25X1

Page Denied

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

PROCESSING

INFORMATION REPORT INFORMATION REPORT

CENTRAL INTELLIGENCE AGENCY

C-O-N-F-I-D-E-N-T-I-A-L

COUNTRY	USSR	REPORT	[redacted]
SUBJECT	Aeroflot Schedule for June to September 1956	DATE DISTR.	8 February 1957
		NO. PAGES	1
		REQUIREMENT NO.	RD
DATE OF INFO.	[redacted]	REFERENCES	
PLACE & DATE ACQ.	[redacted]		

25X1

Reel # 97

SOURCE EVALUATIONS ARE DEFINITIVE. APPRAISAL OF CONTENT IS TENTATIVE.

[redacted]

[redacted] unclassified USSR Aeroflot schedule for June to September 1956. Included in the schedule are ticket rates, ticket agency and airport addresses, and driving time to airports from town locations. 25X1

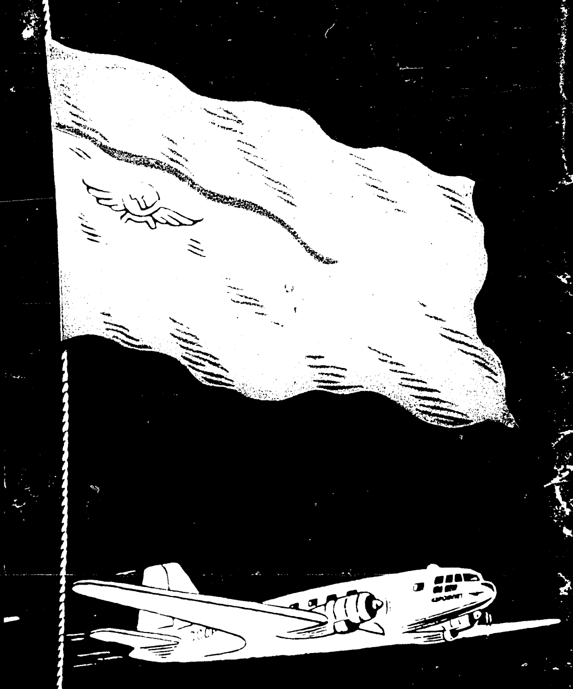
[redacted] 25X1

C-O-N-F-I-D-E-N-T-I-A-L

STATE	X	ARMY	X	NAVY	X	AIR	X	FBI		AEC					
(Note: Washington distribution indicated by "X"; Field distribution by "#".)															

INFORMATION REPORT INFORMATION REPORT

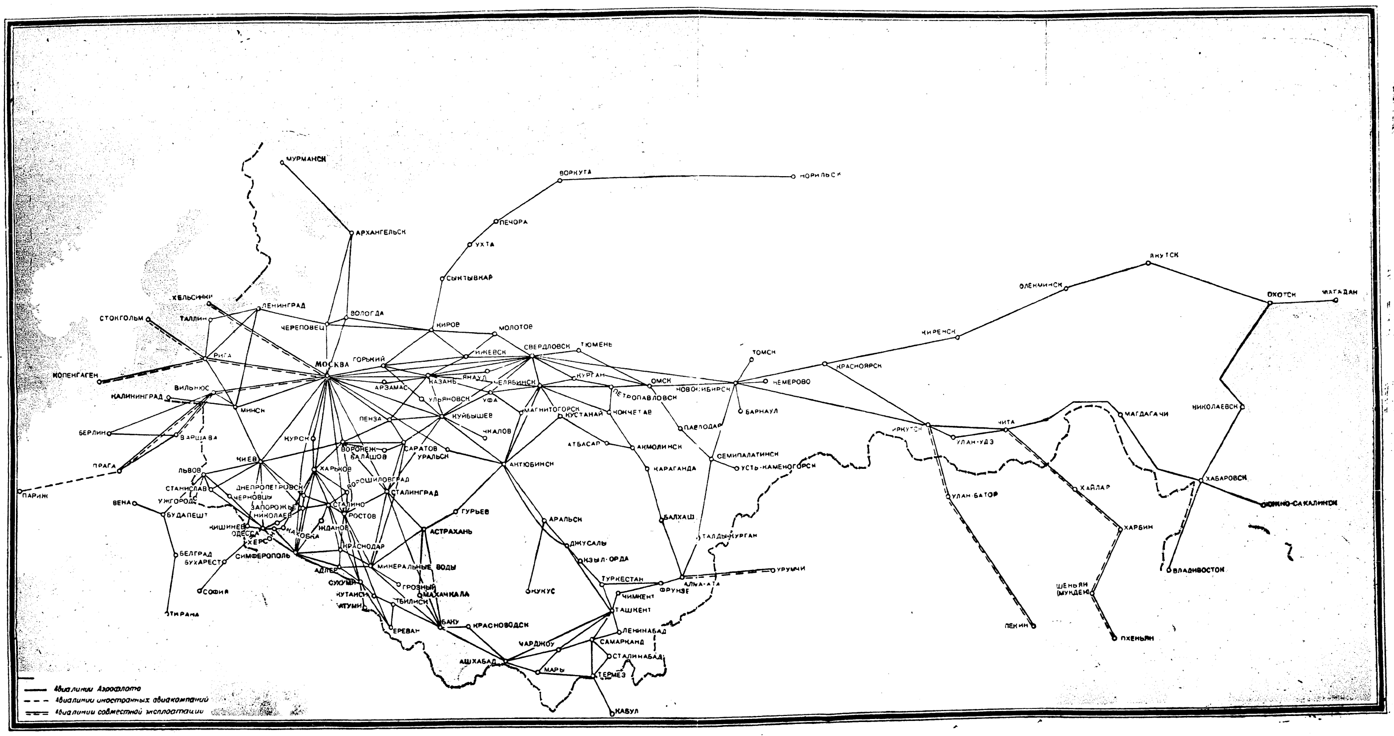
АЭРОФЛОТ



РАСПИСАНИЕ ДВИЖЕНИЯ САМОЛЕТОВ

№ 1 ИЮНЬ—СЕНТЯБРЬ 1956 г.

