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ACCIDENT COST INDICATOR MODEL TO ESTIMATE COSTS TO INDUSTRY AND SOCIETY FROM WORK-RELATED INJURIES AND DEATHS IN UNDERGROUND COAL MINING

VOLUME I DEVELOPMENT AND APPLICATION OF COST MODEL

Bureau of Mines Open File Report 39(1)-77

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for Underground Coal Mining Accidents

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16. Abstracts This report describes a computer-based model for estimating the tangible costs of injuries and deaths from work-related accidents in underground coal mines. The study undertook to identify and quantify the elements of accident costs, including field visits to coal mines, insurance carriers, and public agencies. The mathematical models developed for each tangible element of accident cost are presented in Volume I of the report. A listing of the computer programs which comprise the model and instructions for using the programs are presented in Volume II. Statistical distributions of mining family characteristics, data on 95 miners killed in underground accidents, and other basic data used to develop the model are presented in Volume III. Application of the model to a data base of 9,286 accidents which occured in underground bituminous coal mines during 1974 yielded a total of $56,900,000 in tangible costs to industry, mining families, and public agencies. Loss of income to the families of miners injured or killed in these accidents accounted for 47 percent of the total.

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FOREWORD

This report was prepared by FMC Corporation, Engineered Systems Division, Santa Clara, California 95052, under USBM Contract Number J0255031. The contract was initiated under the Coal Mine Health and Safety Program. It was administered under the technical direction of DMRC, with Mr. Douglas C. Boyd acting as the Technical Project Officer. Mr. William R. Case was the Contract Administrator for the Bureau of Mines.

This report is a summary of the work recently completed as part of this contract during the period June 1975 to February 1976. This report was submitted by the authors on 30 September 1976.

A number of persons were involved in the project and merit acknowledgement for their contributions. Art Nakata and Dominic Colvert of the ESD Systems Engineering Department spent many days in the field during the data collection task, and contributed major elements of model logic. Mr. Nakata battled the verbal complexities of union, state and federal workmen's compensation laws to develop the indemnity cost algorithms. Mr. Colvert identified the relation between fatal accidents and post-accident losses in productivity. Linda McDonald worked with Mr. Colvert in analyzing reams of daily section reports. Dr. Edgar LaVeque served as medical cost consultant, and prepared the model treatment study used for computing medical costs. Douglas Boyd, the Technical Project Officer for the U.S. Bureau of Mines, contributed many valuable guidelines during the project, worked with the staff of the Health and Safety Analysis Center to prepare the accident data tape used in the project, and provided valuable assistance during installation of the programs on the Bureau's Denver computer system. Irene Taylor of ESD typed the final report, including the many tables and flow charts. Dan DiCanio served as Project Manager and was the principal designer of the model. Many persons from mining companies, insurance carriers, state workmen's compensation funds, and other agencies took time away from their work to assist members of the field visit team. We would like to thank the following people for their time and for providing valuable data to the project: Donald De Carlo, Anthony Grippa and Joseph DiScale of the National Council on Compensation Insurance. John Wright of the Old Republic Insurance Company. Alan Blevins of Blue Diamond Coal Company. Mike Hartung of the AMAX Coal Company. Joe Craigs of the Peabody Coal Company. The following coal mine inspectors from district offices of MESA: Paul Lenyo, Johnstown, PA; Michael Dorazio, Morgantown, WV; and Mr. Childers, Vincennes, IN.

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NAME CONVENTIONS

The following name conventions are used:

- All names prefixed by ACIM are the names of programs

- [name]DATA is a reference to a data file.
- A subprogram (subroutine or function) is referred to by the FORTRAN name of the subprogram.
- The names of FORTRAN variables follow standard type conventions, as follows:
  - Names beginning with letters A-H, O-Z are REAL
  - Names beginning with letters I-N are INTEGER.
- Any variable name beginning with the letter H is used as a literal data constant†.
- All variables in the common areas labelled BDSECA-BDSECG are initialized in the BLOCK DATA subprogram for Program ACIMEXEC. The letter suffix of the label is the BLOCK DATA section in which the variables are initialized (e.g., variables in COMMON/BDSECB/ are initialized in Section B).

- The following abbreviations and acronyms are used:
  - ACIM: Refers generically to the Accident Cost Indicator Model
  - MESA: The Mining Enforcement and Safety Administration of the U.S. Department of the Interior
  - HSAC: The Health and Safety Analysis Center of the MESA, located at Denver, Colorado
  - AEMF: The Address and Employment Master File for coal mines maintained at HSAC
  - CAIF: The Coal Accident and Injury File for coal mines maintained at HSAC.

†: REAL *8 variable in IBM 360/370 FORTRAN (G/H level)

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DEFINITIONS OF SYMBOLS

Symbol(s)	Definition
a_{1m}, a_{2m}	Constants in empirical equations for Mining Method m
A	Factor for allowable number of dependents for indemnity benefits
$\overline{A}$	Average annual base wage for social security benefits
A_c	Present annual cost to mining companies
A_m	Present annual cost to mining families
A_n	Base wage for Year n for social security benefits
A_p	Present annual cost to public agencies
A_{ys}	Present annual cost of injuries in Population Subset s to Societal Sector y
b_{1m}, b_{2m}	Constants in empirical equations for Mining Method m
b_{ss}	Net present and future benefit for injury compensation paid from social security fund (SSF)
$b_{ss2(f)}$	Maximum monthly benefit paid to family member f from SSF (f=d, m, w)*
b_{ss4w}	Total weekly benefit from SSF for temporary total disability injury
b_{ssc}	Gross present and future benefit computed for SSF before application of maximum limit
$b_{ss1(f)}$	Maximum monthly death benefit paid to family member f from SSF (f=d, w)*
b_{st}	Present and future benefit for injury compensation paid from state workmen's compensation fund (SWCF)
b_{st21}	Present and future benefit from SWCF for compensation of wage losses for permanent total disability injury
b_{st22}	Maximum one-time payment from SWCF for loss of member/function
b_{st23}	Maximum one-time payment from SWCF for disfigurement
$b_{st2(f)}$	Maximum weekly benefit payable from SWCF to family member f for compensation of permanent total disability injury (f=d,m)*

*Codes for Family Member f: d = dependent child, m = injured miner, w = spouse of injured miner

Definition of Symbols (continued)

Symbol(s)	Definition
b_{st31}	Present and future benefit from SWCF for compensation of wage losses for permanent partial disability injury during the period of partial disability
b_{st32}	Portion of b_{st22} paid for permanent partial disability injury
b_{st33}	Portion of b_{st23} paid for permanent partial disability injury
b_{st34}	Benefits from SWCF during period of total disability for permanent partial disability injury
$b_{st4(f)}$	Maximum weekly benefit paid by SWCF to family member f for temporary total disability injury (f=d, m, w)*
$b_{st1}(ip)$	Maximum one-time benefit from SWCF for loss of body member/ function corresponding to ACIM code ip
$b_{st1}(max)$	Maximum $[b_{st1}(ip)]$
b_{stn}	Expected present and future death benefit from SWCF given no remarriage of spouse of fatally injured miner before death of spouse
b_{str}	Expected present and future death benefit from SWCF given remarriage of spouse within z_{rw} years after benefits start
$b_{st(f)1}$	Weekly death benefit paid from SWCF to wife and dependents of deceased miner (f=w,d)
b_{un}	Present and future benefits paid from Union disability and retirement fund (UDRF)
b_{unal}	Monthly benefits paid from UDRF to widow of miner in addition to normal benefit b_{unr}
b_{unc}	Present and future benefits paid from UDRF before application of factor for claim administration and overhead
b_{undd}	Expected present and future death benefits paid from UDRF to youngest dependent child given no remarriage and death of widow before child reaches 22 years of age
$b_{unr}(i)$	Monthly death benefit from UDRF per year of payment into UDRF by deceased miner for qualifying period i
b_{unr}	Total monthly death benefit from UDRF for a deceased miner y_m years of age with z_{exp} years of payment into the UDRF
b_{untn}	Net weekly benefit paid from UDRF for total disability after deduction of weekly benefits from SSF and SWCF.
b_{unwd}	Expected present and future death benefit paid to widow from UDRF in addition to b_{unwp} given no remarriage of widow before 65 years of age

*Codes for Family Member f: d = dependent child, m = injured miner, w = spouse of injured miner

Definition of Symbols (continued)

Symbol(s)	Definition
b_{unwp}	Expected present and future basic death benefit paid to widow from UDRF given no remarriage of widow before 65 years of age
b_{unwr}	Expected present and future basic death benefit paid to widow from UDRF given remarriage of widow by y_{rw} years of age
B	Qualifying period of benefits from SWCF for dependents of miner
C_c	Total cost to Company for investigating fatal accident
C_m	Total cost to MESA for investigating fatal accident
C_p	Total cost to public for investigating fatal accident
C_s	Total cost to state for investigating fatal accident
C_u	Total cost to union for investigating fatal accident
C_{ecp}	Total cost of lost production from fatal accident = e_{pl}
C_{inv}	Total cost to all societal sectors for investigating fatal accident
C_{med}	Total medical costs of an injury
C_{pin}	Expected current and future loss of income to injured miner and family = w_{en}
C_{ssb}	Expected current and future cost of benefits from SSF = b_{ss}
C_{stb}	Expected current and future cost of benefits from SWCF = b_{st}
C_{unb}	Expected current and future cost of benefits from UDRF = b_{un}
C_{tx}	Total cost to Agency x of fatal accident investigative task t
d_{dt}	Number of days away from normal occupation for a miner with a total disability injury
d_{dtq}	Number of days for which miner qualifies for total disability benefits
d_{el}	Number of post-accident workdays of reduced production due to occurrence of a fatal or amputation accident
d_t	Number of days required to perform fatal accident investigative task t

Definition of Symbols (continued)

Symbol(s)	Definition
D_{st}	Maximum one-time benefit paid by SWCF for disfigurement due to occupational injury
d_y	Total workdays underground at mine ID
e_{pl}	$= C_{ecp}$
f_d	Fraction of D_{st} paid for an injury
f_{pp}	Fraction of $b_{stl}(ip)$ paid for an injury
h_y	Total workhours underground at mine ID during the year in which a fatal or amputation accident occurred
ip	ACIM code for part of body involved in an injury
ID	HSAC identification code for an underground coal mine where a fatal or amputation accident occurred
$I_{xss}(n)$	Escalation index for year n (base = 1974) applied to benefits paid from SSF
I_y	Present annual average cost to societal sector y per injury in injury population subset s
l_{bss}	Maximum limit specified in SSF for b_{ss}
l_{stf}	Maximum SWCF limit on b_{st} for fatal injury
l_{stpp}	Maximum SWCF limit on b_{st} for permanent partial injury
l_{stpt}	Maximum SWCF limit on b_{st} for permanent total injury
l_{sttt}	Maximum SWCF limit on b_{st} for temporary total injury
l_{unl1}	One-time basic death benefit to widow paid from UDRF
l_{unl2}	One-time basic death benefit to each child in excess of five children paid from UDRF
l_{unl3}	One-time additional benefit paid to widow from UDRF for death of miner caused by occupational accident
n_c	Number of dependent children (< 18 years of age) in family of injured miner
n_{txy}	Number of personnel of occupational classification x from agency y involved in fatal accident investigative task t
n_{ug}	Average number of miners underground daily at mine ID
n_{xy}	Total number of personnel of occupational classification x from Agency y involved in fatal accident investigation
NI	ACIM code for nature of injury
N_{is}	Total number of injuries in population subset s
O_{xx}	Factor applied to b_{xx} for administration and overhead associated with processing occupational and injury claim (xx=ss, st, un)

Definition of Symbols (continued)

Symbol(s)	Definition
P_{65m}	Probability that a male of age y_m lives to age 65
P_{65w}	Probability that a female of age y_w lives to age 65
P_{cpI}	Percentage change in the Consumer Price Index for all items from year n-1 to year n
P_{el}	Fractional reduction in pre-accident productivity on a working section where a fatal or amputation accident has occurred: averaged over d_{el} workdays
p_{rw}	Probability that a widow of age y_w will remarry by age y_{rw}
P_{unr}	Fraction of b_{unr} paid by UDRF
PB	= ip
q_{1s}	Minimum number of days of total disability required to qualify for benefits from SWCF
q_{2s}	Number of days of total disability required to qualify for retroactive benefits for minimum qualifying period q_{1s}
q_p	Minimum number of days of total disability required to qualify for benefits from SSF
R_s	One-time benefit paid from SWCF upon remarriage of widow of fatally injured miner
s_m	Marital status of miner at time of injury; Section 4.2.3 only : number of working sections using mining method m in mine ID
s_z	Daily wage paid to person in salary classification z
t (subscript)	Index of fatal accident investigative task t (=1,2,3,4)
t_t	Workdays per person required to perform fatal accident investigative task t
t_d	Average tons of coal produced daily at mine ID
t_{li}	Tons of coal production lost due to closure of mine ID for one workday following occurrence of fatal accident
t_{ll}	Tons of coal production lost due to reduction in productivity at mine ID following occurrence of a fatal or amputation accident
t_{sd}	Average tons of coal produced daily at mine ID per working section
t_y	Tons of coal produced at mine ID during the year in which a fatal or amputation accident occurred
T_{ys}	Total present and future cost to societal sector y of N_{is} injuries in population subset s.

Definition of Symbols (continued)

Symbol(s)	Definition
U_t	Total present and future cost of an injury to all sectors of society
U_y	Total present and future cost of an injury to societal sector y (y = c: companies; y = m: family; y = p: public agencies
V_t	Value ($/ton) of coal produced at underground mines, F.O.B. mine
w_d	Average daily wage of an underground coal miner.
w_{eg}	Gross expected loss in present and future wages due to an injury
w_{en}	Net expected present and future wage losses after deduction from w_{eg} of compensation benefits paid from SSF, SWCF, and UDRF
w_y	Average annual wage of an underground coal miner
y_{ci}	Age of dependent child ci (ci=1, 2, ..., n_c)
y_m	Age of miner at time of injury occurrence
y_{pmax}	Age at which miner qualifies for maximum benefits from UDRF
y_{pmin}	Age at which miner qualifies for any benefits from UDRF
y_{rw}	Expected age at which a widow of age y_w remarries
y_w	Age of wife of injured miner at time of injury occurrence
$z_{2(f)}$	Years of payment to family member f(= d,w) from SWCF for permanent total disability injury
$z_{3(f)}$	Years of payment of partial benefits to family member f (= d,m,w) from SWCF for permanent partial disability injury
z_{ci}	Eligibility period for dependent child ci (age y_{ci}) for determination of payment period of benefits from SWCF
z_{ci}^*	Years of payment to youngest dependent child from SWCF
z_{dss}	Years of payment to youngest dependent child from SSF
z_{exp}	Years of experience in mining for injured miner at age y_m
z_m	Maximum eligibility period of miner for all compensation benefits
z_{maxcs}	Eligibility period for youngest dependent child for SWCF and SSF

*Codes for Family Member f: d = dependent child, m = injured miner. w = spouse of injured miner

Definition of Symbols (continued)

Symbol(s)	Definition
z^*_{maxcs}	Lesser of z_{maxcs} and z_{rw}
z_{maxcu}	Eligibility period for youngest dependent child for UDRF
z_{mss}	Years of payment of partial benefits to miner from SSF for permanent partial disability injury
z_{rw}	Expected years to remarriage of female widowed at age y_w
$z_{unr}(i)$	Minimum years of payment into the UDRF required to qualify for benefit amount $b_{unr}(i)$
z_{unw}	Years of payment to widow from UDRF given no remarriage of widow before age 65
z_w	Maximum eligibility period of wife of injured miner for all funds
z_{wss}	Years of payment of partial benefits to wife of injured miner from SSF for permanent partial disability injury
z_{xss}	Years of paid-in eligibilty for benefits from Social Security retirement fund

*Codes for Family Member f: d = dependent child, m = injured miner, w = spouse of injured miner

1. INTRODUCTION

This report is Volume I of the final report for U.S. Bureau of Mines Contract J0255031, "Development of a Cost Indicator for Under-Ground Coal Mining Accidents." The project to accomplish the requirements of the contract was performed by the Engineered Systems Division of FMC Corporation. The purpose of the project was to develop and program a model for estimating the tangible economic impacts of injury accidents in underground bituminous coal mines upon mining companies, coal miners, and society.

The model, called the "Accident Cost Indicator Model (ACIM), was designed to use the Coal Accident and Injury File (CAIF) maintained by the Mining Enforcement and Safety Administration as the source of data for injury accidents.

The final report is in three volumes:

Volume I: Development of Cost Model contains a description of the investigations performed to identify the cost elements contained in the ACIM, the logic and algorithms used to compute each cost element, and the results of a program run using the data from the 1974 CAIF.

Volume II: Program User Manual contains all of the information necessary to run the ACIM and to update the base cost data used by the programs.

Volume III: Supporting Data contains the source information used in the development of base cost data and computations performed to verify the algorithms contained in ACIM.

2. SUMMARY

A stochastic model, called the Accident Cost Indicator Model (ACIM) was developed for injury accidents which occur in underground coal mining from information and data collected from literature search and field visits to 15 mining companies and 12 public and private agencies. The model was programmed in the FORTRAN language, tested, and installed on the B6700 computer system of the U.S. Bureau of Mines in Denver, Colorado. The completed model consists of six programs and 24 subprograms.

The scope of ACIM includes all accidents which occur underground in bituminous coal mines during a calendar year (the current year), and which cause death or a traumatic injury. The data source used by ACIM is the Coal Accident and Injury File (CAIF) maintained by the Health and Safety Analysis center of the Mining Enforcement and Safety Administration.

The total expected values of the following tangible cost elements are computed by ACIM in present-worth dollars from the data in a CAIF record, from a stochastically-generated profile of the characteristics of the miner and the composition of his family, and from base cost data contained in the model:

(1) loss in personal income
(2) compensation of wages from state, federal, and union funds for disabling injuries
(3) benefits for injuries resulting in death or permanent disability
(4) medical treatment and hospital care
(5) immediate and post-accident production losses as the result of a fatality or amputation injury
(6) the investigation of a fatal accident.

The elements of cost are used to compute three indicators of accident cost:

(1) total current and future cost
(2) total current annual cost
(3) current annual cost per injury.

These indicators are computed for each of three categories: mining companies, mining families, and agencies of society, and for the total over-all categories.

The cost indicators for each category and for the total are displayed in a summary table for all injuries from the CAIF processed by ACIM, and in a series of tables for cross-sections and detailed summaries of the CAIF, including cross-sections by

- mining activity at the time of accident by regular job title
- type of accident by degree of injury,

and summaries by:

- mining activities
- regular job title
- nature of injury
- underground mining method
- type of accident
- degree of injury.

Each cost element record computed by ACIM contains a reference to the original record in the CAIF to permit future addition to display cost indicators for other accident parameters in the CAIF.

A total of 9286 accident records for underground bituminous coal mines were accepted by ACIM from the 1974 CAIF for computation. The result of the program run was an estimated total of $56.9 million (1974 dollars) in current and future costs of these accidents. About 60% ($34.0 million) of this total was incurred in 1974 (i.e., the year in which the accident occurred. The average annual cost of an accident was $3,700. About 41% ($23.6 million) of

the total cost was incurred by mining companies as compensation payments, lost coal production, and investigative costs. Wage losses to the injured miner and his family accounted for 47% ($26.6 million) of the total. Compensation payments and investigative costs borne by public agencies accounted for the remaining 12% ($6.7 million).

A total of 89 fatalities in the 1974 CAIF accounted for almost 54% ($30.5 million) of the total cost; the average annual cost was $125,000 for a single fatality.

A total of 5325 disabling injuries (lost-time) accounted for 45% ($25.5 million) of total cost with an average annual cost of about $4,000 per injury. A total of 3872 medical injuries (no lost time) accounted for 2% ($0.95 million) of the total cost, with an average annual cost of about $250 per injury.

Mining task activities associated with roof support (roof scaling and bolting, jack and prop handling) were, as a group, the most costly, accounting for 22% ($12.4 million) of total cost. Tramming/positioning of equipment account for 5% of the total. Handling supplies/materials, hauling coal (shuttle cars and tractors), and handling of wires and cables each accounted for 4% of the total.

The body of Part I of this volume contains the information and logic used to develop the algorithms which compute the elements of cost for an injury accident. Part II contains the listing of the tables produced by ACIM from the accident records contained in the CAIF for Calendar Year 1974.

3. IDENTIFICATION OF ACCIDENT COST ELEMENTS

This section contains a description of the investigations performed to identify the elements of tangible cost included in the ACIM. Numbers in brackets in this and in subsequent sections are references contained in Section 7.

3.1 Background

The literature yielded more than 200 historical investigations into the costs of industrial accidents, dating from studies performed by the Bureau of Mines in 1929-1932 on the costs of accidents in coal mines [e.g., 5, 20, 21]. The bulk of these investigations dealt with the direct costs (i.e., out-of-pocket expenses) of accidents to the company, and generally excluded (1) indirect costs which did not appear on the company books as payouts, and (2) the economic impacts upon the family of a worker who was seriously injured or killed.

These early studies expressed the direct cost of accidents in terms of a cost per unit of goods produced (e.g., $/ton of coal). These costs, being direct costs to the company, usually encompassed only those costs covered by industrial insurance [e.g., 22, 23]. These include the costs of

- wage compensation and disability benefits
- medical treatment
- hospital care.

These costs were and still are the prime measure used by industry and insurance carriers as the costs of accidents.

The works of Heinrich [2] in the 1930's, and Simonds [1, 23, 24] in the 1940's pioneered the investigation into the uninsured (i.e., indirect) costs of industrial accidents. Heinrich investigated a large number of cases of industrial accidents drawn from insurance carrier files, identified several common categories of uninsured cost, and developed an average ratio of insured to uninsured costs of 1:4. The ratio was intended only as a general measure of uninsured

costs [2, 24]. However, the ratio was used in many recent studies to estimate total accident cost [e.g., 25, 26], although the ratio approach has been shown to unsatisfactorily represent actual cost experience in many cases [1, pp. 106-11]].

The work of Simonds [1, pp. 112-117] is the principal method of accident cost estimation currently used by government agencies and industrial organizations, and is recommended by the National Safety Council [27,]8]. The method yields the total accident cost as the sum of the insured costs and valid elements of indirect (uninsured) costs. The insured costs of an accident are given above. The valid elements of indirect costs are expressed in terms of the degree of accident damage; in the case of injury accidents the standard definition of injury degree are used [29, pp. 7-8]. An uninsured element is considered a valid component of accident cost if (1) a clear causal relationship exists between the cost and the accident, and (2) the cost can be measured with reasonable accuracy. Valid elements include the cost of:

- wages for working time lost by workers not injured
- repair, replacement, or recovery of damaged plant and equipment, including wages to workers engaged in these activities
- wages to the injured worker and medical costs which are not covered by insurance programs
- overtime work caused by the accident
- wages to an injured worker whose post-accident productivity is reduced because of the injuries
- investigating and administering the paperwork for the accident
- other elements specific to individual cases.

Elements which are not considered valid components include the cost of:

- hiring and training a new worker, or retraining a present worker to perform the tasks of the injured worker, if such procedures are a normal part of the company personnel procedures

- subsequent injuries caused by the post-accident milieu rather than the accident itself
- lost profit or sales from reduced worker efficiency or equipment idled by the accident, unless certain conditions are fulfilled (see Sections 3.4 and 4.2 for further discussion).

The procedure outlined for collection of data to estimate valid costs is based upon sampling case histories and computing the cost per accident by degree of injury.

The Simonds/National Safety Council method was used by the project team as a starting point for the preparation of a plan for collecting information, and to define the cost elements to be included in the ACIM.

3.2 Collection of Information

The literature search yielded a number of sources for base data relevant to accident costs in general, and to statistics on the costs of industrial injuries by industry classification and by the degree of injury severity. However, none of the published information collected during the course of the search yielded information on costs of recent accidents in underground coal mines, other than industry summary statistics by various demographic and geographic classifications [e.g., 18, 19]. These data were of insufficient detail to fulfill the prime project objective of identifying accident costs by the mining job functions and activities at the time of the accident.

The references which appeared most promising as sources of detailed data were contacted by telephone. Concurrently, a plan was developed for visiting a sample of undergound coal mining companies to collect case history data on accident costs. Appendix A contains a description of the procedure used to select mine company samples.

The telephone contacts yielded several sources who consented to allow access to information relevant to underground mining accident costs. Visits were planned to these sources and to the mining companies who agreed to provide information. Appendix B contains a description of the field visits and the information obtained from the sources visited. Field visits were made to a total of:

- 15 coal mining companies (13 underground mines) in Illinois, Kentucky, Pennsylvania, Virginia, and West Virginia
- four state agencies for workmen's compensation in Kentucky, New York, Ohio, and West Virginia
- two private carriers of indemnity insurance to underground coal mines in Kentucky and Pennsylvania
- two consulting firms in New York who specialize in actuarial statistics and computation of rates for indemnity insurance to underground coal mines
- three district offices of MESA in Illinois, Pennsylvania, and West Virginia
- one major medical facility in West Virginia.

The primary goal of the field visits was to collect data on accident costs by (1) the characteristics of the injury, (2) the job title and activity of the miner at the time of accident occurrence, and (3) the nature of the accident. This goal was set in light of the original plan for the model structure, and by the data collection procedures outlined in the Simonds/National Safety Council method discussed above. The original general plan for the model structure was to develop a series of statistical distributions for injury parameters from the HSAC CAIF, and process these distributions with time-based distributions for lost time and medical resources to stochastically estimate injury resource expenditures, and then apply unit costs of these resources to compute injury costs.

At the conclusion of the field visits it was apparent that the model could not be built entirely from the statistical approach for several reasons, the most important of which were:

(1) A relatively large number of case histories were required to define statistical distributions for even a sampling of injury characteristics.

(2) Public and private agencies responsible for administration of occupational injury accident cases did not compile detailed statistics on accident costs by injury characteristics or, in the case of coal mining accidents, by occupational characteristics.

(3) Correlation of accident and cost data for individual cases required examination of records of the original accident, filed by company, to identify the accident and injury characteristics, and then location of the claim history separately filed by case number. This task clearly required far more time than the project schedule allowed.

(4) Mining companies, the most direct source of accident cost data were generally uncooperative in allowing access to company records of medical and compensation claim payments, and to daily production records.

(5) Statistical distributions for accident costs based on case histories extracted from unpublished records could not be updated on an annual basis without repetition of an extensive field study.

These reasons provided sufficient basis to alter the plan for ACIM to primarily an algorithmic structure, with each algorithm using elements of data contained in the CAIF records of the accident to compute an expected value for the present and future cost of a single element. When the feasibility of this plan had been decided

upon, the information gathered from the literature and from field sources were used to define the elements of the model, and the algorithm for computing each element. The following section contains the definition of each cost element included in the model, and Section 4 contains the algorithms developed for the elements.

3.3 Definition of Tangible Cost Elements

3.3.1 Accident Record Acceptance Criteria

Since the final plan for ACIM was based upon the use of the CAIF, it was first necessary to define criteria with which to accept a CAIF record for computation of accident costs. These criteria were developed in light of the data available for development of cost algorithms, and require that an accident defined by a CAIF record must have

(1) occurred during the performance of a mining task underground at a bituminous coal mine
(2) inflicted an immediate and physically damaging traumatic injury, or resulted in death of the miner
(3) been a clear cause of the injury or death, rather than a contributing factor to a pre-existing medical condition (as defined by the HSAC code for accident/illness type).

The criteria cause rejection of CAIF records for

(1) accidents which cause no injury or death. The majority of these accidents are roof falls which occur in idle sections of a mine, or during holiday and vacation periods. Insufficient data concerning the costs of this type of accident were identified to justify inclusion
(2) occupational illnesses and illnesses of an infectious or contagious nature
(3) deaths which occur on mine property but which are not associated with underground mining tasks
(4) injury codes which are undefined (i.e., a code is not present in the CAIF record.

3.3.2 Direct Cost Elements

The following elements, drawn from the Simonds/National Safety Council method, include cost elements which are covered in part or entirely by occupational insurance. The costs computed for these elements are not, however, based on the cost of the insurance to a mining company, but on algorithms which compute, either directly or statistically, the cost of a specific injury based on the characteristic of the injury and certain vital statistics and characteristics of the injured miner and his family. This approach was taken so that the cost indicators computed by ACIM could be used to compute relative economic impact by occupational and injury characteristics. Using an average insurance cost per injury does not permit this type of comparison.

- Medical Treatment Cost includes the cost of medical resources required to treat the injury and repair the damage caused by the injury, the cost of in-patient hospital care associated with the treatment and repair procedures, and the cost of out-patient followup treatments.
- Compensation from Occupational Insurance includes wage compensation paid to a miner for periods of partial or total disability, benefits for loss of a member or body function as a result of the accident, and death benefits paid to the widow and children of the miner. The algorithms used to compute these benefits are based on state workmen's compensation laws, and the benefits for a specific injury are computed using the benefits for the state in which the accident occurred.
- Compensation from Social Security Funds includes wage compensation for periods of total disability and death benefits to the widow and dependent children. The algorithms are based on the social security laws for disability and retirement benefits.

- Compensation from Union Funds includes wage compensation for total disability, basic death benefits to the widow from the union retirement fund, and additional death benefits for accidental death. The algorithms are based on the current wage agreement between the United Mine Workers of America and the Bituminous Coal Operators Association.

- Administration and Overhead Expenses include the incremental costs to each of the above agencies for processing of claims for death and disability benefits.

3.3.3 Indirect Cost Elements

- Loss of Income to Mining Families includes the net expected loss of current and future income, after deduction of wage compensation and other benefits defined above, to the miner or to his survivors as a result of his death. The gross income is based upon the wage of the miner at the time of the accident.

- Cost of Fatal Accident Investigation includes the wages expended by MESA and state inspectors, representatives and employees of the mining company where the accident occurred, and union representatives during the investigation of the accident. The algorithm is based on a set of frequency distributions developed from data obtained from MESA inspectors, and from an analysis of 95 MESA reports of fatal accidents which occurred in 1973 and 1974.

- Losses in Coal Production as the result of an accident which causes a fatality or an amputation injury, including the loss due to the shutdown of the mine where a fatal accident occurs, and the post-accident loss resulting from reduced efficiency on the section where the accident occurred. This algorithm is based on an analysis of the daily section reports at three mines which had experienced fatal or amputation injuries in 1974-1975.

4. COMPUTATIONAL LOGIC FOR ELEMENTS OF ACCIDENT COST

This section contains the logic developed for the computation of tangible cost elements identified from the information gathered from the field visits and literature.

It should be noted that several cost elements are based upon the generation of a stochastic profile of the family of an injured miner. This profile includes the life expectancies of the miner, his marital status, and the characteristics of his wife and children. This profile is required for the computation of compensation benefits. Volume III contains the base data for the statistical distributions used to generate the profile shown in Table 1, given y_m, the age of the miner at the time of accident occurrence.

Table 1. Parameters Used for Profile of Mining Family

Parameter	Definition of the Parameter
s_m	Marital status of miner (0 = unmarried; 1 = married)
y_w	Age of wife
n_c	Number of dependent children < 18 years of age in miner's family
y_{ci}	Age of a dependent child
y_{rw}	Age at which the widow of a miner is expected to remarry
p_{65m}	Probability that a male of Age y_m will survive to 65 years of age
p_{65w}	Probability that a female of Age y_w will survive to 65 years of age
p_{rw}	Probability that a widow of Age y_w will remarry by Age y_{rw}.

The parameters are generated by Subroutine VSTATS (Section A.7, Volume II). The value of y_m is obtained from the accident record in File CAIFDATA. If $y_m = 0$, then VSTATS defines $y_m = 18 + z_{exp}$ (total years of mining experience). If $y_m = 0$ and $z_{exp} = 0$, an age is generated stochastically in Function IAGEIX.

4.1 Medical Treatment

The medical resources required for the treatment of traumatic injuries inflicted by mining accidents range from first-aid for minor wounds administered from the working section medical kit to emergency room treatment and prolonged hospitalization for repair of major damage, such as compound fractures and amputations. The information obtainable from the record of the accidents contained in the CAIF identifies a general category of injury by nature of injury, and part of body injured. The record additionally provides a partial measure of relative severity by the degree of injury and actual days of total disability for a miner who is temporarily disabled, or equivalent days of disability for a miner who is permanently disabled or killed.

The development of a procedure to estimate medical costs was initially approached with the idea of relating medical cost as a function of disability days by injury category. Analysis of sample records in the 1974 CAIF showed a general relationship between disability days and the degree of injury for specific categories of injuries. This course was pursued in discussions at insurance carriers and mining companies during the field visits, and with local physicians. Two insurance carriers and four mining companies provided medical costs for a total of more than 200 cases of underground mining injuries during 1973-1974 in Pennsylvania, Illinois, and Kentucky. An actuarial agency used by most of the major workmen's compensation insurers in the U.S. provided medical costs summarized by degree of injury for injuries in underground coal mines in Kentucky during the period 1970-1973.

During the field visits, specific injury cases were discussed with Safety Directors at mines where the injuries occured, and with personnel of the workmen's compensation department at the mining companies. One of the purposes of these discussions was to determine if the lost time of the injured miner reflected the medical costs of the injury.

The following observations were made from these data and discussions:

(1) The degree of damage in any specific category of injury vary over a considerable range

(2) The medical costs of an injury are not generally correlated with actual or equivalent days of disability
(3) The cost of equivalent medical resources in different coal regions vary by as much as 50%.

Because of these reasons, the approach at correlating disability days with medical costs was abandoned, and a statistical approach was investigated. The medical cost data obtained from the field visits were used to compute the distribution of medical cost for several injury categories. This approach was feasible simply because it uses actual data to compute frequency distribution. However, the approach was abandoned because analysis of the 1974 CAIF yielded more than 200 combinations of injury categories (unique codes for nature of injury and part of body) distributed among 16 coal mining states. Neglecting the effect of regional cost variations, it was estimated that medical costs for at least 3000 injuries (based on 15 samples/injury category) would be required to develop the necessary distributions. This sample size was much larger than the samples collected during the field visits and the project budget precluded further data collection. Furthermore, medical costs by case history or by specific injury categories are not generally available from public sources (without extensive field visits and personal contact). For these reasons, the statistical approach using historical data was abandoned.

The approach selected for use in the model is a statistical one, but the basis of the distributions for medical costs is a set of injury and treatment scenarios developed by a physician who acted as medical consultant to the project. Injury scenarios were developed for each of 61 combinations of nature of injury and part of body injured, and a treatment scenario was developed for each injury scenario.

Three scenarios, corresponding to minor, moderate, and severe degrees of damage were developed for each injury category. The medical resources required for treatment and repair of each degree of damage were assigned. The medical resources included medical procedures that would be employed,

days of in-patient hospital care required, and number of out-patient followup visits required.

The basis for assignment of medical procedures was the 1974 revision of the California Relative Value Studies (CRVS) [30]. The 74CRVS is a publication of the California Medical Association as a guide to physicians for establishing the relative value of medical procedures within each of five areas of medical specialties. Each procedure in a specific specialty has an associated unit value which expresses the cost value of the procedure relative to all other procedures in the specialty. Appendix C contains the study performed to develop the treatment scenarios.

The prime assumption required for use of the scenario approach and the CRVS is that the medical resources employed in the treatment and repair of a specific category and degree of injury will not vary appreciably in different regions of the U.S. This assumption was discussed with the project medical consultant, and with other members of the medical profession during the field visits. There was agreement on the validity of the assumption, primarily because a uniform set of standards for medical education and practice exists throughout the U.S. This set of standards is defined by the American Medical Association, and all medical schools in the U.S. must adhere to the standards to receive accreditation. Furthermore, all of the injuries included in the treatment study are common injuries treated by relatively standard procedures and medical equipment.

The relative value units, days of hospitalization, and followup treatment visits for an injury scenario are converted into base costs by Program ACIMMEDC using average unit costs for California. A minimum, mean, and maximum cost, corresponding to minor, moderate, and severe degrees of injury damage are computed. ACIMMEDC also computes average minimum, mean, and maximum cost points for (1) each nature of injury code, and (2) all code combinations. These costs are used by Function AMEDIC to generate

a base medical cost for an accident record given by the codes for nature of injury (NI) and part of body (PB), and assuming that the base cost points have associated cumulative frequencies of 0, .5 and 1. respectively. A random number is generated and a base cost computed by interpolation.

The following rules apply to determine the particular base cost distribution used:

(1) If the (NI, PB) pair were used in the medical treatment study, the corresponding cost points are used
(2) If the (NI,PB) pair were not used, but average cost points are defined for NI, these points are used
(3) If no cost points are defined for the (NI,PB) pair or for NI, the average points over all (NI,PB) are used.

The base medical cost generated by the above procedure is multiplied by a medical cost index for the state in which the accident occurred, to adjust the base cost to a closer estimate of regional cost. State indexes are contained in the BLOCK DATA subprograms for ACTMEXEC (Vol. II, Section A.7). The computation of these indexes is described in Volume II, Section D.2. The resulting cost is used for the medical cost of the injury.

4.2 Losses in Coal Production

Part of the interview format with safety directors and production section personnel was a discussion of their observations and records of immediate and long-term production lost as a result of accidents on production sections. The discussions were approached in terms of injury severity categories, as suggested by Simonds [1, pp. 83-84]. The following categories of injury severity were used:

(1) Minor injury - where only first-aid is required to treat the injury either on-site or at the plant dispensary. No lost time is involved other than 30-60 minutes of the injured worker's time and, perhaps, the foreman's time, and no loss in production occurs.

(2) Serious injury - where the injured worker required treatment at a hospital and is disabled for several days. The nature of the injury may require immediate assistance by co-workers, causing work stoppage in the area of the accident, and transport of the injured worker to an ambulance. Replacement of the injured worker during his recovery would be required.

(3) Fatal injury - where the worker dies as a result of the accident. In underground coal mining, an accident of this type usually results in an immediate death.

In all cases the general observations about lost production and accidents were similar, but all of the observations were intuitive. All of the officials stated that no records of lost production, other than that implied by the daily section reports, were maintained at the mine.

These discussions generally supported the earlier studies of industrial accidents [1, 2, 5], and are summarized as follows:

- A general relationship exists between injury severity (i.e., degree of damage to the injured) and the duration of work stoppage in the immediate area of the accident.
- Major injuries, in which the injured person is severely damaged (e.g., amputation or disfigurement) and/or requires assistance by others to reach medical facilities, and fatal accidents cause a measurable reduction in productivity for some days after the accident. Again, the duration of this reduction is related to the degree of injury damage.

In addition to these general effects is the loss of all production for one workday due to closing the mine after the occurrence of a fatal accident, which is both traditional and contractual [6].

Quantitative data were required to translate these general observations into statistics useful to the project. To accomplish this, team members requested access to the daily section reports at each mine where discussions were held, so that the dates of accident occurrences could be plotted against daily production in the sections where the accidents occurred. Two mines

allowed the team member to copy samples of daily section reports for six-month periods in 1974 and 1975. One of the mines had experienced a fatality and both mines had experienced a number of lost-time injuries during the peridods covered by the section reports. These reports were analyzed in terms of the accidents which occurred during the time periods covered by the reports. The following paragraphs describe the results obtained from these analyses.

4.2.1 Immediate Losses at Time of Accident Occurrence

No conclusive evidence of lost production could be determined from the section reports other than that for the occurrence of a fatal accident (roof fall in a continuous mining section). The mine at which this accident occurred was closed for two workdays (a loss of more than 15,000 tons of coal based on the mean daily production at the mine for 39 days prior to the accident). The section on which the accident occurred was closed for five workdays to clear the fall and recover the victim.

The fact that no conclusions could be drawn from the data about non-fatal injuries does not mean that production losses are not experienced, but rather that the sample size was insufficient. For example, production shifts at one mine experienced changes of -8%, -14%, and -9% of pre-accident production on the days corresponding to the occurrence of severe traumatic injuries on the shifts. Analysis of other production periods for this mine, and production periods for the second mine showed similar results. A much larger sample of mines and injuries is required to draw any valid conclusions about immediate losses for non-fatal injuries.

Based on these observations, the only immediate loss of production included in ACIM is the average production for one workday for the occurrence of a fatal accident. Section 4.2.3 describes how this value is computed.

4.2.2 Post-Accident Losses

Analysis of the section reports clearly showed consistent losses in production for several days following the occurrence of (1) the fatal roof fall accident, and (2) accidents which inflicted an immediate amputation injury. Inconclusive results were obtained for accidents which inflicted disabling injuries (non-amputation). Accidents which inflicted minor wounds (first-aid treatment or emergency room treatment with no ensuing disability) consistently caused no observable loss in post-accident production.

4.2.2.1 Fatal Accident

The daily section reports for continuous mining sections (three production shifts/section) were analyzed for a period of 39 workdays prior to the accident and 35 workdays following resumption of normal operations (after the fall was removed). Table [2] contains the location of each section in the mine(all sections are in the same mine).

Table [2]. Location of Sections in Fatal Roof Fall Accident

Section	Location in Mine Relative to Roof Fall Area[1]
A[2]	Roof fall occurred in this section
B	Same panel in adjacent working places
C	Approximately 5 miles from Section A.

Note: 1. All crews working in Sections A, B and C entered the mine from the same shaft

2. Accident occurred on Shift 2 (4:00 p.m. - 12:00 p.m.).

The daily reports from eight shifts (records for Section B, Shift 3 were not available) were analyzed to determine the pre- and post-accident means for productivity, in terms of tons/operating minute, and number of miners in the face crew (tons/operating minute was used as the measure of productivity to eleminate non-productive time due to equipment malfunctions, place changes,

and other delays). The mean pre-accident values were computed, and linear regressions of the post-accident data were made. Table 3 shows the results of this analysis. Figure 1 shows a plot of productivity for the section-shift on which the accident occurred. The post-accident trend in Figure 1 was observed on all other shifts in Sections A and B.

Table 3. Pre-and Post-Fatal Productivities by Section-Shift

	Pre-Accident		Post-Accident		
Section-Shift	Productivity[1,2]	Crew Size	Productivity[1,3]	Crew Size	Days to Reach Normal[4]
A1	2.28	12.8	1.82 (20%)[5]	12.7 (1)%[5]	96
A2 (Fatal)	1.63	9.5	1.33 (19%)	9.1 (4%)	54
A3	2.01	10.5	1.65 (18%)	10.5 (-)	25
B1	2.85	12.5	2.41 (12%)	12.4 (1%)	111
B2	2.20	8.8	1.95 (11%)	8.8 (-)	54
C1	2.20	13.3	2.21 (-)	14.2 (-)	--
C2	1.82	11.1	1.82 (-)	11.3 (-)	--
C3	1.49	10.1	1.49 (-)	9.9 (2%)	

Notes:
1. Tons/operating minute
2. Mean value for 39 workdays prior to accident
3. Mean value for post-accident period required to return to pre-accident mean
4. Period corresponding to post-accident mean productivity
5. Percent loss from pre-accident mean.

The right-hand column in Table 3 is the number of working days at which the post-accident productivity regression line intercepted the pre-accident mean. It is evident from Table 3 that a consistent loss of production was experienced on all shifts of the section where the accident occurred and on the section adjacent to the accident section.

It is important to note that (1) the productivities are expressed in tons/operating minute, which eliminates delays as a possible reason for productivity changes, and (2) crew sizes did not change significantly, which eliminates this factor as a possible reason. Analysis of section reports

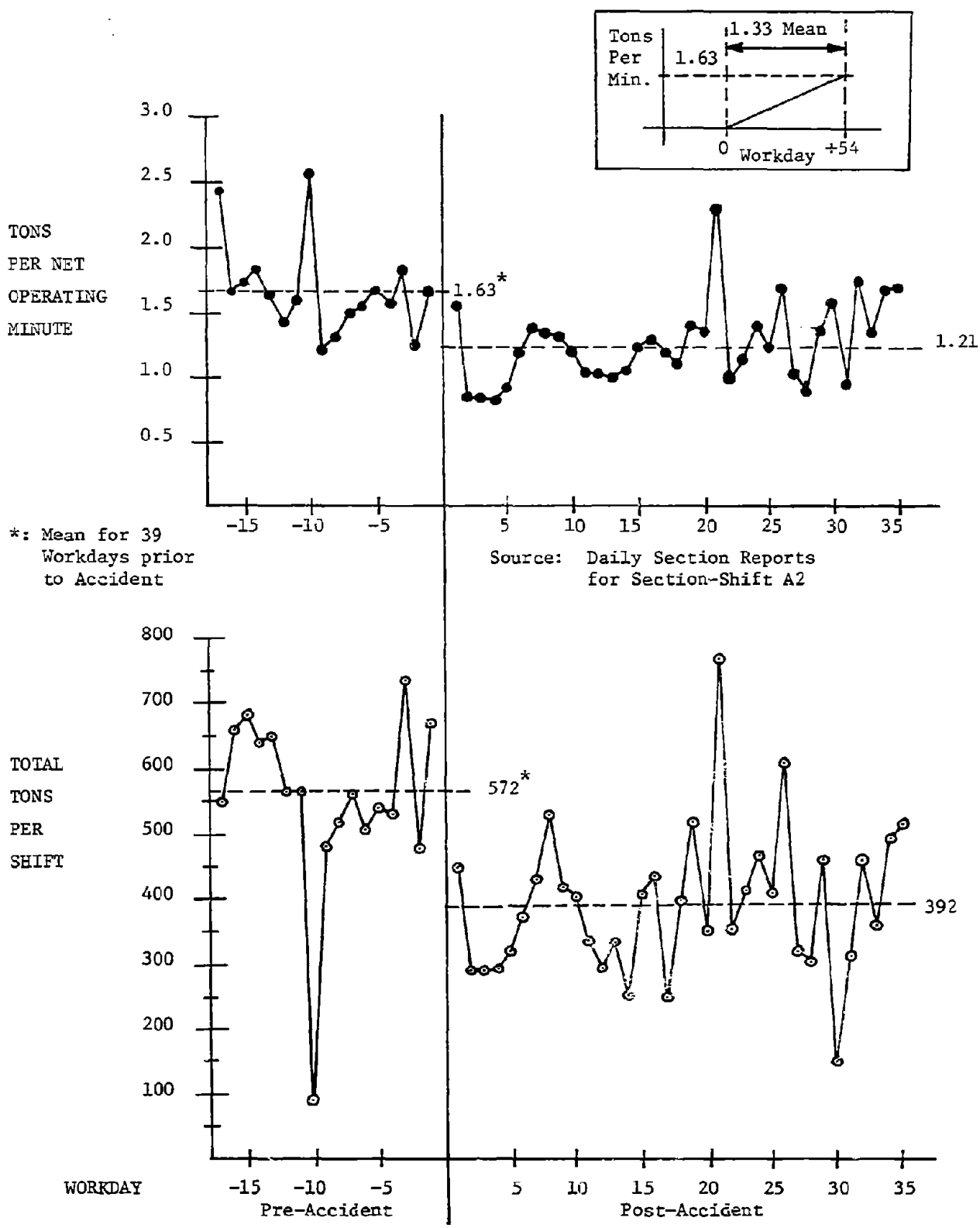

Figure 1. Daily Production and Operating Efficiency for Fatal Roof Fall Accident Section A, Shift 2

cannot be used as a means for identifying the reasons why productivity dropped after the accident. However, it is obvious from the consistency of the data and from the duration of productivity losses that the cause was the fatal roof fall.

The magnitude and duration of the productivity losses shown in Table 3, when translated into tons of coal and lost sales, are significant. For example, Table 4 shows the total losses considering only Section A.

Table 4. Post-Accident Production Loss From Roof Fall Fatality

Section Shift	Pre-Accident Mean Tons/Shift	% Loss in Productivity	Days	Tons of Coal Lost
A1	680	20	96	13056
A2	572	19	54	5869
A3	598	18	25	2691
Total Loss in Post-Accident Production				21616

At a price of $15 per ton, this is a loss of $324,240 in gross sales within a calendar time of less than five months. When one observes that (1) an adjacent working section experienced significant losses, and (2) four other working sections are located in the same area of the mine, the potential total loss in revenue, in profit, or in any other measure of value is staggering.

Only the productivity losses for the accident section are used in Section 4.2.3 to develop an algorithm for use in ACIM because of the admittedly small sample size. It is obvious from these data that the potential economic impact of a fatal accident from lost productivity should be sufficient cause for a more detailed analyses with a larger sample size.

4.2.2.2 Amputation Injury

A regression analysis similar to that described above was performed for two injuries which resulted in amputation damage. Trends similar to the fatal analysis were observed. The trends showed an average loss of 8% and a maximum loss of 15% in post-accident productivity over an average of 26 working days.

4.2.3 Production Loss Algorithm Used in ACIM

The following parameters are computed in Subroutine SECEFF:

t_{li} = the immediate loss of production due to closure of the mine for one workday as a result of a fatal accident

t_{ll} = the post-accident loss in production in the production section where the accident caused (1) a fatality, or (2) an amputation injury.

A value for t_{li} is computed for any CAIF record corresponding to an underground fatality (degree of injury code = 1). t_{ll} is computed only when the underground fatality or amputation injury (HSAC nature of injury code = 100) occurred on a working section (accident location code = 1). The values are given by

$$t_{li} = t_d \qquad (1a)$$

$$t_{ll} = p_{el} d_{el} t_{sd} \qquad (1b)$$

where

t_d = the average tons/day produced at the mine

t_{sd} = the average tons/day/working section

p_{el} = the average fractional reduction in section productivity

d_{el} = the workdays over which p_{el} applies.

