska 99501 • 907/276-1610

Public Employee Local 71  
Don Valesko, Business Manager

Laborers Local 942  
Joe Thomas, Business Manager

Laborers Local 341  
Mano Frey, Business Manager

Don Valesko  
President

Andrew J. "Bear" Piekarski  
Business Manager/Secretary Treasurer

TO: DON ETHERIDGE

FROM: KEVIN DOUGHERTY  
GENERAL COUNSEL

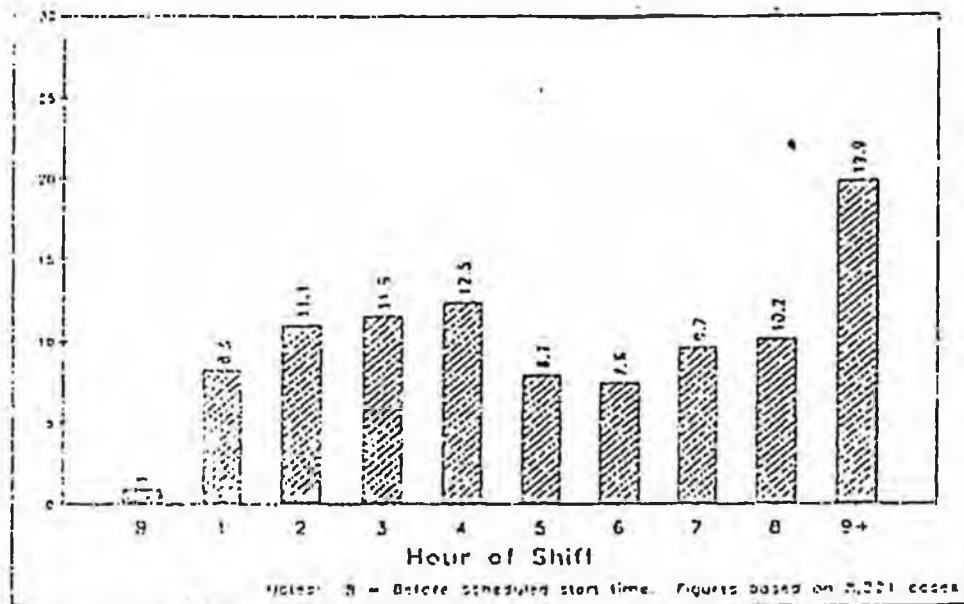
RE: MINING/UNDERGROUND MAXIMUM HOURS PROTECTION

DATE: FEB. 2, 1996

The Alaska law which protects miners safety by its 8 hour maximum hours provision was one of the very first laws enacted by the Territorial Legislature in 1913. One would expect that this historic Alaska standard would still be respected by Alaskan Legislators.

As the enclosed statistics demonstrate, the common sense basis for the 1913 law still exists today-- preventing accidents! These current statistics show that as a matter of proven fact the rate of accidents after the 8 workhour increases drastically. And safety is not only of concern to employees and their families, but also important to Employer's worker compensation and general liability exposure.

**FIGURE 2-14**  
**Time Loss Injuries Percent Distribution**  
**by Shift Hour Accident Occurred**  
**Alaska 1984**



distribution points out that fatigue plays a significant role in the occurrence of time loss accidents. A historical summary of the portion of cases after the eighth hour of work is given in Text Table 2-9. For industries which characteristically have long working hours, the percentage of accidents occurring after eight work hours is greater than the average.

## Methodology

Claims for work injuries and illnesses are reported to the Alaska Division of Workers' Compensation using the Report of Occupational or Illness Form 6101 (Rev. 12/83). See Section 6 for a sample form. The information from the form is analyzed and coded for nature and source of injury or illness, part of body affected, and type of accident or exposure. The classification of these characteristics is defined by the American National Standards Institute's "Method of Recording Basic Facts Relating to the Nature of Occurrence of Work Injuries," ANSI 216.2-1962 (R1979). The coding scheme for the supplementary data system is provided by the U.S. Bureau of Labor Statistics.

The occupation of the worker is classified according to the 1970 Census Classification of Industries and Occupations. Employer firms are classified into industries according to the 1972 *Standard Industrial Classification (SIC) Manual*. The industry code for every employer is available from an existing data base in the Department of Labor.

The data from the Workers' Compensation report forms is continuously coded and entered into a computer data base. When all data for the reference year have been entered, a magnetic tape is made which the U.S. Bureau of Labor Statistics uses to generate the SDS tabulations. Only those cases which occurred during the year and involved fatalities or one or more lost workdays beyond the day of injury were coded into the SDS system.

Text Table 2-9  
**Percent of Injuries after the 8th Work Hour**  
**by Industry Division**  
**Alaska 1980-1984**

	1980	1981	1982	1983	1984
Private Sector	23.6	23.6	23.6	19.5	20.4
Mining	34.7	34.8	36.5	31.9	34.7
Oil & Gas	36.0	35.8	39.5	32.4	36.0
Construction	27.8	25.9	26.5	22.0	21.3
Manufacturing	27.0	25.1	24.0	19.8	24.9
Seafood	38.6	35.8	32.6	28.9	37.1
Lumber & Wood	17.8	16.5	15.2	11.1	16.1
Transportation	20.7	24.1	22.7	19.2	20.3
Trade	16.5	17.1	17.3	14.9	16.9
Finance	12.9	15.0	27.2	19.5	18.7
Services	19.1	20.2	20.5	16.3	16.2
St. & Local Govt.	13.4	14.9	18.1	15.4	17.0

THIS DATA FROM  
THE TABULATIONS  
IN 1985

TABLE 2-16  
Time Loss Injuries  
Hour of Shift During Which Injury Occurred  
Alaska 1984

	SIC	TOTAL	BEFORE SHIFT BEGAN	1st HOUR	2nd HOUR	3rd HOUR	4th HOUR	5th HOUR	6th HOUR	7th HOUR	8th HOUR	9th or LATER HOUR	SHIFT HOUR UNKNOWN
TOTAL PUBLIC AND PRIVATE SECTOR		10,777	85	686	913	956	1,029	664	619	795	835	1,637	2,556
TOTAL PRIVATE SECTOR		9,267	65	560	787	814	864	577	520	665	702	1,422	2,273
AGRICULTURE, FORESTRY & FISHING		54	.	8	2	4	4	3	2	3	7	4	17
MINING		515	4	21	34	33	36	31	14	29	39	128	166
Metal Mining	10	37	1	.	3	6	2	1	.	3	5	6	10
Oil & Gas Extraction	13	460	3	20	29	27	33	30	13	24	31	118	132
CONSTRUCTION		2,537	8	121	205	238	255	184	121	189	203	414	594
General Building Contractors	15	793	3	39	55	81	72	63	41	67	64	122	174
Heavy Construction Contractors	16	689	.	30	47	62	53	58	21	50	63	146	153
Special Trade Contractors	17	1,052	4	52	93	95	130	58	59	72	81	146	262
MANUFACTURING		1,253	5	72	110	91	123	73	72	76	69	225	332
DURABLE GOODS		516	.	29	51	40	44	35	33	35	29	66	133
Lumber & Wood Products	24	434	.	22	41	35	60	29	28	30	26	54	109
Stone, Clay, and Glass Products	32	40	.	5	5	1	1	5	2	2	1	6	12
Fabricated Metal Products	34	17	.	.	2	1	.	.	1	3	1	3	6
NON-DURABLE GOODS		737	5	43	59	51	58	38	39	40	40	159	205
Food, Kindred Products	20	570	5	24	31	31	39	24	21	34	32	142	187
Paper, Allied Products	26	54	.	7	7	3	9	4	5	3	4	4	3
Printing and Publishing	27	87	.	7	17	10	7	10	10	3	2	8	13
TRANSPORTATION & PUBLIC UTILITIES		1,225	13	97	113	113	107	67	67	81	93	192	280
Local & Interurban Passenger Transit	41	46	1	7	7	2	4	1	1	1	3	13	6
Trucking & Warehousing	42	326	1	14	24	35	33	23	14	22	26	46	59
Water Transportation	43	23	.	2	4	1	3	2	2	2	4	7	1
Transportation by Air	45	492	6	50	52	37	37	29	28	28	27	75	123
Pipelines, Except Nat. Gas	46	10	.	1	.	1	2	2	.	.	3	6	4
Transportation Services	47	19	.	1	1	2	2	2	2	1	3	2	3
Communication	48	173	5	16	10	16	15	5	11	18	12	30	35
Electrical, Gas & Sanitary Svcs.	49	122	.	6	15	17	11	5	9	9	15	13	20
WHOLESALE TRADE		509	1	28	50	50	51	25	36	39	43	68	118
Durable Goods	50	291	1	17	29	31	34	10	22	17	27	37	65
Non-Durable Goods	51	218	.	11	21	19	17	15	14	22	16	31	52
RETAIL TRADE		1,689	16	110	147	152	141	97	125	144	120	211	426
Building Materials & Garden Supplies	52	189	.	10	14	16	7	12	11	25	21	34	37
General Merchandising Stores	53	164	.	8	15	14	13	6	10	12	12	23	31
Food Stores	54	347	1	28	29	25	34	15	27	31	21	39	100
Auto Dealers & Service Stations	55	198	2	9	16	28	15	7	13	18	23	24	40
Apparel and Accessory Stores	56	19	1	1	1	3	1	1	.	.	1	1	9
Furniture and Home Furnishings	57	55	2	2	6	7	2	3	6	3	3	4	15
Eating & Drinking Places	58	583	9	45	69	37	54	47	50	43	28	64	122
Misc. Retail	59	134	1	7	17	20	14	8	8	12	11	17	37
FINANCE, INSURANCE & REAL ESTATE		168	2	15	17	11	17	16	11	8	11	25	34
Banking	60	36	.	5	3	3	2	2	7	1	2	5	6
Real Estate	65	59	.	5	5	3	5	5	3	.	6	13	14
Holding and Other Investment Offices	67	33	.	1	5	3	5	2	.	4	2	4	7
SERVICES		1,223	16	91	101	118	127	77	66	90	107	153	277
Hotels & Other Lodging Places	70	232	3	24	21	23	15	15	18	15	26	19	47
Personal Services	72	43	.	4	3	2	6	4	2	4	5	4	9
Business Services	73	260	5	15	18	13	29	10	12	21	11	48	75
Auto Repair, Svcs. & Garages	75	108	1	4	8	11	17	5	5	10	17	12	18
Misc. Repair Services	75	54	1	3	9	3	2	2	1	6	6	7	16
Amusement & Recreation Services	79	29	1	.	.	3	3	1	.	1	3	2	14
Health Services	80	143	2	11	10	14	15	16	8	7	8	11	41
Legal Services	81	8	.	2	1	1	1	.	.	.	1	1	1
Educational Services	82	6	.	.	.	2	.	.	.	2	1	1	.
Social Services	83	177	1	13	20	25	23	14	13	14	15	16	22
Membership Organizations	85	34	.	4	3	10	9	4	1	2	3	5	11
Misc. Services	89	107	2	3	7	8	7	5	6	7	11	27	24
NOT AVAILABLE		94	1	4	8	4	4	4	6	6	5	9	43
TOTAL PUBLIC SECTOR		1,510	19	118	126	142	165	87	99	130	133	208	283
State Government		568	3	42	37	57	63	28	35	51	52	84	116
Local Government		942	16	76	89	85	102	59	64	79	81	124	157