СХЕМА ВОЗДУШНЫХ ЛИНИЙ



Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

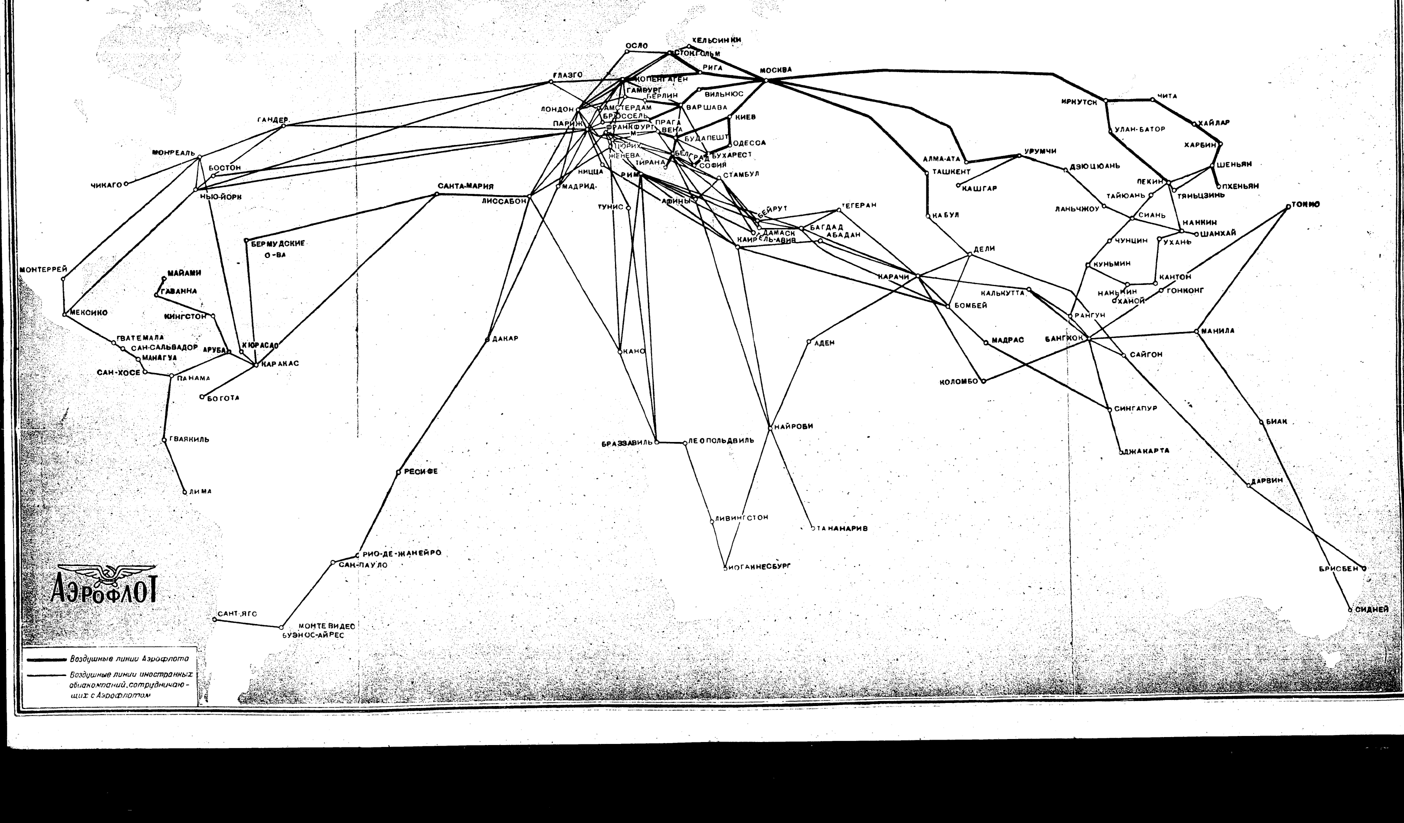


СХЕМА МЕЖДУНАРОДНЫХ ВОЗДУШНЫХ ЛИНИЙ
ОСЛО
ХЕЛЬСИНКИ
СТОКГОЛЬМ
РИГА
МОСКВА
ГЛАЗГО
КОПЕНГАГЕН
ГАМБУРГ
БЕРЛИН
ВИЛЬНЮС
ЛОНДОН
АМСТЕРДАМ
ВАРШАВА
БРЮССЕЛЬ
ПАРИЖ
ПРАГА
КИЕВ
ФРАНКФУРТ
ВЕНА
БУДАПЕШТ
ОДЕССА
ЦЮРИХ
ЖЕНЕВА
БЕЛГРАД
БУХАРЕСТ
СОФИЯ
ТИРАНА
НИЦЦА
РИМ
СТАМБУЛ
АФИНЫ
ТУНИС
МАДРИД
ЛИССАБОН
САНТА-МАРИЯ
ГАНДЕР
МОНРЕАЛЬ
БОСТОН
ЧИКАГО
НЬЮ-ЙОРК
БЕРМУДСКИЕ О-ВА
МОНТЕРРЕЙ
МАЙАМИ
ГАВАННА
МЕКСИКО
КИНГСТОН
ГВАТЕМАЛА
САН-САЛЬВАДОР
МАНАГУА
АРУБА
КЮРАСАО
САН-ХОСЕ
ПАНАМА
КАРАКАС
БОГОТА
ГВАЯКИЛЬ
ЛИМА
ДАКАР
РЕСИФЕ
РИО-ДЕ-ЖАНЕЙРО
САН-ПАУЛО
САНТЬЯГО
МОНТЕВИДЕО
БУЭНОС-АЙРЕС
КАНО
БРАЗЗАВИЛЬ
ЛЕОПОЛЬДВИЛЬ
НАЙРОБИ
ЛИВИНГСТОН
ТАНАНАРИВ
ИОГАННЕСБУРГ
БЕЙРУТ
ДАМАСК
КАИР
ТЕЛЬ-АВИВ
ТЕГЕРАН
БАГДАД
АБАДАН
АДЕН
КАРАЧИ
ДЕЛИ
БОМБЕЙ
МАДРАС
КОЛОМБО
КАЛЬКУТТА
РАНГУН
БАНГКОК
САЙГОН
СИНГАПУР
ДЖАКАРТА
АЛМА-АТА
ТАШКЕНТ
КАШГАР
КАБУЛ
УРУМЧИ
ДЗЮЦЮАНЬ
ЛАНЬЧЖОУ
ТАЙЮАНЬ
СИАНЬ
ЧУНЦИН
КУНЬМИН
НАНЬНИН
ХАНОЙ
КАНТОН
ГОНКОНГ
УХАНЬ
НАНКИН
ШАНХАЙ
ПЕКИН
ТЯНЬЦЗИНЬ
ИРКУТСК
УЛАН-БАТОР
ЧИТА
ХАЙЛАР
ХАРБИН
ШЕНЬЯН
ПХЕНЬЯН
ТОКИО
МАНИЛА
БИАК
ДАРВИН
БРИСБЕН
СИДНЕЙ
АЭРОФЛОТ
Воздушные линии Аэрофлота
Воздушные линии иностранных авиакомпаний, сотрудничающих с Аэрофлотом

ЗАМЕЧЕННЫЕ ОПЕЧАТКИ

На стр. 6 пропущено примечание к рейсам №№ 127а и 128а: «Выполняются по особому распоряжению».

На стр. 9 время в пути следует считать рейс № 119—31.15.
рейс № 120—32.15.