The value of lost coal production is computed from the assumption that the lost production is not made up through overtime work. This a valid assumption since most of the mines at which fatalities occur are large mines working three shifts, six days per week. The gross value of lost production, in the case of a fatal accident, is reduced by the total underground wages for one workday because of the custom in mining of forfeiting one day of pay in memorial. Based on these assumptions, the net value of lost coal is given by:

$$e_{pl} = v_t(t_{li} + t_{ll}) - n_{ug}w_d \qquad (2a)$$

for a fatal accident, and

$$e_{pl} = v_t t_{ll} \qquad (2b)$$

for an amputation injury, where

v_t = the value/ton of coal produced

n_{ug} = the number of miners underground

w_d = the average daily wage of an underground miner

and t_{il} = 0 if the accident did not occur on-section.

A value for v_t is input in File EXECDATA. The daily wage for UMWA Wage Class 3 [6,Appendix A] is used for w_d. This is a reasonable approximation of the average wage at the mines visited in the project. The remaining variables in Equations 1 and 2 are computed as shown below from empirical data derived from a sample of 95 cases of fatal underground accidents (see Appendix D) and from the annual data for the mine contained in File MINEDATA.

The empirical equations used in SECEFF are given by

$$n_{ug} = a_{1m} + b_{1m}s_m \qquad (3a)$$

$$t_d = a_{2m} + b_{2m}s_m \qquad (3b)$$

where s_m = the number of production sections of mining method m at the mine,

a_{im}, b_{im} = empirical constants for mining method m,

and $t_{sd} = b_{2m}$ for Equation 1b.

The codes for m and the 8-digit mine identification (ID) number are extracted from the CAIFDATA record. A value of 1 is assumed for m if the value is undefined in the record, since the majority of underground coal in the U.S. is extracted by continuous miners. A search is made in MINEDATA for the record corresponding to ID. If a match is found, the annual production (t_y) and underground workhours (h_y) in the MINEDATA records are used to implicitly determine s_m by assuming that all production sections at mine ID use mining method m, and using the corresponding empirical constants for a_{im}, b_{im} as follows:

- m = 1 (continuous mining sections)

Empirical constants are derived in terms of t_y, as shown in Table 4.

Table 4. Empirical Constants for Continuous Mining Sections

Range of t_y (10^3 tons/year)	a_{11}	b_{11}	a_{21}	b_{21}
≤ 50	0	13	0	150
51-500	-7	32	230	270
> 500	11	34	0	667

- m = 2 (conventional mining sections)

A single set of constants is defined. To wit:

$a_{12} = -40$, $b_{12} = 60$, $a_{22} = -600$, $b_{22} = 1000$

- m = 3(longwall) or 4(hand loading)

$a_{1m} = a_{2m} = 0$, and average values, shown below in Table 5 for n_{ug} and t_d are used, respectively, for b_{1m} and b_{2m}.

The empirical constants are used in Equations 3a-b to empirically derive a value for s_m by computing n_{ug} and t_d for incremental values of $s_m(=1,2,...)$ until d_y, the average workdays per year is 250 or less. d_y is computed as follows:

$$d_y = 0.5(d_{y1} + d_{y2}) \quad (4a)$$

$$d_{y1} = h_y/8n_{ug} \quad (4b)$$

$$d_{y2} = t_y/t_d \quad (4c)$$

This empirical method for computing s_m^* can be discarded by altering Program MINEDATA to compute the average number of men underground (n_{ug}) and the workdays per year (d_y) from the monthly data in the employment portion of the AEMFDATA records. Then t_d and t_{sd} are given by

$$t_d = t_y/d_y \tag{5}$$

$$s_m = (n_{ug}-a_{1m})/b_{1m} \tag{6a}$$

$$t_{sd} = t_d/s_m \tag{6b}$$

This more direct method was not used in SECEFF because the HSAC AEMF file for 1974 had been processed prior to the development of SECEFF, to create File MINEDATA. Processing of the AEMF required a much larger expenditure of computer time than was planned in the project budget. Thus, reprocessing of the AEMF to include computation of n_{ug} and d_y could not be undertaken without further exceeding the budget. The modification to ACIMMINE, SECEFF, and the record format of MINEDATA required to use this method are minor and can be made before the 1975 AEMF is processed.

If no match for ID is found in MINEDATA, the average values of t_d, n_{ug}, and t_{sd} for mining method m are used, as shown in Table 5 (see Appendix D for derivation of values).

Table 5 . Average Values Used in SECEFF for Mining Methods

	Average Value Used for			
Mining Method	t_d	n_{ug}	b_{1m}	$b_{2m}= t_{sd}$
1. Continuous	3810	228	38	635
2. Conventional	1920	110	37	640
3. Longwall	4730	389	90	1090
4. Hand Loading	100	7	7	100

*See Section E.3 for an example of the trial-and-error procedure used by Subroutine SECEFF to compute s_m.

The fractional production loss (p_{el}) remaining for computation of t_{ll} in Equation 1b is determined stochastically from the cumulative frequencies shown in Table 6, which are derived fromthe data in Tables 3 and 4 in Section 4.2.2.

Table 6 . Cumulative Frequencies for Fractional Production Loss

Accident Type	Fractional Loss for Cumulative Frequency			Average Days of Loss (d_{el})
	0.0	0.5	1.0	
Fatality	0.07	0.15	0.30	68
Amputation	0.0	0.08	0.15	26

A value for p_{el} is computed by interpolation using a random value for cumulative frequency. The cumulative frequency points for fatal accidents were determined by normalizing the values for the fractions of lost production observed in the sample mine (Table 3 in Section 4.2.7 The normalized values are shown below.

Table 7 . Computation of Normalized Production Loss for Fatal Roof Fall

Section-Shift	Loss in Post-Accident Productivity		
	Observed	Days	Normalized[1]
A1	0.20	96	0.28
A2	0.19	54	0.15
A3	0.18	25	0.07
B1	0.12	111	0.20
B2	0.11	54	0.09
Average	0.15	68	0.15

Note 1. Normalized fraction = observed fraction x observed days/68

4.3 Loss of Income to Mining Families

The occurrence of a disabling injury or a fatality results in a loss of income to the injured miner, or to the surviving widow and dependent children. This income loss is partially offset by compensation from several sources (see Section 4.4). However, the miner and his family will lose present and future income because the average salary of coal miners is, on the whole, two to three times greater than the average wages in coal mining states, upon which the benefits for state workmen's compensation are based.

Let w_{eg} = the total expected loss in present and future wages as a result of a disabling injury or fatality. Let w_{en} = the net wage loss after deduction of benefits from state, federal, and union funds. Then,

$$w_{en} = \text{maximum } (0, w_{eg}-b_{st}-b_{ss}-b_{un}) \tag{7}$$

where b_{st} = the total benefit from state workmen's compensation
b_{ss} = the total benefit from social security
b_{un} = the total benefit from union funds.

The following algorithms are used to compute w_{eg} in Program ACIMEXEC (vital statistic parameters defined in Table 1).

- Fatal and Permanent Disability Injuries (degree of injury codes 1-3)

$$w_{eg} = p_{65m} w_y (65-y_m) \tag{8a}$$

where w_y = annual wage of miner at time of accident.

If the injury is a permanent partial disability,

$$w_{eg} = f_{pp} p_{65m} w_y (65-y_m) \tag{8b}$$

where f_{pp} = the fraction of maximum benefit awarded for partial disability, a stochastic variable generated by Function PPFUN (see Section 4.4.1.3).

Equations 8a-b are based on the assumption that the injured miner would have worked full-time until a retirement age of 65 had the injury not occurred. The assumption is valid relative to the compensation of benefits (Section 4.4) which are based on the same span of employment. Note that w_{eg} is an expected value which takes into account the fact that the miner may not live to retirement age in normal circumstances.

- Temporary Total Disability (degree of injury code 4)

$$w_{eg} = w_d d_{dt} \tag{8c}$$

where w_d = the daily wage at time of injury
d_{dt} = the number of days of total disability.

The value of d_{dt} is obtained from the CAIFDATA record for closed cases. If the case is still open (injured not yet returned to work as of last update of CAIF), the assumption is made that the miner is still on total disability, and d_{dt} is given by

$$d_{dt} = \text{date of last update of CAIF} - \text{date of injury specified in CAIF record} \tag{8d}$$

This calculation is performed in Subroutine PROCAR.

- Non-Lost Time Injuries (codes 5 and 6)

No wage losses apply to these injuries.

4.4 Compensation for Accidents Resulting in Death or Disability

Benefits from workmen's compensation funds, social security and union funds are computed for any accident record containing degree of injury codes 1-4. The amount of benefits are based upon the profile generated for the miner and his family (see Table 1 at the beginning of Section 4), and the retirement assumptions described in Section 4.3. The following sections contain the algorithms used to compute these benefits.

4.4.1 State Benefits from Workmen's Compensation Funds

The algorithms used to compute b_{st}, the total cost of benefits from workmen's compensation funds, are derived from state workmen's compensation laws. In actuality, many mining companies are insured for indemnity costs through private insurance carriers, or maintain a fund within the company. However, any privately insured or self-insured fund must follow the workmen's compensation laws of the state, and must provide at least the minimum compensation benefits defined by the state. These rules apply in every state in the U.S. The state laws were selected as a basis for developing the algorithms because the laws and the benefits are available to the public.

The following general assumptions are used to compute state benefits:

- Benefits for accidental death or permanent disability terminate when the recipient reaches the age of 65, since benefits after this age would be paid for normal retirement, and are therefore not a cost attributable to the accident.
- Death benefits payable to the widow terminate upon her death or remarriage.
- Benefits payable to a dependent child terminate when the child reaches 18 years of age. Some states provide for continuation of benefits in certain situations, but the incremental amount of these benefits was insufficient to justify the additional logic required to include these situations.
- A miner who is unmarried at the time of injury has no dependent children. This assumption excludes only a very small number of widowed or divorced miners (see Table 1 in Section 4, Volume III).
- All benefits are payable at the maximum rates specified by the workmen's compensation law of the state in which the miner is injured. Without exception, the average weekly wage of coal miners is two to three times higher than the average weekly wage of the coal mining states, upon which maximum benefits are based.
- Payment of benefits for death and permanent total disability begins on the date of the injury specified in the CAIF record.
- Payment of full benefits for cases of permanent partial disability

are made for the number of days specified for lost time in Field 54 of the CAIF record (see Volume III for description of the CAIF record). Partial benefits are paid after this time.

4.4.1.1 Death Benefits

If the miner is unmarried at the time of the accident ($s_m = 0$), no compensation is paid. If the miner is married, b_{st} is computed as follows:

$$b_{st} = o_{st} \text{ minimum } [l_{stf}, (p_{rw} b_{str} + (1-p_{rw}) b_{stn})] \qquad (9a)$$

where o_{st} = factor for administration and overhead

b_{str} = total expected benefit given remarriage of widow before her death

b_{stn} = total expected benefit given no remarriage of widow before her death

l_{stf} = maximum state limit for death benefits

The expected benefit given remarriage of the widow before her death is

$$b_{str} = R_s + 52 [b_{stwl} z_{rw} + b_{stdl} A] \qquad (9b)$$

where R_s = lump sum payment upon remarriage of widow

b_{stwl} = weekly benefit to widow

b_{stdl} = weekly benefit to a dependent child

z_{rw} = expected years to remarriage = $y_{rw} - y_w$

$$A = \begin{cases} z^*_{maxcs} \text{ for Illinois, Kentucky, and Pennsylvania} \\ \sum_{i=1}^{n_c} z^*_{ci} \text{ for other states} \\ 0 \text{ if } n_c = 0 \end{cases} \qquad (9c)$$

where the benefit periods for Equation 9c are determined as follows:

$z_{ci} = 18 - y_{ci}$

$z^*_{ci} = \text{minimum } (z_{rw}, z_{ci})$

$z_{maxcs} = \text{maximum } (z_{ci})$

$z^*_{maxcs} = \text{minimum } (z_{rw}, z_{maxcs})$

for ci = 1, ...,n_c

The expected benefit, given no remarriage of the widow before her death, is

$$b_{stn} = 52[p_{65w} b_{stw1} z_w + b_{std1} B] \quad (9d)$$

where z_w = years of payment = $65-y_w$

B = z_{max} for Illinois, Kentucky, and Pennsylvania

= $\sum_{i=1}^{n_c} z_{ci}$ for other states

= 0 for $n_c = 0$

4.4.1.2 Benefits for Permanent Total Disability

Benefits for permanent disability are composed of a weekly benefit for compensation of wage losses (b_{st21}), a lump-sum payment if the injury involves loss of a body member or function, (b_{st22}), and a lump-sum payment for disfigurement (b_{st23}). Thus, b_{st} is given by

$$b_{st} = o_{st} \text{ minimum } [l_{stpt}, (b_{st21} + b_{st22} + b_{st23})] \quad (10a)$$

l_{stpt} = maximum state limit for permanent total benefits

$$b_{st21} = 52[b_{st2m} p_{65m} z_m + b_{st2d} A] \quad (10b)$$

b_{st2m} = weekly benefit for injured miner

b_{st2d} = weekly benefit per dependent

z_m = years of payment to the miner = $65-y_m$

A = 0 for unmarried miner

= $p_{65w} z_{2w}$ for married miner with no children

= $p_{65w} z_{2w} + \sum_{i=1}^{n_c} z_{2d}$ married miner with n_c children

where the payment periods for spouse and children are

z_{2w} = minimum (z_m, z_w)

z_{2d} = minimum (z_m, z_{ci}) $\quad ci = 1, \ldots, n_c$

Values for b_{st22} and b_{st23} are computed only if the nature of injury is an amputation (HSAC Code 100) or loss of hearing (110-112).

Then,

$$b_{st22} = b_{st1}(ip) \quad (10c)$$

= maximum benefit payable for loss of member/function of part of body ip, where ip is the ACIM code for the body part.*

Values of b_{st1} are contained in the array BNLOSS (in COMMON area STBENF).

$$b_{st23} = f_d D_{st} \quad (10d)$$

D_{st} = the maximum disfigurement benefit (in COMMON area STBENF) and

f_d = the fraction of maximum disfigurement benefit awarded for the injury.

The value of f_d is computed by

$$f_d = b_{st1}(ip)/b_{st1}(max) \quad (10e)$$

where $b_{st1}(max)$ = the maximum state benefit for any loss of member/body function.

Equation 10e is an estimate for f_d, any loss of member/body function which is usually determined through arbitration by the state workmen's compensation commission. Discussions with officials in several states indicate that Equation 10e is a reasonable estimate.

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*See Volume III for cross-references between HSAC and ACIM codes.

4.4.1.3 Benefits for Permanent Partial Disability

A permanent partial disability injury usually consists of an initial period of total disability followed by partial disability for the remaining life of the injured. In the total disability period the injured person is unable to work (e.g., due to being hospitalized, or following surgery). In the partial disability period, the injured person, in the judgment of the state workmen's compensation commission, can resume some form of employment, but in a reduced capacity (which usually means at a lower salary). The following algorithm is based upon these two periods of compensation:

The total benefit for permanent partial disability injury is given by:

$$b_{st} = o_{st} \text{ minimum } [l_{stpp}, (b_{st31} + b_{st32} + b_{st33} + b_{st34})] \quad (11a)$$

where $b_{st31}, b_{st32}, b_{st33}$ = the total benefits for the partial disability period

l_{stpp} = maximum state limit for permanent partial benefits

b_{st34} = the benefit for total disability period (Equation 12a)

Let d_{dtq} = the days of qualified total disability (Equations 12b-d)

z_{3m} = the period of partial disability

Then $z_{3m} = z_m - d_{dtq}/365$, where z_m is defined in Equation 10b (11b)

Thus, the total benefit paid by the state during the period of partial disability is given by:

$$b_{st31} = 52[p_{65m} z_{3m} b_{st4m} + A b_{st4d}] f_{pp} \quad (11c)$$

where b_{st4m} = the weekly benefit to the miner*

b_{st4d} = the weekly benefit per dependent*

A = 0 for unmarried miner

= $p_{65w} z_{3w}$ for married miner with no children

= $p_{65w} z_{3w} + \sum_{i=1}^{n_c} z_{3d}$ for married miner with n_c children

*The same maximum weekly benefits apply for permanent partial and temporary total disability. The factor f_{pp} implicity reduces the maximum benefits.

z_{3w} = minimum (z_{3m}, z_w)

z_{3d} = minimum (z_{3m}, z_i)

and f_{pp} = the fraction of maximum benefit awarded for the partial disability.

The value of f_{pp} in cases of permanent partial disability are determined through arbitration by workmen's compensation commissions. The case is reviewed by medical examiners and a final ruling is reached based upon the specific permanent effects of the injury. Discussions with physicians and examiners involved in state workmen's compensation claims led to the conclusion that f_{pp} could be expressed as a fraction of the relative award for total loss of body segment (f_d). The following distribution for the ratio of f_{pp}/f_d was developed from these discussions:

Ratio	Cumulative Frequency
0.1	0.0
0.5	0.5
0.9	1.0

Function PPFUN generates f_{pp} = ratio x f_d, which is also used to reduce expected wage losses (Section 4.3) in accordance with the assumption of employment at partial capacity.

Benefits b_{st32} and b_{st33} are compensation for loss of member/body function and disfigurement (see Equations 10c-d), and are given by

$$b_{st32} = f_{pp} b_{st1}(i_P) \qquad (11d)$$

$$b_{st33} = f_d D_{st} \qquad (11e)$$

where the variables are defined in Equations 10d-e.

Compensation for the period of total disability is computed with the algorithm for temporary total disability, shown in the next section.

4.4.1.4 Temporary Total Disability

Temporary total disability means that a worker has incurred an injury which totally reduces the ability of the worker to perform any job for some period of time. The total disability period ends when the worker resumes a paid occupation. An injury resulting in temporary total disability is compensated at the maximum rates allowed by the state during the period in which the injured is unable to work. The total benefit is given by

$$b_{st34} = o_{st} \text{ minimum } [l_{sttt}, (d_{dtq}(b_{st4m} + Ab_{st4d})/7] \quad (12a)$$

where l_{sttt} = maximum state limit for temporary total benefits

d_{dtq} = the number of days of qualified total disability

$$= 0 \quad \text{if } d_{dt} \leq q_{1s} \quad (12b)$$

$$= d_{dt} - q_{1s} \quad \text{if } q_{1s} < d_{dt} \leq q_{2s} \quad (12c)$$

$$= d_{dt} \quad \text{if } d_{dt} > q_{2s} \quad (12d)$$

q_{1s} and q_{2s} are the minimum and maximum qualifying periods (days)

and A = 0 for an unmarried miner

= 1 for a married miner with no children

= $1 + n_c$ for a married miner with n_c children.

4.4.2 Federal Benefits from Social Security

Any person who has paid into the social security fund from earned wages is entitled to compensation for death or total disability from occupational accidents. The algorithms used to compute the total benefits (b_{ss}) are developed in this section, using the following general rules defined by the Social Security Disability fund:

- Death benefits are payable to a widow with at least one dependent child less than 18 years of age, regardless of whether she remarries, until her death or upon reaching 65 years of age.
- Death benefits terminate when the youngest child reaches the age of 18.
- Maximum benefits for any injury or death are limited to 80% of the total expected wages of the injured, less the total benefit from state workmen's compensation.

Additionally, the following assumption is used:

- All benefits are payable at the maximum rates allowed, based on the fact that average wages in coal mining exceed the base wage used to compute social security deductions.

Benefit schedules for the base year of 1974 [10,11,12] were used to develop the algorithms used for computing b_{ss}. These benefits must be escalated each year after the base year by a factor [10,p24] keyed to the Consumer Price Index [13]. The factor is given by [15]:

$$I_{xss}(n) = I_{xss}(n-1), \quad p_{cpI} \leq 3\% \tag{13a}$$

$$I_{xss}(n) = I_{xss}(n-1)(1 + p_{cpI}/100), \quad p_{cpI} > 3\% \tag{13b}$$

where $I_{xss}(n)$ = the index for year n (n >1974)

$I_{xss}(n-1)$ = the index for year n-1

and p_{cpI} = the percentage change in the Consumer Price Index for all items from Year n-1 to Year n[14, Table B for example].

All benefits from social security are subject to a maximum limit (l_{bss}) given by

$$l_{bss} = \text{maximum } [0, (0.8\, w_{eg} - b_{st})] \tag{13c}$$

and

$$b_{ss} = o_{ss}[\text{minimum } (b_{ssc}, l_{bss})] \tag{13d}$$

where w_{eg} = the total expected loss in wages (Section 4.3)

b_{st} = the total benefit paid by workmen's compensation (Section 4.4.1)

b_{ssc} = the benefit computed with the algorithms in the following paragraphs,

and o_{ss} = a factor for claim administration and overhead.

4.4.2.1 Death Benefits

If the deceased miner had no dependent children less than 18 years old, no death benefits are payable. Otherwise, b_{ssc} is given by

$$b_{ssc} = 12I_{xss}(b_{sslw}\, z_{wss} + z_{dss}\, b_{ssld}) \qquad (14a)$$

where b_{sslw} = monthly benefit to widow

b_{ssld} = monthly benefit to youngest child under 18

z_{wss} = number of years benefit payable to widow

z_{dss} = number of years benefit payable to child

The payment periods are as follows (z_{maxcs} and z_w defined in Section 4.4.1.1):

$$z_{dss} = 0 \text{ for } n_c = 0 \qquad (14b)$$
$$= z_{maxcs} \text{ for } n_c > 0$$

$$z_{wss} = \text{minimum } (z_{dss},\, z_w) \qquad (14c)$$

The monthly benefits are a function of the average annual wage of the miner during the years in which he paid into the social security fund [11, p. 14-15]. Since his average wages are assumed to exceed the social security base wage (see beginning of section); maximum monthly benefits are used.

Thus, let

z_{exp} = the number of years which the miner has paid into social security, up until the time of the accident.

A_n = the annual base for year n for determination of social security benefits [11, p.15].

The following empirical function, derived from the 1975 schedule of benefits [12, columns 1, 2, 7], express monthly benefits:

$$\bar{A} = \left(\sum_{n=0}^{z_{xss}} A_n\right)/z_{xss},\ z_{xss} > 1 \qquad (14d)$$

$$= 0,\ z_{xss} \leq 1$$

where $\bar{A}$ = the average annual base wage from Year 0 (the year of the accident) to z_{xss} years prior to the accident

and $z_{xss} = z_{exp} - 1$ (14e)

Total years of mining experience (Field 38 of CAIF record) is used for z_{exp}.

b_{ssld} and b_{sslw} are given by the following empirical functions:

Range of $\bar{A}$	$b_{ssld} =$	$b_{sslw} =$	
0 - 1200	$0.75(1200 + 350)^{0.66}$	35.82	(14f)
>1200	$0.75(\bar{A} + 350)^{0.66}$	b_{ssld}	(14g)

4.4.2.2 Permanent Total Disability

$$b_{ssc} = 12I_{xss}(p_{65m}z_{mss}b_{ss2m} + z_{wss}b_{ss2w} + z_{dss}b_{ss2d}) \quad (15a)$$

where b_{ss2m} = the monthly benefit to the disabled miner
b_{ss2w} = the monthly benefit to the miner's wife
b_{ss2d} = the monthly benefit to the youngest child

There is a five-month waiting period before benefits begin for cases of total disability. Thus,

$$z_{mss} = 65 - y_m - q_p \quad (15b)$$

$$z_{dss} = \text{maximum } (z_i) - q_p \quad (15c)$$

$$z_{wss} = \text{minimum } (z_{dss}, z_w - q_p) \quad (15d)$$

where q_p = 5/12 (benefits begin in month 6)

Monthly benefits to the miner and to the youngest child are given by:

$$b_{ss2m} = (\bar{A} + 350)^{0.66} \quad (15e.1)$$

$$b_{ss2d} = 0.5b_{ss2m} \quad (15e.2)$$

Monthly benefits to the wife are given by the following:

Range of $\bar{A}$	$b_{ss2w} = Bb_{ss2m}$ where B =	
0-3200	0	(15e.3)
3201-5300	C-1.5	(15e.4)
5301-7500	2.2-C	(15e.5)
> 7500	0.25	(15e.6)

where $C = (\bar{A} - 3000)^{0.0795}$ (15e.7)

4.4.2.3 Permanent Partial and Temporary Total Disability

Benefits for a permanent partial disability are paid only for the initial period of total disability. A waiting period of six months is required before benefits for total disability begins. The total benefit is given as follows:

- $d_{dt} > q_p$

$$b_{ssc} = 12I_{xss}(d_{dt}-q_p)(b_{ss2m} + b_{ss2w} + b_{ss2d})/365 \quad (16a)$$

- $d_{dt} \leq q_p$

$$b_{ssc} = 0$$

where d_{dt} = the number of days of total disability

q_p = 152 days (5 months)

and the monthly benefits are given by Equation Set 15e.

4.4.3 Union Benefits from Retirement or Disability Funds

The algorithms for union disability benefits are based on the United Mine Workers of America (UMWA) wage agreement with the Bituminous Coal Operators Association [6]. The majority of underground coal miners in the U. S. are members of labor unions; the largest of which is the UMWA, with an estimated membership in excess of 100,000 [16, p.242]. Thus, the UMWA benefits are reasonable to use for the industry.

The algorithms are based on the national wage agreement, and do not take into account any additional benefits which may be included in local agreements between UMWA district groups and individual companies.

The general equation for b_{un}, the total union benefit, is given by

$$b_{un} = o_{un} b_{unc} \qquad (16a.1)$$

where o_{un} = a factor for claim administration and overhead
b_{unc} = the benefit computed by the following algorithms.

4.4.3.1 Death Benefits

The surviving closest relative of a miner who was unmarried at the time of the accident receives no benefits other than a lump sum payment (l_{unll}, see below). The following algorithm is used if the miner was married at the time of the accident, based on the following rules:

- The widow of a miner receives 50% of his earned union pension until the age of 65 or her death, regardless of whether she remarries.
- The additional benefit to a widow (in excess of the above) will terminate upon her remarriage, or upon the conditions described above.
- Benefits are paid for each dependent child in excess of five, under the age of 22. Benefits for a child terminate at age 22.

The general algorithm for b_{unc} is given by:

$$b_{unc} = p_{65w} b_{unwp} + p_{rw} b_{unwr} + (1-p_{rw})[p_{65w} b_{unwd} + (1-p_{65w}) b_{undd}] + l_{unll} + \Delta n_c l_{unl2} + l_{unl3} \qquad (16a.2)$$

where b_{unwp} = the total benefit to the widow from the miner's retirement fund, given no remarriage prior to age 65

b_{unwr} = the total additional benefit to the widow, given remarriage prior to age 65

b_{unwd} = the total additional benefit to the widow, given no remarriage prior to age 65

b_{undd} = the total additional benefit to the youngest dependent child given the widow does not remarry and dies before the child reaches the age of 22

l_{unl1} = lump sum benefit payable to the widow or survivor*

l_{unl2} = lump sum benefit payable to each child in excess of five*

$$\Delta n_c = \begin{cases} 0 \\ n_c - 5 \\ 4 \end{cases} \text{ for } n_c = \begin{cases} 0\text{-}5 \\ 6\text{-}8 \\ \geq 9 \end{cases}$$

and l_{unl3} = Additional lump sum benefit payable to widow only for death caused by an occupational accident.*

Let z_{exp} = the total numbers of years in which the miner paid into the retirement fund**

y_{pmin} = the minimum age at which a miner may retire and collect minimum retirement benefits

y_{pmax} = the age at which a miner qualifies for maximum retirement benefits

z_m = $65-y_m$

z_w = $65-y_w$

z_{unw} = minimum (z_m, z_w)

p_{unr} = the fraction of maximum retirement benefits which the miner was qualified for

b_{unr} = the maximum monthly retirement benefit for a miner of age y_m with z_{exp} years paid into the pension fund

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*Specified in the wage agreement

** Same value as z_{exp} in Equation 14e.

Then,

$$b_{unwp} = (0.5)(12)p_{unr}z_{unw}b_{unr} \tag{16b}$$

$$p_{unr} = \left\{\begin{array}{l} 0 \\ 0.79 + 0.03(y_m - y_{pmin}) \\ 1 \end{array}\right\} \text{for} \left\{\begin{array}{l} y_m \leq y_{pmin} \\ y_{pmin} < y_m < y_{pmax} \\ y_m \geq y_{pmax} \end{array}\right\} \tag{16c}$$

The total monthly retirement benefit (b_{unr}) is based on y_m and incremental years of payment into the retirement fund. No benefit is paid ($b_{unr} = 0$) if $y_m < y_{pmin}$. For $y_m \geq y_{pmin}$, define

$b_{unr}(i)$ = the monthly benefit per year of payment into the retirement fund for qualifying period i*

$z_{unr}(i)$ = the minimum number of years to qualify for $b_{unr}(i)$*

Then,

$$b_{unr} = 0 \quad \text{for } z_{exp} < z_{unr}(1) \tag{16d.1}$$

$$= [z_{exp} - z_{unr}(1)]\, b_{unr}(1) \quad \text{for } z_{unr}(1) \leq z_{exp} < z_{unr}(2) \tag{16d.2}$$

$$= [z_{exp} - z_{unr}(p)]\, b_{unr}(p) + \sum_{i=1}^{p-1} [z_{unr}(i+1) - z_{unr}(i)]\, b_{unr}(i) \tag{16d.3}$$

$$\text{for } p > 2,\ z_{unr}(p) \leq z_{exp} < z_{unr}(p+1)$$

The additional widow benefits in Equation 16a.2 are given by

$$b_{unwr} = 12\, b_{unal}(y_{rw} - y_w) \tag{16e.1}$$

$$b_{unwd} = 12\, b_{unal}\, z_{unw} \tag{16e.2}$$

$$b_{undd} = 0 \quad \text{for } n_c = 0 \tag{16e.3}$$

$$= 12 b_{unal} z_{maxcu} \quad \text{for } n_c \geq 1 \tag{16e.4}$$

where b_{unal} = the additional monthly widow benefit specified in the wage agreement

z_{maxcu} = maximum $(22 - y_{ci})$, $ci = 1, \ldots, n_c$

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*Specified in the wage agreement

4.4.3.2 Permanent Total Disability

The amount of monthly benefit is determined by the number of years in which the miner paid into the union retirement fund prior to the year in which the accident occurred. If $z_{exp} < z_{unr}(1)$, then

$$b_{unc} = 12 p_{65m} z_m b_{unr}(min) \quad (17a)$$

where $b_{unr}(min)$ = the minimum monthly retirement benefit specified in the wage agreement

If $z_{unr}(p) \leq z_{exp} < z_{unr}(p+1)$ for $p \geq 1$,

$$b_{unc} = 12 p_{65m} z_m b_{unr} \quad (17b)$$

where $$b_{unr} = (z_{exp} - z_{unr}(p))\, b_{unr}(p+1) + \sum_{i=1}^{p} (z_{unr}(i) - z_{unr}(i-1)) b_{unr}(i) \quad (17c)$$

4.4.3.3 Permanent Partial and Temporary Total Disability

Only the period of total disability is compensated for an injury which results in permanent partial disability. The total benefit is given by:

$$b_{unc} = (d_{dt}/7) b_{untn} \quad (18a)$$

where d_{dt} = number of days of total disability

b_{untn} = the net weekly benefit paid by union disability fund after deduction of weekly benefits from state workmen's compensation and social security

$$= \text{maximum } (0, b_{untw} - b_{st4w} - b_{ss4w}) \quad (18b)$$

b_{untw} = the maximum weekly union benefit specified in the wage agreement

b_{st4w} = the weekly benefit from the state

b_{ss4w} = the weekly benefit from social security.

4.5 Costs of Investigating a Fatal Accident

Federal law [3] requires the Mining Enforcement and Safety Administration (MESA) to investigate and prepare an official report describing the circumstances and probable causes of an underground mining accident that results in a fatality. The investigation of the accident requires a significant expenditure of time on the part of MESA investigator, officials and employees of the mining company involved, and state investigators. The equivalent cost of this time is a valid element of the total cost of a fatal injury because it represents a loss of productive time in terms of

(1) the time available for accident prevention inspection by the MESA and state inspectors assigned to the investigation

(2) the performance of coal production activities by officials and employees (including union members and officials) of the mine under investigation.

4.5.1 Data Sources

Members of the ESD project team interviewed officials and employees at five underground mines at which a fatal accident had occurred within the past three years, and inspectors at four MESA district offices to establish the resources expended during an investigation. Each company official and employee interviewed had previous involvement as a member of the investigating team or as a witness. Each MESA inspector has conducted several official investigations of fatal accidents in the past three years. The information gathered from these interviews was used to construct the chronology of a typical official investigation to identify the elements of time expended in each stage of the investigation, and the persons involved at each stage. Each MESA office maintained detailed records of the time charged to a fatal investigation by each inspector. These records were used to establish distributions for the time expended per person at each stage of the investigation. Finally, distributions for the number of persons involved in each stage of the investigation were established from an analysis of the official MESA report of 95 fatal accidents which occurred in 1973-1974 (see Volume III).

4.5.2 Chronology of a Typical Investigation

When an accident in an underground coal mine results in a fatality (assumed here to be immediate, although the same general chronology applies if the injured person dies in hospital), a mine official (usually the Safety Director or Mine Superintendent) must immediately notify the MESA district office of the fatality. The mine official also notifies the state inspection district office and the company executive offices (usually vice-president or president level) at this time.

The MESA inspector who is notified by the mine official will usually issue an immediate closure order under Section 104(a) or 104(f) of the Federal Coal Mine Health and Safety Act. This order will apply to the area in which the accident occured, theoretically allowing mining operations to continue in other areas of the mine. In actuality, mine management usually withdraws all persons from the mine for one full day of operation (this cost is addressed in Section 4.2).

The manager of the MESA office assigns the following personnel to the MESA investigation team:

- A supervisory inspector (team leader)
- Underground mine inspector
- Engineer specialists (e.g., roof control, haulage, electrical, etc.) as dictated by the nature of the accident.

In some cases, an inspection or engineering specialist from the MESA headquarters in Arlington, Virginia will join the team.

The MESA team travels to the mine and the remainder of the official investigating team (OIT) is assembled. The OIT will include the MESA team and

- state inspectors
- company officials
- mine management
- union representatives.

The OIT will begin the investigation with a detailed examination of the accident scene. Eyewitnesses to the accident are questioned in detail about the circumstances surrounding the accident. Other witnesses are usually called to testify on technical aspects which may be contributory to determining the causes of the accident, or may clarify points covering operation of the mine, the mining plan, etc.

When the OIT has completed the initial investigation, a report of the accident will be prepared by the MESA team; the state officials and mine management usually prepare independent reports for their own use. The MESA report, however, is the official record of the accident, and must be prepared in concise detail since it is sometimes used in evidence in court proceedings.

A draft of the MESA report is reviewed with the other members of the OIT. In some cases additional analysis of the accident scene or interviews with witnesses is required. When the OIT members have reached a consensus agreement about the draft report, the report is reviewed by the supervisor of the MESA district in which the accident occurred, and by officials at the main office of MESA in Arlington, Va. In some instances, an official from Arlington is a member of the OIT.

Preparation and review of the MESA report usually requires one or two members of the MESA investigating team on a full-time basis for several days. When all reviews and approvals have been completed, between 375 and 450 copies of the final version of the report are distributed to other MESA offices, company and union officials, state agencies, insurance carriers, and a number of other recipients.

4.5.3 Investigation Algorithm

The algorithm developed from the above chronology and from the data extracted from the sample MESA reports is a stochastic model which generates the costs to the mine company and to public agencies based on the time expended per person in each of four investigative tasks. Thus,

C_c = the cost of the investigation to the mine company

C_p = the cost of the investigation to the public agencies.

Four investigative tasks were defined from the chronology:

Task (t)	Description of the Work Task t
1	Conduct of the investigation by the OIT
2	Interrogation of witnesses to the accident
3	Interview of other persons (not witnesses)
4	Preparation and review of the official report.

Tasks 2 and 3 apply to the time spent by witnesses away from their normal work tasks. The time spent by the OIT to conduct the interviews is included as part of the time elements of Task 1.

The following abbreviations are used as subscripts (xy) to associate model variables with an agency and a personnel grade with the agency:

X	Agency	Personnel Grade for y-Suffix
m	MESA	s: Supervisor Inspector; i: Inspector; e: Engineer
c	Company	e: Executive Management; m: Mine Management; 1-5: UMWA Wage Classes 1-5 [6, Appendix A]
s	State	i: Inspector
u	Union	r: Representative

The following salary classes (s_z) were assigned to each personnel grade listed above:

z	Personnel Grades	Basis of Salary Class
1	c1	UMWA Wage Class 1
2	c2	" 2
3	c3	" 3
4	c4, ur	" 4
5	c5, me	" 5
6	cm, mi, si	120% of s_5
7	ms	GS-12, step 10*
8	ce	GS-16, step 10

*General Schedule salary grades [17]

The salary bases shown above are representative of the personnel grades shown, and are available from published sources to permit annual updating. Sections A.7 and D.3.1 of Volume II contain further information. In the following model, the s_z are in units of $/workday.

Let C_{tx} = the total cost of Investigative Task t to Agency x

Then,

$$C_c = C_{1c} + C_{2c} + C_{3c} + C_{4c} \qquad (19a)$$

$$C_p = C_{1m} + C_{1u} + C_{1s} + C_{3u} + C_{4m} + C_{4s} + C_{4u} \qquad (19b)$$

Computation of the cost elements in Equations 19a-b are based on the stochastic generation of values for the following variables:

d_t = the maximum time/person involved in Task t(days)

n_{txy} = the number of persons of Grade y from Agency x involved in Task t.

Then, the general expression for C_{tx} is given as follows:

$$C_{tx} = d_t \sum_y s_z n_{txy} \qquad (19c)$$

Frequency distributions for d_t were developed from discussions with mine officials who were involved in fatal investigations, and from the daily time records at each MESA office visited. These records are maintained for each investigation, so a very accurate chronology was determined. Frequency distributions for n_{xy} were developed from the data extracted from the sample MESA reports [Volume III]. The distributions for d_t and n_{xy} are contained in the listing of the BLOCK DATA subprogram (Volume II, Section A.7).

The following rules were developed to compute the n_{txy}, based on the discussions and the sample reports:

- Task 1

$$n_{1ce} = \text{minimum } (1, n_{ce}) \tag{20a}$$

$$n_{1cm} = \text{minimum } (2, n_{cm}) \tag{20b}$$

$$n_{1my} = n_{my};\ y = s, i, e \tag{20c}$$

$$n_{1si} = n_{si} \tag{20d}$$

$$n_{1ur} = \text{minimum } (3, n_{ur}) \tag{20e}$$

- Task 2

$$n_{2cj} = n_{cj},\ j = 1,5 \tag{20f}$$

- Task 3

$$n_{3ce} = n_{ce} - n_{1ce} \tag{20g}$$

$$n_{3cm} = n_{cm} - n_{1cm} \tag{20h}$$

$$n_{3ur} = n_{ur} - n_{1ur} \tag{20i}$$

- Task 4

$$n_{4ce} = n_{4cm} = 1 \text{ for 1 day each} \tag{20j}$$

$$n_{4ms} = \text{maximum } (0, n_{ms}-1) \text{ for } d_4 \text{ days each} \tag{20k}$$

$$n_{4mi} = \text{maximum } (0, n_{mi}-1) \text{ for 1 day each} + 1 \text{ for } 0.5\ d_4 \text{ days} \tag{20l}$$

$$n_{4me} = \text{maximum } (1, n_{me}) \text{ for 2 days each} \tag{20m}$$

$$n_{4si} = \text{minimum } (1, n_{si}) \text{ for } d_4 \text{ days} \tag{20n}$$

$$n_{4ur} = \text{minimum } (1, n_{lur}) \text{ for 1 day} \tag{20p}$$

Substitution of Equation Set 20 into Equation 19c and substitution of the appropriate daily wage rates yields the following:

- Costs to Company

$$C_{1c} = d_1(s_8 n_{1ce} + s_6 n_{1cm}) \tag{21a}$$

$$C_{2c} = d_2 \sum_{y=1}^{5} s_y n_{2cy} \tag{21b}$$

$$C_{3c} = d_3(s_8 n_{3ce} + s_6 n_{3cm}) \tag{21c}$$

$$C_{4c} = (s_8 + s_6) \tag{21d}$$

- Costs to MESA

$$C_{1m} = d_1(s_7 n_{ms} + s_6 n_{mi} + s_5 n_{me}) \tag{21e}$$

$$C_{4m} = s_7(d_4 + n_{4ms}) + s_6(0.5d_4 + n_{4mi}) + 2s_5 n_{4me} \tag{21f}$$

- Costs to State

$$C_{1s} = d_1 s_6 n_{si} \tag{21g}$$

$$C_{4s} = d_4 s_6 n_{4si} \tag{21h}$$

- Costs to Union

$$C_{1u} = d_1 s_4 n_{1ur} \tag{21i}$$

$$C_{3u} = d_3 s_4 n_{3ur} \tag{21j}$$

$$C_{4u} = s_4 n_{4ur} \tag{21k}$$

Equation Set 21 has been rearranged by agency for use in Subroutine FTLINV (Volume II, Section A.7) for better computational efficiency The new equations are given by Equation Set 22.

$$C_c = s_8(d_1 n_{1ce} + d_3 n_{3ce} + 1) + s_6(d_1 n_{1cm} + d_3 n_{3cm} + 1) + d_2 \sum_{y=1}^{5} s_y n_{cy} \tag{22a}$$

$$C_m = s_7(d_1 n_{ms} + d_4 + n_{4ms}) + s_6(d_1 n_{1mi} + 0.5d_4 + n_{4mi}) + s_5(d_1 n_{me} + n_{4me} + n_{4me}) \tag{22b}$$

$$C_s = s_6(d_1 n_{si} + d_4 n_{4si}) \tag{22c}$$

$$C_u = s_4(d_1 n_{1ur} = d_3 n_{3ur} + n_{4ur}) \tag{22d}$$

$$C_p = C_m + C_s + C_u \tag{22e}$$

4.6 Administration and Overhead Costs

The basic costs computed for medical treatment and compensation benefits are multiplied by a quantity o_c, which is a factor > 1 to account for the fact that handling of medical and compensation claims requires paperwork, administration, and other indirect overhead factors not included in the direct cost. The o_c factors are applied by direct multiplication of the direct cost because most business organizations apply such factors in this manner, and because the additional costs represented by overhead are a small part of the total cost. Note that unit costs of medical resource units used in the medical cost algorithm includes the direct overhead of medical and hospital treatment such as plant, equipment, supplies, etc.

The following tabulation summarizes the indirect cost experience of selected agencies and organizations who were contacted during the field visits, or from whom information was requested.

Source of Indirect Cost Information	Average Indirect Cost
West Virginia Workmen's Compensation Commission [18]	5.8%
Kentucky Workmen's Compensation Fund [19]	3.1%
Private Insurance Company	15.0%
Industry Estimate [16, p. 297, Table 484]	5-10%

Based on these averages, a factor of 1.075 is used in ACIM to account for indirect overheads for both medical and compensation costs.

4.7 Allocation of Cost Elements

The cost elements defined in the previous sections were allocated among mining companies, mining families, and public agencies to compute the total present and future cost to each sector. Table 8 shows the allocation of the elements, where C_x is the cost of element x for a single injury, and $C_{ecp} = e_{pl}$, $C_{pin} = w_{en}$, $C_{stb} = b_{st}$, $C_{ssb} = b_{ss}$, $C_{unb} = b_{un}$, C_{inv} (company) $= C_c$, C_{inv} (public agencies) $= C_p$.

Table 8 . Allocation of Cost Elements to Sectors of Society

Cost Element Computed by ACIM (C_x)		Total Cost Allocated to Companies	Families	Public Agencies
Medical Treatment	(C_{med})	X		
Loss in Coal Production	(C_{ecp})	X		
Loss of Personal Income	(C_{pin})		X	
State Disability Benefits	(C_{stb})	X		
Federal Disability Benefits	(C_{ssb})			X
Union Disability Benefits	(C_{unb})		X	
Fatal Accident Investigation	(C_{inv})	X		X

C_{med} and C_{stb} are costs to mining companies, as insurance premiums, even though actual payments of the costs may be administered by the state or by private insurance carriers. C_{ssb} is borne by the Social Security fund, which is entirely paid for by working persons and businesses in general. C_{unb} is paid from union retirement and disability funds which are entirely supported by the dues paid by coal miners.

Thus, U_y, the total present and future costs of a single injury to sector of society y is the sum of the C_x associated with the sector:

$$U_c = \text{total cost to mining company} = C_{med} + C_{ecp} + C_{stb} + C_{inv}(\text{company}) \quad (23a)$$

$$U_m = \text{total cost to mining family} = C_{pin} + C_{unb} \quad (23b)$$

$$U_p = \text{total cost to public agencies} = C_{ssb} + C_{inv}\ (\text{public agencies}) \quad (23c)$$

and

$$U_t = \text{the total cost to all sectors of society} = U_c + U_m + U_p \quad (23d)$$

4.8 Computation of Accident Cost Indicators

The ACIM computes three indicators of accident cost for the total population of accident records extracted from the HSAC CAIF for each societal sector listed in Table 8, and for subsets of the population. Population Subset S is defined by a combination of characteristics common to all accidents (e.g., all accidents involving roof bolters employed in roof drilling when the accident occurred). The number of accidents in Subset S (N_{is}) is the same for each societal sector but the cost indicators are different, as shown in Table 8. The following paragraphs contain the procedure used by ACIM to compute the cost indicators defined as follows for Population Subset S, Societal Sector y:

T_{ys} = total present and future cost

A_{ys} = present annual cost

I_y = present annual cost per injury in Subset S.

Volume II contains a description of the subsets for which ACIM can compute these indicators. Note that all of the indicators are expressed in present value, where the term 'present' refers to the year corresponding to the CAIF used as the source of accident data.

4.8.1 Total Present and Future Cost (T_{ys})

The general expression for T_{ys} is given by:

$$T_{ys} = \sum_{N_{is}} U_y$$

where the U_y are defined in Equation Set 23. (24)

In other words, T_{ys} expresses the gross economic impact (out-of-pocket and committed costs) upon Societal Sector y from the group of accidents in Population Subset S.

4.8.2 Present Annual Cost Indicators (A_{ys}, I_y)

Some of the cost elements in Table 8 are generally incurred in the same year in which the accident occurred. An example is C_{ecp}, which

is an immediate income loss. The total cost of these elements is used to compute A_{ys}. Compensation for permanent disability and death (HSAC Degree of Injury codes* 1, 2, 3) are payable to the miner or his survivors over z_m, the remaining working life of the miner. The annual costs of these elements are used to compute A_{ys}. Table 9 shows how ACIM treats each C_x for the computation of A_x, the present annual cost of C_x, where y_m is the age of the miner at the time of injury and $z_m = 65 - y_m$.

Table 9. Computation Procedure for Present Annual Cost

Cost Elements (C_x)	Degree of Injury	A_x =
C_{med}, C_{ecp}, C_{inv}	All values	C_x
C_{pin}, C_{stb}, C_{ssb}, C_{unb}	1, 2, 3	C_x/z_m
	4, 5, 6	C_x

Thus, the general expressions for A_y and A_{ys} are analogous to the expression for U_y and T_{ys} given in Equations 23-24. The following modified expressions are actually used in ACIMEXEC to compute A_y for each CAIFDATA record for a fatality or permanent disability:

$$A_c = U_c - C_{stb} + C_{stb}/z_m \tag{25a}$$

$$A_m = U_m/z_m \tag{25b}$$

$$A_p = U_p - C_{ssb} + C_{ssb}/z_m \tag{25c}$$

It can be shown that Equation Set 25 yields the same results as the general expressions for A_y. The modified forms are used to conserve computer time.

The final cost indicator, I_y, is defined in general by

$$I_y = A_{ys}/N_{is} \tag{26}$$

and is a normalized measure of relative annual cost among different population subsets and/or different societal sectors.

*See Volume III for definitions

5. LIMITATIONS AND USES OF ACIM

5.1 Model Limitations

Users of the cost indicators produced by ACIM should be aware of certain limitations imposed upon the scope of the model with respect to (1) restriction of certain cost elements to specific types of accidents, and (2) exclusion of cost elements which appeared to be valid vandidates for ACIM. These limitations generally result in conservative values for the cost elements of certain types of injuries. Consequently, the costs produced by ACIM should be viewed as lower limit values.

The limitations described in the following paragraphs were applied to tangible elements of accident cost which were identified from the information available during the model development but which could not be developed further from this information. The cost element was excluded from the model if no relevant quantitative data were available. The scope of the cost element was restricted to specific types of injuries when limited quantitative data were available.

The prime constraints which acted to limit the information available to the project were the time and funds available for data collection. Without exception, the limitations placed on the cost elements can be removed through collection of the additional quantitative data noted below.

5.1.1 Lost Production

The following restrictions were imposed upon the computation of the cost of production lost as the result of an injury accident:

- accidents which do not result in either a fatality or an immediate amputation injury are excluded
- immediate loss of production due to disruption of working places by an accident occurrence is not computed for non-fatal accidents.
- any production loss resulting from a closure order issued by MESA as a result of a fatal accident is not computed.