. = Zero Cases.  
SIC = Standard Industrial Classification Code.  
NOTE: Figures for SIC groups will not necessarily add up to the industry division total figure because some industries have been omitted.  
NOTE: Data includes only those reported cases which occurred during the year involving death of one or more lost workdays beyond the day of injury.  
SOURCE: Alaska SOS Table 222.

ALASKA, 1984.

SIC CODE 1/	INDUSTRY	TOTAL	HOURS OF THE SHIFT DURING WHICH INJURY OCCURRED 2/										
			BEFORE WEEKDAY BEGIN	1ST HOUR	2ND HOUR	3RD HOUR	4TH HOUR	5TH HOUR	6TH HOUR	7TH HOUR	8TH HOUR	9TH HOUR	
	TOTAL ALL INDUSTRIES- PUBLIC AND PRIVATE SECTORS.	10,777	65	686	913	750	1,027	664	619	725	835	1,657	2,555
	PERCENT.....	100.0	.3	6.4	8.5	6.9	9.5	6.2	5.7	7.4	7.7	15.2	23.7
	TOTAL PRIVATE SECTOR-ALL INDUSTRIES.	9,267	65	560	707	614	864	579	520	645	702	1,420	2,275
	PERCENT.....	100.0	.7	6.1	7.6	6.6	9.3	6.2	5.6	7.0	7.6	15.4	24.6
	AGRICULTURE, FORESTRY, AND FISHING.....	54	-	0	2	4	4	3	2	3	7	4	17
	PERCENT.....	100.0	-	14.8	3.7	7.4	7.4	5.6	3.7	5.6	13.0	7.4	31.5
	01 AGRICULTURAL PRODUCTION-CROPS..	4	-	-	-	1	-	-	-	-	-	2	1
	PERCENT.....	100.0	-	-	-	25.0	-	-	-	-	-	50.0	25.0
	02 AGRICULTURAL PRODUCTION- LIVESTOCK.....	6	-	-	-	-	-	-	-	-	2	1	5
	PERCENT.....	100.0	-	-	-	-	-	-	-	-	33.3	16.7	50.0
	07 AGRICULTURAL SERVICES.....	21	-	4	1	1	2	2	1	2	2	1	5
	PERCENT.....	100.0	-	19.0	4.8	4.8	9.5	9.5	4.8	9.5	9.5	4.8	25.0
	08 FORESTRY.....	10	-	3	1	2	1	1	1	1	2	-	6
	PERCENT.....	100.0	-	16.7	5.6	11.1	5.6	5.6	5.6	5.6	11.1	-	33.3
	09 FISHING, HUNTING, AND TRAPPING.	6	-	1	-	-	1	-	-	-	1	-	2
	PERCENT.....	100.0	-	20.0	-	-	20.0	-	-	-	20.0	-	40.0
	MINING.....	515	4	21	34	33	36	31	14	29	39	128	146
	PERCENT.....	100.0	.8	4.1	6.6	6.4	7.0	6.0	2.7	5.6	7.6	24.9	28.3
	10 METAL MINING.....	37	1	-	3	6	2	1	-	3	5	6	10
	PERCENT.....	100.0	2.7	-	8.1	16.2	5.4	2.7	-	8.1	13.5	16.2	27.0

SEE FOOTNOTES AT END OF TABLE.

ALASKA, 1984.

SIC CODE 1/	INDUSTRY	TOTAL	HOUR OF THE SHIFT DURING WHICH INJURY OCCURRED 2/										
			BEFORE WEEKDAY BEGAN	1ST HOUR	2ND HOUR	3RD HOUR	4TH HOUR	5TH HOUR	6TH HOUR	7TH HOUR	8TH HOUR	9TH HOUR	10TH HOUR
TOTAL ALL INDUSTRIES- PUBLIC AND PRIVATE SECTORS.		10,777	85	686	713	956	1,027	664	419	703	835	1,637	2,556
PERCENT.....		100.0	.3	6.4	6.5	8.9	9.5	6.2	3.9	6.5	7.7	15.2	23.7
TOTAL PRIVATE SECTOR-ALL INDUSTRIES.		9,267	65	568	767	1,014	864	579	520	663	792	1,629	2,275
PERCENT.....		100.0	.7	6.1	8.3	10.9	9.3	6.2	5.6	7.2	8.5	18.1	24.5
AGRICULTURE, FORESTRY, AND FISHING.....		54	-	8	2	4	4	3	2	3	7	4	17
PERCENT.....		100.0	-	14.8	3.7	7.4	7.4	5.6	3.7	5.6	13.0	7.4	31.5
01 AGRICULTURAL PRODUCTION-CROPS.....		4	-	-	-	1	-	-	-	-	-	2	1
PERCENT.....		100.0	-	-	-	25.0	-	-	-	-	-	50.0	25.0
02 AGRICULTURAL PRODUCTION- LIVESTOCK.....		6	-	-	-	-	-	-	-	-	2	1	3
PERCENT.....		100.0	-	-	-	-	-	-	-	-	33.3	16.7	50.0
07 AGRICULTURAL SERVICES.....		21	-	4	1	1	2	2	1	2	2	1	5
PERCENT.....		100.0	-	19.0	4.8	4.8	9.5	9.5	4.8	9.5	9.5	4.8	23.8
08 FORESTRY.....		18	-	3	1	2	1	1	1	1	2	-	6
PERCENT.....		100.0	-	16.7	5.6	11.1	5.6	5.6	5.6	5.6	11.1	-	33.3
09 FISHING, HUNTING, AND TRAPPING.....		6	-	1	-	-	1	-	-	-	1	-	2
PERCENT.....		100.0	-	20.0	-	-	20.0	-	-	-	20.0	-	40.0
MINING.....		515	4	21	34	33	36	31	14	29	39	128	146
PERCENT.....		100.0	.8	4.1	6.6	6.4	7.0	6.0	2.7	5.6	7.6	24.9	28.3
10 METAL MINING.....		37	1	-	3	6	2	1	-	3	5	6	19
PERCENT.....		100.0	2.7	-	8.1	16.2	5.4	2.7	-	8.1	13.5	16.2	27.0

SEE FOOTNOTES AT END OF TABLE.

CS FOR HOUSE BILL NO. 311(L&C)  
IN THE LEGISLATURE OF THE STATE OF ALASKA  
NINETEENTH LEGISLATURE - SECOND SESSION

BY THE HOUSE LABOR AND COMMERCE COMMITTEE

Offered:  
Referred:

Sponsor(s): REPRESENTATIVES VEZEY, Toohey, Martin

A BILL

FOR AN ACT ENTITLED

1 "An Act relating to the hours a person may be employed in a mine."

2 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

3 \* Section 1. AS 23.10.410(a) is amended to read:

4 (a) Except as provided in (d) of this section, a [A] person may not be  
5 employed in an underground coal mine, underground lode mine, underground placer  
6 mine, underground coal, lode, or placer workings, or other underground mine, or  
7 workings for more than 10 [EIGHT] hours in 24 hours, except on a day when a change  
8 of shift is made, excluding, however, an intermission of time for meals, or otherwise  
9 going to or from the place where the work is actually carried on, whether in going on  
10 or off shift, or in going to or returning from meals.

11 \* Sec. 2. AS 23.10.410(b) is amended to read:

12 (b) It is the purpose of this section to limit the hours of employment in 24 hours  
13 to 10 [EIGHT] hours of actual labor at the face, or other place where the work or labor  
14 to be done is actually performed.

15 \* Sec. 3. AS 23.10.410 is amended by adding new subsections to read:

- 1           (d) On application from an employer, the commissioner may grant a variance  
2 that permits employment in an underground mine or workings for more than 10 but  
3 not more than 12 hours in a 24-hour period if the commissioner finds that
- 4           (1) the additional working time is permitted under the terms of a  
5 collective bargaining agreement entered into by a bargaining organization that  
6 represents workers performing the work covered by the variance; and
- 7           (2) the extension is in the best interest of resident workers of the state.
- 8           (e) The department shall issue orders and adopt regulations necessary to carry  
9 out this section.