На стр. 7. Рейс № 594 из Москвы следует считать 593, а рейс 593 из Праги следует считать 594.

На стр. 53 вместо параход следует читать пароход.

МОСКВА — связана воздушным сообщением со всеми столицами союзных республик, с крупными городами, промышленными центрами, курортами Крыма, Кавказа и Рижского взморья.

ИЗ МОСКВЫ — установлено регулярное движение самолетов в Белград, Берлин, Будапешт, Бухарест, Варшаву, Вену, Кабул, Копенгаген, Париж, Пекин, Прагу, Пхеньян, Софию, Стокгольм, Тирану, Улан-Батор, Хельсинки.

Главное управление Гражданского воздушного флота при Совете Министров СССР

АЭРОФЛОТ

Москва, ул. Разина, 9. Тел. Б 1-00-65. Телегр. адрес: Москва, Аэрофлот.

В расписании движения самолетов в графе „Отправление" указано время взлета самолета.

Отруливание самолета от перрона начинается за 5 минут до взлета, поэтому время отправления из всех аэропортов (начальных и промежуточных) следует считать на 5 минут раньше времени, указанного в расписании.

Все справки о воздушном сообщении можно получить в городских агентствах Аэрофлота и аэропортах.

Адреса городских агентств см. на стр. 53.

ОГЛАВЛЕНИЕ

КАК ПОЛЬЗОВАТЬСЯ РАСПИСАНИЕМ

1. Все рейсы, выполняемые из различных городов и помещенные в расписании, сгруппированы по направлениям:

МЕЖДУНАРОДНЫЕ ВОЗДУШНЫЕ ЛИНИИ

ВНУТРЕННИЕ ВОЗДУШНЫЕ ЛИНИИ

В ВОСТОЧНОМ НАПРАВЛЕНИИ — указаны рейсы, идущие в Горький, Казань, Ижевск, Свердловск, Челябинск, Магнитогорск, Уфу, Курган, Молотов, Омск, Новосибирск, Кемерово, Барнаул, Красноярск и во все остальные пункты — от Красноярска до Хабаровска, Ю.-Сахалинска, Владивостока, Якутска и Магадана.

В СРЕДНЕАЗИАТСКОМ НАПРАВЛЕНИИ — указаны рейсы, идущие в Пензу, Уральск, Актюбинск, Кустанай, Акмолинск, Караганду, Балхаш, Джусалы, Фрунзе, Ташкент, Самарканд, Сталинабад, Алма-Ату, Чимкент, Нукус, Ашхабад.

В ВОЛЖСКОМ НАПРАВЛЕНИИ — указаны рейсы, идущие в Казань, Ульяновск, Саратов, Куйбышев, Чкалов.

В КАВКАЗСКОМ НАПРАВЛЕНИИ — указаны рейсы, идущие в Ростов, Краснодар, Грозный, Мин. Воды, Адлер, Сухуми, Кутаиси, Тбилиси, Ереван, Баку.

В КРЫМСКОМ НАПРАВЛЕНИИ — указаны рейсы, идущие в Симферополь.

В УКРАИНСКОМ НАПРАВЛЕНИИ — указаны рейсы, идущие в Харьков, Днепропетровск, Жданов, Сталино, Запорожье, Ворошиловград, Киев, Львов, Кишинев, Станислав, Ужгород, Одессу.

В ЗАПАДНОМ И СЕВЕРНОМ НАПРАВЛЕНИЯХ — указаны рейсы, идущие в Ленинград, Ригу, Таллин, Минск, Вильнюс, Калининград, Киров, Сыктывкар, Ухту, Печору, Воркуту, Мурманск, Архангельск, Норильск.

2. Чтобы найти нужный рейс, следует обратиться к указателю рейсов, помещенному в начале расписания, в котором указаны номер таблицы нужного рейса и страница.

3. Перед каждым номером рейса, помещенного в расписании, поставлено условное обозначение территориального управления ГВФ, выполняющего данный рейс.

УСЛОВНЫЕ ОБОЗНАЧЕНИЯ И СОКРАЩЕНИЯ

ПЕРЕВОЗЧИКИ:

АФЛ — Аэрофлот
АФ — Эр Франс — Французская национальная авиакомпания
АУ — АЭРО — Финское авиационное акционерное общество
АИ — Эр Индия — Эр Индия интерненшл Корпорейшн
БЕ — БЕА — Бритиш Юропиен Эрвейс Корпорейшн (Англия)
КЛ — КЛМ — Голландские Королевские авиалинии
ЛО — ЛОТ — Польские воздушные линии
ЛЗ — ТАБСО — Управление Болгарского гражданского воздушного транспорта
МА — Малев — Венгерское воздушно-транспортное предприятие
МХД — Миньхандюй — Управление гражданского воздушного флота КНР
ОК — ЧСА — Чехословацкие аэролинии
СК — САС — Скандинавские авиалинии
СР — Свиссер — Швейцарское акционерное об-во воздушных сообщений
СН — Сабена — Бельгийское акционерное об-во по эксплуатации воздушных сообщений
ЮА — ЮАТ — Югославский аэротранспорт
УКА — УКАМПС — Управление Корейской гражд. авиации

ПЕРЕВОЗЧИКИ ПО ВОЗДУШНЫМ ЛИНИЯМ АЭРОФЛОТА

АЗ — Азербайджанское территориальное управление ГВФ
АМ — Армянская отдельная авиагруппа ГВФ
ВС — Восточносибирское территориальное управление ГВФ
ГЗ — Грузинское территориальное управление ГВФ
ДВ — Дальневосточное территориальное управление ГВФ
ЗП — Западное территориальное управление ГВФ
ЗС — Западносибирское территориальное управление ГВФ
КЗ — Казахское территориальное управление ГВФ
КР — Красноярское территориальное управление ГВФ
МС — Московское управление транспортной авиации ГВФ
ПВ — Приволжское территориальное управление ГВФ
СА — Среднеазиатское территориальное управление ГВФ
СВ — Северное территориальное управление ГВФ
СК — Северокавказское территориальное управление ГВФ
УК — Украинское территориальное управление ГВФ

ТИПЫ САМОЛЕТОВ

Ил-12 — Ильюшин 12
Ил-14 — Ильюшин 14
Ли-2 — Лисунов 2
КВ — Конвер
СК — Скандия
ДС-6 — Дуглас 6

ДНИ ДВИЖЕНИЯ САМОЛЕТОВ

— ежедневно
ч. т. — по четным числам
н. ч. — по нечетным числам
1 — по понедельникам
2 — по вторникам
3 — по средам
4 — по четвергам
5 — по пятницам
6 — по субботам
7 — по воскресеньям