The first two restrictions were applied because of limited sample size (see Section 4.2). Qualitative evidence did indicate the potential for significant disruptions in production for accidents which cause injuries less serious than death or amputations, especially when malfunction or breakdown of face equipment is either a cause or associative result of the accident. A detailed analysis of a larger sample of accidents would be required to remove these restrictions.

The third restriction was imposed because a clear causal relationship between closure orders and accident occurrence could not be established from the information collected by the project team. This information consisted primarily of official MESA reports of more than 100 fatal accidents which occurred in underground coal mines during 1973-1975. It is clear from these reports that orders to close part or all of a mine are often issued in addition to the immediate danger closure order (Sections 104(a) or 104(f) of the Federal Coal Mine Health and Safety Act of 1969) issued when the accident is first reported to MESA. These additional closure orders are for violations observed during the investigation of the accident. In a number of cases, closure orders were issued for violations which appeared to be related to the conditions which caused the accident, which would qualify the production lost as a result of the closure as a valid element of accident cost.

However, the information in the majority of the reports was of insufficient detail to (1) establish a clear relationship between the closure order and the causes of the accident, or (2) determine the number of workdays in which the order was in effect. About 10% of the reports did contain sufficient information to indicate that from one to 15 day of production were lost as as result of the closure. Analysis of the original closure orders and subsequent notices and orders would be required to firmly establish these relationships.

5.1.2 Non-Disability Injuries

No cost elements other than the cost of medical treatment are computed by ACIM for a non-disability injury, which is defined as an injury requiring medical treatment but not resulting in time away from work subsequent to the day on which the injury occurred. Injuries of this type are identified in the HSAC accident records by a value of 5 or 6 for the code for degree of injury.

The information collected by the project team indicated that other elements of cost may be associated with these types of injuries, including,

- An immediate loss of production due to the disruptive effect of an injury serious enough to require medical attention (this loss is discussed above and in Section 4).
- The potential of a post-accident loss in production due to temporary replacement of the injured miner because the injury prevents the miner from resuming his normal work tasks for some period of time.

The literature contains evidence from industries other than mining of post-accident loss in productivity when the regular job of the injured worker must be temporarily performed by a worker with less experience, even though the injured worker returns to work after receiving medical treatment. There is strong reason to believe that this potential exists in underground coal mining, especially in view of the demand imposed by the environment for close interaction among members of a face crew in terms of productivity and safety. Further study is recommended to fully explore this potential.

5.1.3 Fines

Some of the violation orders issued by MESA for unsafe conditions result in the assessment of fines upon the mine. If the issuance of the order is a direct result of a condition leading to an accident (as discussed in Section 5.1.1), then the fine is a tangible element of the cost of the accident to the mining company. However, since the fine is paid to the federal government, the amount of the fine should be deducted from the total cost of the accident to public agencies. Thus, it is conceivable that the imposition of the fine would have no net effect upon the total cost of the accident. In some cases, the fines are in the tens of thousands of dollars. The project team did not collect sufficient data to warrant inclusion of this element in ACIM. Section 5.1.1 contains a discussion of the data required for further analysis of this cost element.

5.1.4 Lawsuits

Discussion with representatives of agencies dealing with insurance for coal mining companies yielded specific examples of lawsuits brought against coal mining companies by the survivors of miners who were permanently disabled or killed as a result of accidents underground. The financial settlements from these suits was primarily composed of compensation for:

(1) Estimated loss of future income, and

(2) Pain and suffering of the injured miner or his survivors. The total award in the examples identified ranged from $15,000 to $250,000. Thus, this cost can be a major element of the total cost to a mining company of a particular accident. However, analysis of a larger sample of lawsuits is required to develop a meaningful quantitative relation. It should be noted that the major portion of a legal settlement, the estimated loss of future income, is presently computed by ACIM as a cost to mining families. Incorporation of a cost element for awards arising from lawsuits would, in fact, transfer the loss-of-income cost from the mining family to the company. The inclusion of any additional award, such as that for pain and suffering, would require a case-by-case analysis since the amount of this award is strictly a function of the competence of the attorney for the plaintiffs, and the personal sympathies of the members of the jury.

5.2 Potential Uses

A number of potential uses of the cost indicators produced by ACIM are described in this section. The majority of these uses are, of course, directed to an audience within the Bureau of Mines, MESA, and other agencies in the Department of the Interior. However, other government and private organizations who have an interest in coal mine health and safety may also find the indicators of use as a tool for monitoring safety in coal mining. Specific application of the model are suggested for individual mining companies. Finally, adaptation of the generalized structure of ACIM by organizations in other industries to generate accident cost indicators within these industries is described.

ACIM was developed for the primary purpose of providing the Bureau of Mines with a breakdown of industry-wide accident costs by various characteristics of the underground work environment. The tables produced by the computer model contained in Volume II produce these breakdowns by mining task activity, regular job title, and other characteristics of the work environment. However, ACIM computes accident costs for individual records from a subset of the records in the HSAC CAIF, and maintains an audit trail by which an individual accident cost record is associated with the original record in the CAIF. Thus, with minor modifications, ACIM can produce a breakdown of accident costs for any subset of the CAIF. For example, tables of costs by years of mining experience, or by HSAC classification for agency of accident or source of injury could be produced with only minor addition of program code. The potential uses discussed below should be considered in light of this flexibility of the ACIM.

One potential use of the indicators is for examination of annual trends in underground accident statistics on the basis of economic losses to specific sectors of society. This usage of the indicators is intended to augment the accident experience statistics currently published by MESA. This is both feasible and valid since the ACIM uses the same data base of injury records from which the MESA statistics are compiled. Inclusion of ACIM indicators in an analysis of annual trends would extend the scope and meaning of the analysis because the indicators directly express, in dollar values, the consequences of accidents - production and wage losses, medical costs, disability compensation, etc. The expression of accident statistics in terms of economic losses to specific sectors of society provides the additional advantage of dramatizing, in familiar terms, the need for improving safety. This is, of course, one of the prime reasons for compiling and publishing trends in accident statistics.

The cost indicators could be used in planning and allocation of the annual budgets for coal mine health and safety programs to identify relatively high-risk areas in mining, and measure the potential return (reduction of annual costs of accidents) from investment of research and development funds in these areas. In this application, ACIM would be used to generate expected annual and total costs by major areas of the budget for health and safety (e.g., roof control, haulage).

A simple procedure for accomplishing this would be to (1) associate each of the categories used to identify the activity of the miner at the time of accident with those areas of the budget which could, to some degree, improve the safety of the activity, (2) compute the sums of expected annual cost and the cost per injury for each area from the tables of accident costs by mining activities currently printed by ACIM, (3) use the cost per injury as the measure of relative risk, and (4) use the annual cost as the gross potential return from investment of budget funds in these areas.

A more complex procedure could be used to obtain a more direct association between the cost indicators and specific programs proposed for inclusion in the annual budget. Each program would be evaluated to determined the subset of the mining environment to which the proposed program applies. The accident costs associated with this mining environment would be computed by (1) determining the codes for the mining activities, sources of accidents, and agencies of accidents which best define the environment, (2) processing the HSAC CAIF to extract the subset of accident records which contain these codes, and (3) using this subset as the input (File CAIFDATA) to ACIM. This procedure would be applied to each proposed program to generate total potential benefits from implementation of the program . These potential benefits would then be used in subsequent analyses to determine the relative merit of each program in terms of net expected benefit versus expected program cost.

The potential uses described above are directed to planning and budgeting of funds in relatively broad areas. However, these uses also apply at a more detailed level to aid in evaluation of specific proposals submitted to the Bureau of Mines, MESA, or other agencies within the Department of the Interior. The same general procedure would be applied to estimate the net expected benefit (expected reduction of accident costs) of the proposal for improvement of mining safety, and provide an objective figure of merit for use in evaluation of the proposal.

The success of funded programs can be measured by annual monitoring of the ACIM indicators for the same subset of the mining environment used to evaluate the expected benefit of the project as proposed. For example, the success of a program which results in the development of a machine to replace manual handling of supplies and [illegible]s (excluding coal) in working places can be measured by comparing the [illegible] accidents costs associated with manual handling before deployment of the machine with the trend of the same costs after deployment. The resulting reduction in the annual costs to industry can also be used in an economic evaluation to estimate payback period and annual cost savings for presentation to mining companies as an argument for deploying the results of a particular project in their mines.

The outputs of ACIM can be used by individual mining companies to monitor their accident costs experiences relative to the industry averages, and individual mines relative to the company average. This application would require the extraction of CAIF records for the company's mines, sorting of the records by mine identification code into separate files, processing of each file to obtain statistics by mine, and processing of all files together to obtain company statistics. These tasks can be performed with simple sorting procedures prior to using ACIM.

Large companies with a number of mines would obtain the greatest benefits from ACIM. These companies might wish to examine their costs on a more detailed level - by sections and locations within each mine for example. Minor modification to ACIM would permit display of accident costs for any cross-section of codes contained in the HSAC accident records.

Individual companies might wish to replace the logic used to compute production losses with data that is specific to their mines. This can be done by applying the analytical procedure described in Section 4.2 and Appendix D of this volume to the daily section reports of mines within the company. In fact, individual companies are urged to analyze the post-accident performance of working sections in which serious accidents occur to confirm or deny the validity of the observations documented in this report. The potential economic impact upon the company in terms of reduced production efficiency is sufficiently high to justify such

an analysis, not only to develop more accurate data for ACIM, but to confirm that procedures for improving safety pay off in economic as well as humanitarian terms.

Companies and agencies in industries outside of coal mining can adapt ACIM for use as a tool for monitoring accident cost experience because of the generalized nature of the model. All of the cost element algorithms except those used to compute post-accident production losses and fatal accident investigation costs apply to any industrial work environment. Furthermore, the procedures used to develop algorithms for post-accident production losses and investigation costs can be applied to most industrial environments. All codes and definitions used to define the nature and extent of injuries are U.S. standards used by all industries to record injury experience. Work-related parameters such as task activity, job title, location of accident, etc., are defined external to the program and are easily changed to suit the work of any industry.

6. RECOMMENDATIONS FOR FURTHER RESEARCH

The investigations conducted during the course of this project revealed several elements of accident costs which warrant further investigation in light of the potential economic impact of these elements. The following paragraphs outline a recommended course for further research into these elements.

- Losses in Production From Major Injuries

  The analysis of post-accident production losses (Section 4.2.2) presents strong evidence that accidents resulting in a death or amputation caused significant reduction in the production efficiency on the sections where the accidents occurred. In the case of the fatal roof fall accident (Section 4.2.2.1), reduced production efficiency was also observed on other sections in the area of the accident. The reduced efficiency on the accident section alone resulted in a loss of more than 20,000 tons of coal production. In two cases of amputation injuries at different mines,

the average efficiency loss (8% of pre-accident mean over 26 days) resulted in a loss of more than 1000 tons of production. These losses are direct reductions in gross profit because full wages and direct overhead costs are paid during the period of reduced efficiency. In a mine operating normally, these costs are relatively constant whether or not coal is produced.

A more detailed analysis of these effects during the project was precluded by the project schedule, which did not permit expansion of the visit sample, or in-depth study at each mine where section reports were made available to project team members. Because of the pronounced and consistent trends observed from the samples analyzed in the project, a separate study of post-accident production losses is recommended to increase the scope of analysis and the number of accidents sampled. The scope of analysis should include the examination of the causal as well as the statistical relationships between the accident and the effects on production efficiency. An in-depth study of each accident is required to accomplish this, including interviews of section crews and analysis of section performance over longer time periods. The records of each mine included in the study should be analyzed over a time period of at least 12 months to correlate accident occurrence with production performance.

- Non-Injury Accidents

The scope of the project excluded investigation of reportable accidents which do not cause injury. A typical example is a fall of roof in a working place during a weekend or holiday period. Some of these accidents cause irreparable damage to equipment. Additionally, a considerable expenditure of productive worktime may be required to restore production operations. The potential of large economic impacts of these accidents certainly justifies a study, and possible incorporation of this cost element into ACIM.

- Retraining and Rehabilitation of Disabled Workers

  Sufficient data could not be collected during the project to develop an algorithm because of the reasons discussed in Section 3. Examination of specific case histories at two of the state agencies visited during the project revealed that as much as $5000 may be paid for retraining of workers injured in occupational accidents. A study to further identify these costs would require analysis of a sample of individual cases.

- Long-Term Medical Treatment Expenses

  The medical costs computed by ACIM cover only the short-term expenses of treating and repairing the injury caused by the accident. Some portion of the injuries addressed by ACIM result in the requirement for medical treatment over a much longer time: back injuries are a typical example. These long-term medical costs can be several times that of the short-term costs. The occurrence of such injuries cannot be directly identified from the information contained in an HSAC record of the accident. However, the long-term costs of such injuries can be taken into account stochastically by developing probability functions of the occurrence of long-term treatment requirements by injury categories, and statistical distributions of medical resources required in each category (expressed in the resource units used in the medical treatment study performed during the project). This model could be incorporated into the current ACIM medical cost model. A relatively large number of case histories would have to be analyzed to develop the functions and distributions for the long-term model. In view of the potentially high costs of long-term treatment, an exploratory study is recommended to determine if a larger study is justified.

7. REFERENCES

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APPENDIX A. INDUSTRY PROFILE

This appendix contains a description of the industry profile used to select a sample of underground bituminous coal mines for collection of field data, including a description of the data base of underground bituminous coal mines used to construct the industry profile, and comparison of the industry population with the sample of mines drawn from this population. This sample was used to select specific mines for collection of data relevant to injuries and fatalities underground.

The data base consisted of all underground bituminous coal mines which reported to the Health and Safety Analysis Center (HSAC) of the Mining Enforcement and Safety Administration (MESA) during Calendar Year 1974. A copy of the HSAC Address/Employment Master file (AEMF) was used to identify mines which met this criterion, and to extract the monthly production and work hours reported by these mines.

A total of 1853 mines were extracted from the AEMF. The following sources were used to identify the seam height worked at each mine:

- data base of mines developed by ESD for use on the Inherently Safe Mining Systems project, U.S.B.M. Contract HO111670
- 1974 edition of Keystone Coal Industry Manual
- annual reports of coal mining activities for 1973 and 1974, published by coal-producing states.

Seam heights for 1154 mines were identified, stratified into intervals, and assigned codes for computer processing.

The data base was processed to compute annual production and work hours for mines which reported an active status for all 12 months of 1974. This population (745 mines reporting production; 748 mines reporting

work hours) was chosen to ensure that the industry sample contained only mines which were active within the same 12 consecutive months.

Tables A.1 and A.2 contain a statistical summary of the industry population by seam height and size of mine. Table A.3 contains the distribution of the population by state. The population totals of roughly 233 million tons of production and 152 million hours of work time represent approximately 75% of the respective totals for the entire underground bituminous industry.

The corresponding profile statistics for the industry sample selected by ESD are also shown in Tables A.1 - A.3.

Table A.4 shows the listing of the mines in the industry sample. The codes for seam height interval are defined as follows:

$$s = (h_u/12) - 1$$

where s = the seam height code

and h_u = the upper bound of the interval.

For example, a seam height code of 3 in Table A.4 corresponds to a seam height between 37 and 48 inches, inclusive.

A total of 25 mining companies from Table A.4 were contacted by telephone to obtain consent for a visit. A total of 15 companies granted permission for a visit. Two of these visits were to company headquarters. Table A.5 shows the characteristics of each mine where a visit was made.

1974 STATISTICS FOR INDUSTRY PROFILE

SUMMARY BY INTERVAL

SEAM HEIGHT INTERVAL (INCHES)	MINE COUNT		PRODUCTION (000 TONS)				WORKTIME (000 HOURS)			
	SUM	%*10	MINES	%*10	SUM	%*10	MINES	%*10	SUM	%*10
25- 36	245	132	105	141	9109	39	105	140	6349	42
37- 48	399	215	240	322	43092	185	243	325	33582	221
49- 60	274	148	173	232	67084	288	173	231	45071	297
61- 72	105	57	79	106	38922	167	79	106	25755	170
73- 84	64	35	52	70	35293	152	52	70	20235	133
85- 96	34	18	25	34	19553	84	25	33	10331	68
97- 108	15	8	14	19	11790	51	14	19	5803	38
109- 120	6	3	4	5	1654	7	4	5	1194	8
121- 132	5	3	4	5	874	4	4	5	339	2
133- 144	1	1	1	1	869	4	1	1	385	3
145- 156	2	1	2	3	661	3	2	3	284	2
157- 168	2	1	2	3	1001	4	2	3	504	3
> 180	2	1	2	3	14	0	2	3	15	0
UNKNOWN	699	377	42	56	2996	13	42	56	1833	12
TOTAL	1853	1000	745	1000	232912	1000	748	1000	151680	1000

1974 INDUSTRY SAMPLE PROFILE

SUMMARY BY INTERVAL

SEAM HEIGHT INTERVAL (INCHES)	MINE COUNT		PRODUCTION (000 TONS)				WORKTIME (000 HOURS)			
	SUM	%*10	MINES	%*10	SUM	%*10	MINES	%*10	SUM	%*10
25- 36	14	139	14	139	1823	52	14	139	1338	59
37- 48	32	317	32	317	6559	188	32	317	5255	232
49- 60	25	248	25	248	9127	261	25	248	6718	297
61- 72	14	139	14	139	4007	115	14	139	2605	115
73- 84	7	69	7	69	3101	89	7	69	1953	86
85- 96	3	30	3	30	5316	152	3	30	2355	106
97- 108	3	30	3	30	3515	101	3	30	1776	78
109- 120	1	10	1	10	459	13	1	10	171	8
133- 144	1	10	1	10	869	25	1	10	385	17
145- 156	1	10	1	10	176	5	1	10	59	3
TOTAL	101	1000	101	1000	34952	1000	101	1000	22655	1000

Table A.1 Industry Profile Statistics
by Seam Height Interval

SUMMARY BY INTERVAL — INDUSTRY PROFILE

MINE SIZE INTERVAL	MEAN VALUE TONS	MEAN VALUE WKHRS	PRODUCTION (000 TONS) MINES	PRODUCTION (000 TONS) %*10	PRODUCTION (000 TONS) SUM	PRODUCTION (000 TONS) %*10	WORKTIME (000 HOURS) MINES	WORKTIME (000 HOURS) %*10	WORKTIME (000 HOURS) SUM	WORKTIME (000 HOURS) %*10
1- 10	6	7	22	30	130	1	42	56	295	2
11- 50	30	26	158	212	4688	20	226	302	5772	38
51- 100	72	72	121	162	8749	38	109	146	7853	52
101- 250	163	162	169	227	27539	118	148	198	23994	158
251- 500	354	355	123	165	43572	187	127	170	45104	297
501- 750	613	615	66	89	40427	174	66	88	40559	267
751-1000	871	879	39	52	33988	146	25	33	21967	145
1001-1250	1067	1073	14	19	14939	64	3	4	3218	21
1251-1500	1365	1306	12	16	16374	70	1	1	1306	9
1501-1750	1658	1612	9	12	14920	64	1	1	1612	11
1751-2000	1901	0	6	8	11403	49	0	0	0	0
>2000	2697	0	6	8	16183	69	0	0	0	0
TOTAL	313	203	745	1000	232912	1000	748	1000	151680	1000

SUMMARY BY INTERVAL — INDUSTRY SAMPLE

MINE SIZE INTERVAL	MEAN VALUE TONS	MEAN VALUE WKHRS	PRODUCTION (000 TONS) MINES	PRODUCTION (000 TONS) %*10	PRODUCTION (000 TONS) SUM	PRODUCTION (000 TONS) %*10	WORKTIME (000 HOURS) MINES	WORKTIME (000 HOURS) %*10	WORKTIME (000 HOURS) SUM	WORKTIME (000 HOURS) %*10
1- 10	6	9	2	20	11	0	4	40	34	2
11- 50	31	24	26	257	809	23	32	317	755	33
51- 100	74	69	11	109	813	23	14	139	963	43
101- 250	163	169	17	168	2768	79	20	198	3378	149
251- 500	354	355	24	238	8491	243	17	168	6032	266
501- 750	608	633	9	89	5472	157	7	69	4429	195
751-1000	863	878	7	69	6038	173	5	50	4391	194
1001-1250	1006	1061	1	10	1006	29	1	10	1061	47
1251-1500	1405	0	1	10	1405	40	0	0	0	0
1501-1750	1538	1612	1	10	1538	44	1	10	1612	71
>2000	3301	0	2	20	6601	189	0	0	0	0
TOTAL	346	224	101	1000	34952	1000	101	1000	22655	1000

Table A.2 Industry Profile Statistics by Size of Mine

1974 STATISTICS FOR INDUSTRY PROFILE

SUMMARY BY STATE

	MINE COUNT		PRODUCTION (000 TONS)				WORKTIME (000 HOURS)			
STATE	SUM	%*10	MINES	%*10	SUM	%*10	MINES	%*10	SUM	%*10
ALABAMA	20	11	11	15	6886	30	11	15	5325	35
COLORADO	22	12	18	24	3146	14	18	24	2220	15
ILLINOIS	22	12	21	28	30900	133	21	28	13477	89
INDIANA	1	1	1	1	94	0	1	1	21	0
IOWA	2	1	1	1	262	1	1	1	55	0
KENTUCKY	654	353	169	227	43693	188	169	226	22722	150
NEW MEXICO	1	1	1	1	529	2	1	1	384	3
OHIO	28	15	23	31	12514	54	23	31	8998	59
PENNSYLVANIA	125	67	97	130	39451	169	99	132	29443	194
TENNESSEE	94	51	15	20	2430	10	15	20	1315	9
UTAH	19	10	8	11	4076	18	8	11	2053	14
VIRGINIA	293	158	91	122	15310	66	91	122	12783	84
WASHINGTON	1	1	0	0	0	0	0	0	0	0
WEST VIRGINIA	567	306	287	385	73111	314	288	385	52663	347
WYOMING	4	2	2	3	510	2	2	3	221	1
TOTAL	1853	1000	745	1000	232912	1000	748	1000	151680	1000

1974 INDUSTRY SAMPLE [redacted] PROFILE

SUMMARY BY STATE

	MINE COUNT		PRODUCTION (000 TONS)				WORKTIME (000 HOURS)			
STATE	SUM	%*10	MINES	%*10	SUM	%*10	MINES	%*10	SUM	%*10
ALABAMA	3	30	3	30	1584	45	3	30	934	41
COLORADO	3	30	3	30	1524	44	3	30	1207	53
ILLINOIS	5	50	5	50	8025	230	5	50	3342	148
IOWA	1	10	1	10	262	7	1	10	55	2
KENTUCKY	27	267	27	267	7558	216	27	267	4485	198
NEW MEXICO	1	10	1	10	529	15	1	10	384	17
OHIO	2	20	2	20	1044	30	2	20	975	43
PENNSYLVANIA	11	109	11	109	4712	135	11	109	3444	152
TENNESSEE	4	40	4	40	594	17	4	40	325	14
UTAH	1	10	1	10	1006	29	1	10	591	26
VIRGINIA	9	89	9	89	1456	42	9	89	1246	55
WEST VIRGINIA	33	327	33	327	6251	179	33	327	5524	244
WYOMING	1	10	1	10	407	12	1	10	143	6
TOTAL	101	1000	101	1000	34952	1000	101	1000	22655	1000

Table. A.3 Distribution of Industry Profile Mines by State

COMPANY	NAME OF MINE	COUNTY	MINE ID	SEAM CODE	ANNUAL TONS	(*1000) WORKHRS
ALABAMA						
ALABAMA BY-PRODUCTS CORP	CHETOPA MINE	JEFFERSON	01003230	4	450	196
ALABAMA BY-PRODUCTS CORP.	MAXINE MINE	JEFFERSON	01003220	4	875	600
U S PIPE & FOUNDRY CO	FLAT TOP MINE	JEFFERSON	01003270	6	259	138
COLORADO						
UNITED STATES STEEL CORP	SOMERSET - WESTERN COAL DIST	GUNNISON	05002940	11	869	385
CF & I STEEL CRP	ALLEN MINE UG	LAS ANIMAS	05002960	4	479	763
EMPIRE ENERGY CRP	WISE HILL #5 UG	MOFFAT	05013700	12	176	59
ILLINOIS						
PEABODY COAL CO	#10 MINE	CHRISTIAN	11005850	7	4132	1612
INLAND STEEL CO	INLAND MINE	JEFFERSON	11006010	6	2469	1061
SAHARA COAL CO INC	#21 UG	SALINE	11007840	4	675	319
V-DAY MINING CO	V-DAY UG	VERMILION	11006240	5	5	10
AMAX COAL CO	WABASH MINE	WABASH	11008770	6	744	332
IOWA						
LOVILIA COAL CO	NO 4 UG	MONROE	13003840	4	262	55
KENTUCKY						
EASTOVER MINING CO	BAKER #1 UG	BELL	15019660	3	581	231
LEECO INC	#3 MINE UG	CLAY	15060230	2	197	188
FLATWOOD MINING CO	#1 UG MINE	FLOYD	15067430	3	81	10
HITE PREPARATION CO	G-3	FLOYD	15004600	3	39	17
HITE PREPARATION CO	G-6	FLOYD	15022100	2	32	15
COAL RESOURCES CRP	OXFORD DIVISION MINE #1	HARLAN	15022680	3	176	65
DIXIE FUEL CO	NO 1 MINE	HARLAN	15065900	2	158	71
LAMAR COAL INC	NO 1	HARLAN	15026770	3	27	21
UNITED STATES STEEL CORPORATIO	"37 UG	HARLAN	15046700	9	459	171
ADKINS COAL COMPANY	NO 11 UG MI 10151	KNOTT	15022900	3	291	77
GUM BRANCH COAL CO	#25 UG	KNOTT	15063380	3	46	16
NATL MINE CRP	BEAVER CREEK NO 4 UG	KNOTT	15028100	3	111	91
NATL MINE CRP	STINSON #2 UG	KNOTT	15026140	2	195	144
JOSEPH BROTHERS COAL CO	NO 14 MINE	LETCHER	15027090	2	16	8
PRATT BROTHERS COAL CO INC	SAPPHIRE #1 UG & PREP PLANT	LETCHER	15021510	3	54	47
SCOTIA COAL CO	D SEAM	LETCHER	15051830	3	14	22
STEARNS MINING CO	JUSTUS MINE	MCCREARY	15023630	3	385	400
MARTIN COUNTY COAL CORP	#1-C UG	MARTIN	15037520	3	539	109
MARTIN COUNTY COAL CORP	#1-S UG	MARTIN	15041940	4	276	119
BLUE DIAMOND COAL CO.	LEATHERWOOD	PERRY	15020820	3	972	956
BLAIR BROTHERS COAL CO	#2-C UG	PIKE	15026000	3	33	15
LICK FORK MINING CO INC	#1 UG	PIKE	15016460	2	27	15
LITTLE HACKNEY CREEK COAL CO	NO 32 MINE MI8436.20	PIKE	15025180	2	24	13
PIKEVILLE COAL CO	CHISHOLM UG & PREP PLANT	PIKE	15024550	4	793	285
F & R COAL CO INC	UTOPIA MINE	HOPKINS	15020240	4	83	40
ISLAND CREEK COAL CO	HAMILTON NO 1 MINE	UNION	15021290	5	1538	969
ISLAND CREEK COAL CO	OHIO NO 11 MINE	UNION	15031730	4	411	290

Table A.4 Industry Sample Mines

COMPANY	NAME OF MINE	COUNTY	MINE ID	SEAM CODE	ANNUAL TONS	(*1000) WORKHRS
NEW MEXICO						
KAISER STEEL CORP.	YORK CANYON #1 UG	COLFAX	29000950	5	529	384
OHIO						
CONSL COAL-CEN DIV	FRANKLIN #25 UG	HARRISON	33009630	4	771	773
CONSL COAL-CEN DIV	FRANKLIN HIGHWALL UG	HARRISON	33010650	4	273	202
PENNSYLVANIA						
PENN ALLEGH COAL CO INC	ALLEGHENY #2 UG	ALLEGHENY	36025810	3	531	155
BETHLEHEM MINES CORP	#32 UG	CAMBRIA	36008420	3	417	560
BUCKEYE COAL CO.	NEMACOLIN	GREENE	36009040	7	878	670
DUNKARD MINING CO	DUNKARD UG	GREENE	36013010	4	37	21
UNITED STATES STEEL CORP	ROBENA #1 - FRICK COAL DIST	GREENE	36009090	6	685	681
FLORENCE MINING CO	FLORENCE #1 BLACKLICK PORTAL	INDIANA	36009240	3	473	455
MEARS COAL INC	DIXON RUN #3 UG	INDIANA	36013590	2	117	55
MEARS COAL INC	M Y #1	INDIANA	36023960	2	37	21
CRESCENT HILLS COAL CO INC	CRESCENT HILLS	WASHINGTON	36035540	6	120	70
PITTSBURGH COAL CO	MONTOUR	WASHINGTON	36009660	4	1405	750
PARTNER COAL CO INC	GILMUR #1	WESTMORELAND	36023720	3	12	6
TENNESSEE						
GAY COAL INC	#5 UG	ANDERSON	40005490	3	29	20
OLIVER SPRINGS MINING CO INC	#3 UG	ANDERSON	40005130	5	169	76
GRUNDY MINING CO INC	#21 UG	MARION	40005240	2	390	217
PHILLIPS & WEST COAL CRP	NO 3 MINE UG	SCOTT	40005250	6	6	12
UTAH						
KAISER STEEL CORP.	SUNNYSIDE NO. 1	CARBON	42000930	8	1006	591
VIRGINIA						
JEWELL RIDGE COAL CORP.	#11 UG & PREP PLT	BUCHANAN	44002510	2	480	474
WHITED ALFRED COAL CO	MINE #2	BUCHANAN	44022390	3	24	23
HONEY CAMP COAL CO	NO 12 MINE	DICKENSON	44016530	5	43	25
CLINCHFIELD COAL CO	HURRICANE CREEK MINE	RUSSELL	44017730	7	306	113
APACHE BITUMINOUS COAL CO	#1 MINE UG	WISE	44013670	4	73	24
BIG STAR COAL CO	#1 UG	WISE	44034970	4	97	25
EASTOVER MINING CO	VIRGINIA #1 MINE	WISE	44002940	5	93	55
STEEL FORK MINING CO	NO 1 UG MINE	WISE	44002880	3	29	28
WESTMORELAND COAL CO	WENTZ #1B MINE UG	WISE	44003020	4	311	479
WEST VIRGINIA						
BADGER COAL CO INC	BADGER NO 14 UG	BARBOUR	46012540	5	332	251
BETHLEHEM MINES CORP	#105 UG	BARBOUR	46021770	5	260	148
DEXCAR QUEEN COAL CO INC	#12 UG	BARBOUR	46037680	5	46	16
CEDAR COAL CO	GRACE #2	BOONE	46025950	4	151	58
CEDAR COAL CO	ROBIN #3 UG	BOONE	46034880	5	139	53
HAWKS NEST MINING CO	DORIS MINE UG	FAYETTE	46025960	3	130	104
ISLAND CREEK COAL CO NORTHERN	ALPINE MINE UG	GRANT	46013080	4	320	292
ISLAND CREEK COAL CO NORTHERN	NORTH BRANCH	GRANT	46013090	6	880	577

COMPANY	NAME OF MINE	COUNTY	MINE ID	SEAM CODE	ANNUAL TONS	(*1000) WORKHRS
WEST VIRGINIA (CONTINUED)						
BUFFALO MINING CO	BUFFALO #5-A UG	LOGAN	46013770	3	304	298
S & M COAL CO	NO 2 MINE	LOGAN	46035120	3	40	15
ZAPATA COAL CRP	BETTY UG	LOGAN	46040430	4	50	37
BISHOP COAL CO	BISHOP #36 UG	MCDOWELL	46021540	4	198	230
EASTERN ASSOCIATED COAL CORP.	KEYSTONE #1 UG	MCDOWELL	46014040	4	652	930
EBONY COAL CO	#11-A UG	MCDOWELL	46007660	5	19	12
U S STEEL CORP	#4 UG	MCDOWELL	46014130	5	275	242
MOUNTAINEER COAL CO-CONSL COAL	CONSOL #9 UG	MARION	46014340	8	40	124
VALLEY CAMP COAL CO.	ALEXANDER UG	MARSHALL	46014400	5	536	344
C N & B COAL CO	D-424 UG	MINGO	46034010	5	23	12
GIBSON COAL CO	NO 1 MINE	MINGO	46034830	3	28	19
NORMA COAL MINING CRP	NORMA D-422	MINGO	46039670	4	32	17
BIG FORK COAL CO	NO 8 UG	NICHOLAS	46009250	3	66	37
SEWELL COAL CO	SEWELL #19 UG	NICHOLAS	46019310	2	56	45
WESTMORELAND COAL CO IMP SMOKE	QUINWOOD #7	NICHOLAS	46014740	3	365	333
AFFINITY MINING CO	KEYSTONE #5 UG	RALEIGH	46020670	3	222	399
FLAT TOP COLLIERY CORP	#3 MINE UG	RALEIGH	46014990	2	31	34
SLAB FORK COAL CO	#14 UG	RALEIGH	46021260	2	63	38
WESTMORELAND COAL CO	EASTGULF UG-WINDING GULF DIV	RALEIGH	46015130	3	243	312
BETHLEHEM MINES CORP	#108 UG	UPSHUR	46036870	4	306	91
WEBSTER COAL CO	#3 UG	WEBSTER	46037560	4	54	35
ITMANN COAL CO	ITMANN NO 2	WYOMING	46018850	3	161	222
MATOAKA MNG CO	KITCHEKAN #60-UG	WYOMING	46031480	3	105	102
RANGER FUEL CORP	BOLT #3-D UG	WYOMING	46015480	4	93	87
3-C COAL CO	#3 UG	WYOMING	46038130	3	31	10
WYOMING						
ENERGY DEVELOPMENT CO	VANGUARD #1 UG-IOWA PUBLIC SER	CARBON	48001680	6	407	143

Table A.4 Industry Sample Mines

Table A.5 Characteristics of Mines Visited During Project

Seam Height Range (In.)	Size of Mine by Annual Underground Work Hours (000)					
	51-100	101-250	251-500	501-750	751-1000	>1000
37 - 48		(2 mines)	X	X	X	
49 - 60	X		(2 mines)	X		
73 - 84			X			
85 - 96			X	X		X

APPENDIX B. SUMMARY OF FIELD VISITS

Field visits were made to a number of mines, mining companies, insurance carriers, state agencies, and other sources to obtain information used in the course of the project. This appendix contains a summary of these visits.

B.1 Mining Companies and Mines

A total of 13 mines and two mining companies were visited. The mines in the visit sample were selected as representative of the industry sample on the basis of geographical location, seam height, size of mine*, and mining method. Thus, each mine in the visit sample characteristically, rather than statistically, represented a group of mines in the industry population.

A company official at each mine in the visit sample was contacted by telephone to obtain consent to visit. The project objectives and information goals of the visit were explained to the official. Each telephone contact which resulted in an invitation to visit was followed up with a confirming letter to the official contacted. If the official denied permission to visit, a substitute mine with similar characteristics was selected from the industry sample.

Initial visits were made to the headquarters of two mining companies. The prime purposes of these visits were to: (1) assess the availability of detailed data relevant to injury compensation, (2) assess the willingness of mining companies to cooperate in the project, and (3) test procedures for collection of field data.

Contact was made with the operating vice-president at each mining company. Both companies are among the 10 largest domestic coal mining companies. Each company operates more than 20 mines in Ohio, Pennsylvania, Virginia, and West Virginia.

The format outlined above was followed in the initial telephone contact with each official, made one week prior to the visits. Each official expressed interest in the project, and a willingness to cooperate. However, during the

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*Annual production and workhours underground

visits, both officials expressed reluctance in divulging company records of payments for injury and disability. Both companies are self-insured and maintain internal records, by individual case, of injury and disability payments to employees. Each official reiterated an interest in the project goals and indicated that an injury cost index would serve a useful purpose within their respective companies. However, neither official was willing to approve access to detailed records, or to specific mines.

Each official recommended that a request for specific information regarding injury and disability payments be sent in a letter which will be reviewed by higher management for approval or denial. These letters were prepared and sent. A sample of the data requested is contained at the end of this appendix.

The experience gathered from the initial contacts was used to alter the requests made in subsequent contacts. The following general format was developed and followed during the initial telephone contact and during the visits:

- Discussion with the Safety Director and Mine Superintendent concerning reductions in section efficiency experienced at the time of and following an injury accident on a production section.
- Discussion with the Safety Director concerning investigative, retraining and replacement expenses associated with injury accidents.
- Analysis of section production reports for several shifts preceding and following the occurrence of specific injuries on the section to determine if production losses occurred as a result of the injury.
- Discussion with personnel responsible for administering medical claim and compensation payments to determine the availability of accident cost records, and to request access to these records.

Each member of the project team was instructed to frame the discussions concerning section efficiency in terms of three broad levels of injury degree:

- Injuries requiring only first-aid treatment at the mine
- Injuries requiring removal of the injured miner by other crew members for transport and treatment at a medical facility
- Accidents resulting in a fatality.

The discussion framework was used to elicit estimates for total work hours lost as a result of the accident, and total work hours required for investigation. The sample data form at the end of the Appendix was used as a guide.

A total of 11 mines (located in Illinois, Kentucky, Pennsylvania, Virginia, and West Virginia) approved a request to visit. The contact were made at the mine superintendent or vice-president level. The project objectives and the information being sought were explained during each telephone contact. The information requested was confined to company records and experience relevant to (1) the effect of injury and fatal accidents on the production performance of the section on which the accident occurred, and (2) indirect expenses incurred as a result of an accident. Access to records of medical and compensation costs was not requested during the telephone contacts as a result of the experiences during the initial field visits. The following paragraphs summarize the information obtained during the course of these visits.

- Production Losses Due to Injury Accidents

  Although specific estimates showed considerable variation, there was general agreement among the mines that a serious injury (stretcher/hospital case) or a fatality causes total stoppage in the section where the accident occurs, and has a disruptive effect on the remainder of the mine. Additionally, it is the policy at all of the mines to shut down for one work day following the occurrence of a fatality. The employees forfeit their pay for these shifts at all but one of the mines contacted. This custom is traditional among coal miners and is also contained in the 1974 UMWA wage agreement (Article XXII, Section k). This is obviously a major cost impact upon the company and the miners.

The majority of safety personnel interviewed estimated that shift production on a section where the injury or fatality occurred decreased by from 10% to 50% for some time after the accident, depending upon injury severity. The duration of this decrease was estimated at anywhere between one week and several months. As a check of these estimates, project team members requested samples of the daily reports from a section where an injury or fatality occurred, to examine shift production preceding and following the occurrence of specific injuries. These reports were obtained at three of the mines. The Safety Director at another mine allowed the team member access to the daily reports for two sections for a two-week period preceding and following six injury accidents and one fatal accident selected from the records of the Safety Director. The team member was permitted to record shift production, but could not obtain copies of the reports. Access to these records was refused at the other mines. The daily section reports obtained from three of the mines were used as the basis for the production loss algorithm. The data obtained from the fourth mine did not cover a large enough time period to be of value.

- Medical and Disability Compensation Costs

  Access to medical and compensation claim payments for on-the-job injuries was received at two mines. At each mine the team member obtained copies of the monthly reports of medical and compensation payments for each injury which occured during 1974 at the mine. These reports contain, for each active injury case, the amount paid by the company for medical expenses and wage compensation. The days of lost time and the nature of injury were also recorded in the reports.

  Requests for similar data were made at the other mines with the following results:

  - at two mines, the person contacted (either the supervisor of the compensation department, the mine manager, or the division manager) requested the team member to submit a written request to the next higher management level. These requests were sent and followup telephone contacts were made. One of the mines sent the data requested.
  - at four mines the team member was denied access to the company compensation records.

- at three mines the team member was informed that all medical bills and compensation claim records were forwarded to private insurance carrier or state workmen's compensation for payment, and copies of these records were not maintained in the company. At two mines the team member was referred to the insurance carrier agent (see Section B.2).

In summary, mining companies were reluctant to divulge records concerning accident-related costs to the project team members, or claimed that such records were maintained by the insurance carrier.

B.2 Private Insurance Carriers

Claims representatives of two private insurance carriers were contacted. One representative managed a claims office in Kentucky which carries compensation insurance for a number of small independent coal mining companies in the Eastern Kentucky area. This representative expressed willingness to provide copies of claim payment records to ESD, provided that a written request was submitted to and approved by the company president. A written request was submitted for sample copies of claims records to evaluate the utility of these records to the project. A reply to this request was not received.

The second claims representative managed a field office in Western Pennsylvania for the largest private insurer of underground coal mines in the U. S. The representative supplied cost data for underground mining injury claims. The data consisted of total medical and indemnity costs for a sample of 145 injury claims from Pennsylvania mining companies. The cause and type of injury were identified for each claim. All of the injuries occurred during 1973 and 1974 at underground mines.

B.3 MESA District Offices

Inspection supervisors were contacted and interviewed at the following MESA district offices:

- Johnstown, PA
- Morgantown, WV
- Vincennes, IN.

In each interview the team member established the resources expended for the official investigation of a fatal accident, as required by Title 30 of the Code of Federal Regulations. Samples of fatal accidents which occurred during 1974 at underground mines within the jurisdiction of each office were used as a basis for establishing the expenditure of resources, which include the following major elements:

- Time expenditure for the investigation by a team which usually includes three MESA inspectors, two state inspectors, one official of the UMWA, and one or more officials of the company.
- Lost time of each employee interviewed for information relevant to the accident.
- Lost time and production resulting from closure of the section in which the accident occurred (in some cases closure of the mine) following the issuance of an Imminent Danger Order.
- Time expenditure for preparation and approval of the official report; costs of reproducing and distributing the official report.

Each of the MESA inspectors contacted during these visits was extremely helpful in providing any information requested by the project team member. Copies of more than 40 fatal accident reports for 1974 were obtained, and these reports provided data for a number of areas in ACIM.

B.4 State Workmen's Compensation Commissions

Telephone contacts were made with the following agencies:

- Kentucky Department of Labor
- Pennsylvania Department of Labor and Industry, Bureau of Occupational Injury and Disease Compensation
- West Virginia Workmen's Compensation Commission.

Officials of the Pennsylvania and Kentucky agencies stated that no records or statistics relevant to coal mine accident costs were maintained because their states do not have a general workmen's compensation fund; all compensation insurance is carried by private insurers or administered by the coal mining companies. Each state maintains only special funds for certain occupational diseases, and for "second injury" cases.

Discussion with the Director of the West Virginia Workmen's Compensation Commission revealed that the original report of an industrial injury and subsequent claim payment records were maintained in separate files by individual company. Thus, attempting to extract the claim payment records and associate these records with nature of injury and job function would have required weeks of work. The Director did state that a project to implement a computerized compensation data management system was underway. When completed, the system will permit retrieval of the entire history of a specific claim. Unfortunately, the system was at least one year away from completion.

It was also learned that the Commission did not maintain summary records of claim payments by type of injury or job function. The Director referred the team member to the firm of Woodward and Fondiller, Inc., in New York City. This firm prepares the annual financial statement for the Commission and determines the rates to be charged for state compensation insurance. This firm was contacted by the team member (see Section B.6).

A visit was made to the Ohio Bureau of Workmen's Compensation. Discussion with the chief actuary for underground coal mines revealed that detailed statistics are available for the frequency and lost time by type of injury. However, the computer data base and listings of these statistics do not contain cross-reference to the data base which contain claim payment data. This data base is ordered by individual case number. Thus, examination of the records of individual cases is required to identify costs by type of injury. A sample of individual cases was requested for examination, but were not received in time for use in the project.

It was concluded from these discussions that historical data for compensation costs by type of injury and specific to underground coal mining was not readily available for use as a basis for computing these costs in ACIM.

B.5 Medical Facilities

The administrator of a major medical center in West Virginia was contacted to determine the availability of injury data. The medical center serves the area surrounding Morgantown, which includes a number of underground coal mines. No information of value was obtained from the contact. All medical and hospital records maintained by the Center are confidential, and cannot be examined without approval of the attending physician and the patient. This preservation of confidentiality is common practice in most areas of the country. The team member was provided with information such as daily room rates, cost per patient per day for meals, duty nurses, etc. This information was of little value to the project. Further telephone contacts were made with two medical facilities in Pennsylvania. These contacts confirmed that no data of value would be obtained. Based on these experiences, the project team decided to cease any further contacts with medical facilities.

B.6 Other Agencies

Two team members contacted the following agencies:

- National Council on Compensation Insurance (NCCI)
- New York State Rating Commission (NYSRC)
- Woodward and Fondiller, Inc.

The NCCI is cooperatively funded by state and private insurance companies in 29 states and chartered to determine the rate structures for compensation insurance by geographic area, industry, and other relevant factors. The Council maintains individual claim payment data for all industries, and uses these data to compute insurance rates.

The team members spoke with the senior statistical actuary, who agreed to provide ESD with the following data for 1974:

- Summary by state of medical compensation, and other costs by injury severity category* for underground coal mining injuries, and the number of injuries associated with each cost.
- Tabulation of each claim which composes the summary for the underground coal mining injuries of one state. This tabulation will include for each claim, the type of injury and the total payments for medical, compensation, and other expenses.

These data, summarized by degree of injury for more than 1800 underground coal mining accidents in Kentucky during 1970-1973, were subsequently received from the NCCI.

Further discussions with the officials of the Council were directed at determining if states other than California use a standard rate table for determining allowable medical compensation payments for treatment of traumatic injury. The team members were referred to an official of the NYSRC, who stated that of the coal mining states, only West Virginia used a standard table of rates to determine allowable medical fees.** The official provided the following publications to the team members:

- Medical rate schedule for workmen's compensation payments in New York State
- Table of allowable daily rates chargeable to the workmen's compensation fund for each hospital in New York State.

Although New York and California do not have coal mining industries, the medical rate schedules for these states, which express treatments in terms of relative units divorced from a dollar value, appeared to be a valid source for identifying specific types of injuries in terms of relative treatment units. Application of unit costs based on regional cost indexes to these treatments units was one alternative investigated for estimating medical costs for specific injuries.

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*As defined in U.S.A. Standard Z16.1-1967, "Method of Recording and Measuring Work Injury Experience"

**Telephone contact was made with the Director of the West Virginia Workmen's Compensation Commission to obtain a copy of the rate table. The Director stated that the use of the table has been discontinued.

Discussion was held with a general partner of the consulting firm of Woodward and Fondiller. The partner is in charge of preparing the annual report and rate schedules for the West Virginia Workmen's Compensation Commission. He stated that insurance companies, state commissions, and other agencies involved in setting rates or making payments for workmen's compensation do not, at present, have a requirement to maintain cost data in terms of specific type of injury or job function at time of injury because these data are of no practical use in assigning risk or determining rates. He referred to a "statistical plan" which sets industry standards for the types of statistics which the insurance industry maintains. At the present time this plan does not contain the type of statistics which ESD was seeking. He confirmed the statements of the senior actuary at the NCCI. To wit, rates are determined by cumulative claim payments to specific companies within the five traumatic injury categories defined in the ANSI Standard (see above). These claim payments are also summarized by type of industry and by state, but not by type of injury or job function.

REQUEST FOR INJURY ACCIDENT INFORMATION

(Base on recent experience at specific mine)

Mine: _____ Date: _____

1. Estimated total manhours required to investigate an injury accident and prepare and file accident reports (include time required of mine superintendent, foremen, safety personnel, clerks, etc.).

   a. Average manhours per accident involving a fatality ..... _____ Hrs.

   b. Average manhours per injury accident in which injured miner(s) requires hospitalization ..... _____ Hrs.

   c. Average manhours per injury accident in which injured miner(s) does not require hospitalization ..... _____ Hrs.

2. Estimated total manhours required per injury accident, to prepare and process paperwork for medical, wage and other compensation claims (if self-insured, do not include time required to actually issue and maintain records of payments).

   a. Average manhours per accident involving a fatality ..... _____ Hrs.

   b. Average manhours per injury accident in which injured miner(s) requires hospitalization ..... _____ Hrs.

   c. Average manhours per injury accident in which injured miner(s) does not require hospitalization ..... _____ Hrs.

3. Estimated total manhours lost by section personnel other than victim when an injury accident occurs (paid time lost by miners whose work is stopped as a result of the accident)

   a. Average total manhours per accident involving a fatality ..... _____ Hrs.

   b. Average total manhours per injury accident in which injured miner(s) requires hospitalization ..... _____ Hrs.

   c. Average total manhours per injury accident in which injured miner(s) does not require hospitalization ..... _____ Hrs.

4. Estimated total manhours required to train a replacement for an injured miner

   a. Average manhours for temporary replacement ..... _____ Hrs.

   b. Average manhours for permanent replacement ..... _____ Hrs.