File Library

# FISCAL NOTE

STATE OF ALASKA  
1996 LEGISLATIVE SESSION

BILL NO. HB311

Revision Date: Original Dept Affected Natural Resources  
 Title: An Act repealing the limitation on the hours BRU: Resource Development  
a person may be employed in a mine; and making a ... Component: Mining Development  
 Sponsor: Representative(s) Vezey, Toohey, Martin  
 Requestor: \_\_\_\_\_ Component Serial No. 442

Expenditures/Revenues (Thousands of Dollars)

	FY97	FY98	FY99	FY00	FY01	FY02
<b>OPERATING EXPENDITURES</b>						
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
<b>TOTAL OPERATING</b>	0.0	0.0	0.0	0.0	0.0	0.0
<b>CAPITAL EXPENDITURES</b>	0.0	0.0	0.0	0.0	0.0	0.0
<b>CHANGE IN REVENUES ( )</b>	0.0	0.0	0.0	0.0	0.0	0.0

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1006 GF/MHTIA						
Other						
<b>TOTAL</b>	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY96) cost: \$ none

POSITIONS

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

ANALYSIS: (Attach a separate page if necessary)

There is no anticipated fiscal impact associated with implementation of this legislation.

Prepared by: Jules Tileston, Director Phone: 269-8625  
 Division: Mining & Water Date: 31-Jan-96  
 Approved by Commissioner: [Signature] Date: 31-Jan-96  
 Agency: Natural Resources

# Alaska State Legislature

## House of Representatives

Official Business



State Capitol  
Juneau, Alaska 99801-1182  
(907) 485-3718

House Majority Leader

### ***SPONSOR STATEMENT***

HB-311 "An Act repealing the limitation on the hours a person may be employed in a mine;"...was introduced to correct the current statutes that contemporary, advanced underground mining technology have made obsolete. The source of the original legislation is found in 43-2-1,2,&3 ACLA 1949.

At the time this legislation was introduced, underground mining was performed by people using hand tools, pneumatic drills and push cars. There were no state or federal safety or health laws like we have today. There were also no wage and hour laws in those days. The explosives used in those days produced large amounts of noxious fumes and ventilation was almost non existent. Air operated drills used without water and wetting agents produced large amounts of dust. Silicosis was a serious occupational hazard. The methods used to prevent cave-ins and inhalation of foreign material were primitive, at best.

Times have changed and so have the methods used to mine underground. Today's underground mining activities are performed by machines with the operator supervising the operation. The health safety standards are among the highest in the world. Accident and injury rates are among the lowest for any industrial operation in Alaska. They are almost half that of the norm for the construction industry. The engineering methods of insuring safety have also dramatically improved.

HB-311 will result in increased wages for miners, increased profits for mining companies and more miners working in more mines for all Alaskans.

*Sponsor Statement*

# LEGAL SERVICES

DIVISION OF LEGAL AND RESEARCH SERVICES  
LEGISLATIVE AFFAIRS AGENCY  
STATE OF ALASKA

(907) 465-3867 or 465-2450  
FAX (907) 465-2029  
Mail Stop 3101

130 Seward Street, Suite 409  
Juneau, Alaska 99801-2105

## MEMORANDUM

January 23, 1996

**SUBJECT:** Sectional Summary of HB 311. (Repealing the limitation on the hours a person may work in a mine)

**TO:** Representative Al Vezey  
Attn: Joe Ryan

**FROM:** Teresa B. Cramer *TBC*  
Legislative Counsel

You have requested a sectional summary of the above-described bill.

As a preliminary matter, note that a sectional summary of a bill should not be considered an authoritative interpretation of the bill and the bill itself is the best statement of its contents. If you would like an interpretation of the bill as it may apply to a particular set of circumstances, please advise.

Section 1 incorporates the punishment schedule enacted in bill section 2, into the statute that makes failure of an employer to make benefit payments a violation of law. This subsection currently incorporates the schedule of punishment set out in AS 23.10.415 which is repealed by this bill.

Sec. 2 sets a schedule of punishment, which is taken from the current provisions of AS 23.10.415, for violation of AS 23.10.045.

Sec. 3 repeals three statutes relating to employment in underground mines.

AS 23.10.405 declares that employment in underground mines is injurious to health and dangerous to life and limb.

AS 23.10.410 sets an eight-hour limit on the number of hours in a day that a person may be employed in an underground mine. (There is an exception for days with a change of shift.)

AS 23.10.415 establishes a schedule of penalties for violation of AS 23.10.410. This is the statute that is transferred, with conforming amendments, by bill section 2.

Please let me know if you have additional questions on this matter.

TBC:glc  
96-034.glc

*Sectional*

# Legislative Research Agency

Alaska State Legislature



130 Seward Street, Suite 218  
Juneau, Alaska 99801-2196

Phone: (907) 465-3991  
Fax: (907) 463-3351

April 25, 1995

## MEMORANDUM

TO: Representative Al Vezey

FROM: Dale Brandt *DB*  
Legislative Analyst

RE: Legislative History of AS 23.10.410 "Limitation on Period of Employment in Mines"  
Research Request 95.194

You asked for background information on the original adoption of the eight-hour day for underground miners in territorial law (now AS 23.10.405-415).

An eight-hour day for underground miners and mill workers was adopted during the first session of Alaska's territorial legislature in 1913. There was considerable labor legislation at that time. In addition to the eight-hour day for miners, the legislature adopted an eight-hour day for employees of the territorial government and all municipal governments in Alaska. During the next session—1915—the legislature extended the coverage of the miners' eight-hour day to include placer miners and others. Also, the legislature adopted a measure to hold a referendum on the question of extending the eight-hour day to all employment in the territory. The referendum passed by a large measure, so at the next biennial session--1917—the legislature adopted a "universal" eight-hour day. It also further extended the coverage of the miners' eight-hour day.

We can only speculate that the impetus for the legislation was the arduous and dangerous conditions in Alaska mines and mills at the time. Juneau and Douglas lode mines were among the largest in the country.

Attached are copies of pertinent laws and excerpts from the Report of the Territorial Mine Inspector to the Governor of Alaska for the Year 1917.

We hope this information is helpful. Call us if you have questions or desire further information.

Attachments

*Background*

# Shift Workers See the Dawn of a New Era

*The '90s promise to be a decade of change for America's 20 million shift workers.*

Reprinted with permission of *Safety and Health*, published by the National Safety Council, 1121 Spring Lake Drive, Itasca, Illinois, 60143.

# Shift Workers See the Dawn of a New Era

*The '90s promise to be a decade of change for America's 20 million shift workers.*

By Jean Wallace

How would you like to spend a week in New York, followed by a week in London and a week in Tokyo, all expenses paid?

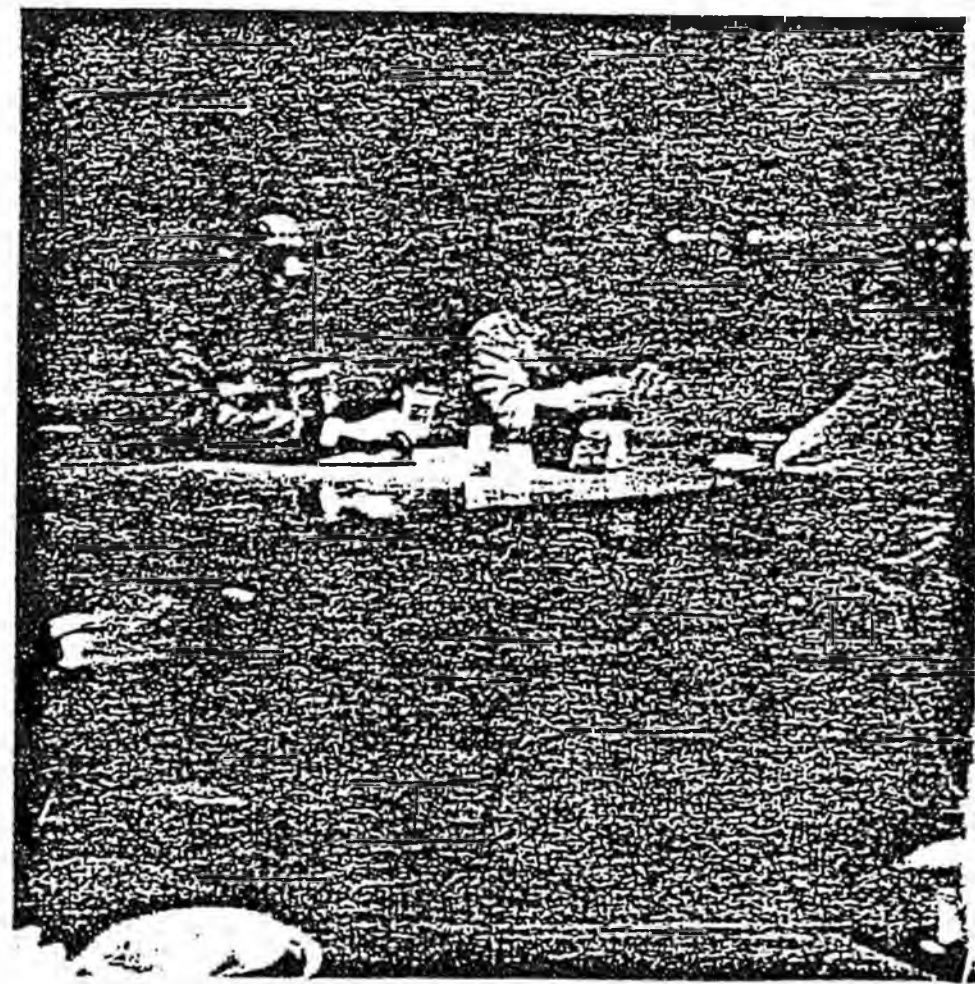
Sound good? There's a catch: You'll have to remain on this whirlwind tour indefinitely, perhaps for the rest of your career. You'll probably sleep poorly, suffer stomach troubles and feel cranky most of the time. And you'll be so preoccupied with hopping between time zones that you'll have little time or energy left for your family or social life.