ПРОЧИЕ ОБОЗНАЧЕНИЯ

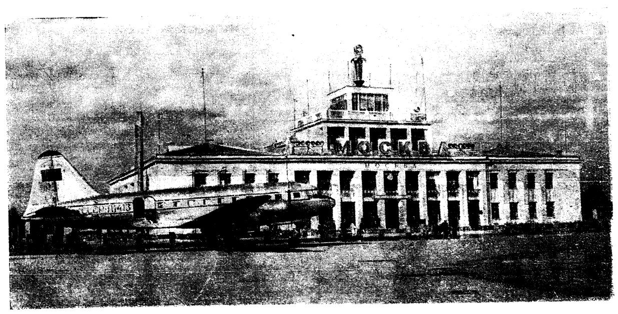
Н — ночевка
ОТ — отдых
О — отправление
П — прибытие
— пересадка
↓↑ — туда, обратно (короткие линии по движению рейсов означают пролет пунктов посадки)
I — первый класс
Т — класс турист
IT — первый класс и класс турист

УКАЗАТЕЛЬ
рейсов, помещенных в расписании

МЕЖДУНАРОДНЫЕ ВОЗДУШНЫЕ ЛИНИИ

МОСКВА—УЛАН-БАТОР—ПЕКИН—МОСКВА

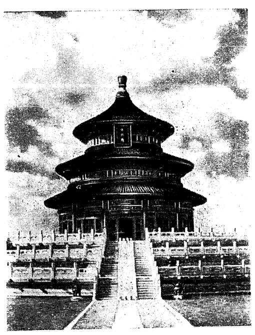
АФЛ 127 Ил-12 #	МХД 127 Ил-14 #	АФЛ 129 Ил-12 7	АФЛ 135 Ил-12 #		1 Аэропорты		АФЛ 128 Ил-12 #	МХД 128 Ил-14 #	АФЛ 130 Ил-12 2	АФЛ 136 Ил-12 #
21.40	—	2.35	1.30	О	Москва	П	13.05	—	14.15	14.25
0.05 0.50	—	5.00 5.40	3.55 4.35	П О	Казань	О П	10.25 9.40	—	11.35 10.55	12.05 11.25
3.10 4.20	—	8.00 9.10	6.55 7.55	П О	Свердловск	О П	7.00 5.50	—	8.15 7.05	8.45 7.35
7.10 7.50	—	12.00 12.40	10.45 11.25	П О	Омск	О П	2.40 1.55	—	3.55 3.10	4.25 3.45
9.50 11.10	—	14.40Н 2.40	13.25 14.45	П О	Новосибирск	О П	23.10 22.20	—	0.55 11.55Н	1.30 0.10
13.20 14.20	—	4.50 5.50	16.55 17.45	П О	Красноярск	О П	19.55 18.55	—	9.30 8.30	21.45 20.45
17.15 —	— 1.40	8.45 10.05	20.40 2.40	П О	Иркутск	О П	15.40 —	— 9.00	5.15 3.55	17.30 8.10
— —	3.25 4.05	11.50	4.25 5.10	П О	Улан-Батор	О П	— —	7.10 6.20	2.00 —	6.15 5.25
—	7.55		8.50	П	Пекин	О	—	2.20	—	1.20
	34.15	33.15	31.20		*Время в пути*		34.45		36.15	37.05



Московский аэропорт Внуково.

МОСКВА—ЧИТА—ПХЕНЬЯН—МОСКВА

АФЛ 137 Ил-12 #	АФЛ 137 Ли-2 1.3.5	УКА 137 Ли-2 2.4.6	2 Аэропорты	АФЛ 138 Ил-12 #	АФЛ 138 Ли-2 2.4.6	УКА 138 Ли-2 1.3.5
11.40	—	—	О Москва . . . . . П	3.00	—	—
14.05 14.45	— —	— —	П О Казань . . . . . О П	0.20 23.35		— —
17.05 18.20	— —	— —	П О Свердловск . . . О П	20.55 19.40	— —	— —
21.10 21.55	— —	— —	П О Омск . . . . . . О П	16.30 15.45	— —	— —
23.55 1.15	— —	— —	П О Новосибирск . . О П	13.30 12.10	— —	— —
3.25 4.25	— —	— —	П О Красноярск . . . О П	9.45 8.45	— —	— —
7.20 8.40	— —	— —	П О Иркутск . . . . О П	5.30 4.40	— —	— —
10.35	—	—	П Чита . . . . . . О	2.30	—	—
—	1.10	1.10	О Чита . . . . . . П	—	12.35	12.35
— —	3.35 4.20	3.35 4.20	П О Хайлар . . . . . О П	— —	10.00 9.15	10.00 9.15
— —	6.55 8.05	6.55 8.05	П О Харбин . . . . . О П	— —	6.25 5.15	6.25 5.15
— —	10.10 10.40	10.10 10.40	П О Шеньян . . . . . О П	— —	3.00 2.15	3.00 2.15
—	12.20	12.20	П Пхеньян . . . . О	—	0.30	0.30
	48.40	48.40	*Время в пути*	—	50.30	50.30



Пекин. Храм неба.

МОСКВА—ПЕКИН—МОСКВА

АФЛ 127А Ил-12 #	МХД 127 Ил-14	1 Аэропорты	АФЛ 128А Ил-12 #	МХД 128 Ил-14
21.40	—	О Москва . . П	10.35	—
2.20 3.30	— —	П О Свердловск О П	5.15 4.05	— —
8.20 9.40	— —	П О Новосибирск . О П	22.40 21.20	—
14.45н	—	П Иркутск . О	15.40	—
—	1.40	О Иркутск . П	—	9.00н
—	3.25 4.05	П О Улан-Батор О П	— —	7.10 6.20
— —	7.55	П Пекин . . О	—	2.20
	34.15	*Время в пути*	32.15	

Международные воздушные линии Аэрофлота служат делу развития сотрудничества и дружбы между народами, усиления экономических и культурных связей с другими странами.