5. Estimated cost (excluding training cost) for replacing an injured miner (e.g., hiring cost, cost of shifting men, etc.)

   a. Average cost for temporary replacement .....$_____

   b. Average cost for permanent replacement .....$_____

6. Estimated total cost per injury accident for administering first-aid to injured miner(s) at time of accident and for subsequent company-administered treatments ..... $_____

7. Number of miners employed by job title in a mine section

No. of Miners	Occupation Title
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

APPENDIX C. MEDICAL TREATMENT STUDY

C.1 Introduction

This appendix contains the study performed by the medical consultant to the ACIM project to relate HSAC injury categories to the medical resources that would typically be employed in the initial treatment and followup repair of the injuries. The basis for assigning cost-relatable values for medical treatment resources was the 1974 revision of the California Relative Value Studies* (74CRVS), a comprehensive study of relative medical costs in California published by the California Medical Society. The CRVS was selected as the basis for expressing medical resources in relative terms because:

(1) the CRVS is the most comprehensive work of its kind presently available

(2) a number of insurance carriers and state workmen's compensation agencies use the CRVS as the basis for establishing medical payment schedules

(3) the values used for medical treatments are in terms of relative resource units within specific areas of medical procedure, thus providing a common base for comparison of medical costs among different injury categories

(4) unit values are not expressed in dollars, thus permitting the application of regional cost factors to adjust costs for different coal mining areas.

The study was performed by Edgar G. LaVeque, M.D., who currently practices medicine in Los Gatos, CA. Dr. LaVeque is an active member of the Committee on California Relative Value Studies.

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* Reference 30, Section 7

C.2 Scope of the Study

Medical resources were developed for each of three degrees of injury damage which are termed minor, typical, and major, in each of 61 injury categories. These categories contained the highest frequencies of occurrence in the 1974 CAIF. An injury scenario was postulated for each category and degree of damage, and the scenario was used to develop a treatment scenario. The medical resources (in terms of 74CRVS codes, hospitalization, and followup treatments) were determined, based on the scenarios. The resources apply only to the treatment and followup required to repair the immediate injury. Medical care and treatment in cases of aggravated injury and continual treatment for complications arising from the immediate injury are not included. Additionally, certain assumptions and restrictions, as noted in Section C.3, have been applied to the scope of the study. The study results are contained in Section C.4

C.3 Assumptions and Restrictions

Application of the 1974 revision of the 1969 California Relative Value Studies (74CRVS) in the following report is an effort to develop a Model Treatment System (MIS) related to a very specific set of medical circumstances. In order to prevent misinterpretation of the MIS, it is necessary to understand the parameters which make up each unit of the system.

1. MIS applies to industrial injuries occurring during underground mining.
2. Three levels of injury are defined for each specific type of injury (except amputations): minor, typical, and major.
3. In each case, no other injury would have occurred. This is, of course, unusual in some injuries.
4. All injured persons are assumed to have no prior medical disease which prevents usual recovery, and no unusual complications are considered.
5. All treatment is initiated in the outpatient (Emergency) Department of a hospital.

6. When admission to a hospital is indicated, all routine in-hospital diagnostic laboratory studies and x-rays which are not specific to the injury in question are ignored. One must assume in evaluating hospital costs that itemization of these costs has been eliminated.
7. Occasionally, general anesthesia will be assumed to be required for repair of a specific injury. Laboratory studies usually performed prior to such anesthesia are a complete blood count (CBC), CRVS85022, and a urinalysis, routine, CRVS81000. For convenience, these have been grouped and reported as CRVS89005. The requirement by some institutions of an electrocardiogram (EKG) and a chest x-ray as a prerequisite for general anesthesia is not considered in this study.
8. Followup visits as indicated may be included as part of the initial cost in some procedures (see Surgery Ground Rules, page 46, 74CRVS).
9. Occasionally, a single CRVS procedure will occur more than one time for the treatment of an injury. These procedures will be noted by a prefix ( ), such as in the case of multiple hospital visits (4) 90250, indicating four (4) followup hospital visits.

C.4 Injury and Treatment Scenarios

This section contains the scenarios of each injury and treatment used as the basis for medical costs in ACIM. The section is divided into subsections by the general nature of injury. The HSAC code for nature of injury is in parentheses following the subsection title. The HSAC code for part of body precedes the name of the body part. The entries for each scenario are as follows:

Injury: A description of the injury. The degree of injury is noted in parentheses preceding the description.

CRVS: The codes for the treatments administered, from the 74 CRVS. A number in parentheses preceding a code indicates a treatment replication.

Hospital: The number of days of in-patient care in a nursing unit.

Follow-up: The number of days of out-patient follow-up care.

Volume II contains a listing of the total number of CRVS treatment units for each injury and the procedure for updating these values.

C.4.1 Amputation (100)

340 Finger

Injury: (Typical) amputation of index finger through proximal phalanx at mid-shaft

CRVS: 26951 26951-81 26951-30 00004 73130 89005

Hospital: 1-2 Follow-up: 45

330 Hand

Injury: (Typical) amputation of hand at level of carpal bones with distal fragment destroyed in accident.

CRVS: 25920 25920-80 25920-30 00006 89005 73090

Hospital: 5 Follow-up: 90

313 Arm at elbow

Injury: (Typical) loss of arm at level of elbow joint requiring supracondylar amputation.

CRVS: 24900 24900-80 24900-30 00006 73060 71020 89005

Hospital: 7 Follow-up: 90

540 Toe

Injury: (Typical) loss of great toe (hallux) at metatarso-phalangeal joint.

CRVS: 28820 28820-81 28820-30 00004 73630 89005

Hospital: 2 Follow-up: 90

530 Foot

Injury: (Typical) injury to foot at ankle requiring amputation above ankle joint.

CRVS: 27880 27880-80 27880-30 00008 73610 71020 89005 97520 (2)97521

Hospital: 7 days Follow-up care: 120

513 Leg at knee

Injury: (Typical) loss of leg to knee requiring supracondylar femoral amputation.

CRVS: 27590 27590-80 27590-30 00008 73550 71020 89005 97520 (6)97521

Hospital: 10 Follow-up: 120

C.4.2 Burn or Scald - Heat (120)

148 Face

Injury: (Minor) - first degree burn requiring minimal dressing or no dressing.

CRVS: 90510 90540

Hospital: None Follow-up: 7

148 Face

Injury: (Typical) First and second degree burns of face.

CRVS: 16025 90510 (3)90540

Hospital: 1 Follow-up: 10

148 Face

Injury: (Major) first, second and third degree burns requiring skin graft reconstruction to area of forehead.

CRVS: 90290 16014 (4)16025 15120 15120-81 15120-30 00006 89005 71020

Hospital: 10 Follow-up: 45

330 Hand

Injury: (Minor) first degree burn requiring temporary dressing only.

CRVS: 16000 90510

Hospital: None Follow-up: None

330 Hand

Injury: (Typical) first and second degree burn

CRVS: (3)16020

Hospital: None Follow-up: 14

330 Hand

Injury: (Major) second and third degree with loss of skin from dorsum (back) of hand requiring skin grafting.

CRVS: 16010 16010-30 00003 (2)16025 15240 15240-30 00006 89005

Hospital: 7 Follow-up: 120

430 Chest

Injury: (Minor) first degree only, upper half of front of chest.

CRVS: 16000 90510

Hospital: None Follow-up: none.

430 Chest

Injury: (Typical) first and second degree of half of chest.

CRVS: (2) 16025 90540

Hospital: None Follow-up: 14

430 Chest

Injury: (Major) second and third degree of back of chest (18% body surface or more) with shock and loss of at least 1/2 of skin in burned area requiring repeated skin grafts to cover wounds.

CRVS: 90515 89005 86068 86069 71020 16014 16014-80 16014-38 00006 (2)16030 15100 15100-80 (5)15101 15100-30 00007

Hospital: 26 days, 5 days ICU* Follow-up: 180

C.4.3 Burn Chemical (130) (Example used is in form of an acid.)

148 Face

Injury: (Minor) superficial irritation only.

CRVS: 90510

Hospital: None Follow-up: none.

148 Face

Injury: (Typical) erythematous changes requiring topical treatment, dressing and follow-up visit.

CRVS: 90510 90540

Hospital: None Follow-up: 2

148 Face

Injury: (Major) extensive skin destruction requiring late debridement and grafting of skin.

CRVS: 90510 (3)16020 15120 15120-80 15120-30 00006 89005

Hospital: 5 Follow-up: 45

330 Hand

Injury: (Minor) superficial irritation only.

CRVS: 90500

Hospital: None Follow-up: none.

330 Hand

Injury: (Typical) erythematous changes requiring topical treatment/dressing and follow-up visit.

CRVS: 90510 16000 90540

Hospital: None Follow-up: 5

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*Intensive care unit. One day of ICU taken as equivalent to two days in a nursing unit.

330 Hand

Injury: (Major) loss of skin requiring debridement and skin graft.

CRVS: (3)16020 15100 15100-81 15100-30 00004

Hospital: 5 Follow-up: 45

430 Chest

Injury: (Minor) superficial irritation only.

CRVS: 90500

Hospital: None Follow-up: None

430 Chest

Injury: (Typical)erythematous changes requiring topical treatment and dressing and follow-up visit.

CRVS: 90510 16000 90500

Hospital: None Follow-up: 3

430 Chest

Injury: (Major) destructive changes requiring their excision and skin grafting.

CRVS: (3)16025 15100 15101 15100-81 15101-81 15100-30 00006

Hospital: 5 Follow-up: 45

C.4.4 Concussion (140)

110 Brain

Injury: (Minor) no loss of consciousness, headache, dizziness.

CRVS: 90510

Hospital: None Follow-up: None

140 Brain

Injury: (Typical) brief loss of consciousness, headache, nausea, weakness.

CRVS: 90510 90200 90250 89005 70260 76500

Hospital: 2 Follow-up: 7

140 Brain

Injury: (Major) Loss of consciousness for more than one hour, but with no evidence of intra cranial hemorrhage; and with return of all functions within 24 hours.

CRVS: 90510 90215 (7)90250 89005 70260 76500 90550

Hospital: 7 days Followup: 30
(2 days ICU)

C.4.5 Contusion, crushing, bruise (160) - intact skin surface

150 Scalp

Injury: (Minor) small area requiring exam only for evaluation

CRVS: 90510

Hospital: None Followup: None

150 Scalp

Injury: (Typical) Associated with moderate cephalohematoma.

CRVS: 90510

Hospital: None Followup: None

150 Scalp

Injury: (Major) Large hematoma, concern with skull fracture (none found) and requiring pressure dressings, ice packs to control subcutaneous bleeding. Observe in hospital one day.

CRVS: 90510 (3)90540 70260 90200

Hospital: 1 Followup: 21

310 Arm

Injury: (Minor) Soft tissue bruising only

CRVS: 90510

Hospital: None Followup: None

310 Arm

Injury: (Typical) Skin bruising, slight swelling of muscle mass, x-ray required to rule out fracture.

CRVS: 90510 90530 73090

Hospital: None Followup: 14

310 Arm

Injury: (Major) Marked swelling due to extensive muscle injury. X-ray negative for fracture, but release by fasciotomy required.

CRVS: 90510 89005 73090 25020 25020-30 00004

Hospital: 8 Followup: 30

330 Hand

Injury: (Minor) Superficial bruising with no loss of function or swelling.

CRVS: 90500

Hospital: None Followup None

330 Hand

Injury: (Typical) Superficial bruising with swelling and ecchymosis, fracture suspected but not found.

CRVS: 90510 73120

Hospital: None Followup: None

330 Hand

Injury: (Major) Severe swelling with circulation in doubt. Requiring hospital observation.

CRVS: 90510 73120 90200 90250 89005

Hospital: 2 Followup: 21

340 Finger

Injury: (Minor) Subungual hematoma only

CRVS: 90500

Hospital: None Followup: None

340 Finger

Injury: (Typical) Above, plus swelling of entire finger.

CRVS: 90500 73140

Hospital: None Followup: None

340 Finger

Injury: (Major) Severe bruising in addition to above, with concern about skin viability.

CRVS: 90510 73140 90540

Hospital: None Followup: 21

450 Shoulder

Injury: (Minor) No loss of function, bruise only.

CRVS: 90500

Hospital: None Followup: None

450 Shoulder

Injury: (Typical) Loss of function (temporary) due to pain.

CRVS: 90510 73030

Hospital: None Followup: None

450 Shoulder

Injury: (Major) Severe injury to muscle, resulting in limited motion (frozen shoulder) and requiring extensive physical therapy.

CRVS: 90510 73030 90200 90250 97100 (12)97101 (6)90548

Hospital: 2 Followup: 21

510 Leg

Injury: (Minor) Ecchymosis only.

CRVS: 90500

Hospital: None Followup: None

510 Leg

Injury: (Typical) Pain,ecchymosis, muscle spasm.

CRVS: 90510

Hospital: None Followup: None

510 Leg

Injury: (Major) Deep hemmorrhage requiring fasciotomy of anterior and posterior compartments. No fracture. No vessel or nerve damage.

CRVS: 90510 27602 27602-81 27602-38 00006 89005 73590 81000

Hospital: 10 Followup: 60

C.4.6 Cut, Laceration, Puncture, Open Wound (170)

150 Scalp

Injury: (Minor) Simple suturing of small scalp laceration.

CRVS: 90500 12001 90530

Hospital: None Followup: 7

150 Scalp

Injury: (Typical) Simple suturing of 2.5-7.5 cm laceration.

CRVS: 90500 12002 90530

Hospital: None Followup: 7

150 Scalp

Injury: (Major) Extensive laceration (partial avulsion) requiring debridement and closure in layers.

CRVS: 90510 12036-28 70260

Hospital: 2 Followup: 14

310 Arm

Injury: (Minor) Small (less than 2.5 cm) superficial lacteration.

CRVS: 90500 12001 90530

Hospital: None Followup: 7

310 Arm

Injury: (Typical) Deep laceration, no arteries, tendons or nerves involved.

CRVS: 90500 12002 90530

Hospital: None Followup: 10

310 Arm

Injury: (Major) Deep irregular laceration(s) requiring anesthesia for complex repair and debridement.

CRVS: 13121 13121-30 00004 90540 90530

Hospital: 1 Followup: 21

330 Hand

Injury: (Minor) Skin only, dorsum of hand.

CRVS: 90500 12001 90530

Hospital None Followup: 7

330 Hand

Injury: (Typical) 1-2 inch laceration, no tendons or nerves involved

CRVS: 90500 12002 90530

Hospital: None Followup: 7

330 Hand

Injury: (Major) Laceration of palm with tendon severed. Repaired by delayed technique due to contamination of original wound.

CRVS: 90500 12002 90530 26350 26350-81 26350-30 00004

Hospital: 3 Followup: 45

340 Finger

Injury: (Minor) Pad of finger only

CRVS: 90500 12001 90530

Hospital: None Followup: 7

340 Finger (Typical) Large laceration of finger, tendon intact.

CRVS: 90500 12001 90530

Hospital: None Followup: 10

340 Finger

Injury: (Major) Tendon severed, requiring delayed tendon repair after normal wound healing.

CRVS: 90500 12001 90530 26350 26350-81 26350-30 00004

Hospital: 3 Followup: 45

450 Shoulder

Injury: (Minor) Small (less than 2.5 cm) skin only
CRVS: 90500 12001 90530
Hospital: None Followup: 7

450 Shoulder

Injury: (Typical) (7.5 to 12.5) Large laceration - skin only
CRVS: 90500 90530 12004
Hospital: None Followup: 10

450 Shoulder

Injury: (Major) Deep wound with laceration of biceps tendon and joint capsule
CRVS: 20800 20800-80 20800-30 00008
Hospital: 5 Followup: 45

510 Leg

Injury: (Minor) Small (less than 2.5 cm) skin only
CRVS: 90500 12001 90530
Hospital: None Followup: 7

510 Leg

Injury: (Typical) Large (7.5 - 12.5 cm) laceration involving fascia and muscle; no tendon, artery or nerve.
CRVS: 12034
Hospital: None Followup: 14

510 Leg

Injury: (Major) Large laceration with repair of severed femoral artery and requiring transfusion because of blood loss.
CRVS: 37460 12037 37460-30 00008 89005 86068 86069
Hospital: 7, ICU 1 day, Followup: 45

C.4.7 Dislocation (190)

141 Jaw

Injury: (Minor) Sponateous reduction.
CRVS: 90510 70100
Hospital: None Followup: none

141 Jaw

Injury: (Typical) Reduced without anesthesia; no soft tissue or dental damage.
CRVS: 90510 70100 21480 90530
Hospital: None Followup: 7

141 Jaw

Injury: (Major) Reduced under anesthesia and requiring jaw wiring for stability.

CRVS: 70100 21455 21455-80 21455-30 00006 89005

Hospital: 4 Followup: 45

313 Elbow

Injury: (Minor) Immediately reduced without anesthesia; no significant swelling or loss of motion.

CRVS: 90510 24600 73070

Hospital: None Followup: 7

313 Elbow

Injury: (Typical) Anesthesia required for reduction. Considerable swelling. Observed for circulatory function, posterior splint applied.

CRVS: 24605 24605-30 00001 89005 73080

Hospital: 2 Followup: 45

313 Elbow

Injury: (Major) Open reduction required.

CRVS: 24615 24615-80 24615-30 00004 89005 73080 73070

Hospital: 5 Followup: 45

320 Wrist

Injury: (Minor) Incomplete dislocation (subluxation) not requiring manipulation.

CRVS: 90510 73100

Hospital: None Followup: None

320 Wrist

Injury: (Typical) Distal radio-ulnar dislocation. Post-reduction splint or cast required.

CRVS: 25675 73110 25675-30 00001 89005

Hospital: 2 Followup: 30

320 Wrist

Injury: (Major) Open reduction and soft tissue repair, tendons intact.

CRVS: 25670 25670-80 25670-30 00004 89005

Hospital: 5 Followup: 60

340 Finger

Injury: (Minor) Dislocation at proximal inter-phalangeal joint.

CRVS: 90510 26770 73140

Hospital: None Followup: 10

340 Finger

Injury: (Typical) Dislocation at the metacarpal-phalangeal joint.

CRVS: 90510 26700 73140

Hospital: None Followup: 30

340 Finger

Injury: (Major) Open compound wound with dislocation at meta-carpal-phalangeal joint.

CRVS: 26710 26710-30 00003 73120 89005

Hospital: 2 Followup: 45

513 Knee

Injury: (Minor) Patellar dislocation reduced without anesthesia.

CRVS: 90510 27560

Hospital: None Followup: 7

513 Knee

Injury: (Typical) Knee dislocation requiring anesthesia for reduction.

CRVS: 27552 27552-30 00002 73570 89005

Hospital: 3 Followup: 45

513 Knee

Injury: (Major) Same as above, but with need for delayed repair of torn knee cartilage.

CRVS: 27552 27552-30 00002 73570 73580 89005 27332 27332-80 28332-30 00006

Hospital: 12 Followup: 60

520 Ankle

Injury: (Minor) Incomplete dislocation, reduced without anesthesia.

CRVS: 90510 73600 27840 90530

Hospital: None Followup: 7

520 Ankle

Injury: (Typical) Complete dislocation, no soft tissue injury.

CRVS: 27842 27842-30 00003 89005 73610

Hospital: 3 Followup: 45

520 Ankle

Injury: (Major) Open reduction with soft tissue repair.
CRVS: 27846 27846-80 27846-30 00006 89005 73610
Hospital: 7 Followup: 60

C.4.8 Fracture (210)

160 Skull

Injury: (Minor) Undisplaced fracture of zygomatic arch.
CRVS: 90510
Hospital: None Followup: None

160 Skull

Injury: (Typical) Linear undisplaced fracture of parietal bone.
CRVS: 90510 70260 76500 90200 90250
Hospital: 2 Followup: 21

160 Skull

Injury: (Major) Depressed skull fracture, comminuted, with brain damage.
CRVS: 62010 62010-80 62010-39 00012 89005 70260 75635 76500 86068 (2)86069 71020
Hospital: 30, ICU 10; Followup: 180

315 Forearm

Injury: (Minor) Incomplete fracture of radius.
CRVS: 90510 73090 29060 25500
Hospital: None Followup: 30

315 Forearm

Injury: (Typical) Closed reduction of radial fracture, anesthesia required.
CRVS: 25504 25504-30 00002 73090 89005 (2)73090
Hospital: 1 Followup: 45

315 Forearm

Injury: (Major) Compound fracture midshaft of radius and ulna
CRVS: 25574 25574-80 25574-38 00006 89005 (4)73090

141 Jaw

Injury: (Minor) Undisplaced, incomplete fracture.

CRVS: 90510 21450 70110 90530

Hospital: None Followup: 10

141 Jaw

Injury: (Typical) Displaced, requiring jaw wiring.

CRVS: 21455 21455-80 21455-30 00006 70110 89005

Hospital: 2 Followup: 90

141 Jaw

Injury: (Major) Open reduction or fragmented mandible with loss of numerous teeth.

CRVS: 21470 21470-80 21470-38 00008 89005 71020 70110

Hospital: 14, ICU 3 Followup: 90

313 Elbow

Injury: (Minor) Undisplaced fracture of radial head.

CRVS: 24650 29105 90510 (3)90530 (2)73070

Hospital: None Followup: 30

313 Elbow

Injury: (Typical) Supracondylar fracture, displaced.

CRVS: 24535 24535-30 00003 89005 (4)73080

Hospital: 2 Followup: 90

313 Elbow

Injury: (Major) Supracondylar fracture, comminuted, requiring internal fixation.

CRVS: 24545 24545-80 24545-30 00008 89005 (4)73080

Hospital: 10 Followup: 90

320 Wrist

Injury: (Minor) Undisplaced (minimal displacement) fracture of distal radius.

CRVS: 25600 29070 90510 (2)73100

Hospital: None Followup: 30

320 Wrist

Injury: (Typical) Colle's fracture.

CRVS: 25604 25604-30 00002 89005 (3)73110

Hospital: None Followup: 45

320 Wrist

Injury: (Major) Severely compound, comminuted fracture of distal radius.

CRVS: 25620 25620-80 25620-30 00006 89005 (4)73110

Hospital: 6 Followup: 120

340 Finger

Injury: (Minor) Undisplaced or "chip" fracture.

CRVS: 26750

Hospital: None Followup: None

340 Finger

Injury: (Typical) Proximal phalangeal fracture.

CRVS: 26725 (2)73140

Hospital: None Followup: 30

340 Finger

Injury: (Major) Compound, comminuted, requiring skeletal fixation.

CRVS: 26735 73140 26735-30 00004 26735-81 89005

Hospital: 2 Followup: 90

513 Knee

Injury: (Minor) Incomplete fracture of lateral plateau, treated in a splint.

CRVS: 27530 90510 (2)73560

Hospital: None Followup: 30

513 Knee

Injury: (Typical) Supracondylar femoral fracture, closed.

CRVS: 27501 (3) 73570 27501-30 00004 89005

Hospital: 3 Followup: 120

513 Knee

Injury: (Major) Lateral or medial femoral condyle fracture requiring internal fixation (plate or screw).

CRVS: 27514 27514-80 27514-30 00008 89005 (4)73570

Hospital: 14 Followup: 120

520 Ankle

Injury: (Minor) Undisplaced, lateral malleolus.

CRVS: 27786 29425 (3)73610

Hospital: None Followup: 45

520 Ankle

Injury: (Typical) Medial malleolus, with displacement.

CRVS: 27762 (3)73610

Hospital: None Followup: 45

520 Ankle

Injury: (Major) Bimalleolar fracture, requiring open reduction, and internal fixation (screws).

CRVS: 27814 27814-80 27814-30 00008 89005 (4)73610 29355

Hospital: 7 Followup: 120

430 Chest

Injury: (Minor) Undisplaced rib fracture, single rib.

CRVS: 90510 71100

Hospital: None Followup: None

430 Chest

Injury: (Typical) Fracture of three ribs lateral undisplaced.

CRVS: 90510 71100

Hospital: None Followup: None

430 Chest

Injury: (Major) Crushed, flail chest with respiratory difficulty requiring tracheostomy and use of pulmonary ventilator (Emerson or Bennett) for up to six weeks.

CRVS: 90290 93000 71110 32015 89005 86068 (2)83069 (5)82803 (37)90250 (5)85022 (7)71020

Hospital: 40 ICU Followup: 90

440 Hip

Injury: (Minor) Undisplaced fragment of the greater trochanter.

CRVS: 90510 27248 (3)73570

Hospital: None Followup: 45

440 Hip

Injury: (Typical) Internal (nail) fixation of fracture of neck with displacement

CRVS: 27236 27236-80 27236-30 00008 89005 86068 (3)86069 (2)73510 71010 82803

Hospital: 14 Followup: 180

440 Hip

Injury: (Major) Comminuted fracture of neck and shaft, requiring open reduction and prosthesis.

CRVS: 27236 27236-80 27236-30 00012 89005 86068 (3)86069 (2)82803 (4) 73510 71010

Hospital: 14, ICU 2; Followup: 180

515 Lower Leg

Injury: (Minor) Fibular fracture, proximal end

CRVS: 90510 27780 29355 (2)73590

Hospital: None Followup: 28

515 Lower Leg

Injury: (Typical) Fracture of shaft of tibia, closed

CRVS: 27752 (3)73590 27752-30 00002 89005 29355

Hospital: 3 Followup: 90

515 Lower Leg

Injury: (Major) Tibia and fibula, compound, comminuted fracture requiring skeletal fixation.

CRVS: 27804 27804-80 27804-30 00005 89005 29340 29355 (4)73590 82803

Hospital: 10 Followup: 120

530 Foot

Injury: (Minor) "March" fracture or base of 5th metatarsal.

CRVS: 90510 28470 29425 (2)73620

Hospital: None Followup: 30

530 Foot

Injury: (Typical) Displaced metatarsal fracture.

CRVS: 28475 (2)73620 29400 29440

Hospital: None Followup: 45

530 Foot

Injury: (Major) Oscalcis (heel) requiring reduction and skeletal fixation.

CRVS: 28406 28406-80 28406-30 89005 00004 29405 (2)73630 (3)73650

Hospital: 5 Followup: 120

C.4.9 Scratches, Abrasions (superficial wounds) (300)

150 Scalp

Injury: (Minor) Superficial, no treatment beyond first-aid.

CRVS: 90500

Hospital: None Followup: None

150 Scalp

Injury: (Typical) Requires careful cleansing and removal of dirt particles from scalp.

CRVS: 90510

Hospital: None Followup: None

150 Scalp

Injury: (Major) As above, but severe enough to need to rule out a skull fracture.

CRVS: 90510 70250 90530

Hospital: None Followup: 7

310 Arm

Injury: (Minor) "Band-aid" type treatment needed.

CRVS: 90500

Hospital: None Followup: None

310 Arm

Injury: (Typical) Requires cleansing, ointment, dressing.

CRVS: 90510

Hospital: None Followup: None

310 Arm

Injury: (Major) Extensive skin area abrasions; rule out fracture.

CRVS: 90510 73090

Hospital: None Followup: None

330 Hand

Injury: (Minor) "Skinned knuckles"

CRVS: 90500

Hospital: None Followup: None

330 Hand

Injury: (Typical) Abrasion of dorsum of hand

CRVS: 90510

Hospital: None Followup: None

330 Hand

Injury: (Major) Palm of hand, partial loss of skin (superficial)

CRVS: 90510 73120 90530

Hospital: None Followup: 7

340 Finger

Injury: (Minor) "skinned knuckles"

CRVS: 90500

Hospital: None Followup: None

340 Finger

Injury: (Typical) Dorsum of multiple fingers

CRVS: 90510

Hospital: None Followup: None

340 Finger

Injury: (Major) Dorsum of multiple fingers with associated swelling.

CRVS: 90510 73140

Hospital: None Followup: None

450 Shoulder

Injury: (Minor) Small superficial abrasion

CRVS: 90500

Hospital: None Followup: None

450 Shoulder

Injury: (Typical) Posterior shoulder 4-5 inch area

CRVS: 90510

Hospital: None Followup: None

450 Shoulder

Injury: (Major) Most of shoulder area, considerable swelling. Rule out fracture.

CRVS: 90510 73020 90530

Hospital: None Followup: 7

510 Leg

Injury: (Minor) Skinned knee

CRVS: 90500

Hospital: None Followup: None

510 Leg

Injury: (Typical) "Strawberry" of lower leg

CRVS: 90510

Hospital: None Followup: None

510 Leg

Injury: (Major) Entire leg, with moderate swelling

CRVS: 90510 73590 90540

Hospital None Followup: 7

C.4.10 Sprain, Strains (310)

141 Jaw

Injury: (Minor) Negative findings except pain

CRVS: 90500

Hospital: None Followup: None

141 Jaw

Injury: (Typical) Localized tenderness, good motion

CRVS: 90510 70100

Hospital: None Followup: 3

141 Jaw

Injury: (Major) Swelling, tenderness, limited motion

CRVS: 90510 90530 70110

Hospital: None Followup: 3

313 Elbow

Injury: (Minor) No swelling, full motion

CRVS: 90500

Hospital: None Followup: None

313 Elbow

Injury: (Typical) Slight swelling, pain on full motion

CRVS: 90510

Hospital: None Followup: None

313 Elbow

Injury: (Major) Swollen, limited motion, pain at rest

CRVS: 90510 73080 27105 90530

Hospital: None Followup: 21

320 Wrist

Injury: (Minor) No swelling, full motion

CRVS: 90500

Hospital: None Followup: None

320 Wrist

Injury: (Typical) Slight swelling, pain on full motion

CRVS: 90510

Hospital: None Followup: None

320 Wrist

Injury: (Major) Very swollen, limited motion, pain at rest

CRVS: 90510 73110 29125 90540

Hospital: None Followup: 14

340 Finger

Injury: (Minor) No swelling, full motion

CRVS: 90500

Hospital: None Followup: None

340 Finger

Injury: (Typical) Swelling moderate, pain on full motion

CRVS: 90500 73140

Hospital: None Followup: None

340 Finger

Injury: (Major) Swelling severe, limited motion, pain at rest

CRVS: 90510 73140 90530

Hospital: None Followup: 10

513 Knee

Injury: (Minor) No swelling, full motion

CRVS: 90500

Hospital: None Followup: None

513 Knee

Injury: (Typical) Swollen, full motion, no effusion

CRVS: 90510 29505 73570 90540

Hospital: None Followup: 14

513 Knee

Injury: (Major) Swollen, with effusion (bloody) torn medial meniscus.

CRVS: 90510 29525 73570 27332 27332-80 27332-30 00006 89005

Hospital: 7 Followup: 60

520 Ankle

Injury: (Minor) No swelling, full motion

CRVS: 90500

Hospital: None Followup: None

520 Ankle

Injury: (Typical) Swelling; partial motion; moderate pain

CRVS: 90510 73610 90530

Hospital: None Followup: 14

520 Ankle

Injury: (Major) Major swelling, ecchymosis; limited motion

CRVS: 90510 73610 29425 90540

Hospital: None Followup: 21

420 Back

Injury: (Minor) Full range of motion, no spasm

CRVS: 90510

Hospital: None Followup: None

420 Back

Injury: (Typical) Limited motion, paraspinous muscle spasm, pain limited to back.

CRVS: 90510 72110 (3)97100

Hospital: None Followup: 7

420 Back

Injury: (Major) Limited motion, pain radiating to leg; findings of acute ruptured disc syndrome.

CRVS: 90215 72110 89005 (6)90250 72250 62284 63030 63030-80 63030-30 00008

Hospital: 14 Followup: 180

C.4.11 Dermatitis (180)

Injury: (Minor) Mild poison oak (ivy) dermatitis.

CRVS: 90500

Hospital: None Followup: None

Injury: (Typical) Atopic excema, contact dermatitis.

CRVS: 90500

Hospital: None Followup: None

Injury: (Major) Weeping exfoliative (allergic) contact dermatitis.

CRVS: 90510 (3)90540

Hospital: None Followup: 21

C.4.12 Electric Shock (200)

Injury: (Minor) No injury noted.

CRVS: 90500

Hospital: None Followup: None

Injury: (Typical) Momentary "tingling" and weakness of arm.

CRVS: 90510

Hospital: None Followup: None

Injury: (Major) Collapse, cardiac arryhthmia, may require cardiopulmonary resuscitation.

CRVS: 90220 (2)99040 (2)90295 (5)90250 (3)93000 71010 89005 80116 (3)80104 (3)90540

Hospital: ICU 2, 7 Followup: 30

C.4.13 Environmental Heat (Heat Stroke, Cramps, etc.)(240)

Injury: (Minor) Leg cramps

CRVS: 90510

Hospital: None Followup: None

Injury: (Typical) Miner's cramps, abdominal and muscle spasm and weakness.

CRVS: 90510

Hospital: None Followup: None

Injury: (Major) "Heat stroke," collapse, requiring intravenous fluid replacement and electrolyte replacement and balance.

CRVS: 90220 (2)90250 89005 80104 82803 93000 71010

Hospital: 7 Followup: 21

C.4.14 Systemic Poisoning (270)

Injury: (Minor) Carbon monoxide or methane inhalation without loss of function (known exposure, no symptoms).
CRVS: 90510
Hospital: None Followup: None

Injury: (Typical) Methane inhalation with momentary collapse (minor symptoms).
CRVS: 90510
Hospital: None Followup: None

Injury: (Major) Loss of consciousness associated with carbon monoxide or methane, and with collapse.
CRVS: 90220 (2)99040 (2)90295 (5)90250 71010 93000 89005 80116 (3)80104
Hospital: 7, 1-2 ICU; Followup: 30

C.4.15 Radiation Burns (290)

Injury: (Minor) Erythema - first degree
CRVS: 90500
Hospital: None Followup: None

Injury: (Typical) Ultra-violet keratitis (welder's flash)
CRVS: 90510 90540
Hospital: None Followup: 1

Injury: (Major) Second degree burns - face and chest
CRVS: 90200 16030 (2)90250 89005
Hospital: 2 Followup: 7

APPENDIX D. EMPIRICAL CONSTANTS FOR PRODUCTION LOSS ALGORITHM

The empirical constants used in the algorithm (Section 4.2.2) for computing production loss parameters were derived from data extracted from the MESA reports of 95 fatal accidents which occurred during 1973-1974. Section 6 of Volume III contains a listing of the data.

The following data were extracted from each report:

- Number of production sections by mining method (s_m)
- Number of production shifts/day (n_{ps})
- Number of maintenance shifts/day (n_{ms})
- Average daily production of mine (t_d)
- Number of men underground (n_{ug})

D.1 Mines with Continuous Sections or Conventional Sections Only

Plots of n_{ug} and t_d versus s_m were made by mining method for all samples with only continuous or only conventional production sections. The plots for samples with only continuous mining sections were grouped by n_{ps} and n_{ms}, which was found to better represent the data than a composite plot.

Linear regression lines were fitted to the data points in each plot. The intercepts and slopes of these lines are the constants shown in Section 4.2.2. Tables D.1 and D.2 contain the data points used in the plots, which are shown in Figures D.1-D.4.

D.2 Mines with Longwall Sections

Nine sample mines contained longwall sections. An implicit procedure was used to estimate the daily production/longwall section/day because all of the mines also had continuous and/or conventional sections. Table D.3 contains the data used.

D.3 Average Values for Mining Methods

Table D.4 contains the average values used for t_{ds}, t_d, and n_{ug}. Values were computed from the averages in Tables D.1 - D.3, except for hand loading, which are estimated.

Table D.1 Sample Data for Mines with Continuous Sections Only (m = 1)

Sample #1	s_1	n_{ps}	n_{ms}	t_d	n_{ug}
4a	1	1	0	150	11
5a	1	1	0	130	12
6a	1	1	-	150	11
64a	1	1	0	200	20
10a	2	2	0	600	39
11a	1	2	0	300	12
41a	1	2	0	200	28
50a	1	2	0	1000	16
1a	1	2	1	450	21
8a	11	2	1	3200	360
9a	2	2	1	800	75
53a	3	2	1	530	110
60a	3	2	1	1000	110
70a	8	2	1	2500	207
76a	4	2	1	1200	140
93b	6	2	1	4400	249
2a	9	3	0	4300	356
38a	11	3	0	9000	311
45a	10	3	0	5200	272
47a	12	3	0	9000	452
48a	7	3	0	7000	318
51a	6	3	0	3800	246
57a	13	3	0	7200	451
58a	9	3	0	3800	342
61a	3	3	0	2000	120
65a	6	3	0	3800	246
74a	15	3	0	6000	566
79b	4	3	0	2500	328
83b	11	3	0	11000	494
84b	10	3	0	8700	307
86b	10	3	0	8000	298
88b	12	3	0	7000	390
90b	8	3	0	4500	350
94b	15	3	0	10000	500
Average	6	3	0	3810	228

Notes

1. Sample number in Volume III, Section 6, Suffix a, indicates sample from 1973 data; suffix b from 1974 data.

Table D.2. Sample Data for Mines with Conventional Sections Only (m = 2)

Sample #	s_2	n_{ps}	n_{ms}	t_d	n_{ug}
19a	1	1	0	500	9
20a	1	1	0	70	6
22a	1	1	0	100	10
28a	1	1	0	70	4
30a	1	1	0	800	8
35a	1	1	0	150	9
66a	1	1	0	160	7
39a	2	2	0	800	44
40a	1	2	0	100	13
15a	3	2	1	4500	142
26a	3	2	1	1800	140
49a	4	2	1	1500	139
62a	4	2	1	6000	185
68a	5	2	1	4800	222
71a	3	2	1	1200	172
72a	2	2	1	1200	95
75a	2	2	1	1200	54
80b	1	2	1	400	26
81b	8	2	1	6000	421
91b	6	2	1	4600	372
25a	5	3	-	4500	190
29a	1	3	0	800	45
73a	4	3	0	3000	223
Average	3	-	-	1920	110

Table D.3. Estimation of Empirical Constants for Longwall Sections

Sample #[1]	n_{ps}	Number of Sections n_{ms}	CT	CV	LW	t_d[2]	n_{ug}[2]	Tons/Section[3] CT	CV	t_{sd} Computed for Longwall[4]
7a	3	0	8	0	1	3000	335	270	-	840
37a	2	1	6	0	1	2000	423	270	-	380
43a	3	0	7	0	1	6900	550	667	-	2231
46a	2	1	6	0	1	4500	354	667	-	498
52a	3	0	4	0	3	6000	300	667	-	1110
55a	3	0	3	1	2	4200	355	667	640	807
56a	3	0	12	0	1	11000	516	667	-	2996
77a	2	1	2	0	1	1200	150	270	-	660
95b	3	0	8	5	1	3800	518	270	270	290
Averages for Mines with Longwall:						4730	389	-	-	1090

Notes:

1. See Note 1, Table D.1
2. Daily figures for the mine
3. Estimated from data in Figures D.1 - D.4
4. t_{sd} = (t_d - tons from CT + CV sections)/No. of longwall sections

Table D.4. Average Empirical Values for Mining Methods

Mining Method (m)		t_d	n_{ug}	t_{sd}[1]	b_{1m}	Average number of sections/mine
Continuous	(1)	3810	228	635	38	6
Conventional	(2)	1920	110	640	37	3
Longwall	(3)	4730	389	1090	90	1
Hand Loading	(4)	100	7	100	7	1

Notes:

1. t_{sd} = t_d/average number of sections
2. b_1 = n_{ug}/average number of sections

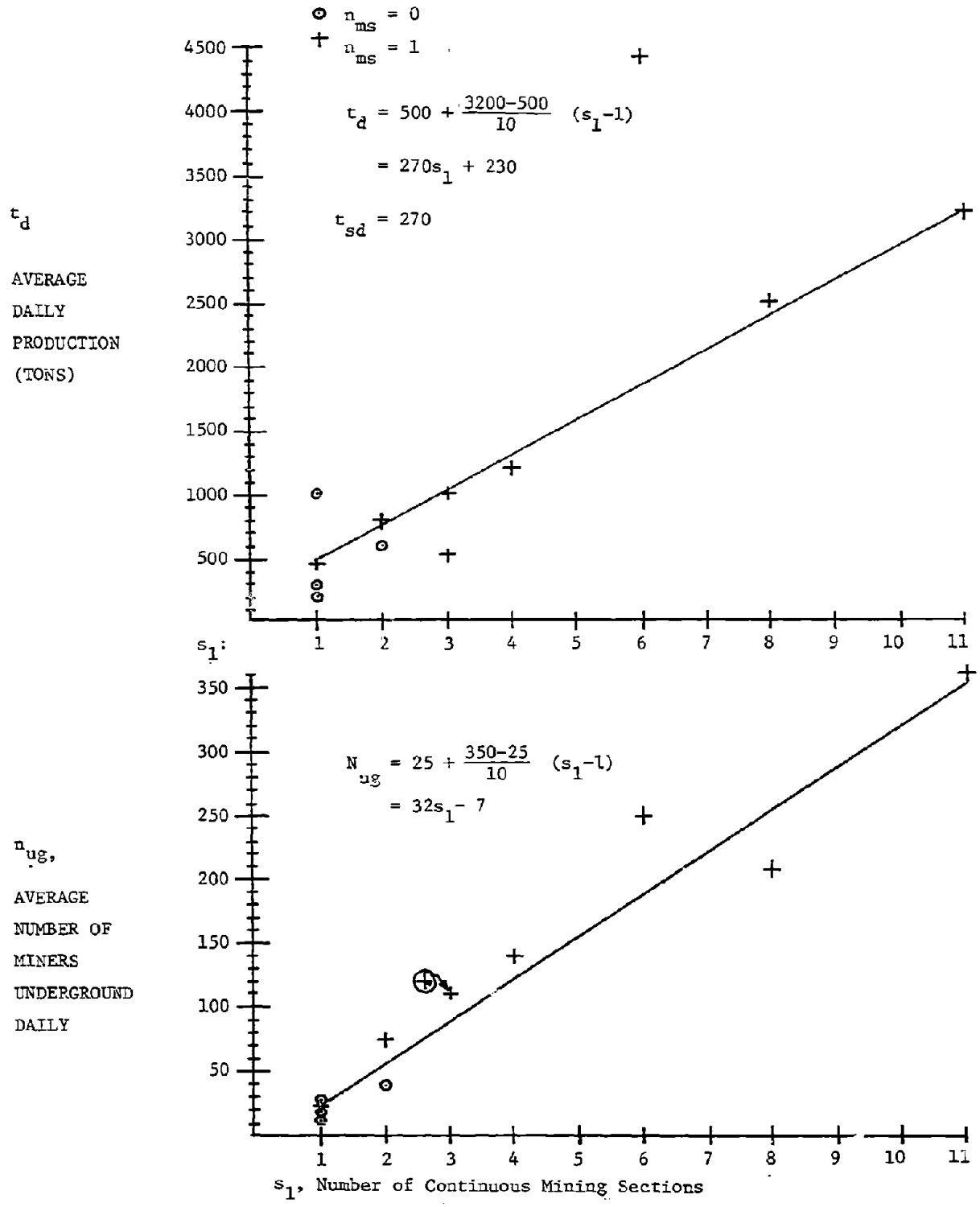

Figure D.1 Daily Production and Miners Underground: Sample Mines with Continuous Sections Only, Two Production Shifts Daily

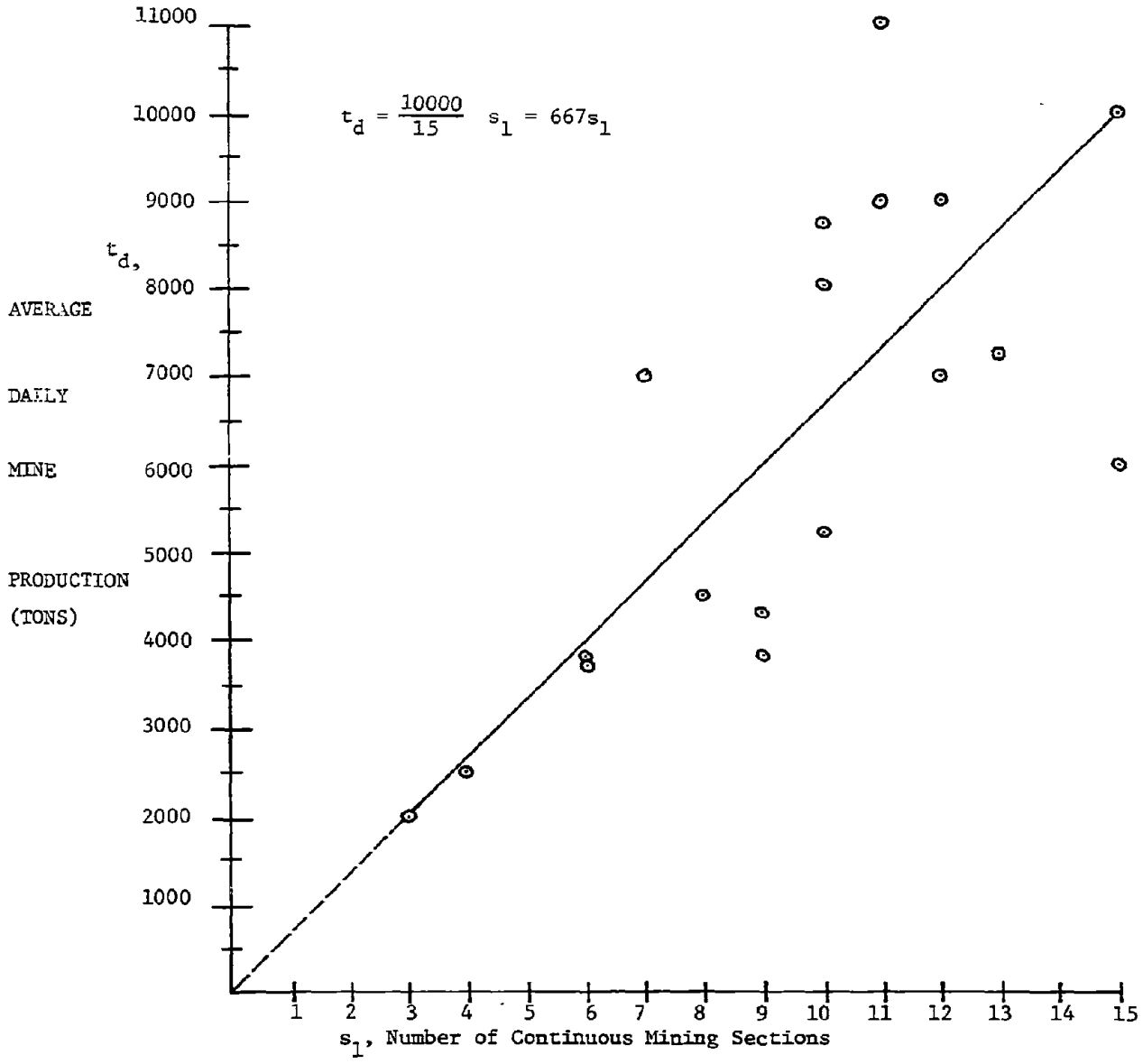

Figure D.2. Daily Production: Sample Mines with Continuous Sections Only, Three Production Shifts Daily

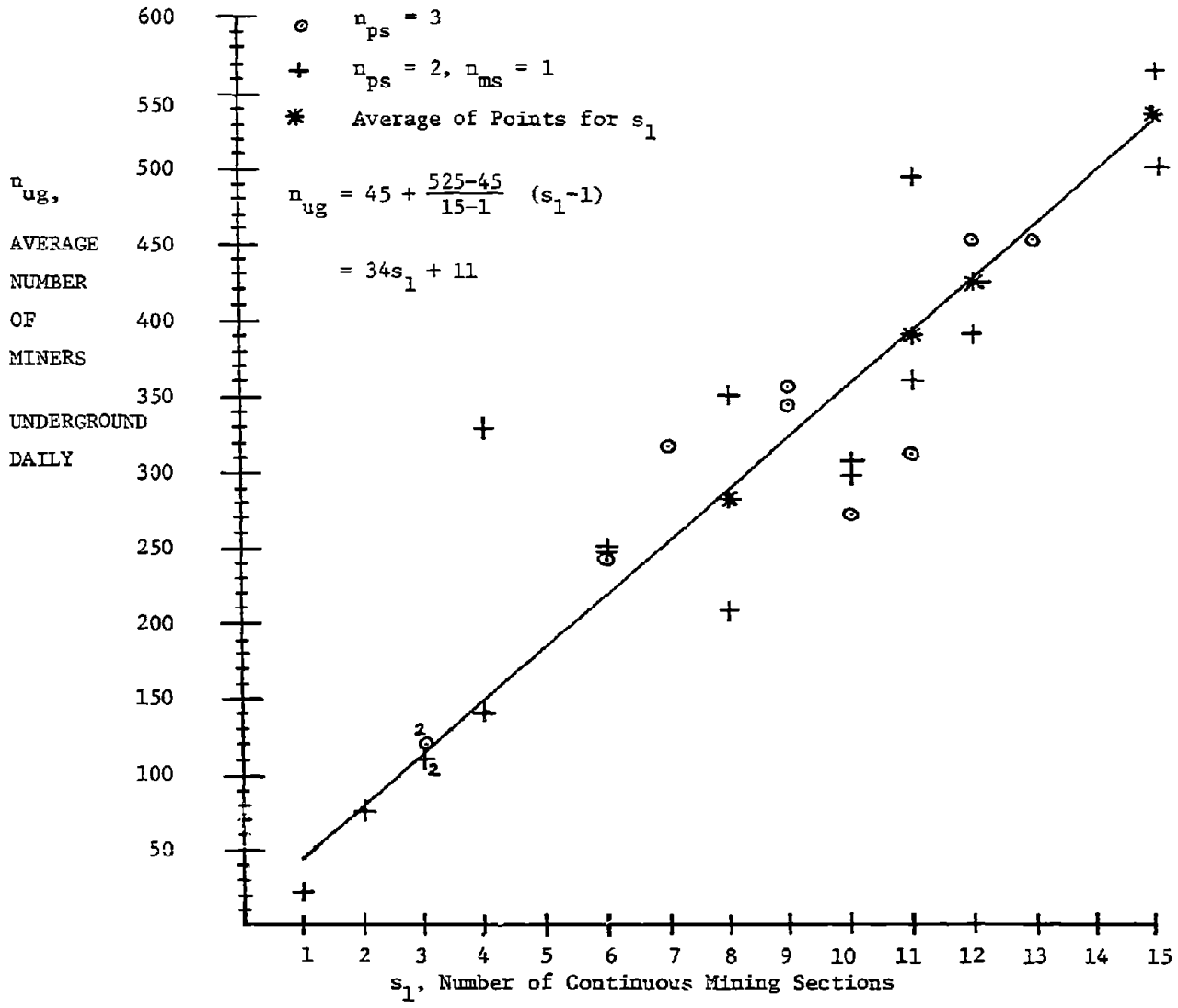

Figure D.3. Daily Number of Miners Underground: Mines with Continuous Sections Only, Three Shifts Daily

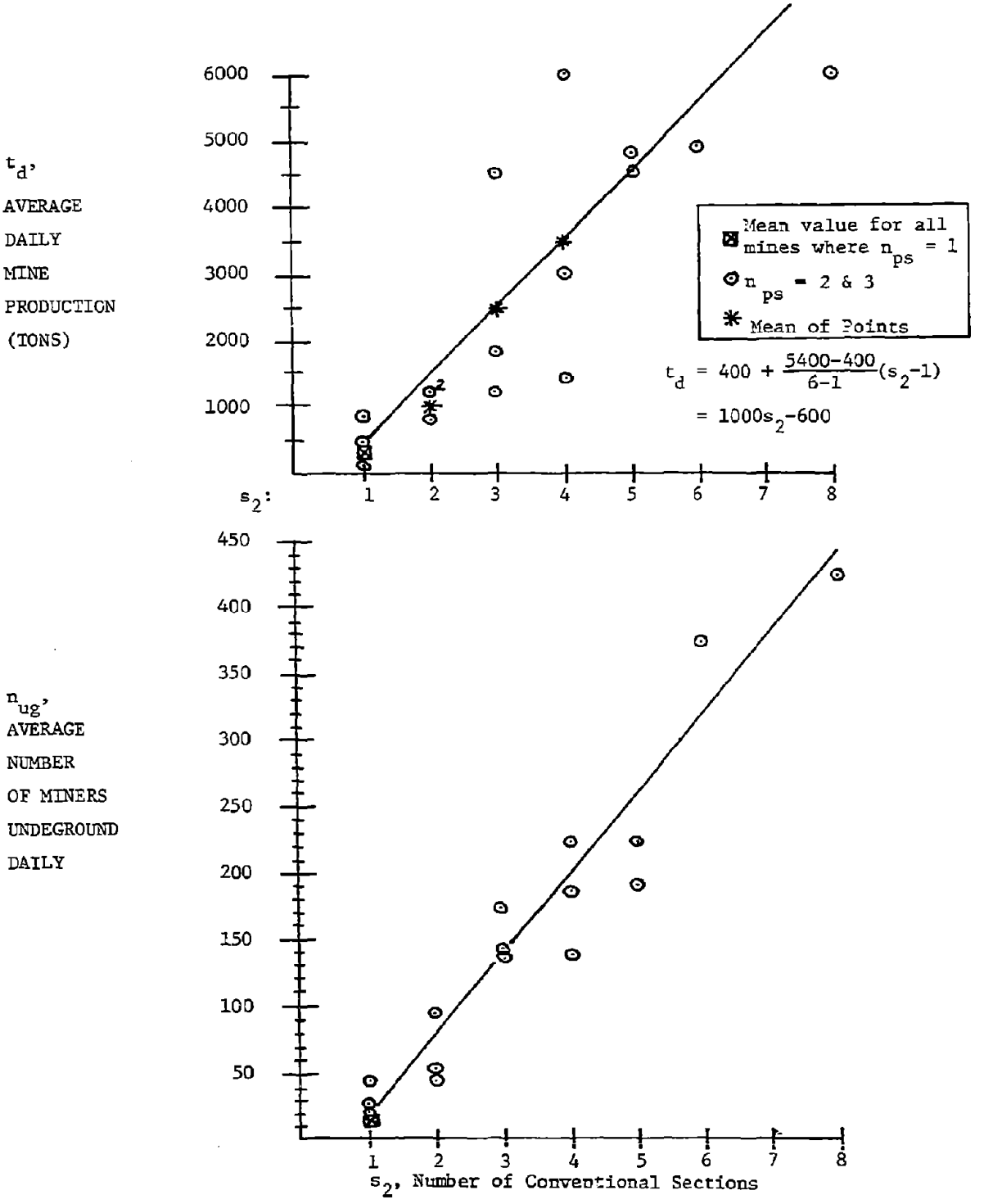

Figure D.4. Average Daily Production and Miners Underground: Mines with Conventional Sections Only

APPENDIX E. SAMPLE CALCULATION OF ACCIDENT COST ELEMENTS

This appendix contains calculations of the cost elements for a sample accident. The sample, which will be referred to as SR1, is the first accident record for Mine 01003230 [II:B.2].* Since the test data did not contain a record for a fatal accident, the Degree-of-Injury code for SR1 was changed from 5 to 1 (fatality). This was done to ensure that a fatality would be included in the test data without resorting to a computer search of the 1974 CAIF. Table E.1 contains the data required by ACIMEXEC from SR1 to compute cost elements.