For one in five American workers, life is much like this endless business trip around the globe. These are our nation's shift workers, the 20 million people whose jobs require them to work evenings or nights on a fixed or rotating basis. Though they may fly on airplanes only occasionally, the vast majority suffer from what health experts call "occupational jet lag."

Shift workers typically feel as bad or worse than jet-weary travelers because their work schedules put them out of phase with their natural rhythms of sleep and alertness, or worse. On the job, their productivity declines and their accident risk increases.

"What we have to recognize is that for many shift workers — not all, but many — shift work is really a nightmare," says Timothy H. Monk, Ph.D., director of the human chronobiology research program at Western Psychiatric Institute and Clinic in Pittsburgh. "If we can help even just a few of these people to cope, it'll be enormously worthwhile."

Researchers and consultants warn that the United States can no longer



afford to ignore the health-and-safety concerns of shift workers. "Shift workers literally make the difference between modern culture and the Dark Ages," says psychologist Marty Klein, Ph.D., the president of SynchroTech, a shift-work consulting firm in Lincoln, Neb. "Just try to imagine one 24-hour period without them. It would be anarchy," he says.

Shift workers keep modern society running around the clock. Long after

the 9-to-5 workers go home, shift workers provide fire and police protection, staff hospitals, man nuclear power plants, transport goods, and make it possible to order pizza or airline tickets at any hour.

Although we depend on them, American shift workers historically have been a neglected group. Government largely ignores them, and industry takes them for granted. Many countries, particularly those in the



Kodak's shift workers benefit from a modernized schedule that allows them more days off in exchange for longer workdays. Photo courtesy of Eastman Kodak Co.



Companies need to provide the same support services for shift workers as they do for day workers. These Du Pont shift workers enjoy the 24-hour employee cafeteria. Photo courtesy of George Widger/Du Pont Co. Chambers Works.

some federal involvement.

"Most of us who are experts in the area feel strongly that there should be some legislation regarding hours of work, particularly in sensitive occupations," he says. "We should indeed protect our shift workers, because many of them don't know what it's doing to them. In the same way that we don't allow people to manufacture asbestos, we should think not necessarily about banning shift work, but at least about curtailing and regulating it."

At present, neither Congress nor OSHA has plans for shift-work regulations. Last year's publication of the OTA report, "Biological Rhythms: Implications for the Worker," is seen as an important stride forward. The report summarizes the state of the art in shift-work research and outlines options for regulatory action.

One of OTA's key findings: Inadequate data collection exists of the effects of shift work on safety and health. "At this point, there's not enough good information to guide regulations," says David R. Liskowsky, project director for the report. "What we need now is an increased awareness of shift-work problems and how they can be addressed."

**Companies Respond to Wake-Up Call**  
Even without government interven-

tion, the future looks bright for at least some shift workers. In recent years, many companies have redesigned work schedules and re-educated employees in an effort to diminish the stress and danger of shift work.

One company on the leading edge of this change is the Eastman Kodak Co. in Rochester, N.Y. Since 1986, hundreds of Kodak shift workers have opted to switch to modernized schedules that allow them more days off in exchange for longer workdays. Kodak operations adopted a variety of 10-hour and 12-hour workdays. The most popular new schedule is the "fireman's schedule." Employees on this schedule work 12 hours per shift for four days (two day shifts, then two night shifts), followed by four days off.

Dennis McCullen, a worker in one of Kodak's paper-producing plants, says the fireman's schedule is nothing short of "fabulous." Because he works only two night shifts every eight days, McCullen, 40, finds it easier to recover from shift-work stress. Better yet, the new schedule provides more free time with his family and for favorite hobbies, such as woodworking and cross-country skiing.

McCullen is not the only Kodak employee who's enthusiastic about the 12-hour workday. In a company survey of those who had switched schedules, 77 percent said they were "satisfied" or "very satisfied" with it. In contrast, only 17 percent gave a favorable rating to Kodak's older rotating schedule of eight-hour shifts. On that schedule, a standard one in many industries, employees worked

European Community, have laws to protect shift-worker safety and health. The United States, however, is one of the few nations with no national shift-work policy. Out of 49 countries studied in a recent report on shift work by the U.S. Office of Technology Assessment, only five other nations had no national regulations of night or shift work: China, Canada, the Dominican Republic, Tunisia and Nigeria.

Monk, for one, would like to see

**MSHA STATISTICS FOR DISTRIBUTION OF INJURIES  
BY TIME INTO SHIFT (ALL REPORTABLE INJURIES)**

MSHA - U.S. UNDERGROUND MINES

	<u>1992</u>	<u>1/1/93 - 9/31/93</u>	<u>1/1/92 - 9/31/93</u>
Total Reportable Accidents Underground	998	685	1683
Less Those Not Reported By Hours Into Shift	(60)	(37)	(97)
Reportable Accidents By Time Into Shift	938	648	1586
<u>Accident Distribution</u>			
• 0 - 8 Hours	908	598	1506
• 8 - 10 Hours	11	34	45
• > 10 Hours	19	16	35
<u>Percent of Accidents</u>			
• 0 - 8 Hours	96.8%	92.3%	95.0%
• 8 - 10 Hours	1.2%	5.2%	2.8%
• > 10 Hours	2.0%	2.5%	2.2%

Report 1

MSHA/SHTC CM180 (FROGGIE)

METAL 1992

DATE PREPARED 12/15/93

CYCLE 122 SELECTION PERIOD - FROM MONTH 1 THROUGH MONTH 12

1992 PAGE 16

DISTRIBUTION OF INJURIES BY TIME INTO SHIFT-DEGREE > ALL INJS

TIME INTO SHIFT	<i>all reportable</i> UNDER GROUND	SURF AT UG	STRIP OPEN PIT	AUGER	CULM OTHER	DREDGE	IND. SHOP	MILL/ P. PLANT	OFFICE	TOTAL
PRE-SHIFT	43	18	335	0	0	23	5	335	15	774
0000-0059	99	25	448	0	0	32	7	626	1	1238
0100-0159	141	15	497	0	0	32	4	562	10	1261
0200-0259	168	28	579	0	0	52	5	700	6	1538
0300-0359	139	27	499	0	0	44	8	468	5	1184
0400-0459	83	17	335	0	0	17	0	364	8	824
0500-0559	116	14	396	0	0	34	2	498	1	1061
0600-0659	65	17	478	0	0	28	1	510	7	1106
0700-0759	39	10	333	0	0	27	2	237	4	652
0800-0859	21	7	206	0	0	18	2	125	1	380
0900-0959	10	0	84	0	0	6	0	71	0	171
1000-1059	1	2	53	0	0	4	0	32	0	92
1100-1159	2	1	21	0	0	2	0	16	0	42
1200-1259	0	0	8	0	0	2	0	11	0	21
1300-1359	3	0	8	0	0	0	0	7	0	18
1400-1459	0	0	8	0	0	0	1	10	0	19
1500-1559	2	0	7	0	0	2	0	8	0	19
1600-1659	8	1	5	0	0	0	0	5	0	19
1700-1759	1	3	6	0	0	2	0	7	0	19
1800-1859	2	0	7	0	0	1	0	9	0	19
1900-1950	0	0	9	0	0	0	0	4	0	13
2000-2059	1	0	7	0	0	1	0	5	0	14
2100-2159	0	0	0	0	0	0	0	0	0	0
2200-2259	0	0	0	0	0	0	0	0	0	0
2300-2359	0	0	0	0	0	0	0	0	0	0
UNREPORTED	60	13	515	0	0	61	3	523	6	1181
TOTAL	908	198	4844	0	0	388	40	5133	64	11665

average 520 hours per person

Report 2

MSHA/SHTC CM180 (FROGGIE)

METAL 1993

DATE PREPARED 11/15/93

CYCLE 050

SELECTION PERIOD - FROM MONTH 1 THROUGH MONTH 9

1993

PAGE 16

DISTRIBUTION OF INJURIES BY TIME INTO SHIFT-DEGREE ALL INJS

TIME INTO SHIFT	UNDER GROUND	SURF AT UG	STRIP OPEN PIT	AUGER	CULM OTHER	DREDGE	IND. SHOP	MILL/ P-PLANT	OFFICE	TOTAL
PRE-SHIFT	25	17	211	0	0	15	5	249	10	532
0000-0059	85	11	332	0	0	25	2	441	6	902
0100-0159	78	10	339	0	0	22	6	427	2	864
0200-0259	105	23	412	0	0	32	6	440	5	1023
0300-0359	82	11	334	0	0	30	7	361	6	831
0400-0459	56	12	215	0	0	23	1	242	0	549
0500-0559	51	16	245	0	0	28	2	347	2	729
0600-0659	48	13	322	0	0	27	3	341	2	756
0700-0759	28	9	220	0	0	16	1	166	2	450
0800-0859	25	5	138	0	0	11	0	78	2	259
0900-0959	9	3	83	0	0	0	0	57	0	152
1000-1059	4	3	28	0	0	3	0	32	0	70
1100-1159	0	2	19	0	0	2	0	5	0	28
1200-1259	2	0	6	0	0	0	0	7	0	15
1300-1359	1	0	9	0	0	0	0	6	0	16
1400-1459	0	1	0	0	0	0	0	1	0	2
1500-1559	3	0	6	0	0	1	0	5	0	15
1600-1659	2	0	6	0	0	1	1	11	1	22
1700-1759	2	0	5	0	0	0	0	8	0	15
1800-1859	0	0	5	0	0	0	0	4	0	9
1800-1950	2	0	10	0	0	0	0	3	0	15
2000-2059	0	0	1	0	0	3	0	4	0	8
2100-2159	0	0	0	0	0	0	0	0	0	0
2200-2259	0	0	0	0	0	0	0	0	0	0
2300-2359	0	0	0	0	0	0	0	0	0	0
UNREPORTED	37	5	323	0	0	22	2	383	6	778
TOTAL	685	141	3277	0	0	259	36	3618	44	8060