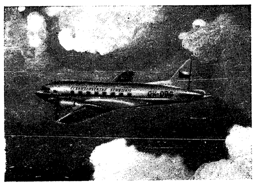
МОСКВА—ПРАГА—ПАРИЖ—МОСКВА

АФЛ 115 Ил-12 #	АФ 751 ДЦ-6 1.2.3	ОК 551 Ил-12 4.5.6	3 Аэропорты	АФЛ 116 Ил-12 #	АФ 750 ДЦ-6 1.2.3	ОК 552 Ил-12 5.6.7
6.40	—	—	О Москва . . . . П	23.05	—	—
9.25 10.40	— —	— —	П О Вильнюс . . . О П	20.35 19.20	— —	— —
14.25	—	—	П Прага . . . . . О	15.55	—	—
—	16.10	16.10	О Прага . . . . . П	—	14.45	14.45
—	19.15	20.45	П Париж . . . . О	—	11.40	11.00
	12.35	14.05	*Время в пути*		11.25	12.05

МОСКВА—ПРАГА—МОСКВА

АФЛ 115 Ил-12 #	ОК 594 Ил-12 #	АФЛ 121 Ил-12 # почт.	4 Аэропорты	АФЛ 116 Ил-12 #	ОК 593 Ил-12 #	АФЛ 122 Ил-12 #
6.40	5.00	8.00	О Москва . . . . П	23.05	0.15	18.05
9.25 10.40	8.00 9.15	10.45 11.55	П О Вильнюс . . . . О П	20.35 19.20	21.45 20.25	15.35 14.25
		13.35 14.25	П О Варшава . . . . О П			12.55 12.10
14.25	13.05	16.35	П Прага . . . . . . О	15.55	17.00	10.10
7.45	8.05	8.35	*Время в пути*	7.10	7.15	7.55

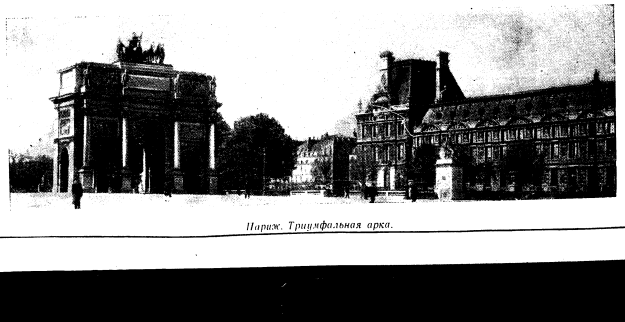
Из Парижа пассажирские самолеты Эр Франс совершают регулярные рейсы в Лондон, Чикаго, Монреаль, Мексико, Токио и другие города.



Самолет ЧСА в полете.

МОСКВА—ХЕЛЬСИНКИ—МОСКВА

АФЛ 107 Ил-12 1.2.3.7	АУ 107 Кв-340 5.6	5 Аэропорты	АФЛ 108 Ил-12 1.2.3.7	АУ 108 Кв-340 4.5
8.45	8.45	О Москва . . П	23.45	23.15
12.15	11.55	П Хельсинки . О	20.15	20.15
3.30	3.10	*Время в пути*	3.30	3.00



Париж. Триумфальная арка.

МОСКВА—ВАРШАВА—БЕРЛИН

ЛО 233 Ил-14 3.5	ЛО 233 Ли-2 1	АФЛ 133 Ил-12 2.3.6 почт.	АФЛ 111 Ил-12 ⌗	АФЛ 117 Ил-12 ⌗	6 Аэропорты	ЛО 232 Ил-14 2.4	ЛО 232 Ли-2 7	АФЛ 134 Ил-12 2.3.6	АФЛ 112 Ил-12 ⌗	АФЛ 118 Ил-12 ⌗
7.30	7.30	7.40	4.00	8.25	О Москва . . . . . П	22.45	18.25	19.55	18.45	15.55
	11.00 12.10	10.25 11.35	6.45 7.55	11.10 12.25	П О Вильнюс . . . О П		15.20 14.10	17.25 16.10	16.15 15.05	13.25 12.15
11.40	14.10	13.15		14.05	П Варшава . . . . О	18.50	12.05	14.40		
—	—	—		15.05	О Варшава . . . . П	—	—	—		
—	—	—	10 50	17.00	П Берлин . . . . . О	—	—	—	12.25	9.35
4.10	6.40	5.35	6.50	8.35	*Время в пути*	3.55	6 20	5.15	6.20	6 20

МОСКВА—БУДАПЕШТ—БЕЛГРАД—ТИРАНА—ВЕНА—МОСКВА

АФЛ 105 Ил-12 2.5	АФЛ 109 Ил-12 1.4	АФЛ 113 Ил-12 1.3.6	7 Аэропорты	АФЛ 106 Ил-12 3.6	АФЛ 110 Ил-12 2.5	АФЛ 114 Ил-12 2.4.7
2.00	2.00	5.50	О Москва . . . . . П	23.15	22.05	20.25
4.40 5.25	4.40 5.25	8.30 9.15	П О Киев . . . . . . О П	20.40 19.15	19.30 18.50	17.50 17.05
7.00 8.10	7.00 8.10	10.50 12.00	П О Львов . . . . . О П		17.15 16.05	15.30 14.20
9.50 10.40	9.50 10.40	13.40 14.25	П О Будапешт . . . . О П	16.00 15.00	14.25 13.40	12.40 11.45
11.45 —	11.45 12.35		П О Белград . . . . . О П	13.55 —	12.35 11.45	
—	14.15		П Тирана . . . . . О	—	10.05	
—	—	15.20	П Вена . . . . . . О	—	—	10.50
9.45	12.15	9.30	*Время в пути*	9 20	12.00	9.35

Белград. Проспект Маршала Тито.

МОСКВА—РИГА—СТОКГОЛЬМ—КОПЕНГАГЕН—МОСКВА

СК 765 Сканд. 5.7	АФЛ 103 Ил-12 1.3	СК 761 Сканд. 1.4	АФЛ 131 Ил-12 5.6	8 Аэропорты	СК 766 Сканд. 6.7	АФЛ 104 Ил-12 1.3	СК 762 Сканд. 3.4	АФЛ 132 Ил-12 5.6
6.20	2.30	9 05	9.05	О Москва . . П	0.30	0 30	0.45	0.45
9.25 10.35	5.30 6.45	12.10 13.15	12.05 13.20	П О Рига . . . О П	21.40 20.25	21.45 20.30	21.55 20.40	22.00 20.55
		15.10 —	15.10 —	П О Стокгольм . О П			18.50 —	19.15 —
13.30	9.35	—	—	П Копенгаген О	17.40	17.45	—	—
7.10	7.05	6.05	6.05	*Время в пути*	6.50	6.45	5.55	5.30

АЛМА-АТА—УРУМЧИ—АЛМА-АТА

МХД 204 Ли-2 3	АФЛ 204 Ли-2 5	10 Аэропорты	МХД 203 Ли-2 2	АФЛ 203 Ли-2 6
3.40	3.40	О Алма-Ата . П	8.00	8.00
5.10 6.10	5.10 6.10	П О Кульджа . О П	6.25 5.25	6.25 5.25
8.20	8.20	П Урумчи . . О	3.05	3.05
4.40	4.40	*Время в пути*	4.55	4.55