Separate computations were made for the IBM 360 and B6700 systems since different random number sequences are generated by each system [II:A.7]. The test run [II:C] was made on an IBM 360/67.

Table E.1 Accident Data Items in Sample Record 1 (SR1)

Mine I.D.	:	01003230 (State Code 1: Alabama)
Accident location	:	On-section
Mining method	:	Conventional
Accident type	:	01 (roof fall)
Age of miner	:	Not specified
Mining experience	:	25 years
Regular job title	:	046 (roof bolter)
Task activity	:	011 (drill roof)
Degree of injury	:	1 (fatality)
Nature of injury	:	160 (contusion, crush, bruise) ACIM Code 7
Part of body	:	340 (finger) ACIM Code 27

Table E.2 shows the cumulative frequencies (PRCUM) generated for SR1 by the random number routines, and the associated values for the random variables.

Table E.3 shows the costs computed by Program ACIMEXEC for SR1.

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*Reference in the final report. For example: [Volume II: Appendix B.2].

Table E.2 Random Variables Generated for SR1

Sequence	Variable in Section 4	FORTRAN Name	PRCUM Generated by 360/67	PRCUM Generated by B6700	Value of Variable on 360/67	Value of Variable on B6700
1	s_m	MARRID	.369	.105	1	1
2	n_c	NUMDEP	.640	.021	4	0
3	y_{ci}	NAGEDP(1)	.452	--	10	--
3	y_{ci}	NAGEDP(2)	.136	--	4	--
3	y_{ci}	NAGEDP(3)	.746	--	14	--
3	y_{ci}	NAGEDP(4)	.256	--	7	--
4, 5	Not used for first accident					
6	p_{el}	FRCSEL	.426	.962	.14	.29
7	n_{ms}	ANPMS	.882	.217	3	1
7	n_{mi}	ANPMI	.462	.430	2	2
7	n_{me}	ANPME	.833	.610	1	1
7	n_{ce}	ANPCE	.842	.504	4	2
7	n_{cm}	ANPCM	.551	.257	6	4
7	n_{c1}	ANPC1	.730	.372	1	0
7	n_{c2}	ANPC2	.420	.287	0	0
7	n_{c3}	ANPC3	.954	.291	3	0
7	n_{c4}	ANPC4	.940	.080	1	0
7	n_{c5}	ANPC5	.057	.063	0	0
7	n_{si}	ANPSI	.880	.951	3	4
7	n_{ur}	ANPUR	.771	.005	5	0
8	d_1	D1	.046	.353	1.09200	1.7060
8	d_2	D2	.483	.918	0.06144	0.21925
8	d_3	D3	.484	.332	0.02050	0.01733
8	d_4	D4	.556	.623	5.56	6.230
9	—	AMEDIC	.483	.604	97	120

Table E.3 Cost Elements Computed by ACIMEXEC for SR1

Cost Element	Description of Element	Cost ($100) computed on IBM 360/67	Cost ($100) computed on B6700
C_c	Cost to Company	2015	3546
C_m	Cost to mining family	695	1616
C_p	Cost to public agencies	946	24
C_{stb}	State death benefits	289	289
C_{ssb}	Social security death benefits	922	0
C_{unb}	Union death benefits	284	273
C_{med}	Medical treatment cost	0	1
C_t	Total Cost ($C_c + C_m + C_p$)	3656	5186

The following sections contain the computations performed by ACIMEXEC to compute the elements shown in Table E.3. The order of the computations follows Section 4.

E.1 Family Profile Parameters

Table E.4 contains the values generated by Subroutine VSTATS for the family profile parameters defined in Table 1. The age of the miner was computed from his mining experience, since SR1 did not contain a value for age. This age is in Age Group 4. The remaining parameters in Table E.4 were generated from data in Table E.3, or determined by the age group from data in Section A of BLOCK DATA [II:A.7].

E.2 Medical Treatment Costs

The injury in SR1 is a bruised finger (ACIM Codes 7, 27 for nature of injury, part of body). The following cost distribution is used by ACIMEXEC [III:7].

Medical Cost ($100)	Cumulative Frequency
0	0.0
1	0.5
2	1.0

Note that the injury corresponds to the accident record before the degree of injury code was changed to 1 (see first paragraph of this Appendix); the miner did not actually die as a result of a bruised finger.

Table E.4 Mining Family Profile Parameters for SR1

Parameter	Value used on 360/67	Value used on B6700	Comment
y_m	43	43	= 18 + mining experience; Subroutine VSTATS.
s_m	1	1	Miner is married
y_w	40	40	= Miner's age - 3; Subroutine VSTATS
n_c	4	0	Number of children
y_{c1}	10	--	Ages of children
y_{c2}	4	--	Ages of children
y_{c3}	14	--	Ages of children
y_{c4}	7	--	Ages of children
y_{rw}	45	45	Expected age at remarriage
p_{65m}	0.63	0.63	Survival probability of miner
p_{65w}	0.70	0.70	Survival probability of wife
p_{rw}	0.848	0.848	Remarriage probability of wife

Table E.2 contains the values used for PRCUM by AMEDIC, and the resulting base costs. The mine is in Alabama, so AMEDIC applies medical cost index STMDCI (1) = 0.409 (BLOCK DATA, Section G) to the base cost, then the resulting cost is multiplied by the administrative overhead factor OVM = 1.075, and rounded to integer units of $100, as follows:

System	Base Cost	Adjusted Cost	C_{med}
360/67	97	43	0
B6700	120	53	1

E.3 Losses in Coal Production

SR1 occurred on a conventional production section, so there is an immediate and a long-term loss in production (t_{li} and t_{ll} respectively [I:4.2.3]).

The following data are used by SECEFF for Mine 01003230 from File MINEDATA [II:B.1]:

1974 Production (t_y) = 450×10^3 Tons

1974 Worktime (h_y) = 196×10^3 Person-hours underground

The value/ton of coal (v_t = \$15) is contained in File EXECDATA [II:B.5].

The daily wage for UMWA Class 3 (WAGEPD[3] = \$49.23 in BLOCK DATA, Section C) is used for w_d. The accident occurred on a conventional section, so Equations 3a-b are given by:

$$n_{ug} = -40 + 60\ s_m \qquad t_d = -600 + 1000\ s_m$$

where t_{ds} = 1000 tons/day/section.

Equation Set 4 is as follows:

$$d_y = 0.5(d_{y1} + d_{y2}) \qquad d_{y1} = 196 \times 10^3/8\ n_{ug} \qquad d_{y2} = 450 \times 10^3/t_d$$

$$= 24.5 \times 10^3/n_{ug}$$

Table E.2 contains the values generated for p_{el} in Equation 1b.

The corresponding value of d_{el} = 68 [I: Table 6].

The iterative solution for s_m is as follows:

s_m	n_{ug}	t_d	d_{y1}	d_{y2}	d_y
1	20	400	1225	1125	1175 > 250
2	80	1400	306	321	314 > 250
3	140	2400	175	188	181 < 250

Thus,

t_{li} = 2400

t_{ll} = (.14) (68)(1000) = 9520 on 360/67

= (.29) (68)(1000) = 19,720 on B6700

Thus, $e_{pl} = C_{ecp}$, from Equation 2a, is as follows:

System	e_{pl}($)	C_{ecp}($100)
360/67	171908	1719
B6700	324908	3249

E.4 Loss of Income to Family

The miner was 43 years old at time of death ($y_m = 43$). The miner was a roof bolter, which corresponds to a wage class of 5 [III:3], with a daily wage of $55.00 (BLOCK DATA, Section C). From Equation 8a, the annual wage and total expected wage loss, respectively, are $w_y = (250)(55) = 13750$ and $w_{eg} = 0.63(13750)(65-43) = \$190575$

Compensation benefits are as follows (see following paragraphs):

Benefit	360/67	B6700
b_{st}	28928	28928
b_{ss}	92194	0
b_{un}	28360	27302
w_{en} (Equation 7)	41093	134345
C_{pin} ($100)	411	1343

E.5 Death Benefits from State Compensation

Mine is located in Alabama, so benefits are as follows [III:7]:

$$R_s = 0 \quad b_{stwl} = 75 \quad b_{stdl} = 0 \quad l_{stf} = 37000$$

From Table E.4, $y_w = 40$, $y_{rw} = 45$, $p_{65w} = 0.70$, $p_{rw} = 0.848$

$n_c = 0$ for B6700; $n_c = 4$, $y_{ci} = 10, 4, 14, 7$ for 360/67. Thus,

Equation 9b is computed as follows:

System	A	z_{rw}	b_{str}
360/67	37	5	0 + 52(75[5] + 0[37]) = 19500
B6700	0	5	0 + 52(75[5] + 0[0]) = 19500

Equation 9c is given by the following for both systems ($b_{stdl} = 0$):

$$b_{stn} = 52(0.70[75][65-40] + 0) = 68250$$

Equation 9a is:

$$b_{st} = (1.075) \text{ minimum } [37000\ (0.848(19500) + (1-0.848)(68250))]$$
$$= 28928$$

$\therefore\ C_{stb} = 289$ (units of \$100) for both systems

E.6 Death Benefits from Social Security

Benefits are paid to the widow only if she has a dependent child under 18 years of age. Since $n_c = 0$ on the B6700, no death benefits are paid ($C_{ss} = 0$ on B6700 for SR1). The following computations apply to the 360/67:

Equation 13c, $l_{bss} = \text{maximum } (0, 0.8(190575-28928)) = 129318$

In Equation Sets 14 and 15,

$$I_{xss} = 1.0,\ z_1 = 18-10 = 8,\ z_2 = 14,\ z_3 = 4,\ z_4 = 11,\ \therefore z_{dss} = 14$$

$$z_{wss} = \text{minimum } (14, 25) = 14$$

$$z_{mssp} = 25 \text{ (years of mining experience)}$$

Since $z_{mspp} > 19$, $\bar{A} = 6505$ (see Subroutine SECEFF)

Thus, $b_{ssld} = b_{sslw} = 0.75(6505 + 350)^{0.66} = 255.17$

and $b_{ssc} = 12(1.0)(255.17)(14 + 14) + 225 = 85762$

$b_{ss} = 1.075 \text{ minimum } (85762, 129318) = 92194$

$C_{ss} = 922$

E.7 Death Benefits from Union Retirement Fund

The miner was 43 years old at time of accident. This is less than the minimum qualifying age of 55 for retirement benefits (y_{pmin} in Equation Set 16; IUBAGL in BLOCK DATA, Section D). Thus,

$b_{unr} = 0$ in Equation 16b, and $b_{unwp} = 0$.

The additional benefits are as follows (Equation Set 16e):

$b_{unae} = 100$ (BUPK in BLOCK DATA)

$b_{unwr} = 12(100)(45-40), = 6000$

$z_{unw} = \text{minimum } (22, 25) = 22;\ z_c(\max) = 18 \text{ for } 360/67$

$b_{unwd} = 12(100)\ (22) = 26400$

$$b_{undd} = \begin{cases} 0 \text{ for B6700} \\ 12(100)(18) = 21600 \text{ for } 360/67 \end{cases}$$

The lump-sum benefits are given by:

$l_{unl1} = 7500$ (EUD (1))

$\Delta n_c = 0$, so $\Delta n_c\ l_{unl2} = 0$

$l_{unl3} = 10000$ (EUD(3))

Thus, b_{unc} in Equation 16a.2 is given as follows:

- B6700

$$b_{unc} = 0.70(0) + (0.848)(6000) + (1 - 0.848)[0.70(26400) + (1 - 0.70)0] + 7500 + 0 + 10000$$
$$= 25397$$

- 360/67

$$b_{unc} = 25397 + (1 - 0.848)\ [(1 - 0.70)(21600)]$$
$$= 26382$$

From Equation 16a.1:

$b_{un} = 1.075(26382) = 28360$ for 360/67

$= 27302$ for B6700

Thus, $C_{un} = \begin{cases} 284 \text{ for } 360/67 \\ 273 \text{ for B6700} \end{cases}$ In units of \$100

E.8 Cost of Investigation

Table E.2 contains the values generated on each system for Subroutine FTLINV. The following computations use these values in Equation Sets 20 and 21:

Number of Personnel

n_{txy}	Task 1		Task 2		Task 3		Task 4	
	360/67	B6700	360/67	B6700	360/67	B6700	360/67	B6700
ce	1	1	--	--	3	1	1	1
cm	2	2	--	--	4	2	1	1
c1	--	--	1	0	--	--	--	--
c2	--	--	0	0	--	--	--	--
c3	--	--	3	0	--	--	--	--
c4	--	--	1	0	--	--	--	--
c5	--	--	0	0	--	--	--	--
ms	3	1	--	--	--	--	2	0
mi	2	2	--	--	--	--	1	1
me	1	1	--	--	--	--	1	1
si	3	4	--	--	--	--	1	1
ur	3	0	--	--	2	0	1	1

Cost Computations

Salary Grade (z)	Personnel Grades	Daily Wage (s_z)*
1	c1	47.03
2	c2	47.58
3	c3	49.23
4	c4, ur	51.98
5	c5, me	55.00
6	cm, mi, si	66.00
7	ms	100.00
8	ce	160.00

*BLOCK DATA Section C

	c_{tx}, Cost of Task to Agency x ($)							
	Company		MESA		State		Union	
Task (t)	360/67	B6700	360/67	B6700	360/67	B6700	360/67	B6700
1	318	498	532	490	216	450	170	0
2	15	0	-	-	-	-	-	-
3	15	5	-	-	-	-	2	0
4	226	226	1115	1005	367	411	52	52
c_x	574	729	1647	1495	583	861	224	52

	Total Cost ($)	
System	C_c	C_p
360/67	574	2454
B6700	729	2408

E.9 Total Costs

The following costs are computed in ACIMEXEC in dollars and then rounded to integer units of $100:

$C_c = C_{med} + C_{ccp} + C_{stb} + C_{inv}$ (Company)

$= 43 + 171908 + 28928 + 574 = 201453$ (360/67)

$= 53 + 324908 + 28928 + 729 = 354618$ (B6700)

$C_m = C_{pm} + C_{unb}$

$= 41093 + 28360 = 69453$ (360/67)

$= 134345 + 27302 = 161647$ (B6700)

$C_p = C_{ssb} + C_{inv}$ (Public Agencies)

$= 92194 + 2454 = 94648$ (360/67)

$= 0 + 2408 = 2408$ (B6700)

Costs in Integer Units of $100

System	C_c	C_m	C_p	C_t	C_{stb}	C_{ssb}	C_{unb}	C_{med}
360/67	2015	695	946	3656	289	922	284	0
B6700	3546	1616	24	5186	289	0	273	1

These manually computed values agree with the values computed by ACIMEXEC, as shown in Table E.3.

Part II of Volume I contains the complete listing produced by the ACIM programs* from the 1974 data received from HSAC for the underground bituminous coal mining industry. Volume II contains a complete description of the programs and base cost data used to produce this listing.

Program ACIMEXEC processed 12629 records for underground bituminous coal mines from the HSAC Coal Injury and Accident file for Calendar Year 1974 and accepted 9286 records for computation of accident costs. The acceptance criteria used by ACIMEXEC are described in Section 3.3.2 of Part I of Volume I.

Figure 1 contains the messages printed by Program ACIMEXEC. The messages for missing HSAC codes are printed by Subroutine PROCAR. Each message indicates that the nature of injury (NOI) code and/or the part of body (POB) code was undefined in the HSAC CAIF record. The end-of-file message is printed by ACIMEXEC and shows the number of accident records read from File CAIFDATA, and the number of records accepted (written into File COSTDATA).

Figure 2 contains the output produced by Program ACIMPREP. Each line of the tabular listing shows the number of mining activities (N ACT) identified by ACIMPREP for one regular job title (HSAC code in column titled JOB). The last line of the listing contains the dimension to be used in ACIMPRNT for the specified arrays.

The Appendix contains the output from Program ACIMPRNT, using all of the table options (see Volume II, Section 3.1.6). Each table contains cost indicators for a cross-section of the accident records accepted by ACIMEXEC. The three cost indicators, titled TOTAL, ANNUAL, and INJURY, are defined as follows:

TOTAL - the sum of all present and future costs (in 1974 dollars) incurred as a result of the injuries which occurred in 1974.

ANNUAL - that part of total cost incurred in 1974.

INJURY - the ANNUAL cost divided by the number of injuries associated with the line item.

The costs correspond, respectively, to T_{ys}, A_{ys}, and I_y in Section 4.8 of Part I.

---

*on an IBM 360/67 computer

The costs are allocated by the sectors of society which bear the direct impact of the cost as a direct expenditure, or as a loss of potential income (see Part I for further discussion). The last three columns show the total costs across the three sectors of society.

The last line of each table shows the number of injuries (N_{is} of Section 4.8) used to compute the costs in the table. The number of injuries associated with one line item can be implicitly determined by dividing ANNUAL cost by INJURY cost.

The table of injury costs by job activity for the job title of Belt Cleaner (Inside), on page 3 of the listing, will be used as an example of program output. There were 67 injury records identified and accepted by ACIMEXEC for this job title. These injuries were distributed among 17 mining task activities. The total cost of these injuries across all sectors of society was $215,300, of which $177,700 was incurred in 1974. The average annual cost per injury is $2700, which is computed as follows:

annual cost per injury = total annual cost/number of injuries
= 177700/67
= $2700 (rounded to $100 units)

The total future cost of the injuries is $215300 - $177700 = $37600. This cost is the sum of (1) future wage compensation payments from state, union, and federal sources, and (2) loss of future income associated with injuries which resulted in death or permanent disability.

The number of injuries associated with a line item in the table can be implicitly determined by dividing ANNUAL cost by INJURY cost and rounding the result to an integer. For example, the costs for the CLEAN UP activity correspond to 713/42 = 17 injury records.

Page 1 of the listing is the table of total costs for all injuries accepted by ACIMEXEC. The table shows a total cost impact of almost $57 million, of which almost $34 million (60%) was incurred in 1974 with an average annual cost of $3,700 per injury.

Pages 2 - 87 contain cost tables for each job title by mining task activities at time of accident occurrence. Pages 88 - 92 contain summary tables by job title and by mining task activities across job titles.

Pages 94 - 102 contain summaries by nature of injury, mining method, degree of injury, and accident types. These summary categories correspond to the categories used by HSAC to code accident records from the original report of the accident (see Volume III).

```
NO HSAC MOI CODE, RECORD NO,    1092
NO HSAC PCB CODE, RECORD NO,    1092
NO HSAC MOI CODE, RECORD NO,    3182
NO HSAC PCB CODE, RECORD NO,    3182
NO HSAC MOI CODE, RECORD NO,    3415
NO HSAC PCB CODE, RECORD NO,    3415

END OF CAIF DATA ON UNIT   1
 12528 RECORDS READ,    9236 RECORDS USED BY ACIM
```

Figure 1. Output from Program ACIMEXEC

JOB	N ACT
261	1
154	17
112	2
1	31
101	29
262	15
32	21
220	3
155	3
113	6
33	2
34	32
122	8
35	43
36	45
37	12
38	27
265	5
276	16
414	3
103	2
3	9
2	27
402	12
102	22
456	3
462	18
49	54
149	25
418	15
494	1
430	22
449	22
221	5
464	6
41	26
16	64
116	46
240	1
42	10
43	37
44	7
5	10
105	7
4	44
104	26
404	4
269	37
118	12
157	15
156	11
6	15
106	15
158	2
45	10
117	4
46	62
47	23
48	3
495	2

Figure 2. Output from Program ACIMPREP

JOB	N ACT
54	24
7	32
160	1
50	55
481	9
9	20
109	15
52	3
10	37
110	18
216	26
123	1
53	36
8	24
108	10
159	3
119	11
11	14
111	16
300	13
0	1

USE 1445 FOR DIMENSION OF NRJBAC,ICJBAC,INJBAC IN ACIMPRNT

Figure 2. (Concluded)

APPENDIX

LISTING FROM PROGRAM ACIMPRNT FOR

ACCIDENT RECORDS FROM 1974 COAL

ACCIDENT AND INJURY FILE

ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

SUMMARY FOR ALL INJURIES

RUN 3/ 5/76

	MINING COMPANIES			MINING FAMILIES			PUBLIC AGENCIES			TOTAL 1974 COSTS		
	TOTAL $00	ANNUAL $00	INJURY $00	TOTAL $00	ANNUAL $00	INJURY $00	TOTAL $00	ANNUAL $00	INJURY $00	TOTAL $00	ANNUAL $00	INJURY $00
SUMMARY FOR ALL INJURIES	235948	193834	21	265605	127732	14	67617	17969	2	569170	339535	37
SUMMARY FOR ALL INJURIES	235948	193834	21	265605	127732	14	67617	17969	2	569170	339535	37

9286 INJURIES OF 9286 TOTAL INJURIES IN TABLE

Page 1

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
BATTERY STATION OPER

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
POSITION EQUIPMENT	58	58	58	109	109	109	0	0	0	167	167	167
BATTERY STATION OPER	58	58	58	109	109	109	0	0	0	167	167	167

1 INJURIES OF 9286 TOTAL INJURIES IN TABLE

Page 2

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
BELT CLEANER(INSIDE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	477	278	16	536	359	21	76	76	4	1089	713	42
MACHINE MAINTAINENCE	47	47	12	76	76	19	0	0	0	123	123	31
SERVICE MACHINE	42	42	11	94	94	24	0	0	0	136	136	34
POSITION EQUIPMENT	5	5	5	5	5	5	0	0	0	10	10	10
TRAM IN	90	90	45	171	171	86	0	0	0	261	261	131
TRANSPORT SUPPLIES	1	1	1	2	2	2	0	0	0	3	3	3
OPERATE TRACTOR	4	4	4	0	0	0	0	0	0	4	4	4
OPERATE MANTRIP CAR	77	77	77	44	44	44	61	61	61	182	182	182
RIDE EQUIPMENT	2	2	1	1	1	0	0	0	0	3	3	1
OTHER WORK TASKS	46	46	4	25	25	2	0	0	0	71	71	5
REPLACE TROLLEY POLE	2	2	2	2	2	2	0	0	0	4	4	4
USE HANDTOOLS	113	113	10	110	110	10	0	0	0	223	223	20
WALKING	7	7	7	0	0	0	0	0	0	7	7	7
OPERATE/RIDE CONV BELT	2	2	2	0	0	0	0	0	0	2	2	2
ENTER/LEAVE MACHINE	0	0	0	2	2	1	0	0	0	2	2	1
LOAD,UNLOAD MATERIALS	2	2	1	4	4	2	0	0	0	6	6	3
OPERATE LOADING MACHINE	13	13	7	14	14	7	0	0	0	27	27	14
BELT CLEANER(INSIDE)	930	731	11	1086	909	14	137	137	2	2153	1777	27

67 INJURIES OF 9296 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
BELT VULCANIZER(INS)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
HAND LOAD	19	19	19	7	7	7	0	0	0	26	26	26
IDLE WORKTIME(LUNCH,ETC)	2	2	2	0	0	0	0	0	0	2	2	2
BELT VULCANIZER(INS)	21	21	11	7	7	4	0	0	0	28	28	14

2 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
BELTMAN(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	798	469	469	610	21	21	1234	78	78	2642	568	568
CHANGE BIT	5	5	5	5	5	5	0	0	0	10	10	10
CLEAN UP	90	90	13	99	99	14	0	0	0	189	189	27
INSPECT EQUIPMENT	39	39	13	51	51	17	0	0	0	90	90	30
SET HYDRAULIC JACK	3	3	3	0	0	0	0	0	0	3	3	3
MOVE CABLES	23	23	8	7	7	2	0	0	0	30	30	10
MACHINE MAINTAINENCE	104	104	8	128	128	10	0	0	0	232	232	18
SERVICE MACHINE	63	63	63	52	52	52	79	79	79	194	194	194
POSITION EQUIPMENT	144	144	36	180	180	45	6	6	2	330	330	83
ROCK DUST	4	4	4	0	0	0	0	0	0	4	4	4
SET PROPS	40	40	20	68	68	34	0	0	0	108	108	54
REMOVE PROPS	3	3	3	5	5	5	0	0	0	8	8	8
TRAM IN	1	1	1	0	0	0	0	0	0	1	1	1
TRANSPORT SUPPLIES	57	57	14	76	76	19	0	0	0	133	133	33
OPERATE SHUTTLE CAR	8	8	4	15	15	8	0	0	0	23	23	12
OPERATE TRACTOR	8	8	8	15	15	15	0	0	0	23	23	23
OBSERVE OPERATIONS	3	3	3	2	2	2	0	0	0	5	5	5
RIDE EQUIPMENT	70	70	23	86	86	29	64	64	21	220	220	73
COUPLE/UNCOUPLE MINE CAR	61	61	20	80	80	27	0	0	0	141	141	47
RERAIL EQUIPMENT	15	15	8	4	4	2	0	0	0	19	19	10
OTHER WORK TASKS	552	552	9	650	650	10	111	111	2	1313	1313	21
OPERATE CONVEYOR BELT	8	8	4	7	7	4	0	0	0	15	15	8
UNKNOWN	1870	1660	277	823	102	17	36	36	6	2729	1798	300
USE HANDTOOLS	291	291	10	371	371	13	48	48	2	710	710	25
OPERATE POWER TOOLS	0	0	0	0	0	0	0	0	0	0	0	0
WALKING	225	225	25	334	334	37	0	0	0	559	559	62
OPERATE/RIDE CONV BELT	725	27	7	643	21	5	0	0	0	1368	48	12
OPERATE ROCKDUST MACHINE	4	4	4	1	1	1	0	0	0	5	5	5
ENTER/LEAVE MACHINE	17	17	9	15	15	8	0	0	0	32	32	16
LOAD,UNLOAD MATERIALS	165	165	16	160	160	16	42	42	4	367	367	37
OPERATE LOADING MACHINE	55	55	18	95	95	32	66	66	22	216	216	72
BELTMAN(FACE)	5451	4214	23	4592	2650	14	1686	530	3	11719	7394	40

184 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
BELTMAN(NON-FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	225	225	12	264	264	15	39	39	2	528	528	29
INSERT BOLT	2	2	2	3	3	3	0	0	0	5	5	5
INSPECT EQUIPMENT	61	61	20	14	14	5	0	0	0	75	75	25
MOVE CABLES	0	0	0	0	0	0	0	0	0	0	0	0
MACHINE MAINTAINENCE	41	41	4	38	38	3	0	0	0	79	79	7
SERVICE MACHINE	3	3	2	6	6	3	0	0	0	9	9	5
POSITION EQUIPMENT	17	17	3	25	25	5	0	0	0	42	42	8
SCALE ROOF	16	16	16	32	32	32	0	0	0	48	48	48
TRANSPORT SUPPLIES	3	3	2	1	1	1	0	0	0	4	4	2
OPERATE SHUTTLE CAR	2	2	2	0	0	0	0	0	0	2	2	2
OPERATE JITNEY	11	11	11	22	22	22	0	0	0	33	33	33
OPERATE TRACTOR	7	7	2	7	7	2	0	0	0	14	14	5
OPERATE MANTRIP CAR	3	3	2	0	0	0	0	0	0	3	3	2
RIDE EQUIPMENT	5	5	2	5	5	2	0	0	0	10	10	3
COUPLE/UNCOUPLE MINE CAR	49	49	16	60	60	20	0	0	0	109	109	36
RERAIL EQUIPMENT	47	47	24	108	108	54	0	0	0	155	155	78
OTHER WORK TASKS	371	371	10	403	403	11	100	100	3	874	874	24
UNKNOWN	2	2	2	3	3	3	0	0	0	5	5	5
REPLACE TROLLEY POLE	1	1	1	0	0	0	0	0	0	1	1	1
CROSSOVER CONVEYOR	14	14	14	0	0	0	0	0	0	14	14	14
USE HANDTOOLS	147	147	8	220	220	12	0	0	0	367	367	19
WALKING	72	72	3	51	51	2	0	0	0	123	123	6
OPERATE/RIDE CONV BELT	73	73	15	98	98	20	0	0	0	171	171	34
OPERATE HOIST	6	6	6	8	8	8	0	0	0	14	14	14
OPERATE LOCOMOTIVE	56	56	28	78	78	39	0	0	0	134	134	67
ENTER/LEAVE MACHINE	9	9	2	6	6	1	0	0	0	15	15	3
LOAD,UNLOAD MATERIALS	178	178	22	128	128	16	80	80	10	386	386	48
OPEN/CLOSE/LIFT CHUTE	91	91	46	57	57	29	47	47	24	195	195	98
OPERATE LOADING MACHINE	0	0	0	0	0	0	0	0	0	0	0	0
BELTMAN(NON-FACE)	1512	1512	9	1637	1637	10	266	266	2	3415	3415	21

163 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
BRAKEMAN/ROPE RIDER

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
REMOVE PROPS	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE MANTRIP CAR	1	1	1	4	4	4	0	0	0	5	5	5
IDLE WORKTIME(LUNCH,ETC)	14	14	14	0	0	0	0	0	0	14	14	14
RIDE EQUIPMENT	89	89	13	84	84	12	0	0	0	173	173	25
COUPLE/UNCOUPLE MINE CAR	6	6	2	0	0	0	0	0	0	6	6	2
SPRAG/BLOCK/CHOCK MINECR	295	10	5	156	4	2	0	0	0	451	14	7
RERAIL EQUIPMENT	20	20	3	30	30	5	0	0	0	50	50	8
OTHER WORK TASKS	172	172	29	206	206	34	0	0	0	378	378	63
ESCAPING HAZARD	2	2	2	0	0	0	0	0	0	2	2	2
UNKNOWN	2	2	2	2	2	2	0	0	0	4	4	4
WALKING	13	13	7	17	17	9	0	0	0	30	30	15
OPERATE LOCOMOTIVE	9	9	9	9	9	9	0	0	0	18	18	18
ENTER/LEAVE MACHINE	29	29	5	24	24	4	0	0	0	53	53	9
LOAD,UNLOAD MATERIALS	155	105	10	158	108	10	0	0	0	313	213	19
SPOT CARS(PLACING)	5	5	3	0	0	0	0	0	0	5	5	3
BRAKEMAN/ROPE RIDER	813	478	9	690	488	10	0	0	0	1503	966	19

51 INJURIES OF 9286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
BRATTICE MAN

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CHANGE DRILL	6	6	3	0	0	0	0	0	0	6	6	3
CLEAN RIB	0	0	0	0	0	0	0	0	0	0	0	0
CLEAN UP	63	63	63	80	80	80	0	0	0	143	143	143
DRILL FACE	2	2	2	0	0	0	0	0	0	2	2	2
DRILL ROOF	12	12	3	2	2	1	0	0	0	14	14	4
INSERT BOLT	5	5	5	4	4	4	0	0	0	9	9	9
INSPECT EQUIPMENT	2	2	2	2	2	2	0	0	0	4	4	4
RELOCATE HYDRAULIC JACK	17	17	17	0	0	0	0	0	0	17	17	17
MOVE CABLES	0	0	0	0	0	0	0	0	0	0	0	0
POSITION EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
ROCK DUST	1	1	1	0	0	0	0	0	0	1	1	1
SET PROPS	37	37	12	45	45	15	0	0	0	82	82	27
SET BRATTICE	100	100	11	104	104	12	0	0	0	204	204	23
SCALE ROOF	21	21	21	26	26	26	0	0	0	47	47	47
TRAM IN	5	5	5	6	6	6	0	0	0	11	11	11
TRANSPORT SUPPLIES	44	44	22	53	53	27	0	0	0	97	97	49
OPERATE SHUTTLE CAR	30	30	30	60	60	60	0	0	0	90	90	90
OPERATE JITNEY	7	7	4	10	10	5	0	0	0	17	17	9
IDLE WORKTIME(LUNCH,ETC)	9	9	9	22	22	22	0	0	0	31	31	31
RIDE EQUIPMENT	27	27	14	48	48	24	0	0	0	75	75	38
COUPLE/UNCOUPLE MINE CAR	7	7	4	0	0	0	0	0	0	7	7	4
SWITCH TRACKS	7	7	7	0	0	0	0	0	0	7	7	7
LOAD/UNLOAD MINECARS	4	4	4	0	0	0	0	0	0	4	4	4
OTHER WORK TASKS	286	286	9	298	298	9	9	9	0	593	593	19
RECOVER/RETRIEVE MTL/EQP	1	1	1	2	2	2	0	0	0	3	3	3
UNKNOWN	0	0	0	6	6	3	0	0	0	6	6	3
USE HANDTOOLS	9	9	1	4	4	1	0	0	0	13	13	2
WALKING	74	74	8	135	135	15	0	0	0	209	209	23
OPERATE/RIDE CONV BELT	10	10	10	13	13	13	0	0	0	23	23	23
ENTER/LEAVE MACHINE	5	5	3	7	7	4	0	0	0	12	12	6
LOAD,UNLOAD MATERIALS	22	22	2	21	21	2	0	0	0	43	43	5
BRATTICE MAN	814	814	8	948	948	9	9	9	0	1771	1771	17

105 INJURIES OF 9286 TOTAL INJURIES IN TABLE

ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
CAGER(INSIDE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
RIDE EQUIPMENT	13	13	13	23	23	23	0	0	0	36	36	36
COUPLE/UNCOUPLE MINE CAR	1	1	1	0	0	0	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	0	0	0	0	0	0	0	0	0	0	0	0
CAGER(INSIDE)	14	14	5	23	23	8	0	0	0	37	37	12

3 INJURIES OF 9296 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
CHAINMAN

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OTHER WORK TASKS	5	5	5	0	0	0	0	0	0	5	5	5
USE HANDTOOLS	0	0	0	0	0	0	0	0	0	0	0	0
WALKING	1	1	1	0	0	0	0	0	0	1	1	1
CHAINMAN	6	6	2	0	0	0	0	0	0	6	6	2

3 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
CLEANUP MAN(NON-FACE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN RIB	12	12	12	3	3	3	0	0	0	15	15	15
CLEAN UP	137	137	34	167	167	42	0	0	0	304	304	76
DRILL ROOF	37	37	37	51	51	51	0	0	0	88	88	88
OTHER WORK TASKS	46	46	15	91	91	30	0	0	0	137	137	46
USE HANDTOOLS	9	9	5	2	2	1	0	0	0	11	11	6
LOAD,UNLOAD MATERIALS	25	25	25	11	11	11	0	0	0	36	36	36
CLEANUP MAN(NON-FACE)	266	266	22	325	325	27	0	0	0	591	591	49

12 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
COAL DRILL HELPER

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
DRILL ROOF	139	6	6	117	3	3	0	0	0	256	9	9
OTHER WORK TASKS	12	12	6	21	21	11	0	0	0	33	33	17
COAL DRILL HELPER	151	18	6	138	24	8	0	0	0	289	42	14

3 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
COAL DRILL OPERATOR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	0	0	0	2	2	2	0	0	0	2	2	2
CHANGE DRILL	20	20	10	19	19	10	0	0	0	39	39	20
CLEAN UP	13	13	7	21	21	11	0	0	0	34	34	17
DRILL FACE	57	57	8	99	99	14	0	0	0	156	156	22
DRILL ROOF	2	2	2	0	0	0	0	0	0	2	2	2
INSERT BOLT	0	0	0	0	0	0	0	0	0	0	0	0
MOVE CABLES	29	29	15	33	33	17	0	0	0	62	62	31
MACHINE MAINTAINENCE	23	23	23	26	26	26	0	0	0	49	49	49
SERVICE MACHINE	53	53	53	111	111	111	0	0	0	164	164	164
POSITION EQUIPMENT	123	123	31	197	197	49	28	28	7	348	348	87
SET PROPS	67	67	67	99	99	99	0	0	0	166	166	166
SET BRATTICE	2	2	2	0	0	0	0	0	0	2	2	2
SHOOT COAL	49	49	49	73	73	73	0	0	0	122	122	122
SCALE ROOF	4	4	1	0	0	0	0	0	0	4	4	1
TRAM IN	9	9	3	10	10	3	0	0	0	19	19	4
TRAM OUT	70	70	23	132	132	44	0	0	0	202	202	67
TRANSPORT SUPPLIES	4	4	4	5	5	5	0	0	0	9	9	9
OPERATE SHUTTLE CAR	2	2	2	0	0	0	0	0	0	2	2	2
OPERATE JITNEY	1	1	1	2	2	2	0	0	0	3	3	3
OPERATE MANTRIP CAR	0	0	0	0	0	0	0	0	0	0	0	0
OBSERVE OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0
IDLE WORKTIME(LUNCH,ETC)	2	2	2	0	0	0	0	0	0	2	2	2
RIDE EQUIPMENT	9	9	5	19	19	10	0	0	0	28	28	14
COUPLE/UNCOUPLE MINE CAR	21	21	11	20	20	10	0	0	0	41	41	21
OTHER WORK TASKS	238	130	7	363	166	9	0	0	0	601	296	16
UNKNOWN	1678	1427	714	538	38	19	368	63	32	2584	1528	764
USE HANDTOOLS	12	12	2	5	5	1	0	0	0	17	17	3
OPERATE POWER TOOLS	55	55	28	80	80	40	0	0	0	135	135	68
WALKING	8	8	4	9	9	5	0	0	0	17	17	9
ENTER/LEAVE MACHINE	20	20	7	28	28	9	0	0	0	48	48	16
LOAD,UNLOAD MATERIALS	52	52	52	165	165	165	5	5	5	222	222	222
OPERATE LOADING MACHINE	1	1	1	2	2	2	0	0	0	3	3	3
COAL DRILL OPERATOR	2624	2265	29	2058	1361	17	401	96	1	5083	3722	47

79 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
COAL DUMP OP(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
SERVICE MACHINE	1	1	1	0	0	0	0	0	0	1	1	1
POSITION EQUIPMENT	594	61	31	3271	90	45	1952	95	48	5817	246	123
RIDE EQUIPMENT	2	2	2	0	0	0	0	0	0	2	2	2
REPAIR EQUIPMENT	0	0	0	0	0	0	0	0	0	0	0	0
OTHER WORK TASKS	70	70	14	99	99	20	0	0	0	169	169	34
WALKING	7	7	2	6	6	2	0	0	0	13	13	3
SPOT CARS(PLACING)	4	4	4	0	0	0	0	0	0	4	4	4
OPERATE LOADING MACHINE	38	38	38	91	91	91	0	0	0	129	129	129
COAL DUMP OP(INSIDE)	716	183	11	3467	286	18	1952	95	6	6135	564	35

16 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
CONTINUOUS MINER HLPR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	0	0	0	0	0	0	0	0	0	0	0	0
CHANGE BIT	0	0	0	2	2	2	0	0	0	2	2	2
CLEAN UP	76	76	38	101	101	51	0	0	0	177	177	89
CONTINUOUS MINE	172	87	11	218	157	20	0	0	0	390	244	31
DRILL FACE	9	9	5	0	0	0	0	0	0	9	9	5
DRILL ROOF	69	69	23	93	93	31	0	0	0	162	162	54
INSERT BOLT	16	16	3	11	11	2	0	0	0	27	27	5
SET HYDRAULIC JACK	36	36	7	42	42	8	0	0	0	78	78	16
REMOVE HYDRAULIC JACK	80	80	80	94	94	94	27	27	27	201	201	201
MOVE CABLES	1224	845	17	3990	938	19	45	45	1	5259	1828	37
MACHINE MAINTAINENCE	33	33	8	52	52	13	0	0	0	85	85	21
SERVICE MACHINE	41	41	41	76	76	76	0	0	0	117	117	117
POSITION EQUIPMENT	83	83	9	170	170	19	0	0	0	253	253	28
PRY FACE/RIB/ROOF	0	0	0	1	1	1	0	0	0	1	1	1
ROCK DUST	546	419	140	360	93	31	38	38	13	944	550	183
SET PROPS	1923	1259	50	2989	565	23	303	38	2	5215	1862	74
RELOCATE PROPS	89	89	45	136	136	68	7	7	4	232	232	116
SET BRATTICE	17	17	4	17	17	4	0	0	0	34	34	9
CLEAN-UP FALL	95	95	95	105	105	105	33	33	33	233	233	233
SCALE ROOF	11	11	4	0	0	0	0	0	0	11	11	4
TRAM OUT	204	75	25	215	121	40	64	64	21	483	260	87
TEST ROOF	1	1	1	0	0	0	0	0	0	1	1	1
TRANSPORT SUPPLIES	66	66	17	86	86	22	0	0	0	152	152	38
SET ROPE(INCH) JACK	12	12	6	12	12	6	0	0	0	24	24	12
OPERATE SHUTTLE CAR	4	4	1	2	2	1	0	0	0	6	6	2
OPERATE MANTRIP CAR	4	4	4	0	0	0	0	0	0	4	4	4
SUPERVISE	3	3	3	0	0	0	0	0	0	3	3	3
IDLE WORKTIME(LUNCH,ETC)	1766	1463	366	1363	122	31	31	31	8	3160	1616	404
RIDE EQUIPMENT	660	434	145	1820	46	15	1267	71	24	3747	551	184
OTHER WORK TASKS	718	551	9	862	760	12	26	26	0	1606	1337	21
OPERATE CONVEYOR BELT	2	2	2	6	6	6	0	0	0	8	8	8
ESCAPING HAZARD	958	641	160	939	105	26	1421	74	19	3318	820	205
UNKNOWN	70	70	10	118	118	17	0	0	0	188	188	27
CROSSOVER CONVEYOR	11	11	11	29	29	29	0	0	0	40	40	40
USE HANDTOOLS	52	52	2	48	48	2	0	0	0	100	100	4
OPERATE POWR TOOLS	1	1	1	0	0	0	0	0	0	1	1	1
WALKING	111	111	9	145	145	12	6	6	0	262	262	22
OPERATE/RIDE CONV BELT	4	4	4	2	2	2	0	0	0	6	6	6
OPERATE HOIST	138	6	6	123	3	3	0	0	0	261	9	9
OPERATE LOCOMOTIVE	4	4	4	1	1	1	0	0	0	5	5	5
ENTER/LEAVE MACHINE	79	79	79	109	109	109	30	30	30	218	218	218
LOAD,UNLOAD MATERIALS	239	239	14	441	441	26	7	7	0	687	687	40
OPERATE LOADING MACHINE	3	3	2	0	0	0	0	0	0	3	3	2
CONTINUOUS MINER HLPR	9630	7101	25	14778	4809	17	3305	497	2	27713	12407	43

289 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
CONTINUOUS MINER OPER

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	1	1	1	3	3	3	0	0	0	4	4	4
CHANGE BIT	7	7	1	12	12	2	0	0	0	19	19	4
CLEAN RIB	16	16	16	23	23	23	0	0	0	39	39	39
CLEAN UP	69	69	17	91	91	23	0	0	0	160	160	40
CONTINUOUS MINE	7708	6307	54	4337	1729	15	3606	468	4	15651	8504	73
DRILL ROOF	7	7	2	12	12	4	0	0	0	19	19	6
HANG TURING	1	1	1	0	0	0	0	0	0	1	1	1
HOOKUP WIRES	528	33	33	510	24	24	0	0	0	1038	57	57
INSERT BOLT	14	14	7	16	16	8	0	0	0	30	30	15
INSPECT MINE	143	143	72	239	239	120	43	43	22	425	425	213
LOAD SHUTTLE CAR	0	0	0	0	0	0	0	0	0	0	0	0
SET HYDRAULIC JACK	9	9	9	18	18	18	0	0	0	27	27	27
MOVE CABLES	395	395	13	712	712	24	74	74	2	1181	1181	39
MACHINE MAINTAINENCE	128	128	16	204	204	26	26	26	3	358	358	45
SERVICE MACHINE	27	27	4	47	47	8	0	0	0	74	74	12
POSITION EQUIPMENT	2303	1854	132	894	120	9	959	62	4	4156	2036	145
PRY FACE/RIB/ROOF	1	1	1	0	0	0	0	0	0	1	1	1
SET PROPS	226	226	11	346	346	17	0	0	0	572	572	29
RELOCATE PROPS	2	2	2	2	2	2	0	0	0	4	4	4
REMOVE PROPS	9	9	5	16	16	8	0	0	0	25	25	13
SET BRATTICE	13	13	7	27	27	14	0	0	0	40	40	20
SCALE ROOF	2836	2179	363	1460	151	25	2751	169	28	7047	2499	416
SUMP	4	4	4	0	0	0	0	0	0	4	4	4
TRAM IN	424	203	20	523	329	33	150	150	15	1097	682	68
TRAM OUT	215	215	24	278	278	31	0	0	0	493	493	55
TEST ROOF	64	64	64	98	98	98	0	0	0	162	162	162
TRANSPORT SUPPLIES	7	7	2	5	5	2	0	0	0	12	12	4
OPERATE SHUTTLE CAR	5	5	3	0	0	0	0	0	0	5	5	3
OPERATE TRACTOR	5	5	3	2	2	1	0	0	0	7	7	4
OPERATE MANTRIP CAR	0	0	0	0	0	0	0	0	0	0	0	0
OBSERVE OPERATIONS	2	2	2	3	3	3	0	0	0	5	5	5
IDLE WORKTIME(LUNCH,ETC)	116	116	39	125	125	42	88	88	29	329	329	110
RIDE EQUIPMENT	71	71	14	111	111	22	0	0	0	182	182	36
COUPLE/UNCOUPLE MINE CAR	0	0	0	0	0	0	0	0	0	0	0	0
SPRAG/BLOCK/CHOCK MINECR	16	16	16	16	16	16	0	0	0	32	32	32
OTHER WORK TASKS	4995	3575	52	4973	961	14	1104	178	3	11072	4714	68
ESCAPING HAZARD	102	102	26	183	183	46	59	59	15	344	344	86
UNKNOWN	62	62	6	63	63	6	0	0	0	125	125	12
OPERATE WELDER	4	4	2	0	0	0	0	0	0	4	4	2
USE HANDTOOLS	112	112	5	64	64	3	0	0	0	176	176	8
WALKING	3288	3040	109	1065	445	16	559	65	2	4912	3550	127
OPERATE CLEANING PLANT	8	8	8	3	3	3	0	0	0	11	11	11
OPERATE LOCOMOTIVE	6	6	3	3	3	2	0	0	0	9	9	5
ENTER/LEAVE MACHINE	78	78	13	150	150	25	0	0	0	228	228	38
LOAD+UNLOAD MATERIALS	141	141	11	239	239	18	0	0	0	380	380	29
CONTINUOUS MINER OPER	24168	19277	45	16873	6870	16	9419	1382	3	50460	27529	65

425 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
CUTTING MACHINE HELPR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CHANGE BIT	3	3	3	2	2	2	0	0	0	5	5	5
MOVE CABLES	141	141	23	193	193	32	72	72	12	406	406	68
MACHINE MAINTAINENCE	88	88	29	70	70	23	70	70	23	228	228	76
SET PROPS	4	4	2	3	3	2	0	0	0	7	7	4
SET BRATTICE	1	1	1	0	0	0	0	0	0	1	1	1
TRAM OUT	0	0	0	0	0	0	0	0	0	0	0	0
RIDE EQUIPMENT	5	5	5	4	4	4	0	0	0	9	9	9
OTHER WORK TASKS	22	22	2	23	23	3	0	0	0	45	45	5
UNKNOWN	9	9	9	11	11	11	0	0	0	20	20	20
USE HANDTOOLS	3	3	3	0	0	0	0	0	0	3	3	3
WALKING	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE CUTTING MACHINE	75	75	19	149	149	37	0	0	0	224	224	56
CUTTING MACHINE HELPR	352	352	11	455	455	14	142	142	4	949	949	30

32 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
CUTTING MACHINE OPER.