SHA  
SHA

Post-It™ brand fax transmittal memo 7671 # of pages X

To: <i>Mr. [unclear]</i>	From: <i>CM180</i>
Co. <i>[unclear]</i>	Co. <i>M-F</i>
Dept. <i>[unclear]</i>	Phone # <i>[unclear]</i>
Fax # <i>[unclear]</i>	Fax # <i>[unclear]</i>

MSHA-DNIS: CM935LA  
CYCLE: 92-122

PART50 MASTER FILE REPORT OF SELECTED INFORMATION FOR  
METAL/NONMETAL  
CLOSED FILES

Report 3

PAGE: 1  
PROCESS DATE: 02/10/94  
AND TIME: 03:05:57

THE FOLLOWING IS A LIST OF REQUESTED SEARCH SELECTIONS

SELECTION NUMBER	FIELD CODE	FIELD VALUE	DATA ELEMENT	
01		MINE FILE 0500790 4800639	MINE-ID(S)	- SUBUNITS REPORTED: ALL SUBUNITS

EMPLOYMENT FIGURES, INJURY COUNTS, AND INCIDENCE RATES FOR 1992

MINE-ID	** EMPLOYMENT **		FATALITIES		***** NFOL9 *****						** NDLS **		TOT INJS	
	EMPLS	EMPL HRS	DEG 01 NBR RATE	DEG 02 NBR RATE	DEG 03 NBR RATE	DEG 04 NBR RATE	DEG 05 NBR RATE	ALL NFOL9 NBR RATE	DEG 06 NBR RATE	DEGS 01-06 NBR RATE				
0500790	517	995,847	-	1 0.20	3 0.60	-		12 2.41	16 3.21	8 1.61	24	4.02		
4800639	336	774,331	-	-	6 1.55	3 0.77	1 0.26	10 2.50	3 0.77	13	3.36			
TOTAL	853	1,770,178	-	1 0.11	9 1.02	3 0.34	13 1.47	26 2.94	11 1.24	37	4.18			
TOTAL MINES MATCHING REQUESTED FIELD VALUES:												2		
TOTAL MINES REQUESTED:												2		

MSHA-DHS: CM935LA  
CYCLE: 93-070

PART50 MASTER FILE REPORT OF SELECTED INFORMATION FOR  
METAL/NONMETAL  
CURRENT FILES (PRELIMINARY DATA)

(Report 4)

PAGE: 1  
PROCESS DATE: 02/10/94  
AND TIME: 03:06:07

THE FOLLOWING IS A LIST OF REQUESTED SEARCH SELECTIONS

SELECTION NUMBER	FIELD CODE	FIELD VALUE	DATA ELEMENT	
01		MINE FILE 0500790 4800639	MINE-ID(S)	- SUBUNITS REPORTED: ALL SUBUNITS

EMPLOYMENT FIGURES, INJURY COUNTS, AND INCIDENCE RATES FOR 1993

MINE-ID	** EMPLOYMENT **		FATALITIES		***** NFDLS *****						** NDLs **		TOT INJS	
	EMPLS	EMPL HRS	DEG 01 NBR RATE	DEG 02 NBR RATE	DEG 03 NBR RATE	DEG 04 NBR RATE	DEG 05 NBR RATE	ALL NFDLS NBR RATE	DEG 06 NBR RATE	DEG 01-06 NBR RATE	DEG 01-06 NBR RATE			
0500790	489	827,837	-	-	7 1.69	2 0.48	5 1.21	14 3.38	12 2.90	26 6.28				
4800639	338	761,983	-	-	7 1.84	-	2 0.52	9 2.36	4 1.05	13 3.41				
TOTAL	827	1,589,820	-	-	14 1.76	2 0.25	7 0.88	23 2.09	16 2.01	39 4.91				
TOTAL MINES MATCHING REQUESTED FIELD VALUES:					2									
TOTAL MINES REQUESTED:					2									

801-322-8100

- Sample - see attachments (3, 4)

REGULATIONS REGISTER



Northwest Territories Canada

1. Certify that the within instrument was registered in the Regulations Register on the 20th day of January, 1987 under registration number R-~~CC2-87~~

Filed  
16/1/87  
Registrar of Regulations  
Northwest Territories.

MINING SAFETY ACT

The Commissioner of the Northwest Territories, pursuant to subsections 6(1) and 16(5) of the Mining Safety Act, and every enabling power, orders as follows:

1. The Salmita Mine Exemption Regulations, established by instrument numbered R-065-86, are amended by adding immediately after section 3 the following section:

"4.(1) In this section, "worker" means only a diamond driller employed by Germac Enterprises Ltd.

(2) Notwithstanding subsection 16(1) of the Act, a worker may remain or be permitted to remain underground in the mine for more than eight but not more than twelve hours in any consecutive twenty-four hours and for seven days a week, if no more than two workers are underground in the mine at any one time.

(3) The twelve hours referred to in subsection (2) must be computed from the time the worker arrives at and returns to the shaft collar or portal.

(4) This section shall cease to have effect on the 31st day of March, 1987."

Dated at Yellowknife this 20th day of January, 1987.

*John H. Parker*  
John H. Parker,  
Commissioner of the  
Northwest Territories.



ROCKY MOUNTAIN DISTRICT  
Metal/Nonmetal Mine Safety & Health  
Salt Lake City Subdistrict  
Federal Building, Drawer 10042  
Helena, MT 59626 0042

FEB 19 1987

February 17, 1987

MEMORANDUM FOR: Whom It May Concern

FROM: Virgil A. Cain, Supervisory Mine Safety & Health Inspector  
Helena, Montana Field Office *Virgil A. Cain*

SUBJECT: Working Hours

This letter deals with the working hours of employees. About five years ago one large mine in my area changed from the eight hours a day, five days a week with two days off to a four day a week, ten hours a day. On the eight hours a day, five days a week, the company had quite a few lost time accidents. After the change to ten hour shifts, four days a week, this company went five months without any accidents and compiled one of the best mining accident records for its size of any mine I have ever had any dealings with.

Just recently this same mine under new management went back to a eight hour day, five days a week and the lost time accidents increased five to six hundred percent. This change has affected the moral of the workers, plus taking away some of their family time.

I am talking about a mine working upto three hundred employees. So what I am really saying, ten hour shifts don't hurt anyone as long as the moral and the time spent with the family plays a big part in the employees work habits and cuts down on accidents.

The Alaska Legislature should repeal the statutory eight-hour limit on underground mining shifts

The following points should be considered with regard to the request that you repeal A. S. 23.10.405 through 415.

First, this statute is not wage and hour legislation and has nothing whatsoever to do with ensuring that mine workers will be compensated properly. Those legal requirements are contained in other sections of the code.

The statutory language to be repealed has been on the books in Alaska unchanged since 1917. There are no annotations behind these statutory provisions, giving rise to the implication that they have never been construed by the courts. Since there has been very little underground mining in Alaska since World War II, it is not surprising that these sections have not received much attention in recent history.

Section 405 of the act indicates that mining is "injurious to health and dangerous to life and limb." Even if this were true in 1917, many giant strides have been taken since that time to make underground mining a safe profession. For one thing, the federal government has virtually pre-empted the field of underground mine safety with the Federal Mine Safety and Health Act of 1977 (P.L. 95-164). That Act granted to the Secretary of Labor broad authority to regulate conditions underground through the Mine Safety and Health Administration or MSHA. MSHA is a very good watchdog on all underground operations, and MSHA inspectors have made frequent visits to the Greens Creek mine as well as all other underground operations which have been worked on over the past several years. MSHA inspectors are required by law to make their inspections without warning. This requirement, of course, is designed to make mine operators function at a high level of safety at all times, which is very positive.

Mining today is a safer occupation than it was 70 years ago. It is no more dangerous to work ten or twelve hours at a shift underground than it would be to work at any other occupation which involves the use of heavy equipment.

The Greens Creek Mine hopes to be operating within the year with two ten-hour shifts per day underground. If it cannot, because of the existing

requirements of law, employ the miners more than eight hours per shift, it will in effect lose a half shift of production every day even though the costs of transportation and mobilization of each shift will remain the same. The economics of the mine will be severely reduced by such a loss. Clearly, two ten-hour shifts per day is the most economical way to proceed.

The workers at Greens Creek will also prefer the opportunity to work four ten-hour shifts per week rather than five eights, because they will have to spend less time in transit to and from their place of work. In discussing this with the Laborers Union, they have not identified any substantive reason why this statute should not be repealed.

The Alaska Department of Labor Division of Occupational Safety and Health has indicated that it does not enforce this law at this time.

An outright repeal of all three of these sections is requested because although the Greens Creek Mine will probably be the first major underground mine to come on line in Alaska, it may be followed rather quickly by others, and the considerations which dictate their management practices may be different from those of Greens Creek. In order to encourage others, it is recommended that the management of mining companies have the maximum reasonable flexibility in scheduling work shifts underground.

We have had informal discussions with the State Departments of Commerce and Economic Development, Labor, and Natural Resources. No objections by any of those agencies have been identified to us at this time.