МОСКВА—БУХАРЕСТ—СОФИЯ—МОСКВА

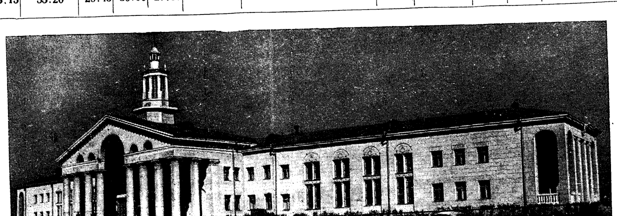
АФЛ 123 Ил-12 3.6	АФЛ 125 Ил-12 ⌗ почт.	9 Аэропорты	АФЛ 124 Ил-12 4.7	АФЛ 126 Ил-12 ⌗
2.00	7.20	О Москва . . . . . П	17.05	17.35
4.40 5.40	10.00 10.45	П О Киев . . . . . . О П	14.30 13.20	15.00 13.50
7.10 8.10	12.15 13.15	П О Одесса . . . . . О П	11.50 10.50	12.20 11.20
9.40 10.25	14.45 15.30	П О Бухарест . . . . О П	9.20 8.40	9.50 9.05
11.40	16.45	П София . . . . . О	7.25	7.50
9.40	9.25	*Время в пути*	9.40	9.45

МОСКВА—КАБУЛ—МОСКВА

АФЛ 119 Ил-12 1	11 Аэропорты	АФЛ 120 Ил-12 3
2.15	О Москва . . . . . П	14.15
5.55 6.35	П О Уральск . . . . О П	10.15 9.35
8 00 9.15	П О Актюбинск . . . О П	8.05 7.10
12.00 12.35	П О Джусалы . . . . О П	4.15 3.40
14.40н 5.00	П О Ташкент . . . . О П	1.30 10.30н
6.50 8.05	П О Термез . . . . . О П	8.40 7.25
9.30	П Кабул . . . . . О	6.00
55.15	*Время в пути*	56.15

МОСКВА—ХАБАРОВСК—ВЛАДИВОСТОК—МОСКВА

МС.ВС.ДВ. 1 Ил-12 #	ЗС.ВС.ДВ. 561 Ил-12 с 1.VII.56 г. #	МС. ВС. 3 Ил-12 #	МС.ЗС.ВС. 5 Ил-12 почт. #	МС. ВС. 7 Ил-12 #	ЗС. ВС. 559 Ил-12 с 15.VI.56 г. #	12 Аэропорты	МС. ВС.ДВ. 2 Ил-12 #	ЗС. ВС. ДВ. 562 Ил-12 с 1.VII.56 г. #	МС. ВС. 4 Ил-12 #	МС.ЗС.ВС. 6 Ил-12 #	МС. ВС. 8 Ил-12 #	ЗС.ВС. 560 Ил-12 с 15.VI.56 г. #
13.50	14.30	4.40	17.20	3.30	2.20	О Внуково . . . . П	12.35	17.15	8.40	23.25	4.35	6.10
16.15 17.00	16.55 17.35	7.05 7.55	19.45 20 25	↓	4.45 5.25	П О Казань . . . О П	9.55 9.15	14.35 13.50	6.00 5.20	20.45 20.00	1.55 1.10	3.30 2.50
19.20 20.30	19.55 21.00	10.15 11.15	22.45 23.45	8.10 9.20	7.45 8.50	П О Свердловск . . . О П	6.35 5.2	11.10 10.05	2.40 1.30	17.20 16.20	22.30 21.15	0.10 23.00
23.20 0.05	23.50 0.35	14.05 14.50	2.35 3.15	↓	11.40 12.20	П О Омск . . . . . . О П	2.15 1.30	6.55 6.15	22.20 21,40	13.10 12.30	18.05 17.20	19.50 19.10
2.05 3.15	2.35 3 50	16.50 18.05	5.15 6.25	14.10 15.20	14.20 15.30	П О Новосибирск . . О П	23 15 22.00	4.00 2.50	19.25 18.15	10.15 9.05	15.05 13.50	16.55 15.50
5.25 6.25	6.00 7.05	20.15 21.15	8.35 9.35	↓	17.40 18.45	П О Красноярск . . . О П	19.35 18.40	0.25 23.25	15.50 14.50	6.40 5.45	11.25 10.25	13.25 12.25
9.20 10.30	10.00 11.10	0.10 1.10	12.30 14.00	20.25 21.35	21.40 22.45	П О Иркутск . . . . О П	15.25 14.15	20.10 19.10	11.35 10.25	2.30 1.20	7.10 5.55	9.10 8.00
12.25 13.25	13.05 14.00	3.05 3.55	15.55 16.40	23.30 0.30	0.40 1.40	П О Чита . . . . . . О П	12.05 11.05	17.00 16.15	8.15 7.15	23.10 22.10	3.45 2.45	5.50 4.50
16.20 17.00	16.55 17.35	6.50 7.30	19.35 20.25	3.25 4.10	4.35 5.25	П О Магдагачи . . О П	7.45 7.05	12.55 12.00	3.55 3.15	18.50 18.05	23.25 22.40	1.30 0.45
19.55 21.05	20.30 21.50	10.25 —	23.20 —	7.05 —	8.20 —	П О Хабаровск . . . О П	3.45 2.25	8.40 7.20	23.55 —	14.45 —	19.20 —	21.25 —
23.05	23.50	—	—	—	—	П Владивосток . О	0.25	5.20	—	—	—	—
33.15	**33.20**	**29.45**	**30.00**	**27.35**	**30.00**	*Время в пути*	**36.10**	**35.55**	**32.45**	**32.40**	**33.15**	**32.45**



Аэровокзал в Красноярске.

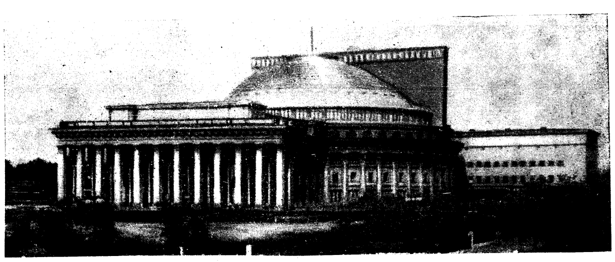
МОСКВА—ЧИТА—ХАБАРОВСК—Ю.-САХАЛИНСК—МОСКВА