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CHANGE BIT	69	69	23	116	116	39	59	59	20	244	244	81
CLEAN BIT	11	11	11	0	0	0	0	0	0	11	11	11
DRILL FACE	95	95	32	173	173	58	0	0	0	268	268	89
DRILL ROOF	2	2	1	1	1	1	0	0	0	3	3	2
INSERT BOLT	2	2	2	5	5	5	0	0	0	7	7	7
MOVE CABLES	32	32	6	29	29	6	0	0	0	61	61	12
MACHINE MAINTAINENCE	118	118	59	108	108	54	72	72	36	298	298	149
POSITION EQUIPMENT	62	7	7	84	5	5	0	0	0	146	12	12
PRY FACE/RIB/ROOF	4	4	4	2	2	2	0	0	0	6	6	6
SET PROPS	0	0	0	0	0	0	0	0	0	0	0	0
CLEAN-UP FALL	1	1	1	0	0	0	0	0	0	1	1	1
TRAM IN	41	41	8	65	65	13	0	0	0	106	106	21
TRAM OUT	11	11	4	15	15	5	0	0	0	26	26	9
OBSERVE OPERATIONS	7	7	7	10	10	10	0	0	0	17	17	17
IDLE WORKTIME(LUNCH,ETC)	5	5	5	12	12	12	0	0	0	17	17	17
RIDE EQUIPMENT	0	0	0	0	0	0	0	0	0	0	0	0
COUPLE/UNCOUPLE MINE CAR	6	6	6	7	7	7	0	0	0	13	13	13
OTHER WORK TASKS	180	180	9	307	307	15	0	0	0	487	487	24
UNKNOWN	19	19	19	24	24	24	0	0	0	43	43	43
USE HANDTOOLS	21	21	5	31	31	8	0	0	0	52	52	13
OPERATE POWER TOOLS	2	2	2	0	0	0	0	0	0	2	2	2
WALKING	46	46	8	37	37	6	0	0	0	83	83	14
OPERATE CUTTING MACHINE	107	107	8	177	177	14	0	0	0	284	284	22
OPERATE/RIDE CONV BELT	1	1	1	0	0	0	0	0	0	1	1	1
ENTER/LEAVE MACHINE	1	1	1	0	0	0	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	1229	904	151	1265	59	10	819	58	10	3313	1021	170
OPERATE LOADING MACHINE	564	70	70	2716	60	60	306	24	24	3586	154	154
CUTTING MACHINE OPER.	2636	1762	20	5184	1243	14	1256	213	2	9076	3218	37

88 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
DISPATCHER(INSIDE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
INSPECT EQUIPMENT	5	5	5	0	0	0	0	0	0	5	5	5
TRANSPORT SUPPLIES	0	0	0	0	0	0	0	0	0	0	0	0
OTHER WORK TASKS	5	5	5	0	0	0	0	0	0	5	5	5
OPERATE POWER TOOLS	0	0	0	0	0	0	0	0	0	0	0	0
OPERATE LOCOMOTIVE	7	7	7	12	12	12	0	0	0	19	19	19
DISPATCHER(INSIDE)	17	17	3	12	12	2	0	0	0	29	29	6

5 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
DRIVER(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN RIB	1	1	1	4	4	4	0	0	0	5	5	5
CLEAN UP	4	4	2	0	0	0	0	0	0	4	4	2
INSERT BOLT	2	2	2	0	0	0	0	0	0	2	2	2
INSPECT EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
MOVE CABLES	4	4	2	4	4	2	0	0	0	8	8	4
MACHINE MAINTAINENCE	37	37	19	60	60	30	0	0	0	97	97	49
SET PROPS	38	38	19	34	34	17	0	0	0	72	72	36
OPERATE SHUTTLE CAR	10	10	3	18	18	6	0	0	0	28	28	9
OPERATE JITNEY	97	97	19	93	93	19	50	50	10	240	240	48
OPERATE TRACTOR	71	71	5	142	142	11	0	0	0	213	213	16
COUPLE/UNCOUPLE MINE CAR	9	9	5	6	6	3	0	0	0	15	15	8
OTHER WORK TASKS	47	47	6	81	81	10	0	0	0	128	128	16
UNKNOWN	4	4	4	4	4	4	0	0	0	8	8	8
ENTER/LEAVE MACHINE	22	22	6	9	9	2	0	0	0	31	31	8
LOAD,UNLOAD MATERIALS	13	13	2	13	13	2	0	0	0	26	26	4
OPERATE LOADING MACHINE	4	4	4	9	9	9	0	0	0	13	13	1
DRIVER(INSIDE)	364	364	7	477	477	9	50	50	1	891	891	16

55 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
DUST SAMPLER(OUTSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
IDLE WORKTIME(LUNCH,ETC)	12	12	12	14	14	14	0	0	0	26	26	26
OTHER WORK TASKS	1	1	1	0	0	0	0	0	0	1	1	1
WALKING	0	0	0	1	1	1	0	0	0	1	1	1
DUST SAMPLER(OUTSIDE)	13	13	3	15	15	4	0	0	0	28	28	7

4 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ELECTR. HLP(NON-FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OTHER WORK TASKS	2	2	2	3	3	3	0	0	0	5	5	5
USE HANDTOOLS	4	4	4	1	1	1	0	0	0	5	5	5
ELECTR. HLP(NON-FACE)	6	6	3	4	4	2	0	0	0	10	10	5

2 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ELECTRICIAN HLP(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
ELECTRICAL MAINTAINENCE	1	1	1	3	3	3	0	0	0	4	4	4
MOVE CABLES	2	2	2	4	4	4	0	0	0	6	6	6
MACHINE MAINTAINENCE	5	5	5	5	5	5	0	0	0	10	10	10
SERVICE MACHINE	108	108	108	54	54	54	117	117	117	279	279	279
POSITION EQUIPMENT	15	15	15	12	12	12	0	0	0	27	27	27
OTHER WORK TASKS	70	70	14	84	84	17	0	0	0	154	154	31
USE HANDTOOLS	96	96	32	111	111	37	35	35	12	242	242	81
WALKING	1	1	1	3	3	3	0	0	0	4	4	4
LOAD,UNLOAD MATERIALS	3	3	3	0	0	0	0	0	0	3	3	3
ELECTRICIAN HLP(FACE)	301	301	20	276	276	18	152	152	10	729	729	49

15 INJURIES OF 5286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ELECTRICIAN(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	26	26	13	29	29	15	0	0	0	55	55	28
CHANGE BIT	0	0	0	0	0	0	0	0	0	0	0	0
CLEAN UP	5	5	3	6	6	3	0	0	0	11	11	6
CONTINUOUS MINE	36	36	18	55	55	28	0	0	0	91	91	46
ELECTRICAL MAINTAINENCE	68	68	4	6	6	0	0	0	0	74	74	4
INSPECT EQUIPMENT	11	11	11	19	19	19	0	0	0	30	30	30
MOVE CABLES	79	79	26	99	99	33	0	0	0	178	178	59
MACHINE MAINTAINENCE	607	550	10	805	716	13	36	36	1	1448	1302	23
SERVICE MACHINE	107	107	27	91	91	23	76	76	19	274	274	69
POSITION EQUIPMENT	18	18	9	29	29	15	0	0	0	47	47	24
TRAM IN	1	1	1	0	0	0	0	0	0	1	1	1
TRAM OUT	0	0	0	0	0	0	0	0	0	0	0	0
TRANSPORT SUPPLIES	5	5	5	7	7	7	0	0	0	12	12	12
OPERATE SHUTTLE CAR	105	105	26	130	130	33	57	57	14	292	292	73
OPERATE TRACTOR	4	4	1	4	4	1	0	0	0	8	8	3
RIDE EQUIPMENT	21	21	5	18	18	5	0	0	0	39	39	10
COUPLE/UNCOUPLE MINE CAR	1	1	1	0	0	0	0	0	0	1	1	1
RERAIL EQUIPMENT	5	5	5	7	7	7	0	0	0	12	12	12
OTHER WORK TASKS	695	585	12	1060	833	18	7	7	0	1762	1425	30
UNKNOWN	165	165	41	181	181	45	88	88	22	434	434	109
CROSSOVER CONVEYOR	2	2	1	4	4	2	0	0	0	6	6	3
OPERATE WELDER	17	17	4	2	2	1	0	0	0	19	19	5
USE HANDTOOLS	402	402	8	502	502	10	0	0	0	904	904	18
OPERATE POWER TOOLS	1	1	1	0	0	0	0	0	0	1	1	1
WALKING	87	87	6	148	148	11	0	0	0	235	235	17
ENTER/LEAVE MACHINE	19	19	10	27	27	14	0	0	0	46	46	23
LOAD,UNLOAD MATERIALS	42	42	4	46	46	4	0	0	0	88	88	8
ELECTRICIAN(FACE)	2529	2362	10	3275	2959	12	264	264	1	6068	5585	23

242 INJURIES OF 5286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
ELECTRICIAN(MASTER)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
DRILL ROOF	8	8	8	17	17	17	0	0	0	25	25	25
ELECTRICAL MAINTAINENCE	26	26	9	2	2	1	0	0	0	28	28	9
INSERT BOLT	1	1	1	4	4	4	0	0	0	5	5	5
MACHINE MAINTAINENCE	37	9	5	42	7	4	0	0	0	79	16	8
POSITION EQUIPMENT	2	2	2	4	4	4	0	0	0	6	6	6
RIDE EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
OTHER WORK TASKS	46	46	15	105	105	35	0	0	0	151	151	50
REPLACE TROLLEY POLE	0	0	0	0	0	0	0	0	0	0	0	0
OPERATE WELDER	2	2	2	5	5	5	0	0	0	7	7	7
USE HANDTOOLS	2	2	1	2	2	1	0	0	0	4	4	2
ENTER/LEAVE MACHINE	1	1	1	0	0	0	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	1	1	1	0	0	0	0	0	0	1	1	1
ELECTRICIAN(MASTER)	127	99	5	181	146	8	0	0	0	308	245	14

18 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
ELECTRICIAN(NON-FACE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	8	8	8	10	10	10	0	0	0	18	18	18
ELECTRICAL MAINTAINENCE	216	73	18	328	106	27	0	0	0	544	179	45
REMOVE HYDRAULIC JACK	6	6	6	6	6	6	0	0	0	12	12	12
MOVE CABLES	7	7	2	11	11	4	0	0	0	18	18	6
MACHINE MAINTAINENCE	68	68	17	103	103	26	0	0	0	171	171	43
SERVICE MACHINE	9	9	3	12	12	4	0	0	0	21	21	7
POSITION EQUIPMENT	3	3	3	0	0	0	0	0	0	3	3	3
TRANSPORT SUPPLIES	57	57	29	96	96	48	0	0	0	153	153	77
OPERATE TRACTOR	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE MANTRIP CAR	5	5	5	13	13	13	0	0	0	18	18	18
RIDE EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
COUPLE/UNCOUPLE MINE CAR	5	5	5	2	2	2	0	0	0	7	7	7
SWITCH TRACKS	3	3	3	0	0	0	0	0	0	3	3	3
RERAIL EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
OTHER WORK TASKS	139	139	14	174	174	17	0	0	0	313	313	31
OPERATE WELDER	120	120	40	177	177	59	0	0	0	297	297	99
USE HANDTOOLS	25	25	4	31	31	5	0	0	0	56	56	9
WALKING	11	11	2	1	1	0	0	0	0	12	12	2
OPERATE LOCOMOTIVE	41	41	14	65	65	22	0	0	0	106	106	35
ENTER/LEAVE MACHINE	14	14	7	24	24	12	0	0	0	38	38	19
LOAD,UNLOAD MATERIALS	58	58	10	88	88	15	0	0	0	146	146	24
OPERATE LOADING MACHINE	4	4	4	0	0	0	0	0	0	4	4	4
ELECTRICIAN(NON-FACE)	802	659	10	1141	919	14	0	0	0	1943	1578	25

64 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
ENGINEER

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
SERVICE MACHINE	2	2	2	1	1	1	0	0	0	3	3	3
RIDE EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
WALKING	24	24	12	37	37	19	0	0	0	61	61	31
ENGINEER	27	27	7	38	38	10	0	0	0	65	65	16

4 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
FIRE BOSS/EXAMINER

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
INSPECT EQUIPMENT	2	2	2	0	0	0	0	0	0	2	2	2
INSPECT MINE	48	48	10	85	85	17	0	0	0	133	133	27
POSITION EQUIPMENT	2	2	2	0	0	0	0	0	0	2	2	2
SET PROPS	27	27	14	19	19	10	0	0	0	46	46	23
SCALE ROOF	8	8	8	0	0	0	0	0	0	8	8	8
TRANSPORT SUPPLIES	3	3	2	3	3	2	0	0	0	6	6	3
OPERATE SHUTTLE CAR	3	3	2	4	4	2	0	0	0	7	7	4
OPERATE TRACTOR	5	5	2	0	0	0	0	0	0	5	5	2
RIDE EQUIPMENT	0	0	0	0	0	0	0	0	0	0	0	0
RERAIL EQUIPMENT	6	6	6	0	0	0	0	0	0	6	6	6
OTHER WORK TASKS	40	40	4	22	22	2	0	0	0	62	62	7
UNKNOWN	2	2	2	0	0	0	0	0	0	2	2	2
REPLACE TROLLEY POLE	16	16	8	15	15	8	0	0	0	31	31	16
WALKING	12	12	2	0	0	0	0	0	0	12	12	2
OPERATE HOIST	7	7	7	0	0	0	0	0	0	7	7	7
OPERATE LOCOMOTIVE	2	2	1	0	0	0	0	0	0	2	2	1
ENTER/LEAVE MACHINE	17	17	6	24	24	8	0	0	0	41	41	14
LOAD,UNLOAD MATERIALS	14	14	14	0	0	0	0	0	0	14	14	14
FIRE BOSS/EXAMINER	214	214	5	172	172	4	0	0	0	386	386	9

44 INJURIES OF 9286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
FOREMAN(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH ROOF	5	5	5	1	1	1	0	0	0	6	6	6
CLEAN BIT	1	1	1	3	3	3	0	0	0	4	4	4
CLEAN UP	13	13	13	0	0	0	0	0	0	13	13	13
CONTINUOUS MINE	12	12	4	7	7	2	0	0	0	19	19	6
DRILL ROOF	82	82	16	167	167	33	0	0	0	249	249	50
GET READY FOR WORK TASK	69	69	69	161	161	161	0	0	0	230	230	230
HANG TURING	0	0	0	0	0	0	0	0	0	0	0	0
INSERT BOLT	12	12	2	6	6	1	0	0	0	18	18	4
INSPECT EQUIPMENT	19	19	2	21	21	3	0	0	0	40	40	5
INSPECT MINE	866	95	8	750	80	7	0	0	0	1616	175	15
SET HYDRAULIC JACK	70	70	14	179	179	36	0	0	0	249	249	50
RELOCATE HYDRAULIC JACK	2	2	2	5	5	5	0	0	0	7	7	7
REMOVE HYDRAULIC JACK	4	4	4	8	8	8	0	0	0	12	12	12
MOVE CABLES	125	125	11	205	205	19	66	66	6	396	396	36
MARK HOLE	4	4	4	0	0	0	0	0	0	4	4	4
MACHINE MAINTAINENCE	127	92	12	237	195	24	0	0	0	364	287	36
SERVICE MACHINE	49	49	16	129	129	43	0	0	0	178	178	59
POSITION EQUIPMENT	84	84	9	171	171	19	0	0	0	255	255	28
PRY FACE/RIB/ROOF	29	29	15	50	50	25	0	0	0	79	79	40
ROCK DUST	2	2	2	0	0	0	0	0	0	2	2	2
SET PROPS	18	18	3	22	22	3	0	0	0	40	40	6
REMOVE PROPS	4	4	1	13	13	4	0	0	0	17	17	6
SET BRATTICE	9	9	5	18	18	9	0	0	0	27	27	14
SHOOT COAL	8	8	8	19	19	19	0	0	0	27	27	27
CLEAN-UP FALL	2877	2525	2525	2062	82	82	202	39	39	5141	2646	2646
SCALE ROOF	131	131	26	399	399	80	0	0	0	530	530	106
TRAM IN	5	5	5	3	3	3	0	0	0	8	8	8
TORQUE BOLT	5	5	5	11	11	11	0	0	0	16	16	16
TEST ROOF	87	87	22	144	144	36	0	0	0	231	231	58
TRANSPORT SUPPLIES	5	5	3	7	7	4	0	0	0	12	12	6
OPERATE SHUTTLE CAR	2	2	2	0	0	0	0	0	0	2	2	2
OPERATE JITNEY	13	13	13	4	4	4	0	0	0	17	17	17
OPERATE TRACTOR	16	16	5	45	45	15	0	0	0	61	61	20
OPERATE MANTRIP CAR	2	2	2	0	0	0	0	0	0	2	2	2
SUPERVISE	178	178	7	221	221	8	0	0	0	399	399	15
OBSERVE OPERATIONS	238	238	15	572	572	36	103	103	6	913	913	57
IDLE WORKTIME(LUNCH,ETC)	88	88	13	213	213	30	0	0	0	301	301	43
RIDE EQUIPMENT	131	131	15	252	252	28	0	0	0	383	383	43
COUPLE/UNCOUPLE MINE CAR	67	9	2	172	12	2	0	0	0	239	21	4
RERAIL EQUIPMENT	3	3	2	5	5	3	0	0	0	8	8	4
OTHER WORK TASKS	875	639	8	1464	1191	16	90	90	1	2429	1920	25
RECOVER/RETRIEVE MTL/EQP	14	14	7	0	0	0	0	0	0	14	14	7
UNKNOWN	237	159	14	533	380	35	0	0	0	770	539	49
REPLACE TROLLEY POLE	0	0	0	0	0	0	0	0	0	0	0	0
CROSSOVER CONVEYOR	61	61	31	132	132	66	0	0	0	193	193	97

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
FOREMAN(FACE) (CONTINUED)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OPERATE HELPER	10	10	10	18	18	18	0	0	0	28	28	28
USE HANDTOOLS	78	78	3	62	62	2	0	0	0	140	140	5
WALKING	462	462	10	765	765	17	133	133	3	1360	1360	30
OPERATE HOIST	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE LOCOMOTIVE	9	9	9	7	7	7	0	0	0	16	16	16
ENTER/LEAVE MACHINE	92	92	9	166	166	17	0	0	0	258	258	26
LOAD,UNLOAD MATERIALS	83	83	6	184	184	14	0	0	0	267	267	21
SPOT CARS(PLACING)	34	34	17	0	0	0	0	0	0	34	34	17
OPERATE LOADING MACHINE	18	18	3	27	27	4	0	0	0	45	45	7
FOREMAN(FACE)	7436	5906	15	9640	6362	17	594	431	1	17670	12699	33

382 INJURIES OF 5286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
FOREMAN(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	17	17	9	38	38	19	0	0	0	55	55	28
HAND LOAD	5	5	5	0	0	0	0	0	0	5	5	5
INSPECT EQUIPMENT	2	2	2	0	0	0	0	0	0	2	2	2
INSPECT MINE	617	315	315	1694	65	65	724	57	57	3035	437	437
REMOVE HYDRAULIC JACK	10	10	10	7	7	7	0	0	0	17	17	17
MOVE CABLES	0	0	0	1	1	1	0	0	0	1	1	1
MACHINE MAINTAINENCE	5	5	3	0	0	0	0	0	0	5	5	3
POSITION EQUIPMENT	36	36	18	125	125	63	0	0	0	161	161	81
OPERATE JITNEY	2	2	2	0	0	0	0	0	0	2	2	2
OPERATE TRACTOR	0	0	0	0	0	0	0	0	0	0	0	0
OPERATE MANTRIP CAR	2	2	1	1	1	0	0	0	0	3	3	1
SUPERVISE	2281	1281	213	2484	222	37	881	61	10	5646	1564	261
OBSERVE OPERATIONS	100	16	8	131	9	5	0	0	0	231	25	13
RIDE EQUIPMENT	15	15	3	29	29	6	0	0	0	44	44	9
SPRAG/BLOCK/CHOCK MINECR	3	3	3	0	0	0	0	0	0	3	3	3
REPAIR EQUIPMENT	31	31	8	55	55	14	0	0	0	86	86	22
OTHER WORK TASKS	164	164	13	292	292	22	0	0	0	456	456	35
REPLACE TROLLEY POLE	1	1	1	0	0	0	0	0	0	1	1	1
CROSSOVER CONVEYOR	3	3	3	8	8	8	0	0	0	11	11	11
USE HANDTOOLS	25	25	4	13	13	2	0	0	0	38	38	6
WALKING	16	16	2	23	23	3	0	0	0	39	39	5
OPERATE/RIDE CONV BELT	1	1	1	2	2	2	0	0	0	3	3	3
OPERATE HOIST	4	4	4	8	8	8	0	0	0	12	12	12
ENTER/LEAVE MACHINE	13	13	4	37	37	12	0	0	0	50	50	17
LOAD,UNLOAD MATERIALS	0	0	0	0	0	0	0	0	0	0	0	0
FOREMAN(INSIDE)	3353	1567	28	4948	935	13	1605	118	2	9906	3020	43

70 INJURIES OF 5286 TOTAL INJURIES IN TABLE

ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CATF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
FOREMAN(MTCE,OUTSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
INSPECT EQUIPMENT	2	2	1	0	0	0	0	0	0	2	2	1
MOVE CABLES	12	12	12	0	0	0	0	0	0	12	12	12
MACHINE MAINTAINENCE	82	82	21	177	177	44	32	32	8	291	291	73
SERVICE MACHINE	4	4	4	10	10	10	0	0	0	14	14	14
POSITION EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE TRACTOR	4	4	4	5	5	5	0	0	0	9	9	9
OPERATE MANTRIP CAR	1	1	1	0	0	0	0	0	0	1	1	1
IDLE WORKTIME(LUNCH,ETC)	1	1	1	0	0	0	0	0	0	1	1	1
RIDE EQUIPMENT	10	10	3	18	18	6	0	0	0	28	28	9
OTHER WORK TASKS	6	6	2	3	3	1	0	0	0	9	9	2
RECOVER/RETRIEVE MTL/EQP	1	1	1	3	3	3	0	0	0	4	4	4
OPERATE WELDER	1	1	1	0	0	0	0	0	0	1	1	1
USE HANDTOOLS	0	0	0	0	0	0	0	0	0	0	0	0
OPERATE HOIST	1	1	1	0	0	0	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	23	23	8	57	57	19	0	0	0	80	80	27
FOREMAN(MTCE,OUTSIDE)	149	149	6	273	273	10	32	32	1	454	454	17

27 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
FOREMAN(PREP PLANT)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
RERAIL EQUIPMENT	2	2	2	11	11	11	0	0	0	13	13	13
FOREMAN(PREP PLANT)	2	2	2	11	11	11	0	0	0	13	13	13

1 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
FOREMAN/MANAGER(ASST)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	417	417	417	610	122	122	18	18	18	1045	557	557
INSERT BOLT	1	1	1	0	0	0	0	0	0	1	1	1
INSPECT EQUIPMENT	9	9	5	11	11	5	0	0	0	20	20	10
INSPECT MINE	0	0	0	0	0	0	0	0	0	0	0	0
MOVE CABLES	51	51	17	122	122	41	0	0	0	173	173	58
MACHINE MAINTAINENCE	18	18	18	8	8	8	0	0	0	26	26	26
SET PROPS	0	0	0	0	0	0	0	0	0	0	0	0
SET BRATTICE	1	1	1	0	0	0	0	0	0	1	1	1
TRANSPORT SUPPLIES	0	0	0	0	0	0	0	0	0	0	0	0
OPERATE JITNEY	8	8	8	20	20	20	0	0	0	28	28	28
SUPERVISE	4	4	1	0	0	0	0	0	0	4	4	1
OBSERVE OPERATIONS	88	88	29	142	142	47	71	71	24	301	301	100
IDLE WORKTIME(LUNCH,ETC)	3	3	3	1	1	1	0	0	0	4	4	4
RIDE EQUIPMENT	3	3	2	1	1	1	0	0	0	4	4	2
COUPLE/UNCOUPLE MINE CAR	20	20	10	0	0	0	0	0	0	20	20	10
RERAIL EQUIPMENT	14	14	14	0	0	0	0	0	0	14	14	14
OTHER WORK TASKS	21	21	3	3	3	0	0	0	0	24	24	4
UNKNOWN	3	3	2	0	0	0	0	0	0	3	3	2
USE HANDTOOLS	8	8	4	2	2	1	0	0	0	10	10	5
WALKING	41	41	3	33	33	3	0	0	0	74	74	6
ENTER/LEAVE MACHINE	0	0	0	0	0	0	0	0	0	0	0	0
LOAD,UNLOAD MATERIALS	56	56	14	107	107	27	0	0	0	163	163	41
FOREMAN/MANAGER(ASST)	766	766	14	1060	572	11	89	89	2	1915	1427	27

53 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
FOREMAN/MANAGER(MINE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	386	33	33	5667	135	135	291	26	26	6344	194	194
CONTINUOUS MINE	0	0	0	4	4	4	0	0	0	4	4	4
ELECTRICAL MAINTAINENCE	6	6	6	0	0	0	0	0	0	6	6	6
INSERT BOLT	0	0	0	0	0	0	0	0	0	0	0	0
INSPECT EQUIPMENT	3	3	3	0	0	0	0	0	0	3	3	3
INSPECT MINE	1710	1423	356	1531	153	39	26	26	7	3267	1602	401
MACHINE MAINTAINENCE	578	47	8	1785	147	24	0	0	0	2363	194	32
POSITION EQUIPMENT	12	12	12	28	28	28	0	0	0	40	40	40
SET PROPS	1	1	1	0	0	0	0	0	0	1	1	1
SET BRATTICE	79	79	79	360	360	360	37	37	37	476	476	476
OPERATE TRACTOR	1	1	1	0	0	0	0	0	0	1	1	1
SUPERVISE	4	4	2	9	9	5	0	0	0	13	13	7
OBSERVE OPERATIONS	1	1	1	0	0	0	0	0	0	1	1	1
IDLE WORKTIME(LUNCH,ETC)	69	8	8	232	18	18	0	0	0	301	26	26
OTHER WORK TASKS	77	77	10	374	374	47	0	0	0	451	451	56
ESCAPING HAZARD	4	4	4	0	0	0	0	0	0	4	4	4
UNKNOWN	893	518	259	4784	364	182	1592	67	34	7249	949	475
CROSSOVER CONVEYOR	6	6	6	20	20	20	0	0	0	26	26	26
USE HANDTOOLS	2	2	1	5	5	3	0	0	0	7	7	4
OPERATE POWER TOOLS	5	5	5	8	8	8	0	0	0	13	13	13
WALKING	76	76	76	344	344	344	90	90	90	510	510	510
ENTER/LEAVE MACHINE	9	9	9	11	11	11	0	0	0	20	20	20
FOREMAN/MANAGER(MINE)	3922	2315	58	15142	1980	49	2036	246	6	21100	4541	114

40 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
HOISTMAN(INSIDE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OTHER WORK TASKS	0	0	0	0	0	0	0	0	0	0	0	0
UNKNOWN	2	2	2	3	3	3	0	0	0	5	5	5
OPERATE HOIST	115	115	29	52	52	13	68	68	17	235	235	59
ENTER/LEAVE MACHINE	1	1	1	0	0	0	0	0	0	1	1	1
SPOT CARS(PLACING)	2975	2975	2975	1164	78	78	26	26	26	4165	3079	3079
HOISTMAN(INSIDE)	3093	3093	387	1219	133	17	94	94	12	4406	3320	415

8 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
INSPECTOR

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
INSPECT MINE	0	0	0	0	0	0	0	0	0	0	0	0
RIDE EQUIPMENT	3	3	3	6	6	6	0	0	0	9	9	9
OTHER WORK TASKS	2	2	2	0	0	0	0	0	0	2	2	2
USE HANDTOOLS	3	3	3	0	0	0	0	0	0	3	3	3
LOAD,UNLOAD MATERIALS	1	1	1	0	0	0	0	0	0	1	1	1
SPOT CARS(PLACING)	46	46	46	146	146	146	0	0	0	192	192	192
INSPECTOR	55	55	9	152	152	25	0	0	0	207	207	34

6 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
JACK SETTER/LONGWALL

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	0	0	0	1	1	1	0	0	0	1	1	1
DRILL FACE	19	19	19	34	34	34	0	0	0	53	53	53
DRILL ROOF	8	8	8	6	6	6	0	0	0	14	14	14
SET HYDRAULIC JACK	15	15	2	17	17	3	0	0	0	32	32	5
RELOCATE HYDRAULIC JACK	2553	2185	137	1868	170	11	1143	68	4	5564	2423	151
REMOVE HYDRAULIC JACK	42	42	7	59	59	10	0	0	0	101	101	17
MOVE CABLES	18	18	18	36	36	36	0	0	0	54	54	54
MACHINE MAINTAINENCE	12	12	6	11	11	6	0	0	0	23	23	12
POSITION EQUIPMENT	258	175	16	312	263	24	0	0	0	570	438	40
PRY FACE/RIB/ROOF	45	45	45	85	85	85	0	0	0	130	130	130
SET PROPS	5	5	3	4	4	2	0	0	0	9	9	5
RELOCATE PROPS	5	5	3	7	7	4	0	0	0	12	12	6
REMOVE PROPS	2	2	2	4	4	4	0	0	0	6	6	6
TIGHTEN POPE(MINEM) JACK	1	1	1	2	2	2	0	0	0	3	3	3
IDLE WORKTIME(LUNCH,ETC)	1	1	1	2	2	1	0	0	0	3	3	2
RIDE EQUIPMENT	2	2	2	4	4	4	0	0	0	6	6	6
RERAIL EQUIPMENT	12	12	12	22	22	22	0	0	0	34	34	34
OTHER WORK TASKS	124	124	6	143	143	7	0	0	0	267	267	13
ESCAPING HAZARD	7	7	7	11	11	11	0	0	0	18	18	18
UNKNOWN	36	36	9	52	52	13	0	0	0	88	88	22
UNDEFINED	6	6	6	5	5	5	0	0	0	11	11	11
USE HANDTOOLS	114	114	13	143	143	16	28	28	3	285	285	32
WALKING	26	26	4	39	39	6	0	0	0	65	65	11
OPERATE HOIST	4	4	4	4	4	4	0	0	0	8	8	8
ENTER/LEAVE MACHINE	0	0	0	1	1	1	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	16	16	3	29	29	6	0	0	0	45	45	9
JACK SETTER/LONGWALL	3331	2880	28	2901	1154	11	1171	96	1	7403	4130	40

104 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
LABORER(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN RIB	996	377	63	1627	61	10	174	26	4	2797	464	77
CLEAN UP	257	257	11	357	357	16	5	5	0	619	619	27
CONTINUOUS MINE	46	46	8	88	88	15	0	0	0	134	134	22
DRILL FACE	9	9	3	0	0	0	0	0	0	9	9	3
DRILL ROOF	567	494	8	671	585	10	134	134	2	1372	1213	21
EMPTY DUSTBOX	14	14	14	25	25	25	0	0	0	39	39	39
EXTEND CONVEYOR	24	24	24	30	30	30	0	0	0	54	54	54
ELECTRICAL MAINTAINENCE	27	27	14	37	37	19	0	0	0	64	64	32
HAND LOAD	101	101	34	127	127	42	9	9	3	237	237	79
HANG TUBING	8	8	3	0	0	0	0	0	0	8	8	3
HOOKUP WIRES	0	0	0	2	2	2	0	0	0	2	2	2
INSERT BOLT	147	147	6	125	125	5	76	76	3	348	348	14
INSERT CHARGE	1	1	1	0	0	0	0	0	0	1	1	1
INSPECT EQUIPMENT	2	2	2	0	0	0	0	0	0	2	2	2
LOAD SHUTTLE CAR	7	7	7	0	0	0	0	0	0	7	7	7
SET HYDRAULIC JACK	40	40	10	61	61	15	0	0	0	101	101	25
RELOCATE HYDRAULIC JACK	2	2	2	4	4	4	0	0	0	6	6	6
MOVE CABLES	3261	3016	70	738	453	11	585	76	2	4584	3545	82
MACHINE MAINTAINENCE	50	50	4	35	35	2	0	0	0	85	85	6
SERVICE MACHINE	12	12	2	6	6	1	0	0	0	18	18	4
POSITION EQUIPMENT	180	180	7	253	253	10	0	0	0	433	433	17
PRY FACE/RIB/ROOF	102	102	20	127	127	25	8	8	2	237	237	47
ROCK DUST	176	176	20	291	291	32	12	12	1	479	479	53
SET PROPS	597	597	12	683	683	14	62	62	1	1342	1342	27
RELOCATE PROPS	2	2	1	8	8	2	0	0	0	10	10	3
REMOVE PROPS	56	56	7	58	58	7	0	0	0	114	114	14
SET BRATTICE	2078	2078	77	617	617	23	90	90	3	2785	2785	103
SHOOT COAL	41	41	10	73	73	18	0	0	0	114	114	29
CLEAN-UP FALL	2	2	1	4	4	2	0	0	0	6	6	3
SCALE ROOF	43	43	6	36	36	5	0	0	0	79	79	11
TRAM IN	27	27	9	46	46	15	0	0	0	73	73	24
TRAM OUT	42	42	21	48	48	24	0	0	0	90	90	45
TORQUE BOLT	4	4	4	0	0	0	0	0	0	4	4	4
TRANSPORT SUPPLIES	120	120	9	126	126	10	7	7	1	253	253	19
SET ROOF(WINCH) JACK	12	12	6	17	17	9	0	0	0	29	29	15
OPERATE SHUTTLE CAR	308	308	11	388	388	14	40	40	1	736	736	27
OPERATE JITNEY	6	6	3	0	0	0	0	0	0	6	6	3
OPERATE TRACTOR	98	98	11	108	108	12	0	0	0	206	206	23
OPERATE MANTRIP CAR	86	86	29	40	40	13	80	80	27	206	206	69
OBSERVE OPERATIONS	122	122	24	161	161	32	7	7	1	290	290	58
TOLS WORKTIME(LUNCH,ETC)	202	202	22	224	224	25	8	8	1	434	434	48
RIDE EQUIPMENT	249	249	16	211	211	13	0	0	0	460	460	29
COUPLE/UNCOUPLE MINE CAR	80	80	5	110	110	7	0	0	0	190	190	12
SPRAG/BLOCK/CHOCK MINECR	57	8	4	13	0	0	0	0	0	70	8	4
LOAD/UNLOAD MINECARS	3	3	3	0	0	0	0	0	0	3	3	3

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
LABORER(FACE) (CONTINUED)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
REPAIR EQUIPMENT	28	28	7	19	19	5	0	0	0	47	47	12
OTHER WORK TASKS	4880	4499	16	4199	2992	10	1421	388	1	10500	7879	28
RECOVER/RETRIEVE MTL/EQP	4	4	1	7	7	2	0	0	0	11	11	3
ESCAPING HAZARD	15	15	15	19	19	19	0	0	0	34	34	34
UNKNOWN	98	98	4	120	120	5	0	0	0	218	218	9
REPLACE TROLLEY POLE	2	2	2	5	5	5	0	0	0	7	7	7
CROSSOVER CONVEYOR	15	15	4	5	5	1	0	0	0	20	20	5
OPERATE WELDER	106	106	106	88	88	88	56	56	56	250	250	250
USE HANDTOOLS	814	814	8	992	992	10	64	64	1	1870	1870	19
OPERATE POWER TOOLS	1	1	1	0	0	0	0	0	0	1	1	1
WALKING	863	863	21	3466	433	10	144	144	3	4473	1440	34
OPERATE/RIDE CONV BELT	142	142	47	157	157	52	40	40	13	339	339	113
OPERATE ROCKDUST MACHINE	92	92	31	207	207	69	6	6	2	305	305	102
OPERATE HOIST	58	58	19	80	80	27	0	0	0	138	138	46
OPERATE LOCOMOTIVE	5	5	1	1	1	0	0	0	0	6	6	2
ENTER/LEAVE MACHINE	158	158	13	213	213	18	0	0	0	371	371	31
PICK SLATE	4	4	4	0	0	0	0	0	0	4	4	4
LOAD,UNLOAD MATERIALS	987	790	8	845	787	8	146	146	2	1978	1723	18
OPERATE LOADING MACHINE	757	757	38	3212	391	20	34	34	2	4003	1182	59
LABORER(FACE)	19293	17729	17	21210	12141	11	3208	1518	1	43711	31388	30

1055 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
LABORER(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	21	21	7	23	23	8	0	0	0	44	44	15
CLEAN UP	183	183	10	267	267	14	0	0	0	450	450	24
DRILL FACE	4	4	2	5	5	3	0	0	0	9	9	5
DRILL ROOF	172	172	17	117	117	12	62	62	6	351	351	35
HANG TUBING	18	18	18	0	0	0	0	0	0	18	18	18
INSERT BOLT	252	85	17	342	65	13	106	106	21	700	256	51
INSPECT EQUIPMENT	71	71	71	108	108	108	4	4	4	183	183	183
MOVE CABLES	717	496	83	420	82	14	217	64	11	1354	642	107
MACHINE MAINTAINENCE	28	28	7	48	48	12	0	0	0	76	76	19
SERVICE MACHINE	2	2	1	0	0	0	0	0	0	2	2	1
POSITION EQUIPMENT	105	105	26	203	203	51	0	0	0	308	308	77
SET PROPS	62	62	10	77	77	13	0	0	0	139	139	23
SET BRATTICE	2	2	1	2	2	1	0	0	0	4	4	2
CLEAN-UP FALL	16	16	8	26	26	13	0	0	0	42	42	21
SCALE ROOF	74	74	25	106	106	35	0	0	0	180	180	60
TRAM IN	26	26	26	35	35	35	0	0	0	61	61	61
TRAM OUT	55	55	28	74	74	37	0	0	0	129	129	65
TRANSPORT SUPPLIES	47	47	8	36	36	6	0	0	0	83	83	14
OPERATE SHUTTLE CAR	4	4	4	5	5	5	0	0	0	9	9	9
OPERATE JITNEY	19	19	19	16	16	16	0	0	0	35	35	35
OPERATE TRACTOR	58	58	15	50	50	13	0	0	0	108	108	27
OPERATE MANTRIP CAR	67	67	22	110	110	37	0	0	0	177	177	59
LAY TRACK	8	8	4	9	9	5	0	0	0	17	17	9
OBSERVE OPERATIONS	4	4	4	0	0	0	0	0	0	4	4	4
IDLE WORKTIME(LUNCH,ETC)	14	14	7	19	19	10	0	0	0	33	33	17
RIDE EQUIPMENT	284	284	10	368	368	13	0	0	0	652	652	22
COUPLE/UNCOUPLE MINE CAR	1321	1072	92	2750	137	11	280	28	2	4341	1237	95
SWITCH TRACKS	1	1	1	2	2	2	0	0	0	3	3	3
SPRAG/BLOCK/CHOCK MINECR	68	68	23	102	102	34	0	0	0	170	170	57
LOAD/UNLOAD MINECARS	73	73	73	96	96	96	6	6	6	175	175	175
RERAIL EQUIPMENT	38	38	6	77	77	13	0	0	0	115	115	19
OTHER WORK TASKS	1189	1189	9	1347	1347	10	62	62	0	2598	2598	20
RECOVER/RETRIEVE MTL/EQP	13	13	3	2	2	0	0	0	0	15	15	3
UNKNOWN	151	151	30	298	298	60	9	9	2	458	458	92
REPLACE TROLLEY POLE	28	28	28	38	38	38	0	0	0	66	66	66
CROSSOVER CONVEYOR	81	81	27	128	128	43	5	5	2	214	214	71
USE HANDTOOLS	229	178	4	62	48	1	0	0	0	291	226	6
OPERATE POWER TOOLS	59	59	59	97	97	97	0	0	0	156	156	156
WALKING	345	345	14	472	472	20	0	0	0	817	817	34
OPERATE ROCKDUST MACHINE	0	0	0	0	0	0	0	0	0	0	0	0
OPERATE HOIST	6	6	3	3	3	2	0	0	0	9	9	5
OPERATE LOCOMOTIVE	144	144	16	128	128	14	41	41	5	313	313	35
ENTER/LEAVE MACHINE	156	156	13	153	153	13	26	26	2	335	335	28
LOAD,UNLOAD MATERIALS	851	597	10	857	702	12	58	58	1	1766	1357	23
SPOT CARS(PLACING)	8	8	8	11	11	11	0	0	0	19	19	19

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
LABORER(INSIDE) (CONTINUED)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OPERATE LOADING MACHINE	6	6	3	6	6	3	0	0	0	12	12	6
LABORER(INSIDE)	7090	6138	14	9095	5698	13	856	471	1	17041	12307	28

441 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
LOADER HEAD/ROSCOE OP

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OTHER WORK TASKS	2	2	2	3	3	3	0	0	0	5	5	5
LOADER HEAD/ROSCOE OP	2	2	2	3	3	3	0	0	0	5	5	5

1 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
LOADING MACHINE HELPR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CHANGE DRILL	4	4	4	0	0	0	0	0	0	4	4	4
CLEAN UP	9	9	9	16	16	16	0	0	0	25	25	25
DRILL ROOF	87	87	29	175	175	58	0	0	0	262	262	87
HAND LOAD	4	4	4	8	8	8	0	0	0	12	12	12
MOVE CABLES	2303	2091	348	618	370	62	262	262	44	3183	2723	454
PRY FACE/RIB/ROOF	17	17	17	0	0	0	0	0	0	17	17	17
SET PROPS	14	14	4	23	23	6	0	0	0	37	37	9
SCALE ROOF	62	62	21	161	161	81	0	0	0	223	223	112
TRAM IN	1904	1323	1323	1212	45	45	430	50	50	3546	1418	1418
OPERATE SHUTTLE CAR	0	0	0	0	0	0	0	0	0	0	0	0
OBSERVE OPERATIONS	0	0	0	0	0	0	0	0	0	0	0	0
RIDE EQUIPMENT	16	16	8	20	20	10	0	0	0	36	36	18
COUPLE/UNCOUPLE MINE CAR	1	1	1	1	1	1	0	0	0	2	2	2
OTHER WORK TASKS	20	20	3	27	27	4	0	0	0	47	47	8
UNKNOWN	1	1	1	1	1	1	0	0	0	2	2	2
USE HANDTOOLS	15	15	5	20	20	7	0	0	0	35	35	12
WALKING	63	63	32	142	142	71	0	0	0	205	205	103
LOAD,UNLOAD MATERIALS	5	5	5	4	4	4	0	0	0	9	9	9
OPERATE LOADING MACHINE	105	105	26	62	62	16	103	103	26	270	270	68
LOADING MACHINE HELPR	4630	3837	91	2490	1075	26	795	415	10	7915	5327	127

42 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
LOADING MACHINE OPER.