It is hoped that this law can be changed during this legislative session because Greens Creek would like to be up and running before the next legislative session convenes. It would be helpful to have this bill adopted this session if for no other reason than to send a clear signal to the world that Alaska supports the efforts of those mining companies like Greens Creek which are trying to get an environmentally sound and socially responsible foothold in the state. In order for the legislation to be most effective, it will have to proceed through the legislature rapidly.

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HISTORICAL LIBRARY

REPORT

OF THE

Territorial Mine Inspector

TO THE

Governor of Alaska

FOR THE

YEAR 1917

717  
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work, was the going wage. This can be partly traced to the large number of men employed by the Alaska Road Commission on the interior wagon roads and the construction of the Government railroad, where the pay was more certain, although lower, large numbers of laboring men being attracted to the railroad construction towns of Nenana and Anchorage, where the number of idle men was noticeable.

There were three strikes by those employed in the mining industry during the year. Early in June the miners in the Willow Creek District demanded an increase in wages from \$3.50 per day and board to \$4 per day and board. The Willow Creek Mines Company, operating the Gold Bullion Mine, was the only company in the district to grant the request of the miners; the other mines continued operations without experiencing any difficulty in getting all the labor needed.

On June 16 the miners working at the mines of the Kennecott Copper Corporation at Kennecott, demanded that they be paid a flat rate of \$4.50 a day and board, instead of the sliding scale then in force at that mine, the miners agreeing to accept the old scale of \$3.75 and \$4.25 per day and pay \$1.25 per day for board upon the price of copper dropping below 18 cents per pound; upon the company refusing this offer the men quit in a body and established a camp near McCarthy, which contained about 220 men. Better living conditions were also demanded by the men.

The schedule of wages used as a base rate by the Kennecott Copper Corporation, which became effective January 1, 1917, in the mining department was as follows:

Shift Bosses .....	\$5 25
Compressormen .....	4 75
Holstmen .....	4 50
Miners .....	4 25
Trammers (main level) .....	4 25
Powdermen .....	4 25
Skip Tenders .....	4 25
Timber Boss .....	4 75
Timbermen .....	4 25
Timbermen Helpers .....	3 75
Pipe and Trackmen .....	4 50
Pipe, Track and General Repairmen .....	4 25
Pipe and Track Helpers .....	3 75
Tramway Operator Shift Boss .....	4 25
Tramway Men .....	3 75

Shaft miners and muckers and miners working in a raise at a distance of over 25 feet, measured vertically from its starting point on the level below, will receive 50 cents per shift above base rates here given during the period of such employment only.

All men to work 8-hour shifts, except those working on a monthly basis.

Board \$1.25 a day; hospital, 10 days or under, 10 cents per day hospital fee; over ten days \$2 per month for single men, calendar month; men with families \$3 per month.

The system of payment before the strike was a base rate as above stated, with an added bonus. The bonus rate adopted January 1, 1917, was as follows:

The standard rate of wages as a base rate will prevail when the average price of copper during the previous month was under 18 cents per pound.

When the average price of copper is 18 cents and under 23 cents per pound, each employee engaged upon daily wage basis will receive a bonus of 25 cents a day.

The raise in the bonus continuing on this rate for every 5 cents per pound raise in copper, the employee receiving a bonus of 25 cents a day additional.

All employees employed by the month shall receive a bonus of not to exceed \$15 per month.

After the men had struck, the company offered a new schedule of rate for bonus, which was as follows:

Effective June 16, 1917, the standard wage scale will continue as the base rate and will prevail when the average price of copper for the previous month is under 15 cents per pound.

When the average price of copper is 15 cents and under 18 cents per pound, each employee engaged upon a daily wage basis will receive a bonus of 25 cents per day.

The raise in the bonus continuing on this rate for every 3 cents per pound raise in the price of copper, the employee receiving 25 cents a day added bonus.

Men employees on a monthly basis will receive a bonus of \$4 per month for each 25 cent change in the bonus for employees on a daily basis.

Bonuses to all other employees on a monthly basis will be fixed by special agreement.

In each and every case the bonus for the current month will be determined by the average selling price of electrolytic copper as given in the Engineering & Mining Journal quotations for the preceding month.

After almost a month of bickering and trying to agree upon a basis of settlement, without coming to any agreement, the company sent me to Cordova and Anchorage, who secured enough men to take the place of those that went out on the strike, thus proving that labor could be procured in the Territory, even under those conditions, which is usually difficult of accomplishment.

At the Ellamor mine the men did not demand any advance in wage but demanded of the management that they discharge the foreman within twenty-four hours or they would all walk out. The demand was signed by 28 of the hundred men employed at the mine. The manager that evening (June 25), before the 24 hours had elapsed, posted a notice to the effect that the mine would be closed until July 7 for repairs to the machinery. The 28 men that signed the agreement drew the money coming to them and left the camp the evening of the 25th. The mine resumed work as soon as the repairs were completed, the foreman having left in the meantime.

The eight-hour law, as amended, covering all underground mining, was generally observed throughout the Territory. The ten-hour scale of wage (\$5 per day and board for eight hours' work) was maintained in the underground placer mines.

A general eight-hour law, applicable to all wage and salary earners in the Territory, was passed by the Alaska Legislature, session of 1917, in response to a referendum submitted to the people at the general election of 1916, the referendum having been adopted by an overwhelming majority. The law became effective January 1, 1918. This law will not affect the mining industry to any great extent, as the quartz mines and underground placer mines are already operated under an eight-hour law. It will, however,

REPORT OF TERRITORIAL MINE INSPECTOR

LAWS PASSED AT THE THIRD REGULAR SESSION

of the

TERRITORIAL LEGISLATURE

re

MINING

Ch.	No.	TITLE
4.	H. B. 3	An Act to declare employment in underground coal mines, underground lode mines; underground placer mines; in underground coal, lode or placer workings; and in all other underground mines, or workings of any kind or nature whatsoever, to be injurious to health and dangerous to life and limb. To regulate and limit the hours of employment in said occupations; to declare the violation thereof a misdemeanor, and to provide penalties for the violation thereof, and repealing all acts and parts of acts in conflict herewith to the extent of such conflict.
17	H. B. 31	An Act to provide for the erection of cabins and shelter along traveled roads and trails and the equipment of such cabins, making it a crime to remove such cabin or any portion thereof, or any articles contained therein, prescribing the penalty for such offense and declaring an emergency.
31	S. B. 24	An Act providing a relief fund for the rescuing and relief of persons lost while prospecting, bunting, hunting or otherwise, in the Territory of Alaska, and declaring an emergency therefor.
36	S. B. 2	An Act to provide for the construction, maintenance and protection of public roads, bridges, trails and ferries and property pertaining to public roads in the Territory of Alaska, to provide funds, regulations and penalties; to carry the provisions and purposes of this act into effect; to provide for the appointment of a Territorial Board of Road Commissioners and defining their duties; to provide for a Board of Divisional Road Commissioners for the First, Second, Third and Fourth judicial divisions in the Territory of Alaska and for other purposes; and declare an emergency.
44	S. H. 35	An Act to amend chapter 71 of the 1915 Session Laws of Alaska, entitled, "An Act relating to the measure and recovery of compensation of injured employees in the mining industry of this Territory, and compensation to designated beneficiaries where such injuries result in death, defining and regulating the liability of employers to their employees in connection with such industry, and repealing all Acts and parts of Acts in conflict with this Act."
61	H. B. 26	An Act to establish the office of mine inspector; to prescribe the duties, powers, qualifications and compensation thereof; to regulate the operation of mines in the Territory of Alaska; to provide for the health and safety of mine workers in the Territory; to declare the violation of any of the provisions hereof a misdemeanor and prescribing punishment therefor; repealing chapter 72 of the 1913 Session Laws of Alaska, and Chapter 69 of the 1915 Session Laws of Alaska.
66	S. B. 13	An Act to Regulate and limit the hours of employment for all wage and salary earners in the Territory of Alaska, to declare the violation thereof a misdemeanor and to prescribe punishment therefor.
67	H. B. 59	An Act defining the rights of locators of mining claims over the waters of any rivers or creeks on which such claims may be staked and the rights of locators of water rights on creeks and rivers in the Territory of Alaska.
62	S. B. 16	An Act for the establishment of the Alaska Agricultural College and School of Mines, in accordance with the provisions of the Act of Congress, approved March 4, 1916, and to grant a charter to the Alaska Agricultural College and School of Mines.
74	S. B. 29	An Act to amend sections 1 and 2 of chapter 76, Laws of Alaska, 1916, entitled "An Act to establish a system of taxation create revenue and provide for collection thereof for the Territory of Alaska, and for other purposes," and to amend an act entitled "An Act to establish a system of taxation, create revenue and provide for collection thereof for the Territory of Alaska, and for other purposes," approved May 1, 1913, and declaring an emergency, approved April 29, 1916.

propriated become available immediately upon the passage and approval of this act.

Approved April 14, 1917.

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## CHAPTER 4.

### AN ACT

(H. B. 3)

To declare ~~employment in underground coal mines~~; underground lode mines; underground placer mines; in underground coal, lode or placer workings; and in all other underground mines, or workings of any kind or nature whatsoever, to be injurious to health and dangerous to life and limb. To regulate and ~~limit~~ the hours of employment in said occupations; to declare the violation thereof a misdemeanor, and to provide penalties for the violation thereof, and repealing all acts and parts of acts in conflict herewith to the extent of such conflict.

Be it enacted by the Legislature of the Territory of Alaska:

Section 1. Employment in underground coal mines, underground lode mines, underground placer mines, in underground coal, lode or placer workings, and in all other underground mines or workings of any kind or nature whatsoever, is hereby declared to be injurious to health and dangerous to life and limb. Declares all underground employment dangerous.