ЗС. МС. ДВ. 9 Ил-12 #	МС. ВС. ДВ. 563 Ил-12 с 1.VII.56 #	МС. ВС. 11 Ил-12 #	ЗС. 13 Ил-12 #	13 Аэропорты	ЗС. МС. ДВ. 10 Ил-12 #	МС. ВС. ДВ. 564 Ил-12 с 1.VII.56 #	МС. ВС. 12 Ил-12 #	ЗС. 14 Ил-12 #
21.20	19.50	9.35	7.55	О Внуково . . . . . . П	20.05	22.35	16.55	5.15
23.45 0.30	22.15 23.00	12.00 12.45	10.20 11.00	П О Казань . . . . О П	17.25 16.40	19.55 19.05	14.15 13.30	2.35 1.50
2.50 3.55	1.20 2.30	15.05 16.05	13.20 14.40	П О Свердловск . . . . . . О П	14.00 12.45	16.25 15.15	10.50 9.35	23.10 22.10
6.45 7.30	5.20 6.00	18.55 19.35	17.30 18.15	П О Омск . . . . О П	9.35 8.55	12.05 11.10	6.25 5.45	19.00 18.25
9.30 10.40	8.00 9.10	21.35 22.45	20.15 21.30	П О Новосибирск . . . . . О П	6.40 5.35	8.55 7.40	3.30 2.20	16.10 15.00
12.50 13.50	11.20 12.15	0.55 1.55	23.40 0.40	П О Красноярск . . . . . . О П	3.10 2.10	5.15 4.20	23.55 22.55	12.35 11.35
16.45 17.45	15.10 16.20	4.50 6.00	3.35 4.25	П О Иркутск . . . . О П	22.55 21.55	1.05 23.55	19.40 18.30	8.20 7.35
↓	↓	↓	5.10 5.50	П О Улан-Удэ . . . . О П	↑	↑	↑	6.45 6.05
19.40 20.25	18.15 19.10	7.55 8.50	7.05 —	П О Чита . . . . О П	19.45 19.00	21.45 20.45	16.20 15.35	4.40 —
23.20 0.10	22.05 22.45	11.45 12.25	— —	П О Магдагачи . . . . . . О П	15.40 14.40	17.25 16.40	12.15 11.15	— —
3.05 4.05	1.40 2.55	15.20 —	— —	П О Хабаровск . . . . О П	11.20 10.10	13.20 11.50	7.55 —	— —
6.25	5.15	—	—	П Ю.-Сахалинск . . . . О	7.40	9.20	—	—
33.05	**33.25**	**29.45**	**23.10**	*Время в пути*	**36.25**	**37.15**	**33.00**	**24.35**

МОСКВА—НОВОСИБИРСК—КЕМЕРОВО—БАРНАУЛ—ТОМСК—МОСКВА

ЗС. 17 Ил-12 н. ч.	МС. 25*) Ил-12 #	МС. 29 Ил-12 #	МС. ЗС. 35 Ил-12 ч. т.	МС. ЗС. 35 Ил-12 н. ч.	14 Аэропорты	ЗС. 18 Ил-12 ч. т.	МС. 26* Ил-12 #	МС. 30 Ил-12 #	МС. ЗС. 36 Ил-12 н. ч.	МС. ЗС. 36 Ил-12 ч. т.
10.10	23.10	1.00	15.40	15.40	О Внуково . . . . П	15.45	19.15	7.45	21.55	21.55
↓	↓	↓	↓	↓	О Быково . . . . . П	↑	↑	↑	↑	↑
12.35 13.15	1.35 2.20	3.25 4 10	18.05 18.45	18.05 18.45	П/О Казань . . . . . О/П	13.05 12.25	16.35 15.50	5.05 4.20	19.15 18.35	19.15 18.35
15.35 16.40	4.40 5.55	6.30 7.40	21.05 22.05	21.05 22.05	П/О Свердловск . . О/П	9.45 8.35	13.10 12.00	1.40 0.40	15.55 14.55	15.55 14.55
19.30 20.10	8.45 9.25	10.30 11.15	0.55 1.40	0.55 1.40	П/О Омск . . . . . . О/П	5.25 4.40	8.50 8.10	21.30 20.50	11.45 10.55	11.45 10.55
22.10 23.05	11.25 12.15	13.15 —	3.40 4 40	3.40 4.40	П/О Новосибирск . . О/П	2.25 1.45	5.55 5.05	18.35 —	8.40 7.50	8.40 7.50
23 50 —	↓	— —	↓	↓	П/О Кемерово . . . . О/П	0.55 —	↑	— —	↑	↑
—	↓	—	5.40	↓	П Барнаул . . . . О	—	↑	—	6.50	↑
—	↓	—	—	5.40	П Томск . . . . . О	—	↑	—	—	↑
—	14.25	—	—	—	П Красноярск . . . О	—	2.40	—	—	6.50
13.40	**15.15**	**12.15**	**14.00**	**12.00**	*Время в пути*	**14.50**	**16.35**	**13.10**	**15.05**	**15.05**

*) Рейсы 25—26 вводятся особым распоряжением.

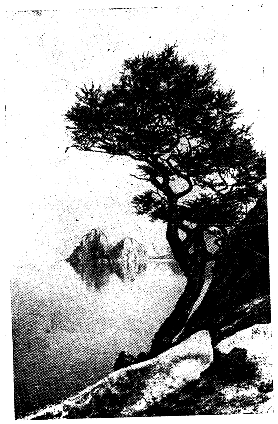


Новосибирск. Театр оперы и балета.

МОСКВА—ЯКУТСК—МАГАДАН—МОСКВА

ЗС. 19 Ил-12 ч. т.	ЗС. ДВ. 21 Ил. 12 #	15 Аэропорты	ЗС. 20 Ил-12 ч. т.	ЗС. ДВ. 22 Ил. 12 #
10.10	19.30	О Внуково . . . . П	15.45	13.25
12,35 13.15	21.55 22.35	П/О Казань . . . . . О/П	13.05 12.25	10.45 10.00
15.35 16.40	0.55 2.00	П/О Свердловск . . . О/П	9.45 8.35	7.20 6.10
19.30 20.10	4.50 5.30	П/О Омск . . . . . О/П	5.25 4.40	3.00 2.20
22.10 23.25	7.30 8.45	П/О Новосибирск . . О/П	2.25 1.10	0.05 22.55
1.35 2.35	10.55 11.55	П/О Красноярск . . . О/П	22.45 21.40	20.30 19.30
5.40 6.50	15.00 16.00	П/О Киренск . . . . О/П	18.25 17.25	16.15 15.15
9.30 10.10	18.40 19.20	П/О Олекминск . . . О/П	14.35 13.50	12.25 11.45
11.55 —	21.05 22.35	П/О Якутск . . . . . О/П	12.00 —	9.55 8.30
— —	↓	П/О Усть-Мая . . . . О/П	— —	↑
— —	1.15 2.00	П/О Охотск . . . . . О/П	— —	5.30 4.45
—	3.30	П Магадан . . . . О	—	3.15
25.45	**32.00**	*Время в пути*	**27.45**	**34.10**

Детская люлька в пассажирском самолете.



Озеро Байкал.