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CHANGE RIT	2	2	2	0	0	0	0	0	0	2	2	2
CLEAN RIB	1	1	1	1	1	1	0	0	0	2	2	2
CLEAN UP	52	52	26	128	128	64	28	28	14	208	208	104
CONTINUOUS MINE	3	3	2	1	1	1	0	0	0	4	4	2
DRILL FACE	24	24	12	31	31	16	0	0	0	55	55	28
DRILL ROOF	71	71	24	106	106	35	0	0	0	177	177	59
ELECTRICAL MAINTAINENCE	24	24	24	36	36	36	0	0	0	60	60	60
HOOKUP WIRES	17	17	9	0	0	0	0	0	0	17	17	9
INSPECT EQUIPMENT	3	3	3	0	0	0	0	0	0	3	3	3
LOAD SHUTTLE CAR	1	1	1	3	3	3	0	0	0	4	4	4
MOVE CABLES	161	161	11	233	233	16	68	68	5	462	462	31
MACHINE MAINTAINENCE	40	40	10	37	37	9	0	0	0	77	77	19
SERVICE MACHINE	29	29	15	35	35	18	0	0	0	64	64	32
POSITION EQUIPMENT	68	68	6	60	60	5	0	0	0	128	128	12
PRY FACE/RIB/ROOF	6	6	2	6	6	2	0	0	0	12	12	4
SET PROPS	7	7	4	2	2	1	0	0	0	9	9	5
REMOVE PROPS	68	68	68	81	81	81	47	47	47	196	196	196
SET BRATTICE	6	6	6	4	4	4	0	0	0	10	10	10
SCALE ROOF	1241	1034	345	737	61	20	83	23	8	2061	1118	373
TRAM IN	58	58	12	101	101	20	0	0	0	159	159	32
TRAM OUT	73	73	12	96	96	16	0	0	0	169	169	28
TRANSPORT SUPPLIES	5	5	3	4	4	2	0	0	0	9	9	5
OPERATE SHUTTLE CAR	7	7	7	17	17	17	0	0	0	24	24	24
LAY TRACK	54	9	9	26	2	2	0	0	0	80	11	11
OBSERVE OPERATIONS	4	4	4	6	6	6	0	0	0	10	10	10
RIDE EQUIPMENT	65	65	11	82	82	14	0	0	0	147	147	24
SWITCH TRACKS	1	1	1	0	0	0	0	0	0	1	1	1
LOAD/UNLOAD MINECARS	12	12	12	10	10	10	0	0	0	22	22	22
OTHER WORK TASKS	354	354	11	407	407	13	4	4	0	765	765	25
ESCAPING HAZARD	6	6	6	4	4	4	0	0	0	10	10	10
UNKNOWN	146	146	49	175	175	58	61	61	20	382	382	127
USE HANDTOOLS	838	497	41	1607	61	5	982	50	4	3427	608	51
WALKING	21	21	4	21	21	4	0	0	0	42	42	8
ENTER/LEAVE MACHINE	1	1	1	2	2	1	0	0	0	3	3	2
PICK SLATE	1	1	1	0	0	0	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	202	202	12	227	227	13	33	33	2	462	462	27
OPERATE LOADING MACHINE	9290	8049	80	4319	1859	19	3039	516	5	16648	10424	104
LOADING MACHINE OPER.	12962	11128	44	8605	3899	15	4345	830	3	25912	15857	62

254 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
LONGWALL OPERATOR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	1	1	1*	6	6	6	0	0	0	7	7	7
CLEAN UP	7	7	4	5	5	3	0	0	0	12	12	6
SERVICE MACHINE	4	4	4	0	0	0	0	0	0	4	4	4
OTHER WORK TASKS	144	144	10	239	239	16	0	0	0	383	383	26
CROSSOVER CONVEYOR	5	5	5	0	0	0	0	0	0	5	5	5
USE HANDTOOLS	1	1	1	2	2	2	0	0	0	3	3	3
LOAD-UNLOAD MATERIALS	4	4	4	6	6	6	0	0	0	10	10	10
LONGWALL OPERATOR	166	166	8	258	258	12	0	0	0	424	424	19

22 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
MECHANIC HELPER(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
INSPECT EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
MACHINE MAINTAINENCE	103	103	11	77	77	9	68	68	8	248	248	28
SERVICE MACHINE	23	23	6	25	25	6	0	0	0	48	48	12
POSITION EQUIPMENT	34	34	17	54	54	27	0	0	0	88	88	44
RIDE EQUIPMENT	0	0	0	2	2	2	0	0	0	2	2	2
OTHER WORK TASKS	10	10	3	15	15	4	0	0	0	25	25	6
USE HANDTOOLS	31	31	4	41	41	6	0	0	0	72	72	10
WALKING	110	110	28	91	91	23	85	85	21	286	286	72
ENTER/LEAVE MACHINE	1	1	1	0	0	0	0	0	0	1	1	1
LOAD-UNLOAD MATERIALS	102	11	4	64	6	2	0	0	0	166	17	6
MECHANIC HELPER(FACE)	415	324	9	369	311	9	153	153	4	937	788	22

36 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
MECHANIC HLPR(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
MOVE CABLES	8	8	8	0	0	0	0	0	0	8	8	8
OPERATE TRACTOR	5	5	5	0	0	0	0	0	0	5	5	5
RIDE EQUIPMENT	57	57	11	90	90	18	0	0	0	147	147	29
OTHER WORK TASKS	13	13	7	10	10	5	0	0	0	23	23	12
UNKNOWN	13	13	13	7	7	7	0	0	0	20	20	20
USE HANDTOOLS	2	2	2	0	0	0	0	0	0	2	2	2
WALKING	3	3	2	3	3	2	0	0	0	6	6	3
MECHANIC HLPR(INSIDE)	101	101	8	110	110	8	0	0	0	211	211	16

13 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
MECHANIC(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	4	4	1	7	7	2	0	0	0	11	11	4
CHANGE BIT	1	1	1	0	0	0	0	0	0	1	1	1
CLEAN UP	0	0	0	0	0	0	0	0	0	0	0	0
CONTINUOUS MINE	69	69	69	103	103	103	0	0	0	172	172	172
DRILL ROOF	4	4	2	0	0	0	0	0	0	4	4	2
ELECTRICAL MAINTAINENCE	2252	2028	225	2073	167	19	1252	58	6	5577	2253	250
GET READY FOR WORK TASK	20	20	20	5	5	5	0	0	0	25	25	25
INSERT CHARGE	90	90	90	69	69	69	76	76	76	235	235	235
INSPECT EQUIPMENT	29	29	5	41	41	7	0	0	0	70	70	12
SET HYDRAULIC JACK	13	13	13	20	20	20	0	0	0	33	33	33
RELOCATE HYDRAULIC JACK	1	1	1	2	2	2	0	0	0	3	3	3
REMOVE HYDRAULIC JACK	0	0	0	0	0	0	0	0	0	0	0	0
MOVE CABLES	178	178	15	297	297	25	4	4	0	479	479	40
MACHINE MAINTAINENCE	4334	3684	26	3040	1471	10	1650	194	1	9024	5349	38
SERVICE MACHINE	282	127	7	404	162	9	32	32	2	718	321	18
POSITION EQUIPMENT	26	26	3	34	34	4	0	0	0	60	60	7
ROCK DUST	4	4	4	3	3	3	0	0	0	7	7	7
SET PROPS	74	74	74	117	117	117	101	101	101	292	292	292
REMOVE PROPS	20	20	20	57	57	57	0	0	0	77	77	77
SET BRATTICE	1	1	1	0	0	0	0	0	0	1	1	1
SUMP	97	97	97	90	90	90	97	97	97	284	284	284
TRAM OUT	2	2	2	4	4	4	0	0	0	6	6	6
TRANSPORT SUPPLIES	106	106	18	96	96	16	53	53	9	255	255	42
OPERATE SHUTTLE CAR	58	27	4	71	44	6	0	0	0	129	71	10
OPERATE TRACTOR	49	49	16	114	114	38	0	0	0	163	163	54
OPERATE MANTRIP CAR	0	0	0	0	0	0	0	0	0	0	0	0
OBSERVE OPERATIONS	106	106	35	87	87	29	79	79	26	272	272	91
IDLE WORKTIME(LUNCH,ETC)	23	23	6	32	32	8	0	0	0	55	55	14
RIDE EQUIPMENT	1047	567	47	689	307	26	185	53	4	1921	927	77
COUPLE/UNCOUPLE MINE CAR	2480	2480	413	3075	91	15	24	24	4	5579	2595	432
REPAIR EQUIPMENT	16	16	8	4	4	2	0	0	0	20	20	10
OTHER WORK TASKS	1047	996	10	1278	1245	13	379	379	4	2704	2620	27
UNKNOWN	82	82	10	196	196	25	7	7	1	285	285	36
CROSSOVER CONVEYOR	4	4	4	0	0	0	0	0	0	4	4	4
OPERATE WELDER	3415	3157	395	3060	78	10	19	19	2	6494	3254	407
USE HANDTOOLS	634	634	5	769	769	7	0	0	0	1403	1403	12
OPERATE POWER TOOLS	64	64	16	96	96	24	0	0	0	160	160	40
WALKING	265	265	8	311	311	10	91	91	3	667	667	21
OPERATE HOIST	5	5	3	7	7	4	0	0	0	12	12	6
OPERATE LOCOMOTIVE	50	50	10	78	78	16	0	0	0	128	128	26
ENTER/LEAVE MACHINE	49	49	6	61	61	8	0	0	0	110	110	14
LOAD,UNLOAD MATERIALS	344	344	20	568	568	33	118	118	7	1030	1030	61
SPOT CARS(PLACING)	2	2	2	0	0	0	0	0	0	2	2	2
OPERATE LOADING MACHINE	24	24	6	45	45	11	0	0	0	69	69	17
MECHANIC(FACE)	17371	15522	28	17003	6878	12	4167	1385	2	38541	23785	42

563 INJURIES OF 5296 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
MECHANIC(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	6	6	6	0	0	0	0	0	0	6	6	6
INSPECT EQUIPMENT	85	85	28	143	143	48	97	97	32	325	325	108
MOVE CABLES	19	19	10	0	0	0	0	0	0	19	19	10
MACHINE MAINTAINENCE	70	70	3	68	68	3	0	0	0	138	138	7
SERVICE MACHINE	34	34	9	44	44	11	0	0	0	78	78	20
POSITION EQUIPMENT	690	565	565	365	61	61	27	27	27	1282	653	653
TRANSPORT SUPPLIES	4	4	1	9	9	3	0	0	0	13	13	4
OPERATE JITNEY	92	92	23	55	55	14	0	0	0	147	147	37
OPERATE TRACTOR	4	4	4	0	0	0	0	0	0	4	4	4
OPR MAINLINE HAULAGE EQP	6	6	6	17	17	17	0	0	0	23	23	23
OPERATE MANTRIP CAR	0	0	0	0	0	0	0	0	0	0	0	0
SUPERVISE	71	71	71	125	125	125	0	0	0	196	196	196
OBSERVE OPERATIONS	64	64	64	130	130	130	40	40	40	234	234	234
IDLE WORKTIME(LUNCH,ETC)	2	2	2	0	0	0	0	0	0	2	2	2
RIDE EQUIPMENT	105	105	10	171	171	17	0	0	0	276	276	28
COUPLE/UNCOUPLE MINE CAR	0	0	0	3	3	3	0	0	0	3	3	3
RERAIL EQUIPMENT	0	0	0	0	0	0	0	0	0	0	0	0
OTHER WORK TASKS	340	216	7	391	258	8	0	0	0	731	474	15
REPLACE TROLLEY POLE	2	2	2	0	0	0	0	0	0	2	2	2
OPERATE WELDER	10	10	3	0	0	0	0	0	0	10	10	3
USE HANDTOOLS	233	233	11	464	464	21	0	0	0	697	697	32
WALKING	157	157	9	188	188	11	0	0	0	345	345	20
OPERATE LOCOMOTIVE	1	1	1	1	1	1	0	0	0	2	2	2
ENTER/LEAVE MACHINE	48	48	10	111	111	22	0	0	0	159	159	32
LOAD,UNLOAD MATERIALS	53	53	7	95	95	12	0	0	0	148	148	19
OPERATE LOADING MACHINE	2	2	1	1	1	1	0	0	0	3	3	2
MECHANIC(INSIDE)	2298	1849	12	2381	1944	13	164	164	1	4843	3957	27

148 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
MECHANIC(MASTER)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
MACHINE MAINTAINENCE	1	1	1	0	0	0	0	0	0	1	1	1
OTHER WORK TASKS	3	3	2	1	1	1	0	0	0	4	4	2
WALKING	0	0	0	0	0	0	0	0	0	0	0	0
LOAD,UNLOAD MATERIALS	4	4	4	0	0	0	0	0	0	4	4	4
MECHANIC(MASTER)	8	8	2	1	1	0	0	0	0	9	9	2

5 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
MOTORMAN(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	37	37	37	3	3	3	0	0	0	40	40	40
CLEAN UP	80	80	80	87	87	87	28	28	28	195	195	195
DRILL ROOF	0	0	0	0	0	0	0	0	0	0	0	0
ELECTRICAL MAINTAINENCE	10	10	10	12	12	12	0	0	0	22	22	22
INSPECT EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
MACHINE MAINTAINENCE	1	1	1	0	0	0	0	0	0	1	1	1
SERVICE MACHINE	18	18	9	23	23	12	0	0	0	41	41	21
SET PROPS	5	5	5	3	3	3	0	0	0	8	8	8
RELOCATE PROPS	1	1	1	2	2	2	0	0	0	3	3	3
SCALE ROOF	77	77	77	44	44	44	58	58	58	179	179	179
TRAM IN	47	47	24	104	104	52	0	0	0	151	151	76
TRANSPORT SUPPLIES	14	14	7	0	0	0	0	0	0	14	14	7
OPERATE JITNEY	8	8	4	6	6	3	0	0	0	14	14	7
OPERATE TRACTOR	0	0	0	0	0	0	0	0	0	0	0	0
OPR MAINLINE HAULAGE EQP	88	88	18	92	92	18	0	0	0	180	180	36
OPERATE MANTRIP CAR	35	35	12	41	41	14	0	0	0	76	76	25
LAY TRACK	1	1	1	0	0	0	0	0	0	1	1	1
OBSERVE OPERATIONS	8	8	4	13	13	7	0	0	0	21	21	11
IDLE WORKTIME(LUNCH,ETC)	17	17	17	35	35	35	0	0	0	52	52	52
RIDE EQUIPMENT	163	163	18	259	259	29	8	8	1	430	430	48
COUPLE/UNCOUPLE MINE CAR	693	364	10	549	373	10	88	88	2	1330	825	23
SWITCH TRACKS	93	93	10	115	115	13	48	48	5	256	256	28
SPRAG/BLOCK/CHOCK MINECR	95	61	20	97	76	25	0	0	0	192	137	46
LOAD/UNLOAD MINECARS	55	55	55	105	105	105	0	0	0	160	160	160
REPAIR EQUIPMENT	458	458	16	506	506	17	170	170	6	1134	1134	39
OTHER WORK TASKS	496	496	11	492	492	11	94	94	2	1082	1082	25
RECOVER/RETRIEVE MTL/EQP	13	13	13	6	6	6	0	0	0	19	19	19
ESCAPING HAZARD	1	1	1	2	2	1	0	0	0	3	3	2
UNKNOWN	1	1	1	3	3	3	0	0	0	4	4	4
REPLACE TROLLEY POLE	18	18	1	2	2	0	0	0	0	20	20	1
USE HANDTOOLS	64	64	5	43	43	3	0	0	0	107	107	8
WALKING	177	177	10	141	141	8	26	26	1	344	344	19
OPERATE ROCKDUST MACHINE	0	0	0	0	0	0	0	0	0	0	0	0
OPERATE LOCOMOTIVE	5257	4345	44	4814	1299	13	429	429	4	10500	6073	62
ENTER/LEAVE MACHINE	229	229	11	247	247	12	64	64	3	540	540	26
LOAD,UNLOAD MATERIALS	399	354	9	241	230	6	65	65	2	705	649	16
SPOT CARS(PLACING)	26	26	7	11	11	3	0	0	0	37	37	9
MOTORMAN(INSIDE)	8686	7366	20	8098	4375	12	1078	1078	3	17862	12819	34

376 INJURIES OF 9286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
OILER/GREASER(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
DRILL FACE	1	1	1	1	1	1	0	0	0	2	2	2
MACHINE MAINTAINENCE	2	2	1	2	2	1	0	0	0	4	4	2
SERVICE MACHINE	5	5	3	0	0	0	0	0	0	5	5	3
OPERATE TRACTOR	1	1	1	0	0	0	0	0	0	1	1	1
OBSERVE OPERATIONS	3	3	3	5	5	5	0	0	0	8	8	8
RIDE EQUIPMENT	6	6	3	3	3	2	0	0	0	9	9	5
OTHER WORK TASKS	57	57	7	23	23	3	0	0	0	80	80	10
OPERATE WELDER	11	11	6	1	1	1	0	0	0	12	12	6
USE HANDTOOLS	8	8	3	0	0	0	0	0	0	8	8	3
WALKING	12	12	4	9	9	3	0	0	0	21	21	7
ENTER/LEAVE MACHINE	29	29	29	33	33	33	0	0	0	62	62	62
LOAD,UNLOAD MATERIALS	58	58	15	67	67	17	0	0	0	125	125	31
OILER/GREASER(INSIDE)	193	193	6	144	144	5	0	0	0	337	337	11

30 INJURIES OF 9286 TOTAL INJURIES IN TABLE

ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
PUMPER

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
INSPECT EQUIPMENT	14	14	7	6	6	3	0	0	0	20	20	10
MACHINE MAINTAINENCE	31	31	8	31	31	8	0	0	0	62	62	16
SERVICE MACHINE	5	5	5	0	0	0	0	0	0	5	5	5
POSITION EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
TEST ROOF	5	5	5	4	4	4	0	0	0	9	9	9
OPERATE JITNEY	7	7	7	4	4	4	0	0	0	11	11	11
IDLE WORKTIME(LUNCH,ETC)	0	0	0	2	2	2	0	0	0	2	2	2
OTHER WORK TASKS	208	208	12	157	157	9	40	40	2	405	405	22
REPLACE TROLLEY POLE	2	2	1	0	0	0	0	0	0	2	2	1
USE HANDTOOLS	24	24	3	0	0	0	0	0	0	24	24	3
WALKING	80	80	8	80	80	8	0	0	0	160	160	16
OPERATE/RIDE CONV BELT	9	9	9	5	5	5	0	0	0	14	14	14
LOAD,UNLOAD MATERIALS	41	41	10	36	36	9	0	0	0	77	77	19
SPOT CARS(PLACING)	17	17	9	19	19	10	0	0	0	36	36	18
OPERATE LOADING MACHINE	1	1	1	2	2	2	0	0	0	3	3	3
PUMPER	445	445	8	346	346	6	40	40	1	831	831	15

57 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROCK DRILLER(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
DRILL FACE	4	4	4	0	0	0	0	0	0	4	4	4
DRILL ROOF	85	85	43	91	91	46	60	60	30	236	236	118
MACHINE MAINTAINENCE	1	1	1	0	0	0	0	0	0	1	1	1
POSITION EQUIPMENT	4	4	4	0	0	0	0	0	0	4	4	4
SUMP	4	4	4	0	0	0	0	0	0	4	4	4
TORQUE BOLT	1	1	1	1	1	1	0	0	0	2	2	2
OTHER WORK TASKS	1553	787	157	5380	164	33	1480	146	29	8413	1097	219
OPERATE POWER TOOLS	4	4	4	0	0	0	0	0	0	4	4	4
ENTER/LEAVE MACHINE	27	27	27	70	70	70	0	0	0	97	97	97
LOAD,UNLOAD MATERIALS	8	8	4	11	11	6	0	0	0	19	19	10
OPERATE LOADING MACHINE	2	2	1	3	3	2	0	0	0	5	5	3
ROCK DRILLER(INSIDE)	1693	927	51	5556	340	19	1540	206	11	8789	1473	82

18 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROCK DUSTER(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	7	7	4	4	4	2	0	0	0	11	11	6
INSERT BOLT	7	7	7	4	4	4	0	0	0	11	11	11
MACHINE MAINTAINENCE	13	13	13	0	0	0	0	0	0	13	13	13
SERVICE MACHINE	1	1	1	0	0	0	0	0	0	1	1	1
POSITION EQUIPMENT	5	5	5	1	1	1	0	0	0	6	6	6
ROCK DUST	0	0	0	0	0	0	0	0	0	0	0	0
RIDE EQUIPMENT	9	9	3	8	8	3	0	0	0	17	17	6
RERAIL EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
OTHER WORK TASKS	27	27	5	11	11	2	0	0	0	38	38	8
REPLACE TROLLEY POLE	0	0	0	2	2	2	0	0	0	2	2	2
USE HANDTOOLS	1	1	1	0	0	0	0	0	0	1	1	1
WALKING	8	8	3	0	0	0	0	0	0	8	8	3
OPERATE ROCKDUST MACHINE	18	18	9	2	2	1	0	0	0	20	20	10
ENTER/LEAVE MACHINE	1	1	1	0	0	0	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	84	84	21	115	115	29	30	30	8	229	229	57
ROCK DUSTER(FACE)	182	182	6	147	147	5	30	30	1	359	359	12

30 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROCK DUSTER(NON-FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
MOVE CABLES	1	1	1	2	2	2	0	0	0	3	3	3
SERVICE MACHINE	5	5	3	0	0	0	0	0	0	5	5	3
POSITION EQUIPMENT	6	6	3	0	0	0	0	0	0	6	6	3
ROCK DUST	15	15	5	15	15	5	0	0	0	30	30	10
OPERATE TRACTOR	2	2	2	0	0	0	0	0	0	2	2	2
RIDE EQUIPMENT	125	125	31	79	79	20	79	79	20	283	283	71
COUPLE/UNCOUPLE MINE CAR	37	37	19	91	91	46	0	0	0	128	128	64
SWITCH TRACKS	2	2	2	0	0	0	0	0	0	2	2	2
OTHER WORK TASKS	14	14	4	7	7	2	0	0	0	21	21	5
USE HANDTOOLS	10	10	3	0	0	0	0	0	0	10	10	3
OPERATE POWER TOOLS	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE ROCKDUST MACHINE	1	1	1	1	1	1	0	0	0	2	2	2
OPERATE LOCOMOTIVE	3	3	2	3	3	2	0	0	0	6	6	3
ENTER/LEAVE MACHINE	3	3	3	0	0	0	0	0	0	3	3	3
LOAD,UNLOAD MATERIALS	3	3	2	2	2	1	0	0	0	5	5	3
ROCK DUSTER(NON-FACE)	228	228	8	200	200	7	79	79	3	507	507	17

30 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROCK MACHINE OPERATOR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
INSERT BOLT	34	34	34	57	57	57	0	0	0	91	91	91
RERAIL EQUIPMENT	3	3	3	0	0	0	0	0	0	3	3	3
ROCK MACHINE OPERATOR	37	37	19	57	57	29	0	0	0	94	94	47

2 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROCKMAN

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	4	4	4	0	0	0	0	0	0	4	4	4
INSERT BOLT	19	19	19	17	17	17	0	0	0	36	36	36
POSITION EQUIPMENT	48	48	16	66	66	22	0	0	0	114	114	38
TRAM IN	6	6	6	15	15	15	0	0	0	21	21	21
TRANSPORT SUPPLIES	2	2	2	3	3	3	0	0	0	5	5	5
OPERATE SHUTTLE CAR	404	16	16	1357	34	34	0	0	0	1761	50	50
OTHER WORK TASKS	59	59	30	68	68	34	0	0	0	127	127	64
USE HANDTOOLS	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE HOIST	1	1	1	0	0	0	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	5	5	3	5	5	3	0	0	0	10	10	5
ROCKMAN	549	161	11	1531	208	15	0	0	0	2080	369	26

14 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROOMEN(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
SET BRATTICE	1	1	1	0	0	0	0	0	0	1	1	1
COUPLE/UNCOUPLE MINE CAR	1	1	1	0	0	0	0	0	0	1	1	1
OTHER WORK TASKS	11	11	11	0	0	0	0	0	0	11	11	11
WALKING	8	8	8	4	4	4	0	0	0	12	12	12
ROOMAN(INSIDE)	21	21	5	4	4	1	0	0	0	25	25	6

4 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROOF BOLTER

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CHANGE BIT	167	48	12	192	16	4	0	0	0	359	64	16
CHANGE DRILL	11	11	4	8	8	3	0	0	0	19	19	6
CLEAN BIT	1	1	1	0	0	0	0	0	0	1	1	1
CLEAN UP	55	55	7	82	82	10	0	0	0	137	137	17
DRILL FACE	54	54	14	99	99	25	0	0	0	153	153	38
DRILL ROOF	9683	7607	17	14473	7583	17	1167	637	1	25323	15827	35
EMPTY DUSTBOX	58	58	8	71	71	10	0	0	0	129	129	18
EXTEND CONVEYOR	4	4	4	0	0	0	0	0	0	4	4	4
GET READY FOR WORK TASK	7	7	4	14	14	7	0	0	0	21	21	11
HANG TUBING	15	15	15	0	0	0	0	0	0	15	15	15
INSERT BOLT	12099	9784	39	12579	4743	19	3626	899	4	28304	15426	61
INSPECT EQUIPMENT	5	5	2	0	0	0	0	0	0	5	5	2
INSPECT MINE	14	14	7	6	6	3	0	0	0	20	20	10
SET HYDRAULIC JACK	2015	1660	208	1299	82	10	1312	71	9	4626	1813	227
RELOCATE HYDRAULIC JACK	136	136	34	259	259	65	8	8	2	403	403	101
REMOVE HYDRAULIC JACK	98	98	98	87	87	87	87	87	87	272	272	272
MOVE CABLES	160	160	8	151	151	8	0	0	0	311	311	16
MACHINE MAINTAINENCE	100	100	8	161	161	15	0	0	0	261	261	22
SERVICE MACHINE	42	42	8	16	16	3	0	0	0	58	58	12
MARK ROOF	1324	546	323	438	64	32	362	54	27	2124	764	382
POSITION EQUIPMENT	739	670	15	943	929	20	210	210	5	1892	1809	39
PRY FACE/RIB/ROOF	136	136	19	177	177	25	58	58	8	371	371	53
ROCK DUST	5	5	1	3	3	1	0	0	0	8	8	2
SET PROPS	596	596	15	770	770	19	156	156	4	1522	1522	37
RELOCATE PROPS	16	16	5	1	1	0	0	0	0	17	17	6
REMOVE PROPS	132	132	11	209	209	17	0	0	0	341	341	28
SET BRATTICE	32	32	3	39	39	4	0	0	0	71	71	7
CLEAN-UP FALL	14	14	14	3	3	3	0	0	0	17	17	17
SCALE ROOF	3169	2942	123	2010	289	12	1496	62	3	6675	3293	137
DRILL TEST HOLE	2	2	2	1	1	1	0	0	0	3	3	3
TRAM IN	441	441	11	790	790	20	143	143	4	1374	1374	35
TRAM OUT	92	92	7	195	195	14	0	0	0	287	287	20
TORQUE BOLT	208	208	10	383	383	19	0	0	0	591	591	30
TEST ROOF	5	5	5	1	1	1	0	0	0	6	6	6
TRANSPORT SUPPLIES	28	28	5	27	27	4	0	0	0	55	55	9
OPERATE SHUTTLE CAR	31	31	4	70	70	9	0	0	0	101	101	13
OPERATE TRACTOR	767	503	101	1356	154	31	1583	65	13	3706	722	144
OPERATE MANTRIP CAR	60	60	12	93	93	19	0	0	0	153	153	31
SUPERVISE	2	2	2	0	0	0	0	0	0	2	2	2
OBSERVE OPERATIONS	14	14	4	26	26	7	0	0	0	40	40	10
IDLE WORKTIME(LUNCH,ETC)	289	289	36	513	513	64	217	217	27	1019	1019	127
RIDE EQUIPMENT	236	236	9	383	383	15	83	83	3	702	702	28
COUPLE/UNCOUPLE MINE CAR	2	2	1	6	6	2	0	0	0	8	8	3
SWITCH TRACKS	0	0	0	0	0	0	0	0	0	0	0	0
RERAIL EQUIPMENT	125	125	63	182	182	91	63	63	32	370	370	185

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROOF BOLTER (CONTINUED)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OTHER WORK TASKS	1829	1490	10	2163	1891	13	175	175	1	4167	3546	23
RECOVER/RETRIEVE MTL/EQP	12	12	4	20	20	7	0	0	0	32	32	11
ESCAPING HAZARD	10	10	10	24	24	24	0	0	0	34	34	34
UNKNOWN	368	368	18	691	691	33	6	6	0	1065	1065	51
CROSSOVER CONVEYOR	58	58	15	95	95	24	0	0	0	153	153	38
USE HANDTOOLS	196	196	5	210	210	6	0	0	0	406	406	11
OPERATE POWER TOOLS	78	23	4	61	18	3	0	0	0	139	41	7
WALKING	268	268	8	369	369	12	6	6	0	643	643	20
OPERATE CUTTING MACHINE	11	11	11	14	14	14	0	0	0	25	25	25
OPERATE/RIDE CONV BELT	15	15	8	30	30	15	0	0	0	45	45	23
OPERATE ROCKDUST MACHINE	6	6	6	0	0	0	0	0	0	6	6	6
OPERATE HOIST	12	12	12	15	15	15	0	0	0	27	27	27
OPERATE LOCOMOTIVE	213	51	13	251	84	21	0	0	0	464	135	34
ENTER/LEAVE MACHINE	1196	869	67	1410	164	13	552	46	4	3158	1079	83
PICK SLATE	34	34	34	101	101	101	0	0	0	135	135	135
LOAD,UNLOAD MATERIALS	409	409	8	554	554	11	0	0	0	963	963	19
OPERATE LOADING MACHINE	302	35	9	163	22	6	0	0	0	465	57	14
ROOF BOLTER	38206	30943	22	44287	22988	16	11310	3046	2	93803	56977	40

1421 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROOF BOLTER HELPER

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CHANGE DRILL	94	5	5	153	4	4	0	0	0	247	9	9
DRILL ROOF	255	141	14	439	260	26	0	0	0	694	401	40
HOOKUP WIRES	0	0	0	0	0	0	0	0	0	0	0	0
INSERT BOLT	7	7	2	1	1	0	0	0	0	8	8	2
SET HYDRAULIC JACK	7	7	7	5	5	5	0	0	0	12	12	12
REMOVE HYDRAULIC JACK	10	10	10	19	19	19	0	0	0	29	29	29
SERVICE MACHINE	4	4	4	7	7	7	0	0	0	11	11	11
MARK ROOF	54	54	54	98	98	98	0	0	0	152	152	152
POSITION EQUIPMENT	4	4	2	0	0	0	0	0	0	4	4	2
SET PROPS	21	21	7	11	11	4	0	0	0	32	32	11
REMOVE PROPS	7	7	7	0	0	0	0	0	0	7	7	7
TRAM IN	52	52	26	90	90	45	0	0	0	142	142	71
TRANSPORT SUPPLIES	1	1	1	0	0	0	0	0	0	1	1	1
LAY TRACK	3	3	3	4	4	4	0	0	0	7	7	7
OBSERVE OPERATIONS	1	1	1	2	2	2	0	0	0	3	3	3
IDLE WORKTIME(LUNCH,ETC)	1	1	1	2	2	2	0	0	0	3	3	3
RIDE EQUIPMENT	2	2	2	0	0	0	0	0	0	2	2	2
OTHER WORK TASKS	364	364	26	560	560	40	0	0	0	924	924	66
RECOVER/RETRIEVE MTL/EQP	1	1	1	2	2	2	0	0	0	3	3	3
UNKNOWN	3	3	3	0	0	0	0	0	0	3	3	3
WALKING	11	11	4	3	3	1	0	0	0	14	14	5
LOAD,UNLOAD MATERIALS	68	68	68	117	117	117	0	0	0	185	185	185
SPOT CARS(PLACING)	3	3	3	8	8	8	0	0	0	11	11	11
ROOF BOLTER HELPER	973	770	14	1521	1193	22	0	0	0	2494	1963	36

54 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
ROOF BOLTER MOUNTED

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
DRILL ROOF	5	5	5	0	0	0	0	0	0	5	5	5
INSERT BOLT	5	5	3	1	1	1	0	0	0	6	6	3
OTHER WORK TASKS	10	10	10	16	16	16	0	0	0	26	26	26
ROOF BOLTER MOUNTED	20	20	5	17	17	4	0	0	0	37	37	9

4 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
SAFETY DIRECTOR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	1	1	1	0	0	0	0	0	0	1	1	1
OTHER WORK TASKS	0	0	0	0	0	0	0	0	0	0	0	0
SAFETY DIRECTOR	1	1	1	0	0	0	0	0	0	1	1	1

2 INJURIES OF 9286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
SCOOP CAR OPERATOR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN RIB	27	27	27	70	70	70	0	0	0	97	97	97
CLEAN UP	3	3	2	3	3	2	0	0	0	6	6	3
DRILL ROOF	0	0	0	2	2	1	0	0	0	2	2	1
ELECTRICAL MAINTAINENCE	10	10	10	10	10	10	0	0	0	20	20	20
MOVE CABLES	30	30	15	21	21	11	0	0	0	51	51	26
MACHINE MAINTAINENCE	4	4	4	0	0	0	0	0	0	4	4	4
POSITION EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
SET PROPS	1312	1039	346	1391	87	29	1585	60	20	4288	1186	395
RELOCATE PROPS	11	11	11	15	15	15	0	0	0	26	26	26
SET BRATTICE	5	5	2	7	7	2	0	0	0	12	12	4
CLEAN-UP FALL	1	1	1	0	0	0	0	0	0	1	1	1
TRANSPORT SUPPLIES	47	47	24	70	70	35	0	0	0	117	117	59
OPERATE SHUTTLE CAR	163	24	4	106	11	2	0	0	0	269	35	6
OPERATE JITNEY	44	44	44	107	107	107	0	0	0	151	151	151
OPERATE TRACTOR	4	4	4	0	0	0	0	0	0	4	4	4
OPR MAINLINE HAULAGE EQP	15	15	15	21	21	21	0	0	0	36	36	36
IDLE WORKTIME(LUNCH,ETC)	38	38	38	114	114	114	0	0	0	152	152	152
RIDE EQUIPMENT	1	1	1	0	0	0	0	0	0	1	1	1
OTHER WORK TASKS	162	162	11	247	247	16	6	6	0	415	415	28
USE HANDTOOLS	122	71	6	158	130	11	0	0	0	280	201	17
WALKING	69	69	14	111	111	22	0	0	0	180	180	36
ENTER/LEAVE MACHINE	0	0	0	0	0	0	0	0	0	0	0	0
LOAD,UNLOAD MATERIALS	84	84	8	126	126	11	0	0	0	210	210	19
OPERATE LOADING MACHINE	2090	1763	71	3389	457	18	856	84	3	6335	2304	92
SCOOP CAR OPERATOR	4243	3453	35	5968	1609	16	2447	150	1	12658	5212	52

100 INJURIES OF 9286 TOTAL INJURIES IN TABLE

ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
SHOOTER/BLASTER(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	16	16	16	4	4	4	0	0	0	20	20	20
DRILL FACE	1	1	1	0	0	0	0	0	0	1	1	1
DRILL ROOF	11	11	11	21	21	21	0	0	0	32	32	32
GET READY FOR WORK TASK	17	17	9	47	47	24	0	0	0	64	64	32
INSERT BOLT	30	30	30	57	57	57	0	0	0	87	87	87
INSERT CHARGE	20	20	4	2	2	0	0	0	0	22	22	4
MOVE CABLES	32	32	8	68	68	17	0	0	0	100	100	25
POSITION EQUIPMENT	13	13	4	20	20	7	0	0	0	33	33	11
PRY FACE/RIB/ROOF	17	17	9	4	4	2	0	0	0	21	21	11
ROCK DUST	25	25	13	64	64	32	0	0	0	89	89	45
SET PROPS	92	92	18	104	104	21	0	0	0	196	196	39
RELOCATE PROPS	21	21	21	12	12	12	0	0	0	33	33	33
SET BRATTICE	10	10	10	25	25	25	0	0	0	35	35	35
SHOOT COAL	217	217	7	382	382	13	0	0	0	599	599	20
SHOOT FLOOR	0	0	0	2	2	2	0	0	0	2	2	2
TRAM IN	21	21	11	24	24	12	0	0	0	45	45	23
TRANSPORT SUPPLIES	17	17	17	10	10	10	0	0	0	27	27	27
OPERATE JITNEY	7	7	4	5	5	3	0	0	0	12	12	6
TOLE WORKTIME(LUNCH,ETC)	11	11	11	14	14	14	0	0	0	25	25	25
RIDE EQUIPMENT	35	35	12	61	61	20	0	0	0	96	96	32
COUPLE/UNCOUPLE MINE CAR	1	1	1	0	0	0	0	0	0	1	1	1
SWITCH TRACKS	0	0	0	0	0	0	0	0	0	0	0	0
OTHER WORK TASKS	341	341	19	390	390	22	64	64	4	795	795	44
RECOVER/RETRIEVE MTL/EQP	50	50	25	95	95	48	0	0	0	145	145	73
UNKNOWN	11	11	11	25	25	25	0	0	0	36	36	36
USE HANDTOOLS	38	38	4	23	23	3	0	0	0	61	61	7
WALKING	92	92	10	111	111	12	0	0	0	203	203	23
OPERATE/RIDE CONV BELT	7	7	4	0	0	0	0	0	0	7	7	4
OPERATE ROCKDUST MACHINE	14	14	14	29	29	29	0	0	0	43	43	43
OPERATE LOCOMOTIVE	6	6	6	6	6	6	0	0	0	12	12	12
ENTER/LEAVE MACHINE	27	27	14	61	61	31	0	0	0	88	88	44
LOAD,UNLOAD MATERIALS	9	9	3	11	11	4	0	0	0	20	20	7
SHOOTER/BLASTER(FACE)	1209	1209	10	1677	1677	14	64	64	1	2950	2950	25

119 INJURIES OF 9286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
SHOPMAN(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OTHER WORK TASKS	4	4	4	0	0	0	0	0	0	4	4	4
SHOPMAN(INSIDE)	4	4	4	0	0	0	0	0	0	4	4	4

1 INJURIES OF 9286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
SHUTTLE CAR OPR(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CHANGE BIT	4	4	4	0	0	0	0	0	0	4	4	4
CLEAN RIB	1	1	1	0	0	0	0	0	0	1	1	1
CLEAN UP	111	111	16	160	160	23	0	0	0	271	271	39
CONTINUOUS MINE	8	8	3	15	15	5	0	0	0	23	23	8
DUMP SHUTTLE CAR	14	14	3	18	18	4	0	0	0	32	32	6
DRILL FACE	48	48	48	72	72	72	0	0	0	120	120	120
DRILL ROOF	21	21	2	21	21	2	0	0	0	42	42	3
ELECTRICAL MAINTAINENCE	4	4	4	0	0	0	0	0	0	4	4	4
HOOKUP WIRES	1	1	1	0	0	0	0	0	0	1	1	1
INSERT BOLT	133	133	27	77	77	15	71	71	14	281	281	56
INSPECT EQUIPMENT	5	5	2	0	0	0	0	0	0	5	5	2
INSPECT MINE	1	1	1	0	0	0	0	0	0	1	1	1
LOAD SHUTTLE CAR	5	5	1	5	5	1	0	0	0	10	10	3
REMOVE HYDRAULIC JACK	1	1	1	0	0	0	0	0	0	1	1	1
MOVE CABLES	156	156	5	182	182	6	0	0	0	338	338	11
MACHINE MAINTAINENCE	104	104	12	146	146	16	7	7	1	257	257	29
SERVICE MACHINE	239	239	18	219	219	17	140	140	11	598	598	46
POSITION EQUIPMENT	34	34	3	19	19	2	0	0	0	53	53	5
PRY FACE/RIB/ROOF	7	7	4	11	11	6	0	0	0	18	18	9
ROCK DUST	75	75	38	96	96	48	0	0	0	171	171	86
SET PROPS	73	73	4	57	57	3	0	0	0	130	130	8
REMOVE PROPS	21	21	5	32	32	8	0	0	0	53	53	13
SET BRATTICE	84	84	21	125	125	31	0	0	0	209	209	52
SHOOT COAL	4	4	4	0	0	0	0	0	0	4	4	4
CLEAN-UP FALL	58	58	58	66	66	66	0	0	0	124	124	124
SCALE ROOF	77	77	15	106	106	21	0	0	0	183	183	37
TRAM IN	9	9	9	0	0	0	0	0	0	9	9	9
TRAM OUT	8	8	3	5	5	2	0	0	0	13	13	6
TORQUE BOLT	20	20	20	63	63	63	0	0	0	83	83	83
TRANSPORT SUPPLIES	76	76	13	131	131	22	0	0	0	207	207	34
OPERATE SHUTTLE CAR	6623	5907	28	4683	3941	18	174	170	1	11480	10018	47
OPERATE JITNEY	37	37	37	95	95	95	0	0	0	132	132	132
OPERATE TRACTOR	271	271	21	435	435	33	17	17	1	723	723	56
OPERATE MANTRIP CAR	12	12	6	7	7	4	0	0	0	19	19	10
OBSERVE OPERATIONS	99	99	99	139	139	139	9	9	9	247	247	247
IDLE WORKTIME(LUNCH,ETC)	6	6	1	6	6	1	0	0	0	12	12	2
RIDE EQUIPMENT	222	222	13	204	204	12	55	55	3	481	481	28
COUPLE/UNCOUPLE MINE CAR	121	121	17	119	119	17	0	0	0	240	240	34
SPRAG/BLOCK/CHOCK MINECR	1	1	1	0	0	0	0	0	0	1	1	1
LOAD/UNLOAD MINECARS	19	19	10	20	20	10	0	0	0	39	39	20
RERAIL EQUIPMENT	6	6	1	0	0	0	0	0	0	6	6	1
OTHER WORK TASKS	1584	1243	11	1597	1478	14	192	192	2	3473	2913	27
ESCAPING HAZARD	0	0	0	0	0	0	0	0	0	0	0	0
UNKNOWN	45	45	6	41	41	6	0	0	0	86	86	12
REPLACE TROLLEY POLE	18	18	18	2	2	2	0	0	0	20	20	20

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
SHUTTLE CAR OPR(FACE) (CONTINUED)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CROSSOVER CONVEYOR	10	10	5	22	22	11	0	0	0	32	32	16
USE HANDTOOLS	432	432	9	401	401	8	130	130	3	963	963	20
OPERATE POWER TOOLS	13	13	7	15	15	8	0	0	0	28	28	14
WALKING	250	250	8	313	313	9	0	0	0	563	563	17
OPERATE/RIDE CONV BELT	50	50	13	61	61	15	0	0	0	111	111	28
OPERATE HOIST	14	14	14	23	23	23	0	0	0	37	37	37
OPERATE LOCOMOTIVE	17	17	4	17	17	4	0	0	0	34	34	9
ENTER/LEAVE MACHINE	242	242	11	222	222	10	0	0	0	464	464	20
LOAD,UNLOAD MATERIALS	1433	1196	16	1660	678	9	28	28	0	3121	1902	25
OPERATE LOADING MACHINE	1620	1393	232	1416	140	23	1660	136	23	4696	1669	278
SHUTTLE CAR OPR(FACE)	14547	13026	18	13224	10005	13	2483	955	1	30254	23986	32

742 INJURIES OF 9286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
SUPERINTENDENT

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1976 COSTS TOTAL $00	TOTAL 1976 COSTS ANNUAL $00	TOTAL 1976 COSTS INJURY $00
CHANGE BIT	1	1	1	2	2	2	0	0	0	3	3	3
INSPECT EQUIPMENT	2	2	2	0	0	0	0	0	0	2	2	2
SERVICE MACHINE	166	10	10	383	17	17	0	0	0	549	27	27
RELOCATE PROPS	77	77	77	346	346	346	73	73	73	496	496	496
OPERATE MANTRIP CAR	0	0	0	0	0	0	0	0	0	0	0	0
RIDE EQUIPMENT	7	7	7	0	0	0	0	0	0	7	7	7
SWITCH TRACKS	0	0	0	0	0	0	0	0	0	0	0	0
OTHER WORK TASKS	28	28	6	50	50	10	0	0	0	78	78	16
USE HANDTOOLS	3	3	3	0	0	0	0	0	0	3	3	3
SUPERINTENDENT	284	128	10	781	415	32	73	73	6	1138	616	47

13 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
SUPPLY MAN(FACE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1976 COSTS TOTAL $00	TOTAL 1976 COSTS ANNUAL $00	TOTAL 1976 COSTS INJURY $00
CLEAN UP	4	4	4	2	2	2	0	0	0	6	6	6
SET HYDRAULIC JACK	6	6	3	0	0	0	0	0	0	6	6	3
MOVE CABLES	10	10	5	11	11	6	0	0	0	21	21	11
POSITION EQUIPMENT	28	28	9	31	31	10	0	0	0	59	59	20
TRAM IN	49	49	49	35	35	35	0	0	0	84	84	84
TRAM OUT	10	10	10	14	14	14	0	0	0	24	24	24
TRANSPORT SUPPLIES	1	1	1	2	2	2	0	0	0	3	3	3
OPERATE TRACTOR	699	440	110	837	43	11	943	56	14	2479	539	135
OPERATE MANTRIP CAR	7	7	7	17	17	17	0	0	0	24	24	24
RIDE EQUIPMENT	138	138	46	192	192	64	6	6	2	336	336	112
COUPLE/UNCOUPLE MINE CAR	47	47	12	72	72	18	0	0	0	119	119	30
OTHER WORK TASKS	212	212	15	392	392	28	0	0	0	604	604	43
RECOVER/RETRIEVE MTL/EQP	5	5	5	3	3	3	0	0	0	8	8	8
UNKNOWN	3	3	3	0	0	0	0	0	0	3	3	3
USE HANDTOOLS	21	21	3	8	8	1	0	0	0	29	29	4
WALKING	21	21	11	19	19	10	0	0	0	40	40	20
OPERATE LOCOMOTIVE	0	0	0	5	5	5	0	0	0	5	5	5
ENTER/LEAVE MACHINE	10	10	3	11	11	4	0	0	0	21	21	7
LOAD,UNLOAD MATERIALS	448	448	17	463	463	17	160	160	6	1071	1071	40
OPERATE LOADING MACHINE	3	3	2	2	2	1	0	0	0	5	5	3
SUPPLY MAN(FACE)	1722	1463	18	2116	1322	16	1109	222	3	4947	3007	37

82 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE
SUPPLY MAN(NON-FACE)

RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1976 COSTS TOTAL $00	TOTAL 1976 COSTS ANNUAL $00	TOTAL 1976 COSTS INJURY $00
INSERT BOLT	6	6	6	0	0	0	0	0	0	6	6	6
SERVICE MACHINE	0	0	0	0	0	0	0	0	0	0	0	0
POSITION EQUIPMENT	1	1	1	2	2	1	0	0	0	3	3	2
SET PROPS	4	4	4	3	3	3	0	0	0	7	7	7
OPERATE JITNEY	8	8	4	16	16	8	0	0	0	24	24	12
OPERATE TRACTOR	37	37	37	13	13	13	0	0	0	50	50	50
COUPLE/UNCOUPLE MINE CAR	185	165	31	272	272	45	45	45	7	502	502	84
REPAIR EQUIPMENT	124	124	25	204	204	41	0	0	0	328	326	66
OTHER WORK TASKS	149	149	15	246	246	25	46	46	5	441	441	44
UNKNOWN	5	5	3	0	0	0	0	0	0	5	5	3
USE HANDTOOLS	19	19	6	23	23	8	0	0	0	42	42	14
WALKING	1	1	1	1	1	1	0	0	0	2	2	2
ENTER/LEAVE MACHINE	26	26	7	22	22	6	0	0	0	48	48	12
LOAD,UNLOAD MATERIALS	144	144	10	160	160	11	0	0	0	304	304	20
OPERATE LOADING MACHINE	447	115	58	832	32	16	819	61	31	2068	208	104
SUPPLY MAN(NON-FACE)	1156	824	15	1764	994	18	910	152	3	3830	1970	35

56 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
TAILGATE OPERATOR

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	9	8	8	5	5	5	0	0	0	13	13	13
OPERATE SHUTTLE CAR	0	0	0	0	0	0	0	0	0	0	0	0
UNKNOWN	6	6	6	3	3	3	0	0	0	9	9	9
TAILGATE OPERATOR	14	14	5	8	8	3	0	0	0	22	22	7

3 INJURIES OF 9286 TOTAL INJURIES IN TABLE

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
TIMBERMAN(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	11	11	6	16	16	8	0	0	0	27	27	14
CLEAN RIB	13	13	13	24	24	24	0	0	0	37	37	37
CLEAN UP	50	18	5	12	6	2	0	0	0	62	24	6
CONTINUOUS MINE	58	58	29	80	80	40	0	0	0	138	138	69
DRILL FACE	48	48	48	74	74	74	0	0	0	122	122	122
DRILL ROOF	257	22	4	181	18	3	0	0	0	438	40	7
EXTEND CONVEYOR	85	85	85	45	45	45	69	69	69	199	199	199
SET HYDRAULIC JACK	1609	985	39	1505	156	6	248	35	1	3362	1176	47
RELOCATE HYDRAULIC JACK	84	84	42	42	42	21	66	66	33	192	192	96
REMOVE HYDRAULIC JACK	11	11	6	19	19	10	0	0	0	30	30	15
MOVE CABLES	1515	1159	193	1105	75	12	1295	56	9	3915	1290	215
MACHINE MAINTAINENCE	11	11	4	12	12	4	0	0	0	23	23	8
POSITION EQUIPMENT	132	122	24	169	162	32	0	0	0	301	284	57
PRY FACE/RIB/ROOF	38	38	19	56	56	28	0	0	0	94	94	47
ROCK DUST	36	36	36	45	45	45	0	0	0	81	81	81
SET PROPS	3541	2674	38	5266	979	14	719	224	3	9526	3877	55
RELOCATE PROPS	162	65	9	205	134	19	4	4	1	371	203	29
REMOVE PROPS	20	20	3	23	23	4	0	0	0	43	43	7
SCALE ROOF	110	110	55	145	145	73	26	26	13	281	281	141
TRANSPORT SUPPLIES	9	9	9	11	11	11	0	0	0	20	20	20
SET ROPE(WINCH) JACK	33	33	2	41	41	2	0	0	0	74	74	4
RELEASE ROPE(WINCH) JACK	14	14	14	19	19	19	0	0	0	33	33	33
TIGHTEN ROPE(WINCH) JACK	1	1	1	1	1	1	0	0	0	2	2	1
OPERATE SHUTTLE CAR	0	0	0	0	0	0	0	0	0	0	0	0
OBSERVE OPERATIONS	10	10	10	7	7	7	0	0	0	17	17	17
IDLE WORKTIME(LUNCH,ETC)	56	56	28	62	62	31	0	0	0	118	118	59
RIDE EQUIPMENT	349	123	41	337	114	38	44	44	15	730	281	94
OTHER WORK TASKS	701	646	10	861	821	13	50	50	1	1612	1517	24
UNKNOWN	44	44	11	45	45	11	0	0	0	89	89	22
USE HANDTOOLS	245	245	8	357	357	12	7	7	0	609	609	20
OPERATE POWER TOOLS	13	13	4	5	5	2	0	0	0	18	18	6
WALKING	298	98	9	284	149	14	0	0	0	582	247	22
OPERATE CUTTING MACHINE	2	2	2	0	0	0	0	0	0	2	2	2
OPERATE/RIDE CONV BELT	0	0	0	1	1	1	0	0	0	1	1	1
ENTER/LEAVE MACHINE	9	9	3	1	1	0	0	0	0	10	10	3
LOAD,UNLOAD MATERIALS	270	270	9	333	333	11	68	68	2	671	671	22
OPERATE LOADING MACHINE	40	40	40	66	66	66	0	0	0	106	106	106
TIMBERMAN(FACE)	9885	7183	22	11455	4144	13	2596	649	2	23936	11976	37