Section 2. That the period of employment of any person in underground coal mines, underground lode mines, underground placer mines, underground coal, lode or placer workings, and in all other underground mines, or workings of any kind or nature whatsoever, shall not exceed eight (8) hours within any twenty-four (24) hours, except on such days as change of shift is made, excluding, however, any intermission of time for lunch or meals, or otherwise going to, or from the place where the work is actually carried on, whether going to or coming from the place of work be in going on, or off shift, or in going to, or returning from meals or lunch. It being the intention of this act to limit the hours of employment in any twenty-four (24) hours to eight (8) hours of actual Limitation upon hours of work.

labor at the face, or other place or places where the work or labor to be done is actually performed; except in case of emergency, where life or property is in imminent danger, the period may be extended during the continuance of such emergency.

Penalty.

Section 3. Any person, persons, body corporate, general manager, foreman or employer, who shall employ, or cause to be employed any person or persons in violation of the provisions of this Act, shall be deemed guilty of a misdemeanor, and upon a first conviction shall be punished by a fine of not less than One Hundred Dollars (\$100.00), nor more than Five Hundred Dollars (\$500.00), or by imprisonment in the Federal Jail, not less than Sixty (60) days, nor more than Six (6) months; or by both fine and imprisonment. Upon a second conviction within the meaning of this act as hereinafter set forth, the punishment shall be imprisonment in the Federal Jail not less than Sixty (60) days, nor more than One (1) year.

Penalty 2nd conviction.

A second conviction within the meaning of this act, shall be a conviction for a violation of this act committed within a period of Two (2) years after a previous conviction of the same person, persons, body corporate, general manager, foreman or employer for a violation of this act. All other convictions within the meaning of this act shall be first convictions. Every day's violation of the provisions of this act shall constitute a separate offense.

Effect partial invalidity.

Section 4. Should it be adjudicated that any portion, section, or part of any section of this act, is unconstitutional or otherwise invalid for any reason, an adjudication of invalidity of such portion, section, proviso or part of any section of this act shall not effect the validity of the act as a whole or any other part thereof.

Repeal.

Section 5. All acts and parts of acts in conflict with this act are hereby repealed to the extent of such conflict.

Emergency declared.

Section 6. An emergency is hereby declared to exist,

mills, chlorination processes, cyanide processes, is hereby declared to be injurious to health and dangerous to life and limb.

Eight hour day therein

Sec. 2. That the period of employment of workmen in underground workings, underground mines, stamp mills, and roller mills, open cut workings, chlorination processes, cyanide processes, and at coke ovens shall not exceed ~~eight (8)~~ hours within any twenty-four (24) hours, except on such days as change of shift is made; excluding, however, any intermission of time for lunch or meals, and excluding also the time required in descending to and ascending from, or otherwise going to or from the place where the work is actually carried on, whether going to or coming from the place of work be in going on or off shift, or in going to or returning from meals or lunch; it being the intention of this act to limit the hours of employment in any twenty-four (24) hours to eight hours of actual labor at the face or other place or places where the work or labor to be done is actually performed; except in case of emergency where life and property is in imminent danger or in case of urgent necessity, the period may be extended during the continuance of such emergency or urgent necessity, providing, however, that this act applies to metalliferous lode mining only.

Exceptions

See also 1917-p3  
and 1915. See Laws 1915-p6

Penalty

Sec. 3. Any person, persons, body corporate, general manager or employer who shall violate, or cause to be violated, any of the provisions of this act, shall be deemed guilty of a misdemeanor and upon conviction shall be punished by a fine of not less than one hundred (\$100.00) dollars or more than five hundred (\$500.00) dollars, or by imprisonment in the federal jail not less than ninety (90) days nor more than six (6) months; or by both fine and imprisonment. Every day's violation of the provisions of this act shall constitute a separate offense.

Sec. 4. If it shall be adjudicated that any portion, section, or part of any section of this act, is unconstitu-

tional and invalid for any reason, an adjudication or invalidity of such portion, section, proviso or part of any section of this act shall not affect the validity of the act as a whole or any part thereof.

Approved, April 24, 1913.

CHAPTER 30.

(S. B. NO. 21.)

AN ACT making it a felony to take, remove or conceal any ore, mineral, amalgam, precipitates, concentrates or other mineral-bearing substance from any mine, sampler, smelter, concentrating mill, chlorination mill, cyanide mill, or other reduction works, with intent to steal the same or to defraud the owner thereof, and providing a penalty therefor.

Be it enacted by the Legislature of the Territory of Alaska:

Section 1. If any person shall take, remove or conceal any ore, or mineral, or amalgam, or precipitates, or concentrates, or other mineral-bearing substance, from any mine, sampler, smelter, concentrating mill, chlorination mill, cyanide mill, or other reduction works, with the intent to steal the same or to defraud the owner thereof, such person shall be deemed guilty of grand larceny, and upon conviction shall be punished by imprisonment in the penitentiary not less than one year nor more than ten years.

Taking etc., with intent to steal. Felony

Sec. 2. All acts and parts of acts in conflict with this act are hereby repealed.

Approved, April 24, 1913.

criminal procedure for said District," be amended to read as follows:

"Sec. 178.—What Time May Be Appointed.—That the time appointed for pronouncing judgment must be at least three days after the verdict, if the court intends to remain in session so long, or if not, as remote time as can reasonably be allowed; but in no case can the judgment be given except by the consent of the defendant, in less than six hours after the verdict."

Approved, April 21, 1913.

#### CHAPTER 27.

(H. B. NO. 67.)

AN ACT to amend Section One Hundred and Sixty-nine of the Code of Criminal Procedure of Alaska. (Compiled Laws of Alaska, Sec. 2278.)

*Be it enacted by the Legislature of the Territory of Alaska:*

Section 1. That Section One Hundred and Sixty-nine of Title Two, Chapter Seventeen, of the Act of March 3, 1899, entitled "An Act to define and punish crimes in the District of Alaska and to provide a Code of Criminal Procedure for said District," be amended to read as follows:

Sec. 169.—Motion for New Trial.—That a motion for a new trial with the affidavits, if any, in support thereof shall be filed within two days after the rendition of the verdict or other decision sought to be set aside. When the adverse party is entitled to oppose the motion by counter affidavits, he shall file the same within one day after the filing of the motion. The motion shall be heard and determined during the term, unless the court continues the same for advisement or want of time to hear it.

Approved, April 21, 1913.

#### CHAPTER 28.

(H. B. NO. 69.)

AN ACT to provide a penalty for inciting another to commit a crime.

*Be it enacted by the Legislature of the Territory of Alaska:*

Section 1. That whoever shall wilfully and knowingly solicit, incite or induce another to commit any act declared to be a misdemeanor in this Territory, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not more than \$500.00 or by imprisonment in the federal jail for not more than six months, or by both such fine and imprisonment.

Approved, April 21, 1913.

#### CHAPTER 29.

(S. B. NO. 1.)

AN ACT to declare ~~employment in underground mines~~, applied to metalliferous lode mining only, underground workings, open cut workings, open pit workings, smelters, reduction works, stamp mills, roller mills, concentrating mills, chlorination processes, cyanide processes, to be injurious to health and dangerous to life and limb. To regulate and limit the hours of employment in said occupations; to declare the violation thereof a misdemeanor and to provide penalties for the violation thereof.

*Be it enacted by the Legislature of the Territory of Alaska:*

Section 1. Employment in underground mines, underground workings, open cut, open pit workings, smelters, reduction works, stamp mills, roller mills, concentratin

Amended 1915 - See laws 1915 - See also 1917-1918

Secs. 1 + 2 of this chapter amended 1915  
See laws 1915  
CHAPTER 29.  
(S. B. NO. 1.)  
See also 1917

## CHAPTER 7.

(S. B. NO. 6.)

AN ACT to establish the number of hours to constitute a day's work on all Territorial and municipal construction or such work done by contract or sub-contract, and providing penalties for its violation.

*Be it enacted by the Legislature of the Territory of Alaska:*

eight hour day  
public work

Section 1. Hereafter, **eight hours in any calendar day, shall constitute a day's work on any work done for the Territory or any municipality within the Territory, subject to the following conditions:**

Sec. 2. All work done by contract or sub-contract on any building or improvements, or work on roads, bridges, streets, alleys or buildings for the Territory or any municipality within the Territory, shall be done under the provisions of this Act;—Provided, that in cases of extraordinary emergency such as danger to life or property, the hours for work may be extended. And for this purpose this Act is made a part of all contracts, sub-contracts or agreements for work done for the Territory or any municipality within the Territory.

applies to sub-  
contracts

Sec. 3. Any contractor, sub-contractor, or agent of contractor or sub-contractor, foreman or employer, who shall violate the provisions of this Act, shall be deemed guilty of misdemeanor, and upon conviction thereof shall be fined in a sum not less than fifty dollars nor more than five hundred dollars, or with imprisonment for a period of not less than ten days nor more than ninety days, or both such fine and imprisonment.

penalty

Approved, April 18, 1913.

## CHAPTER 8.

(S. B. NO. 19.)

AN ACT to regulate the purchase of ore.

*Be it enacted by the Legislature of the Territory of Alaska:*

Section 1. Any person, copartnership, association or corporation in the actual and peaceable possession of any mining claim, under claim or color of title, and engaged in the mining, shipment and treatment, or sale of ores therefrom, shall, as to all persons purchasing such ore or ores in good faith and without notice as herein provided, of the title or claim of title, or ownership of any other person, copartnership, association or corporation thereto shall be deemed to be the lawful owner or owners of such ore or ores.