326 INJURIES OF 9286 TOTAL INJURIES IN TABLE

ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
TIMBERMAN(NON-FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
SET HYDRAULIC JACK	6	6	6	9	9	9	0	0	0	15	15	15
POSITION EQUIPMENT	4	4	4	1	1	1	0	0	0	5	5	5
PRY FACE/RIB/ROOF	0	0	0	1	1	1	0	0	0	1	1	1
SET PROPS	141	141	16	216	216	24	0	0	0	357	357	40
TRANSPORT SUPPLIES	0	0	0	1	1	1	0	0	0	1	1	1
OPERATE SHUTTLE CAR	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE MANTRIP CAR	2	2	2	0	0	0	0	0	0	2	2	2
LAY TRACK	9	9	9	0	0	0	0	0	0	9	9	9
IDLE WORKTIME(LUNCH,ETC)	37	37	37	90	90	90	0	0	0	127	127	127
RIDE EQUIPMENT	35	35	18	40	40	20	0	0	0	75	75	38
COUPLE/UNCOUPLE MINE CAR	17	17	6	27	27	9	0	0	0	44	44	15
OTHER WORK TASKS	68	68	8	77	77	9	0	0	0	145	145	16
RECOVER/RETRIEVE MTL/EQP	4	4	4	5	5	5	0	0	0	9	9	9
UNKNOWN	0	0	0	0	0	0	0	0	0	0	0	0
USE HANDTOOLS	2	2	2	3	3	3	0	0	0	5	5	5
WALKING	4	4	2	6	6	3	0	0	0	10	10	5
OPERATE/RIDE CONV BELT	4	4	4	0	0	0	0	0	0	4	4	4
LOAD,UNLOAD MATERIALS	103	103	21	117	117	23	64	64	13	284	284	57
TIMBERMEN(NON-FACE)	437	437	10	593	593	14	64	64	2	1094	1094	26

42 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
TRACKMAN

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CLEAN UP	3	3	2	0	0	0	0	0	0	3	3	2
INSERT BOLT	13	13	13	18	18	18	0	0	0	31	31	31
MOVE CABLES	8	8	8	0	0	0	0	0	0	8	8	8
POSITION EQUIPMENT	260	16	5	140	3	1	0	0	0	400	19	6
RELOCATE PROPS	10	10	10	0	0	0	0	0	0	10	10	10
SET BRATTICE	0	0	0	2	2	2	0	0	0	2	2	2
TRAM IN	1	1	1	0	0	0	0	0	0	1	1	1
TRANSPORT SUPPLIES	0	0	0	1	1	1	0	0	0	1	1	1
OPERATE JITNEY	1	1	1	0	0	0	0	0	0	1	1	1
LAY TRACK	143	143	12	153	153	13	75	75	6	371	371	31
OBSERVE OPERATIONS	4	4	4	0	0	0	0	0	0	4	4	4
RIDE EQUIPMENT	76	76	15	101	101	20	0	0	0	177	177	35
COUPLE/UNCOUPLE MINE CAR	138	29	6	180	39	8	0	0	0	318	68	14
SWITCH TRACKS	0	0	0	0	0	0	0	0	0	0	0	0
RERAIL EQUIPMENT	30	30	10	17	17	6	0	0	0	47	47	16
OTHER WORK TASKS	662	662	18	690	690	19	208	208	6	1560	1560	42
RECOVER/RETRIEVE MTL/EQP	18	18	9	0	0	0	0	0	0	18	18	9
UNKNOWN	5	5	5	7	7	7	0	0	0	12	12	12
USE HANDTOOLS	76	76	4	51	51	3	0	0	0	127	127	6
OPERATE POWER TOOLS	1	1	1	0	0	0	0	0	0	1	1	1
WALKING	29	29	4	0	0	0	0	0	0	29	29	4
OPERATE LOCOMOTIVE	51	51	10	53	53	11	0	0	0	104	104	21
ENTER/LEAVE MACHINE	10	10	3	2	2	1	0	0	0	12	12	3
LOAD,UNLOAD MATERIALS	369	369	13	404	404	14	160	160	6	933	933	32
SPOT CARS(PLACING)	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE LOADING MACHINE	1	1	1	0	0	0	0	0	0	1	1	1
TRACKMAN	1910	1557	11	1819	1541	10	443	443	3	4172	3541	24

148 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
TRANSIT MAN(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
MARK ROOF	5	5	5	0	0	0	0	0	0	5	5	5
TRANSIT MAN(INSIDE)	5	5	5	0	0	0	0	0	0	5	5	5

1 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
UTILITY MAN(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	2	2	2	4	4	4	0	0	0	6	6	6
CHANGE BIT	0	0	0	0	0	0	0	0	0	0	0	0
CLEAN UP	65	65	16	144	144	36	6	6	2	215	215	54
DRILL ROOF	68	68	8	65	65	7	0	0	0	133	133	15
GET READY FOR WORK TASK	4	4	4	0	0	0	0	0	0	4	4	4
HANG TUBING	93	6	6	59	1	1	0	0	0	152	7	7
INSERT BOLT	52	52	17	114	114	38	0	0	0	166	166	55
INSPECT EQUIPMENT	2	2	2	3	3	3	0	0	0	5	5	5
MOVE CABLES	160	160	23	212	212	30	0	0	0	372	372	53
MACHINE MAINTAINENCE	10	10	3	10	10	3	0	0	0	20	20	7
MARK ROOF	1	1	1	4	4	4	0	0	0	5	5	5
POSITION EQUIPMENT	259	43	11	996	53	13	1275	68	17	2530	164	41
SET PROPS	12	12	4	16	16	5	0	0	0	28	28	9
RELOCATE PROPS	1	1	1	0	0	0	0	0	0	1	1	1
CLEAN-UP FALL	61	61	61	66	66	66	0	0	0	127	127	127
SCALE ROOF	0	0	0	0	0	0	0	0	0	0	0	0
TRAM IN	5	5	5	1	1	1	0	0	0	6	6	6
TORQUE BOLT	5	5	5	7	7	7	0	0	0	12	12	12
TRANSPORT SUPPLIES	0	0	0	0	0	0	0	0	0	0	0	0
OPERATE SHUTTLE CAR	14	14	5	28	28	9	0	0	0	42	42	14
OPERATE TRACTOR	1	1	1	0	0	0	0	0	0	1	1	1
OBSERVE OPERATIONS	2	2	2	0	0	0	0	0	0	2	2	2
RIDE EQUIPMENT	75	75	19	113	113	28	0	0	0	188	188	47
COUPLE/UNCOUPLE MINE CAR	0	0	0	2	2	2	0	0	0	2	2	2
RERAIL EQUIPMENT	0	0	0	0	0	0	0	0	0	0	0	0
OTHER WORK TASKS	478	478	14	582	582	18	156	156	5	1216	1216	37
ESCAPING HAZARD	2	2	2	2	2	2	0	0	0	4	4	4
UNKNOWN	4	4	2	0	0	0	0	0	0	4	4	2
USE HANDTOOLS	167	26	4	107	21	3	0	0	0	274	47	7
WALKING	49	49	10	37	37	7	0	0	0	86	86	17
OPERATE CUTTING MACHINE	22	22	22	27	27	27	0	0	0	49	49	49
OPERATE ROCKDUST MACHINE	58	58	58	120	120	120	0	0	0	178	178	178
OPERATE LOCOMOTIVE	501	209	105	288	12	6	1389	84	42	2178	305	153
ENTER/LEAVE MACHINE	4	4	4	8	8	8	0	0	0	12	12	12
LOAD,UNLOAD MATERIALS	75	75	9	80	80	10	0	0	0	155	155	19
OPERATE LOADING MACHINE	10	10	5	17	17	9	0	0	0	27	27	14
UTILITY MAN(FACE)	2262	1526	13	2112	1749	15	2826	314	3	8200	3588	30

119 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
VENTILATION(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	7	7	7	4	4	4	0	0	0	11	11	11
CHANGE DRILL	4	4	4	0	0	0	0	0	0	4	4	4
CLEAN RIB	8	8	4	4	4	2	0	0	0	12	12	6
DRILL ROOF	63	63	32	73	73	37	0	0	0	136	136	68
ELECTRICAL MAINTAINENCE	2	2	2	4	4	4	0	0	0	6	6	6
GET READY FOR WORK TASK	7	7	7	14	14	14	0	0	0	21	21	21
INSERT BOLT	0	0	0	0	0	0	0	0	0	0	0	0
SET HYDRAULIC JACK	1	1	1	3	3	3	0	0	0	4	4	4
MOVE CABLES	10	10	10	0	0	0	0	0	0	10	10	10
MACHINE MAINTAINENCE	18	18	18	24	24	24	0	0	0	42	42	42
SET PROPS	97	82	27	102	88	29	66	66	22	260	236	79
SET BRATTICE	5	5	2	2	2	1	0	0	0	7	7	2
TRANSPORT SUPPLIES	77	77	77	33	33	33	74	74	74	184	184	184
OPERATE SHUTTLE CAR	45	45	45	111	111	111	0	0	0	156	156	156
OPERATE JITNEY	2	2	2	0	0	0	0	0	0	2	2	2
OPERATE TRACTOR	9	9	9	6	6	6	0	0	0	15	15	15
OPERATE MANTRIP CAR	5	5	5	7	7	7	0	0	0	12	12	12
RIDE EQUIPMENT	1	1	1	1	1	1	0	0	0	2	2	2
OTHER WORK TASKS	560	560	10	561	561	10	77	77	1	1198	1198	22
UNKNOWN	1	1	1	0	0	0	0	0	0	1	1	1
CROSSOVER CONVEYOR	51	51	51	70	70	70	0	0	0	121	121	121
USE HANDTOOLS	82	82	21	107	107	27	0	0	0	189	189	47
WALKING	12	12	3	13	13	3	0	0	0	25	25	6
LOAD,UNLOAD MATERIALS	143	143	24	162	162	27	56	56	9	361	361	60
VENTILATION(FACE)	1205	1195	13	1301	1287	14	273	273	3	2779	2755	29

95 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
VENTILATION(NON-FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
INSPECT EQUIPMENT	0	0	0	0	0	0	0	0	0	0	0	0
SERVICE MACHINE	5	5	5	7	7	7	0	0	0	12	12	12
POSITION EQUIPMENT	1	1	1	1	1	1	0	0	0	2	2	1
RIDE EQUIPMENT	69	69	23	89	89	30	0	0	0	158	158	53
OTHER WORK TASKS	87	87	6	86	86	6	0	0	0	173	173	12
RECOVER/RETRIEVE MTL/EQP	2	2	2	0	0	0	0	0	0	2	2	2
USE HANDTOOLS	42	42	21	55	55	28	0	0	0	97	97	49
WALKING	9	9	2	11	11	2	0	0	0	20	20	4
LOAD,UNLOAD MATERIALS	135	10	3	118	7	2	0	0	0	253	17	4
OPERATE LOADING MACHINE	1	1	1	2	2	2	0	0	0	3	3	3
VENTILATION(NON-FACE)	351	226	7	369	258	8	0	0	0	720	484	14

34 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
WATER LINE MAN

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
MACHINE MAINTAINENCE	1	1	1	1	1	1	0	0	0	2	2	2
SET PROPS	1	1	1	0	0	0	0	0	0	1	1	1
OTHER WORK TASKS	25	25	13	0	0	0	0	0	0	25	25	13
WATER LINE MAN	27	27	7	1	1	0	0	0	0	28	28	7

4 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
WELDER(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
GET READY FOR WORK TASK	4	4	4	0	0	0	0	0	0	4	4	4
MACHINE MAINTAINENCE	6	6	2	3	3	1	0	0	0	9	9	2
TIGHTEN ROPE(WINCH) JACK	11	11	11	18	18	18	0	0	0	29	29	29
IDLE WORKTIME(LUNCH,ETC)	34	34	34	21	21	21	0	0	0	55	55	55
OTHER WORK TASKS	9	9	2	14	14	4	0	0	0	23	23	6
OPERATE WELDER	61	61	10	103	103	17	0	0	0	164	164	27
USE HANDTOOLS	21	21	7	22	22	7	0	0	0	43	43	14
WALKING	63	63	32	94	94	47	0	0	0	157	157	79
ENTER/LEAVE MACHINE	5	5	3	0	0	0	0	0	0	5	5	3
LOAD,UNLOAD MATERIALS	5	5	3	6	6	3	0	0	0	11	11	6
SPOT CARS(PLACING)	1	1	1	1	1	1	0	0	0	2	2	2
WELDER(INSIDE)	220	220	8	282	282	10	0	0	0	502	502	19

27 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
MIREMAN(FACE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
DRILL ROOF	4	4	4	2	2	2	0	0	0	6	6	6
MOVE CABLES	13	13	7	0	0	0	0	0	0	13	13	7
MACHINE MAINTAINENCE	4	4	4	0	0	0	0	0	0	4	4	4
SHOOT COAL	37	37	37	77	77	77	0	0	0	114	114	114
TRAM OUT	7	7	7	11	11	11	0	0	0	18	18	18
OPERATE SHUTTLE CAR	4	4	4	1	1	1	0	0	0	5	5	5
COUPLE/UNCOUPLE MINE CAR	4	4	4	6	6	6	0	0	0	10	10	10
OTHER WORK TASKS	79	79	11	116	116	17	0	0	0	195	195	28
RECOVER/RETRIEVE MTL/EQP	6	6	6	4	4	4	0	0	0	10	10	10
USE HANDTOOLS	6	6	3	0	0	0	0	0	0	6	6	3
WALKING	5	5	3	0	0	0	0	0	0	5	5	3
OPERATE/RIDE CONV BELT	1	1	1	0	0	0	0	0	0	1	1	1
LOAD,UNLOAD MATERIALS	1	1	1	0	0	0	0	0	0	1	1	1
OPERATE LOADING MACHINE	20	20	20	34	34	34	0	0	0	54	54	54
MIREMAN(FACE)	191	191	8	251	251	11	0	0	0	442	442	19

23 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
MIREMAN(INSIDE)

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	3	3	3	0	0	0	0	0	0	3	3	3
DRILL ROOF	1	1	1	0	0	0	0	0	0	1	1	1
ELECTRICAL MAINTAINENCE	1	1	1	0	0	0	0	0	0	1	1	1
HOOKUP WIRES	1073	600	600	1995	53	53	328	48	48	3396	701	701
MOVE CABLES	14	14	14	6	6	6	0	0	0	20	20	20
MACHINE MAINTAINENCE	1	1	1	0	0	0	0	0	0	1	1	1
POSITION EQUIPMENT	0	0	0	0	0	0	0	0	0	0	0	0
SCALE ROOF	5	5	5	0	0	0	0	0	0	5	5	5
TRANSPORT SUPPLIES	0	0	0	0	0	0	0	0	0	0	0	0
RIDE EQUIPMENT	124	124	31	161	161	40	27	27	7	312	312	78
RERAIL EQUIPMENT	13	13	13	17	17	17	0	0	0	30	30	30
OTHER WORK TASKS	24	24	2	30	30	3	0	0	0	54	54	5
USE HANDTOOLS	25	25	6	21	21	5	0	0	0	46	46	12
WALKING	3	3	3	0	0	0	0	0	0	3	3	3
ENTER/LEAVE MACHINE	0	0	0	0	0	0	0	0	0	0	0	0
LOAD,UNLOAD MATERIALS	12	12	6	3	3	2	0	0	0	15	15	8
MIREMAN(INSIDE)	1299	826	25	2233	291	9	355	75	2	3887	1192	36

33 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
SURFACE JOB TITLE

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	1595	1256	1256	1423	41	41	923	49	49	3941	1346	1346
MACHINE MAINTAINENCE	7	7	7	0	0	0	0	0	0	7	7	7
OBSERVE OPERATIONS	24	24	24	36	36	36	0	0	0	60	60	60
RIDE EQUIPMENT	0	0	0	0	0	0	0	0	0	0	0	0
SWITCH TRACKS	4	4	4	0	0	0	0	0	0	4	4	4
SPRAG/BLOCK/CHOCK MINECR	4	4	4	0	0	0	0	0	0	4	4	4
OTHER WORK TASKS	71	71	6	91	91	8	0	0	0	162	162	15
ESCAPING HAZARD	3	3	3	0	0	0	0	0	0	3	3	3
OPERATE WELDER	0	0	0	0	0	0	0	0	0	0	0	0
USE HANDTOOLS	2	2	2	0	0	0	0	0	0	2	2	2
WALKING	3	3	3	0	0	0	0	0	0	3	3	3
ENTER/LEAVE MACHINE	79	79	79	44	44	44	66	66	66	189	189	189
LOAD,UNLOAD MATERIALS	7	7	4	2	2	1	0	0	0	9	9	5
SURFACE JOB TITLE	1799	1460	61	1596	214	9	989	115	5	4384	1789	75

24 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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JOB ACTIVITIES AT TIME OF ACCIDENT BY REGULAR JOB TITLE — RUN 3/ 5/76
OTHER/UNDEFINED JOB

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	939	495	495	325	20	20	560	66	66	1824	581	581
OTHER/UNDEFINED JOB	939	495	495	325	20	20	560	66	66	1824	581	581

1 INJURIES OF 9286 TOTAL INJURIES IN TABLE

SUMMARY TABLE BY REGULAR JOB TITLE — RUN 3/ 5/76

REGULAR JOB TITLE	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BATTERY STATION OPER	58	58	58	109	109	109	0	0	0	167	167	167
BELT CLEANER(INSIDE)	930	731	11	1086	909	14	137	137	2	2153	1777	27
BELT VULCANIZER(INS)	21	21	11	7	7	4	0	0	0	28	28	14
BELTMAN(FACE)	5451	4214	23	4582	2650	14	1686	530	3	11719	7394	40
BELTMAN(NON-FACE)	1512	1512	9	1637	1637	10	266	266	2	3415	3415	21
BRAKEMAN/ROPE RIDER	813	478	9	690	488	10	0	0	0	1503	966	19
BRATTICE MAN	814	814	8	948	948	9	9	9	0	1771	1771	17
CAGER(INSIDE)	14	14	5	23	23	8	0	0	0	37	37	12
CHAINMAN	6	6	2	0	0	0	0	0	0	6	6	2
CLEANUP MAN(NON-FACE)	266	266	22	325	325	27	0	0	0	591	591	49
COAL DRILL HELPER	151	18	6	138	24	8	0	0	0	289	42	14
COAL DRILL OPERATOR	2624	2265	29	2058	1361	17	401	96	1	5083	3722	47
COAL DUMP OP(INSIDE)	716	183	11	3467	286	18	1952	95	6	6135	564	35
CONTINUOUS MINER HLPR	9630	7101	25	14778	4809	17	3305	497	2	27713	12407	43
CONTINUOUS MINER OPER	24168	19277	45	16873	6870	16	9419	1382	3	50460	27529	65
CUTTING MACHINE HELPR	352	352	11	455	455	14	142	142	4	949	949	30
CUTTING MACHINE OPER.	2636	1762	20	5184	1243	14	1256	213	2	9076	3218	37
DISPATCHER(INSIDE)	17	17	3	12	12	2	0	0	0	29	29	6
DRIVER(INSIDE)	364	354	7	477	477	9	50	50	1	891	891	16
DUST SAMPLER(OUTSIDE)	13	13	3	15	15	4	0	0	0	28	28	7
ELECTR. HLP(NON-FACE)	6	6	3	4	4	2	0	0	0	10	10	5
ELECTRICIAN HLP(FACE)	301	301	20	276	276	18	152	152	10	729	729	49
ELECTRICIAN(FACE)	2529	2362	10	3275	2959	12	264	264	1	6068	5585	23
ELECTRICIAN(MASTER)	127	99	5	181	146	8	0	0	0	308	245	14
ELECTRICIAN(NON-FACE)	802	659	10	1141	919	14	0	0	0	1943	1578	25
ENGINEER	27	27	7	38	38	10	0	0	0	65	65	16
FIRE BOSS/EXAMINER	214	214	5	172	172	4	0	0	0	386	386	9
FOREMAN(FACE)	7436	5906	15	9640	6362	17	594	431	1	17670	12699	33
FOREMAN(INSIDE)	3353	1967	28	4948	935	13	1605	118	2	9906	3020	43
FOREMAN(MTCE,OUTSIDE)	149	149	6	273	273	10	32	32	1	454	454	17
FOREMAN(PREP PLANT)	2	2	2	11	11	11	0	0	0	13	13	13
FOREMAN/MANAGER(ASST)	766	766	14	1060	572	11	89	89	2	1915	1427	27
FOREMAN/MANAGER(MINE)	3922	2315	58	15142	1980	49	2036	246	6	21100	4541	114
HOISTMAN(INSIDE)	3093	3093	387	1219	133	17	94	94	12	4406	3320	415
INSPECTOR	55	55	9	152	152	25	0	0	0	207	207	34
JACK SETTER/LONGWALL	3331	2880	28	2901	1154	11	1171	96	1	7403	4130	40
LABORER(FACE)	19293	17729	17	21210	12141	11	3208	1518	1	43711	31388	30
LABORER(INSIDE)	7090	6138	14	9095	5698	13	856	471	1	17041	12307	28
LOADER HEAD/ROSCOE OP	2	2	2	3	3	3	0	0	0	5	5	5
LOADING MACHINE HELPR	4630	3837	91	2490	1075	26	795	415	10	7915	5327	127
LOADING MACHINE OPER.	12962	11128	44	8605	3899	15	4345	830	3	25912	15857	62
LONGWALL OPERATOR	166	166	8	258	258	12	0	0	0	424	424	19
MECHANIC HELPER(FACE)	415	324	9	369	311	9	153	153	4	937	788	22
MECHANIC HLPR(INSIDE)	101	101	8	110	110	8	0	0	0	211	211	16
MECHANIC(FACE)	17371	15522	28	17003	6878	12	4167	1385	2	38541	23785	42

ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

SUMMARY TABLE BY REGULAR JOB TITLE (CONTINUED) RUN 3/ 5/76

REGULAR JOB TITLE	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
MECHANIC(INSIDE)	2298	1849	12	2381	1944	13	164	164	1	4843	3957	27
MECHANIC(MASTER)	8	8	2	1	1	0	0	0	0	9	9	2
MOTORMAN(INSIDE)	8686	7366	20	8098	4375	12	1078	1078	3	17862	12819	34
OILER/GREASER(INSIDE)	193	193	6	144	144	5	0	0	0	337	337	11
PUMPER	445	445	8	346	346	6	40	40	1	831	831	15
ROCK DRILLER(INSIDE)	1693	927	51	5556	340	19	1540	206	11	8789	1473	82
ROCK DUSTER(FACE)	182	182	6	147	147	5	30	30	1	359	359	12
ROCK DUSTER(NON-FACE)	228	228	8	200	200	7	79	79	3	507	507	17
ROCK MACHINE OPERATOR	37	37	19	57	57	29	0	0	0	94	94	47
ROCKMAN	549	161	11	1531	208	15	0	0	0	2080	369	26
RODMAN(INSIDE)	21	21	5	4	4	1	0	0	0	25	25	6
ROOF BOLTER	38206	30943	22	44287	22988	16	11310	3046	2	93803	56977	40
ROOF BOLTER HELPER	973	770	14	1521	1193	22	0	0	0	2494	1963	36
ROOF BOLTER MOUNTED	20	20	5	17	17	4	0	0	0	37	37	9
SAFETY DIRECTOR	1	1	1	0	0	0	0	0	0	1	1	1
SCOOP CAR OPERATOR	4243	3453	35	5968	1609	16	2447	150	1	12658	5212	52
SHOOTER/BLASTER(FACE)	1209	1209	10	1677	1677	14	64	64	1	2950	2950	25
SHOPMAN(INSIDE)	4	4	4	0	0	0	0	0	0	4	4	4
SHUTTLE CAR OPR(FACE)	14547	13026	18	13224	10005	13	2483	955	1	30254	23986	32
SUPERINTENDENT	284	128	10	781	415	32	73	73	6	1138	616	47
SUPPLY MAN(FACE)	1722	1463	18	2116	1322	16	1109	222	3	4947	3007	37
SUPPLY MAN(NON-FACE)	1156	824	15	1764	994	18	910	152	3	3830	1970	35
TAILGATE OPERATOR	14	14	5	8	8	3	0	0	0	22	22	7
TIMBERMAN(FACE)	9885	7183	22	11455	4144	13	2596	649	2	23936	11976	37
TIMBERMAN(NON-FACE)	437	437	10	593	593	14	64	64	2	1094	1094	26
TRACKMAN	1910	1557	11	1819	1541	10	443	443	3	4172	3541	24
TRANSIT MAN(INSIDE)	5	5	5	0	0	0	0	0	0	5	5	5
UTILITY MAN(FACE)	2262	1526	13	3112	1749	15	2826	314	3	8200	3589	30
VENTILATION(FACE)	1205	1195	13	1301	1287	14	273	273	3	2779	2755	29
VENTILATION(NON-FACE)	351	226	7	369	258	8	0	0	0	720	484	14
WATER LINE MAN	27	27	7	1	1	0	0	0	0	28	28	7
WELDER(INSIDE)	220	220	8	282	282	10	0	0	0	502	502	19
WIREMAN(FACE)	191	191	8	251	251	11	0	0	0	442	442	19
WIREMAN(INSIDE)	1209	826	25	2233	291	9	355	75	2	3887	1192	36
SURFACE JOB TITLE	1799	1460	61	1596	214	9	989	115	5	4384	1789	75
OTHER/UNDEFINED JOB	939	495	495	325	20	20	560	66	66	1824	581	581
	235948	193834	21	265605	127732	14	67617	17969	2	569170	339535	37

9286 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

SUMMARY TABLE BY MINING TASK ACTIVITY AT TIME OF ACCIDENT — RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
BRUSH FLOOR	3839	2374	103	8132	324	14	3008	219	10	14979	2917	127
BRUSH ROOF	5	5	5	1	1	1	0	0	0	6	6	6
CHANGE BIT	259	140	6	331	155	7	59	59	3	649	354	16
CHANGE DRILL	139	50	5	140	31	3	0	0	0	319	81	8
CLEAN BIT	2	2	1	3	3	2	0	0	0	5	5	3
CLEAN RIB	1086	467	27	1756	190	11	174	26	2	3016	683	40
CLEAN UP	2527	2256	16	3290	2619	18	200	200	1	6017	5115	35
CONTINUOUS MINE	8112	6626	46	4908	2239	16	3606	468	3	16626	9333	65
DUMP SHUTTLE CAR	14	14	3	18	18	4	0	0	0	32	32	6
DRILL FACE	375	375	12	588	588	20	0	0	0	963	963	32
DRILL ROOF	11720	9089	15	16903	9471	16	1423	893	1	30046	19453	32
EMPTY DUSTBOX	72	72	9	96	96	12	0	0	0	168	168	21
EXTEND CONVEYOR	113	113	38	75	75	25	69	69	23	257	257	86
ELECTRICAL MAINTAINENCE	2647	2280	51	2511	353	8	1252	58	1	6410	2721	60
GET READY FOR WORK TASK	128	128	14	241	241	27	0	0	0	369	369	41
HAND LOAD	129	129	21	142	142	24	9	9	1	280	280	47
HAND TURING	135	48	6	59	1	0	0	0	0	194	49	6
HOOKUP WIRES	1619	651	93	2507	79	11	328	48	7	4454	778	111
INSERT BOLT	12859	10377	32	13441	5328	17	3879	1152	4	30179	16857	52
INSERT CHARGE	111	111	16	71	71	10	76	76	11	258	258	37
INSPECT EQUIPMENT	376	376	7	419	419	8	101	101	2	896	896	18
INSPECT MINE	3399	2039	70	4305	628	22	793	126	4	8497	2793	96
LOAD SHUTTLE CAR	13	13	2	8	8	1	0	0	0	21	21	3
SET HYDRAULIC JACK	3830	2851	47	3154	592	10	1560	106	2	8548	3549	58
RELOCATE HYDRAULIC JACK	2795	2427	93	2186	482	19	1217	142	5	6192	3051	117
REMOVE HYDRAULIC JACK	262	262	16	299	299	19	114	114	7	675	675	42
MOVE CABLES	10898	9485	33	9510	4557	16	2688	787	3	23096	14829	52
MARK HOLE	4	4	4	0	0	0	0	0	0	4	4	4
MACHINE MAINTAINENCE	7098	5797	16	7630	4257	13	1961	505	1	16689	10559	28
SERVICE MACHINE	1395	1074	11	1852	1244	13	444	444	5	3681	2762	29
MARK ROOF	1584	706	141	540	166	33	362	54	11	2286	926	185
POSITION EQUIPMENT	6664	4680	22	8974	3486	16	4457	496	2	20095	8662	40
PRY FACE/RIB/ROOF	402	402	14	520	520	18	66	66	2	988	988	34
ROCK DUST	889	762	26	877	610	21	50	50	2	1816	1422	49
SET PROPS	9030	7216	25	12470	4441	15	2992	707	2	24492	12364	43
RELOCATE PROPS	397	300	12	734	663	27	84	84	3	1215	1047	42
REMOVE PROPS	343	343	8	498	498	12	47	47	1	888	888	22
SET SPATTICE	2446	2446	32	1349	1349	18	127	127	2	3922	3922	52
SHOOT COAL	356	356	9	624	624	16	0	0	0	980	980	26
SHOOT FLOOR	0	0	0	2	2	2	0	0	0	2	2	2
CLEAN-UP FALL	3125	2773	252	2332	352	32	235	72	7	5692	3197	291
SCALE ROOF	7885	6794	98	5262	1556	23	4414	538	5	17561	8688	126
SUMP	105	105	35	90	90	30	97	97	32	292	292	97
DRILL TEST HOLE	2	2	2	1	1	1	0	0	0	3	3	3
TRAM IN	3222	2420	28	3231	1870	22	723	343	4	7176	4633	55

ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

SUMMARY TABLE BY MINING TASK ACTIVITY AT TIME OF ACCIDENT (CONTINUED) RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
TRAM OUT	789	660	13	1087	993	20	64	64	1	1940	1717	34
TORQUE BOLT	243	243	10	465	465	19	0	0	0	708	708	28
TEST ROOF	162	162	20	247	247	31	0	0	0	409	409	51
TRANSPORT SUPPLIES	806	806	10	901	901	11	134	134	2	1841	1841	22
SET ROOF(WINCH) JACK	57	57	3	70	70	3	0	0	0	127	127	6
RELEASE ROOF(WINCH) JACK	14	14	14	19	19	19	0	0	0	33	33	33
TIGHTEN ROOF(WINCH) JACK	13	13	3	21	21	5	0	0	0	34	34	9
OPERATE SHUTTLE CAR	7833	6559	22	7066	4879	17	271	267	1	15170	11705	40
OPERATE JITNEY	370	370	12	455	455	15	50	50	2	875	875	29
OPERATE TRACTOR	2131	1608	20	3139	1143	14	2543	138	2	7813	2889	35
OPR MAINLINE HAULAGE EQP	109	109	16	130	130	19	0	0	0	239	239	34
OPERATE MANTRIP CAR	369	369	11	377	377	11	141	141	4	887	887	25
LAY TRACK	218	173	10	192	168	9	75	75	4	485	416	23
SUPERVISE	2543	1543	38	2839	577	14	881	61	1	6263	2181	53
OBSERVE OPERATIONS	904	820	16	1472	1350	26	309	309	6	2685	2479	49
IDLE WORKTIME(LUNCH,ETC)	2818	2454	39	3118	1663	26	344	344	5	6280	4461	71
RIDE EQUIPMENT	4637	3705	16	6193	3814	16	1818	490	2	12648	8009	34
COUPLE/UNCOUPLE MINE CAR	5391	4636	35	7610	1536	11	417	185	1	13418	6357	47
SWITCH TRACKS	111	111	6	117	117	6	48	48	3	276	276	15
SPRAG/BLOCK/CHOCK MINECR	539	171	12	384	198	14	0	0	0	923	369	26
LOAD/UNLOAD MINECARS	166	166	24	231	231	33	6	6	1	403	403	58
REPAIR EQUIPMENT	998	998	12	1268	1268	15	233	233	3	2499	2499	29
OTHER WORK TASKS	27901	23793	13	35053	23122	13	5901	2608	1	68855	49523	27
RECOVER/RETRIEVE MTL/EQP	144	144	6	149	149	6	0	0	0	293	293	11
OPERATE CONVEYOR BELT	10	10	3	13	13	4	0	0	0	23	23	8
ESCAPING HAZARD	1110	793	40	1184	350	17	1480	133	7	3774	1276	64
UNKNOWN	6041	5127	36	8737	2963	21	2167	337	2	16945	8427	59
REPLACE TROLLEY POLE	90	90	3	66	66	2	0	0	0	156	156	6
CROSSOVER CONVEYOR	-321	-321	13	-513	513	21	5	-5	0	-839	839	35
UNDEFINED.....	-6	-6	-6	-5	5	5	0	-0	0	-11	-11	-11
OPERATE WELDER	3757	3499	106	3454	472	14	75	75	2	7286	4046	123
USE HANDTOOLS	5932	5348	7	7273	5599	7	1294	362	0	14499	11309	15
OPERATE POWER TOOLS	298	243	9	362	319	11	0	0	0	660	562	20
WALKING	7908	7460	15	9493	5705	12	1140	646	1	18541	13811	28
OPERATE CUTTING MACHINE	217	217	11	367	367	18	0	0	0	584	584	29
OPERATE/RIDE CONV BELT	1044	346	12	1012	390	13	40	40	1	2096	776	27
OPERATE CLEANING PLANT	-8	-8	8	-3	-3	-3	0	0	0	-11	11	11
OPERATE ROCKDUST MACHINE	193	193	16	360	360	30	6	6	0	559	559	47
OPERATE HOIST	372	240	11	323	203	9	68	68	3	763	511	23
OPERATE LOCOMOTIVE	6382	5016	34	5820	1862	12	1859	554	4	14061	7432	50
ENTER/LEAVE MACHINE	2736	2409	13	3311	2065	11	738	232	1	6785	4706	26
PICK SLATE	39	39	13	101	101	34	0	0	0	140	140	47
LOAD,UNLOAD MATERIALS	9383	8059	12	10575	7944	12	1939	1178	2	21897	17181	26
SPOT CARS(PLACING)	3122	3122	173	1360	274	15	26	26	1	4508	3422	190
OPEN/CLOSE/LIFT CHUTE	91	91	46	57	57	29	47	47	24	195	195	98

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SUMMARY TABLE BY MINING TASK ACTIVITY AT TIME OF ACCIDENT (CONTINUED) RUN 3/ 5/76

MINING TASK ACTIVITY AT TIME OF ACCIDENT	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
OPERATE LOADING MACHINE	15421	12533	63	16495	3439	17	6883	1024	5	38799	16996	85
	235948	193834	21	265605	127732	14	67617	17969	2	569170	339535	37

9286 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

SUMMARY TABLE BY NATURE OF INJURY — RUN 3/ 5/76

NATURE OF INJURY	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
AMPUTATION/ENUCLEATION	15053	905	9	16223	514	5	73	2	0	31349	1421	14
ASPHYXIA/DROWNING	9	9	1	20	20	2	0	0	0	29	29	3
BURN/SCALD (HEAT)	1702	1342	26	730	403	8	187	187	4	2619	1932	38
BURN(CHEMICAL)	50	50	2	51	51	2	0	0	0	101	101	3
CONCUSSION	175	175	13	274	274	21	0	0	0	449	449	35
CONTUSION/CRUSH/BRUISE	56791	50457	15	55601	31343	9	12396	4069	3	124788	85869	26
CUT/LACERATION/PUNCTURE	9336	9336	6	11498	11498	8	1301	1301	1	22135	22135	15
DERMATITIS	1	1	0	2	2	0	0	0	0	3	3	1
DISLOCATION	642	642	15	784	784	18	175	175	4	1601	1601	37
ELECTRIC SHOCK	5934	5160	323	4442	287	18	2535	180	11	12911	5627	352
FRACTURE	45973	41250	34	51454	38005	32	9822	4789	4	107249	84044	70
HEARING LOSS/IMPAIRMENT	173	28	6	144	25	5	0	0	0	317	53	11
HERNIA/RUPTURE	880	880	14	1602	1602	25	171	171	3	2653	2653	41
RADIATION EXPOSURE	0	0	0	0	0	0	0	0	0	0	0	0
SCRATCHES/ABRASIONS	365	365	3	676	676	6	96	96	1	1137	1137	11
SPRAINS/STRAINS	27519	27519	12	33024	33024	14	3518	3518	1	64061	64061	27
MULTIPLE INJURIES	48509	37085	83	63041	8171	18	26102	2629	6	137652	47885	107
OTHER/NOT SPECIFIED	22936	18630	1164	26039	1053	66	11241	852	53	60116	20535	1283
	235948	193834	21	265605	127732	14	67617	17969	2	569170	339535	37

9286 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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SUMMARY TABLE BY UNDERGROUND MINING METHOD — RUN 3/ 5/76

UNDERGROUND MINING METHOD	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
CONTINUOUS	151088	120548	19	186633	84495	13	48185	12268	2	385906	217311	34
CONVENTIONAL	77538	67461	26	71652	38733	15	17976	5320	2	167166	111514	42
HAND LOAD	623	497	9	1002	734	13	0	0	0	1625	1231	22
LONGWALL	6699	5328	19	6318	3770	13	1456	381	1	14473	9479	33
	235948	193834	21	265605	127732	14	67617	17969	2	569170	339535	37

9286 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT/ILLNESS TYPES BY DEGREE OF INJURY FATALITY — RUN 3/ 5/76

TYPE OF ACCIDENT/ OCCUPATIONAL ILLNESS	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
FALL OF ROOF	61464	47601	1058	68299	2497	55	26090	2219	49	155853	52317	1163
PRESSURE BUMP/BURST	2433	2065	2065	1742	44	44	1143	68	68	5318	2177	2177
FALL OF FACE/RIB/SIDE	7900	7171	1793	2764	372	93	2690	199	50	13354	7742	1936
SLIDING/FALLING MATERIAL	842	93	31	4244	120	40	3227	163	54	8313	376	125
STEP/KNEEL ON OBJECT	1126	799	799	1298	52	52	552	46	46	2976	897	897
HAULAGE	20447	16801	1120	20187	991	66	8031	678	45	48665	18470	1231
ELECTRICITY	8692	7219	1444	6115	251	50	3478	249	50	18285	7719	1544
MACHINERY	24141	19932	1329	20437	788	53	7603	710	47	52181	21430	1429
FATALITY	127045	101681	1142	125086	5115	57	52814	4332	49	304945	111128	1249

89 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

ACCIDENT/ILLNESS TYPES BY DEGREE OF INJURY
PERMANENT TOTAL

RUN 3/ 5/76

TYPE OF ACCIDENT/ OCCUPATIONAL ILLNESS	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
FALL OF ROOF	2537	80	40	2136	62	31	1129	34	17	5802	176	88
PERMANENT TOTAL	2537	80	40	2136	62	31	1129	34	17	5802	176	88

2 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT/ILLNESS TYPES BY DEGREE OF INJURY
PERMANENT PARTIAL

RUN 3/ 5/76

TYPE OF ACCIDENT/ OCCUPATIONAL ILLNESS	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
FALL OF ROOF	1239	58	15	952	29	7	69	2	1	2251	89	22
SLIDING/FALLING MATERIAL	515	43	9	731	38	8	0	0	0	1246	81	16
HANDLING MATERIAL	2143	141	7	1950	60	3	0	0	0	4093	201	10
HANDTOOL	374	36	6	284	10	2	0	0	0	658	46	8
HAULAGE	4019	243	10	4563	137	5	4	0	0	8586	380	15
EXPLOSIVE/BREAKING AGENT	87	9	9	158	5	5	0	0	0	245	14	14
MACHINERY	6836	381	10	7709	240	6	0	0	0	14545	621	16
PERMANENT PARTIAL	15204	911	9	16347	519	5	73	2	0	31624	1432	14

100 INJURIES OF 5286 TOTAL INJURIES IN TABLE

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ACCIDENT/ILLNESS TYPES BY DEGREE OF INJURY
TEMPORARY TOTAL

RUN 3/ 5/76

TYPE OF ACCIDENT/ OCCUPATIONAL ILLNESS	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
FALL OF ROOF	12400	12400	18	20781	20781	30	2353	2353	3	35534	35534	51
PRESSURE BUMP/BURST	20	20	5	29	29	7	0	0	0	49	49	12
FALL OF FACE/RIB/SIDE	3869	3869	19	6411	6411	32	810	810	4	11090	11090	55
SLIDING/FALLING MATERIAL	2156	2156	14	3431	3431	22	459	459	3	6046	6046	39
SLIP/FALL OF PERSON	6723	6723	17	9094	9094	23	1241	1241	3	17058	17058	44
HANDLING MATERIAL	9476	9476	13	13042	13042	18	1346	1346	2	23864	23864	32
HANDTOOL	3186	3186	11	4766	4766	16	317	317	1	8269	8269	27
STEP/KNEEL ON OBJECT	1033	1033	9	1936	1936	18	211	211	2	3180	3180	29
STRIKING/BUMPING	1130	1130	8	1437	1437	10	112	112	1	2679	2579	18
HAULAGE	15741	15741	17	22781	22781	25	2240	2240	2	40762	40762	44
EXPLOSION OF GAS/DUST	24	24	12	11	11	6	0	0	0	35	35	18
EXPLOSIVE/BREAKING AGENT	312	312	15	581	581	28	89	89	4	982	982	47
ELECTRICITY	184	184	13	243	243	17	66	66	5	493	493	35
MACHINERY	12489	12489	16	20314	20314	27	2330	2330	3	35133	35133	46
SUFFOCATION	9	9	1	20	20	3	0	0	0	29	29	5
MINE FIRE	1	1	1	0	0	0	0	0	0	1	1	1
OTHER ACCIDENTS	1098	1098	14	1514	1514	19	264	264	3	2876	2876	37
LIFTING/PULLING	11838	11838	18	15634	15634	23	1763	1763	3	29235	29235	44
IGNITION OF GAS/DUST	3	3	3	11	11	11	0	0	0	14	14	14
TEMPORARY TOTAL	81692	81692	16	122036	122036	23	13601	13601	3	217329	217329	42

5223 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

ACCIDENT/ILLNESS TYPES BY DEGREE OF INJURY
MEDICAL-NO LOST TIME

RUN 3/ 5/76

TYPE OF ACCIDENT/ OCCUPATIONAL ILLNESS	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
FALL OF ROOF	594	594	2	0	0	0	0	0	0	594	594	2
PRESSURE BUMP/BURST	0	0	0	0	0	0	0	0	0	0	0	0
FALL OF FACE/RIB/SIDE	131	131	2	0	0	0	0	0	0	131	131	2
SLIDING/FALLING MATERIAL	187	187	2	0	0	0	0	0	0	187	187	2
SLIP/FALL OF PERSON	774	774	3	0	0	0	0	0	0	774	774	3
HANDLING MATERIAL	1385	1385	2	0	0	0	0	0	0	1385	1385	2
HANDTOOL	1013	1013	2	0	0	0	0	0	0	1013	1013	2
STEP/KNEEL ON OBJECT	177	177	2	0	0	0	0	0	0	177	177	2
STRIKING/BUMPING	255	255	2	0	0	0	0	0	0	255	255	2
HAULAGE	1013	1013	2	0	0	0	0	0	0	1013	1013	2
EXPLOSION OF GAS/DUST	4	4	4	0	0	0	0	0	0	4	4	4
EXPLOSIVE/BREAKING AGENT	33	33	2	0	0	0	0	0	0	33	33	2
ELECTRICITY	36	36	4	0	0	0	0	0	0	36	36	4
MACHINERY	817	817	2	0	0	0	0	0	0	817	817	2
OTHER ACCIDENTS	212	212	3	0	0	0	0	0	0	212	212	3
LIFTING/PULLING	1331	1331	4	0	0	0	0	0	0	1331	1331	4
IGNITION OF GAS/DUST	15	15	5	0	0	0	0	0	0	15	15	5
OTHER OCCUPATION ILLNESS	0	0	0	0	0	0	0	0	0	0	0	0
MEDICAL-NO LOST TIME	7977	7977	2	0	0	0	0	0	0	7977	7977	2

3424 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT/ILLNESS TYPES BY DEGREE OF INJURY
MEDICAL-LOST TIME

RUN 3/ 5/76

TYPE OF ACCIDENT/ OCCUPATIONAL ILLNESS	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
FALL OF ROOF	197	197	3	0	0	0	0	0	0	197	197	3
PRESSURE BUMP/BURST	2	2	1	0	0	0	0	0	0	2	2	1
FALL OF FACE/RIB/SIDE	11	11	1	0	0	0	0	0	0	11	11	1
SLIDING/FALLING MATERIAL	27	27	2	0	0	0	0	0	0	27	27	2
SLIP/FALL OF PERSON	214	214	4	0	0	0	0	0	0	214	214	4
HANDLING MATERIAL	158	158	3	0	0	0	0	0	0	158	158	3
HANDTOOL	44	44	2	0	0	0	0	0	0	44	44	2
STEP/KNEEL ON OBJECT	41	41	3	0	0	0	0	0	0	41	41	3
STRIKING/BUMPING	4	4	1	0	0	0	0	0	0	4	4	1
HAULAGE	406	406	4	0	0	0	0	0	0	406	406	4
ELECTRICITY	1	1	1	0	0	0	0	0	0	1	1	1
MACHINERY	164	164	3	0	0	0	0	0	0	164	164	3
OTHER ACCIDENTS	2	2	1	0	0	0	0	0	0	2	2	1
LIFTING/PULLING	222	222	4	0	0	0	0	0	0	222	222	4
MEDICAL-LOST TIME	1493	1493	3	0	0	0	0	0	0	1493	1493	3

440 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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ACCIDENT COST INDEXES FOR 1974 AT UNDERGROUND BITUMINOUS COAL MINES USING CAIF UPDATE ON 6/15/75

SUMMARY TABLE BY TYPE OF ACCIDENT/ILLNESS — RUN 3/ 5/76

TYPE OF ACCIDENT/ OCCUPATIONAL ILLNESS	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
FALL OF ROOF	78422	60930	55	92169	23369	21	29641	4608	4	200231	88907	80
PRESSURE BUMP/BURST	2455	2087	209	1771	75	7	1143	68	7	5369	2228	223
FALL OF FACE/RIB/SIDE	11911	11182	37	9175	6783	23	3500	1009	3	24586	18974	63
SLIDING/FALLING MATERIAL	3727	2506	10	8406	3589	14	3686	622	2	15819	6717	26
SLIP/FALL OF PERSON	7711	7711	10	9094	9094	12	1241	1241	2	18046	18046	24
HANDLING MATERIAL	13162	11160	8	14992	13102	9	1346	1346	1	29500	25608	18
HANDTOOL	4617	4279	5	5050	4776	6	317	317	0	9984	9372	12
STEP/KNEEL ON OBJECT	2377	2050	9	3234	1988	9	763	257	1	6374	4295	19
STRIKING/BUMPING	1389	1389	5	1437	1437	5	112	112	0	2938	2938	10
HAULAGE	41626	34204	22	47531	23909	15	10275	2918	2	99432	61031	39
EXPLOSION OF GAS/DUST	28	28	9	11	11	4	0	0	0	39	39	13
EXPLOSIVE/BREAKING AGENT	432	354	10	739	586	16	89	89	2	1260	1029	28
ELECTRICITY	8913	7440	240	6358	494	16	3544	315	10	18815	8249	266
MACHINERY	44447	33783	27	48460	21342	17	9933	3040	2	102840	58165	46
SUFFOCATION	9	9	1	20	20	3	0	0	0	29	29	5
MINE FIRE	1	1	1	0	0	0	0	0	0	1	1	1
OTHER ACCIDENTS	1312	1312	9	1514	1514	10	264	264	2	3090	3090	20
LIFTING/PULLING	13391	13391	13	15634	15634	15	1763	1763	2	30788	30788	30
IGNITION OF GAS/DUST	18	18	5	11	11	3	0	0	0	29	29	7
OTHER OCCUPATION ILLNESS	0	0	0	0	0	0	0	0	0	0	0	0
	235948	193834	21	265605	127732	14	67617	17969	2	569170	339535	37

9286 INJURIES OF 9286 TOTAL INJURIES IN TABLE

SUMMARY TABLE BY DEGREE OF INJURY — RUN 3/ 5/76

DEGREE OF INJURY	MINING COMPANIES TOTAL $00	MINING COMPANIES ANNUAL $00	MINING COMPANIES INJURY $00	MINING FAMILIES TOTAL $00	MINING FAMILIES ANNUAL $00	MINING FAMILIES INJURY $00	PUBLIC AGENCIES TOTAL $00	PUBLIC AGENCIES ANNUAL $00	PUBLIC AGENCIES INJURY $00	TOTAL 1974 COSTS TOTAL $00	TOTAL 1974 COSTS ANNUAL $00	TOTAL 1974 COSTS INJURY $00
FATALITY	127045	101681	1142	125096	5115	57	52814	4332	49	304945	111128	1249
PERMANENT TOTAL	2537	80	40	2136	62	31	1129	34	17	5802	176	88
PERMANENT PARTIAL	15204	911	9	16347	519	5	73	2	0	31624	1432	14
TEMPORARY TOTAL	81692	81692	16	122036	122036	23	13601	13601	3	217329	217329	42
MEDICAL-NO LOST TIME	7977	7977	2	0	0	0	0	0	0	7977	7977	2
MEDICAL-LOST TIME	1493	1493	3	0	0	0	0	0	0	1493	1493	3
	235948	193834	21	265605	127732	14	67617	17969	2	569170	339535	37

9286 INJURIES OF 9286 TOTAL INJURIES IN TABLE

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