Possess-  
claim  
to be

Sec. 2. Any person who, or copartnership, association or corporation which shall in good faith and in the usual course of business and without notice, as hereinafter provided, purchase and obtain delivery of any ore or ores from any person, copartnership, association or corporation in possession of the mines, mining claim or claims, from which such ore or ores shall have been mined or extracted, shall be deemed the owner or owners of such ores except as herein provided; and he or they shall not be liable to, or subject to any action at law or in equity, for the recovery of the same or the value thereof by any person, copartnership, association or corporation who or which may thereafter be adjudged to be the owner or owners of such mine, mines, mining claim or claims.

Not in  
to per-  
therom  
judged  
owner

Sec. 3. If any person, copartnership, association or corporation shall be or shall claim to be the owner or owners, or entitled to the possession or enjoyment of any mine, mines, mining claim, claims or premises, then in the possession of some other person, copartnership, association or corporation claiming to be the owner or owners or entitled to the possession thereof, and mining, shipping or treating or selling the ore therefrom, may, if he, they,

Liability  
purcha  
ore own-  
ore own-

transport them as soon as possible to Portland, where it may be of them soon recover. If these detention hospitals were utilized those committed to them were detained there under medical observation and given proper medical treatment, it is possible that they would soon recover and be discharged, thus avoiding the high cost of transportation to the contract hospital and the cost of their maintenance at that institution. These detention hospitals were authorized by act of Congress, approved June 25, 1910, and cost with the equipment \$25,000.

### LABOR CONDITIONS.

There was an excess of labor in nearly all industrial sections of Alaska during the fiscal year. Despite many warnings given by Government officials and others through the public press the influx of men seeking work was almost continuous. In part this influx was stimulated by the beginning of construction work on the Government railroad at Anchorage on Cook Inlet. However, up to this time, a considerable amount of labor has been absorbed in railroad work, while mining and prospecting afforded employment for others. The mines of southeastern Alaska give employment to a large number of men, and the number so employed is constantly being increased. It is expected that the opening of some of the coal fields in Alaska will greatly extend the volume of mining operations throughout the Territory through the furnishing of coke and cheap fuel for industrial use. The fishing industry the present season gave employment to the usual number of men; in this industry many Indians, Chinese, Japanese and other aliens are employed.

The Territorial legislature at its recent session passed an 8-hour law for all workers in lode and placer mines; and during the past summer in the Ruby and Fairbanks mining districts labor strikes resulted in some of the placer mines, when the employees attempted to reduce the wage scale which had been paid for a 12-hour day. In the Fairbanks district the difficulty was soon adjusted, however, and the men returned to work. In the Ruby district the difficulty has continued without settlement. An 8-hour law was already generally in force in the lode mines of the Territory. The wage scale paid to placer miners in the Fairbanks and Ruby districts during the summer season prior to the passage of the 8-hour law was \$5 per day. In the Nome district no reduction of the wage scale followed the enforcement of the 8-hour law. Wage scales in other parts of the Territory have remained practically stationary during the year. The scale of wages paid in lode mines in coastal Alaska is from \$3 to \$3.50 per day.

### ALASKA GAME LAW.

There are many peculiarities in the Alaska game law which render it unsuited in many respects to local and climatic conditions in the different geographical divisions of the Territory. For instance, in the interior regions the open season for waterfowl does not begin until September 1, and by that time migratory birds have either started on their flights or are about to do so. Efforts to have the law changed so that the season should open on August 15 have thus far been

trial purposes, by which it is claimed power can be produced cheaply than by the employment of fuel oil, should greatly increase coal production and consumption. With the opening of the fields of Alaska there should begin an industrial era in the Territory in which the building of smelters for the treatment of copper and other refractory ores should play an important part. The opening of these fields, too, should mean the use of Alaska coal by the Federal Government for naval and other purposes on the Pacific coast and the establishment of one or more coaling stations in the Territory. The numerous tests, naval and other, that have been made of Alaska coal in recent years, have established its value not only for naval, but practically for all other purposes for which coal may be required.

#### LABOR CONDITIONS.

The supply of labor during the greater part of the fiscal year was fully equal to the demand, except in the closing months of the year when the demand for mechanics of various kinds and for workmen on railroad construction was greater than the supply. The demand for miners has also been greater than during the previous year. A strike of laborers and artisans employed on the construction of the Government railroad at Anchorage occurred during the early spring. Increased wages were asked for and work was partially suspended pending an adjustment of the matters involved. A board of conciliation and mediation, appointed by the President, proceeded to Anchorage, where an exhaustive investigation was conducted. The board recommended an increase in the various wage scales, and men returned to work. There has been no difficulty experienced since and the wisdom of settling the strike in an amicable manner has been warmly commended. No other labor troubles of importance have been reported elsewhere in the Territory. In some of the mining districts increases of wages have been reported, also a decrease in the working hours of men employed in surface work about the mines. In the placer mining districts of interior Alaska the wage scale is \$5 per day and board for an 8-hour day. The Territorial legislature, session of 1915, passed a law constituting eight hours a day's work in all the lode and placer mines. This has been generally observed, except in a few cases in the placer mining districts where some of the employers of labor have evinced a disposition to disregard it. Suit has been begun in the fourth judicial division to test the legality of the act.

An act providing for an expression by the electors of the Territory as to whether they are in favor or are not in favor of a general eight-hour day for all wage and salary earners, was passed by the Alaska Legislature at its last session, for submission at the general election in November, 1916. The act also provides that, if the question is decided in the affirmative, the legislature shall at its next session pass such acts as may be necessary to cause such expression of the wishes of the electors to become effective.

In some of the fishing sections of the Territory the usual number of men have not been employed by the cannery operators because of a slack season for salmon, the run of this fish having been greatly below the normal, especially in southeastern Alaska. In this industry many

## UNITED STATES COMMISSIONERS

The judges of the district courts should be as far removed as possible from politics and political influences, if the courts are to retain the respect and confidence of the people. A step in this direction would be the taking of appointments of United States commissioners out of the hands of the judges and vesting the appointing power elsewhere. The democratic way would be the election of United States commissioners, who are also ex officio justices of the peace, coroners, and probate judges, directly by the people of the various recording precincts.

## LABOR CONDITIONS.

Alaska is suffering from a shortage of labor in nearly every section, and in some it has become pronounced during the past spring and summer. This is especially true of southeastern Alaska, where the great low-grade lode mines are severely handicapped in their operation of mines and mills by reason of the lack of sufficient labor to conduct these enterprises. As a result, gold production has been curtailed to a considerable extent and this condition will prevail until a sufficient supply of labor can be procured. Many of the miners employed throughout the Territory have gone to the copper-mining States of the West, attracted thither by the better wages paid there by the operators of copper mines, the price of copper having largely advanced owing to war conditions. It was expected that the close of the salmon-fishery season would relieve the mine labor situation to some extent, but this does not seem to have been the case.

A strike of miners employed by the Kennecott Copper Corporation in the Copper River Basin occurred in June of this year, owing to the demand of the men for an increase in the wage scale. The strike, however, was not of long duration and many of the men returned to work, partially through the efforts of a representative of the Department of Labor who visited Kennecott for the purpose of adjusting the strike difficulties. There was also a labor strike on the part of some of the men employed in the construction of the Government railroad at Nenana, but it was of short duration, the differences having been satisfactorily and speedily adjusted.

A general eight-hour law, applicable to all wage and salary earners in the Territory, will become effective on January 1, 1918. This law was passed by the Alaska legislature, session of 1917, in response to a referendum submitted to the people at the general election of 1916, the referendum having been adopted by an overwhelming majority. The governor of the Territory, however, is "given the power to suspend or modify restrictions contained in the law when such shall be requested by the Council of National Defense or the Secretary of the Interior, and such modification or suspension, when made, shall be continued for a specified period and not longer than the duration of the present war, or during the continuance of any future war with a foreign power."

## COMMISSION OF CRIME.

In the annual report of this office for the fiscal year 1916 reference was made to the commission of capital crimes, especially in the remote regions of the Territory, and it was stated that in many cases

Bill No. House Bill 162

Date March 11, 1987

Title "An Act relating to work in underground mines and workings."

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House Bill 162 proposes to extend the maximum number of hours a person may be employed in an underground mine to ten hours per day. Current law restricts such work to eight hours per day.

Recognizing that the eight hour limitation was mandated many years ago, and that technological advances since that time may have diminished some of the hazards associated with working underground, the Department of Labor is not opposed to some relaxation of the limitation if a review of the work environment indicates it will not detract from the overall well-being of workers. The Department feels, however, that any expansion of underground work hours should be evaluated on a case-by-case basis and only permitted if it is determined that the employment practices and work conditions of a particular mining operation are conducive to such an expansion and that the well-being of the workers is assured.

1984 injury and illness statistics for the mining industry as a whole reflect that nearly 35% of Alaska's time loss injuries and illnesses occurred after eight hours of work; and that over 22% of the time loss injuries in non oil and gas related mining occurred after eight hours of work. Although these statistics are not reflective of underground mining activities per se, they are indicative of the hazards inherent in mining operations and, therefore, underscore the need to very carefully approach expanded work hours for underground mining.

Accordingly, while the Department does not support the across-the-board relaxation of the eight-hour limitation provided in House Bill 162, it would endorse a variance provision to permit underground work for up to ten hours if it is determined that it is in the best interest of the employer and Alaska's mine workers.

The following amendments to House Bill 162 would accomplish this as well as clarify the existing law:

1. Amend Sec. 2, lines 19-23, to read:

than eight hours in 24 hours, except on a day when a change of shift is made, excluding, however, an intermission of time for meals, and the time [OR OTHERWISE GOING TO OR FROM THE PLACE WHERE THE WORK IS ACTUALLY CARRIED ON, WHETHER IN GOING ON OR OFF SHIFT, OR IN] going to or returning from meals.

This amendment would merely clarify the existing law which is designed to regulate only time spent underground.