МОСКВА—ИРКУТСК—МОСКВА

МС. 15 Ил-12 #	16 Аэропорты	МС. 16 Ил-12 #
20.40	О Внуково . . . . П	22.55
23.05 23.50	П/О Казань . . . . . О/П	20.15 19.30
2.10 3.15	П/О Свердловск . . О/П	16.50 15.45
6.05 6.50	П/О Омск . . . . . О/П	12.35 11.50
8.50 9.55	П/О Новосибирск . . О/П	9.35 8.30
12.05 13.00	П/О Красноярск . . . О/П	6.05 5.10
15.55	П Иркутск . . . . О	1.55
19.15	*Время в пути*	**21.00**

МОСКВА—ИЖЕВСК—ГОРЬКИЙ—СВЕРДЛОВСК—МОСКВА

МС. 43 Ли-2 #	ЗС. 47 Ли-2 #	17 Аэропорты	МС. 44 Ли-2 #	ЗС. 48 Ли-2 #
13.40	23.40	О Быково . . . . . П	21.40	6.05
↓	1.20 2.05	П О Горький . . . . О П	↑	4.10 3.30
16.30 17.15	↓	П О Казань . . . . . О П	18.30 17.50	↑
↓	4.40 5.25	П О Ижевск . . . . . О П	↑	0.35 23.55
20.10	7.15	П Свердловск . . . О	14.30	21.50
6.30	**7.35**	*Время в пути*	**7.10**	**8.15**

Казанский университет им. В. И. Ленина. →

МОСКВА—КУРГАН—ОМСК—МОСКВА

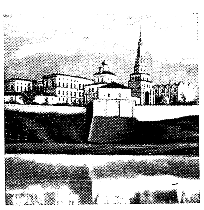
ЗС. 39 Ли-2 почт. #	18 Аэропорты	ЗС. 40 Ли-2 #
11.20	О Быково . . . . П	17.55
13.00 13.45	П О Горький . . . . О П	16.00 15.15
16.20 17.00	П О Ижевск . . . . О П	12.20 11.35
18.50 20.00	П О Свердловск . . . . О П	9.30 8.25
21.20 22.05	П О Курган . . . . О П	7.00 6.20
23.05 23.40	П О Петропавловск . . . . О П	↑
1.05	П Омск . . . . О.	3.40
13.45	*Время в пути*	**14.15**

МОСКВА—МАГНИТОГОРСК—МОСКВА

МС. 55 Ли-2 #	МС. 59 Ли-2 почт. #	19 Аэропорты	МС. 56 Ли-2 ком. #	МС. 60 Ли-2 #
7.25	7.35	О Быково . . . . П	17.45	17.00
9.05 9.40	↓	П О Горький . . О П	15.50 15.05	↑
↓	9.15 9.50	П О Арзамас . . . О П	↑	15.10 14.30
11.05 11.55	11.15 —	П О Казань . . . . О П		12.55 —
↓		Ульяновск . . О П	13.25 12.50	— —
13.45 14.15	— —	П О **Уфа** . . . . . О П	10.30 9.50	— —
15.15	—	П Магнитогорск О	8.40	—
7.50	**3.40**	*Время в пути*	**9.05**	**4.05**

МОСКВА—ЧЕЛЯБИНСК—УФА—МОЛОТОВ—МОСКВА

МС 33 Ли-2 #	МС 63 Ли-2 #	МС 67 Ли-2 #	МС 77 Ли-2 #	20 Аэропорты	МС 34 Ли-2 #	МС 64 Ли-2 #	МС 68 Ли-2 #	МС 78 Ли-2 #
7.00	9.00	20.30	3.55	О Быково . . . П	12.55	13.30	15.20	18.20
8.40 9.15	10.40 11.25	22.10 22.50	↓	П О Горький . . . О П	11.00 10.15	11.35 10.55	13.25 12.45	↑
10.40 11.20	12.50 13.35	0.15 1.00	6.45 7.45	П О Казань . . . О П	8.40 8.10	9.20 8.30	11.10 10.30	15.10 14.20
↓	14.45 15.25	↓	↓	П О Ижевск . . . О П	↑	7.10 6.30	↑	↑
13.10 13.50	↓		9.35 —	П О Уфа . . . . . О П	6.15 5.40	↑		12.20 —
↓	16.25 —		— —	П О Молотов . . . О П	↑	5.20 —		— —
15.30	—	4.30	—	П Челябинск . . О	3.45	—	6.40	—
8.30	7.25	8.00	5.40	*Время в пути*	9.10	8.10	8.40	6.00



Казань. Кремль

Москва. Большой театр.

ХАРЬКОВ—СВЕРДЛОВСК—ХАРЬКОВ

УК 411 Ли-2 ч. т.	21 Аэропорты	УК 412 Ли-2 н. ч.
0.15	О Харьков . . . П	15.50
1.30 2.10	П О Воронеж . . . О П	14.35 13.55
4.00 4.40	П О Пенза . . . . О П	12.05 11.20
6.25 7.40	П О Казань . . . . О П	9.35 8.20
9.10 9.55	П О Янаул . . . . О П	6.40 5.55
11.20	П Свердловск . О	4.10
11.05	*Время в пути*	**11.40**

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

ЛЕНИНГРАД—НОВОСИБИРСК—ЛЕНИНГРАД

СВ 371 Ли-2 #	**22** Аэропорты	СВ 372 Ли-2 #
7.55	О Ленинград . . . П	16.15
9.50 10.30	П/О Череповец . . . О/П	14.05 13.25
13.10 14.10	П/О Киров . . . . . О/П	10.30 9.25
15.50 16.30	П/О Молотов . . . . О/П	7.35 6.55
17.50н 8.05	П/О Свердловск . . . О/П	5.30 20.20н
9.20 10.00	П/О Тюмень . . . . . О/П	18.55 18.10
12.15 12.55	П/О Омск . . . . О/П	15.35 14.40
15.25	П Новосибирск . . О	11.50
31.30	*Время в пути*	**28.25**

ХАРЬКОВ—СВЕРДЛОВСК—ХАРЬКОВ

УК 435 Ли-2 #	УК 437 Ли-2 #	**23** Аэропорты	УК 436 Ли-2 #	УК 438 Ли-2 #
2.45	12.30	О Харьков . . . . П	0.45	13.00
↓	13.45 14.15	П/О Воронеж . . . . О/П	↑	↑
5.50 6.40	16.05 16.40	П/О Пенза . . . . . . О/П	21.40 21.00	9.55 9.00
↓	18.25 19.50	П/О Казань . . . . . О/П	↑	7.15 5.50
8.25 9.20	↓	П/О Куйбышев . . О/П	19.10 17.50	↑
↓	21.00 21.40	П/О Ижевск . . . . . О/П	↑	4.30 3.50
12.35	23.30	П Свердловск . . О	14.35	1.45
9.50	**11.00**	*Время в пути*	**10.10**	**11.15**

ТАШКЕНТ—СВЕРДЛОВСК—ТАШКЕНТ

СА 469 Ли-2 ч. т.	**24** Аэропорты	СА 470 Ли-2 н. ч.
22.30	О Ташкент . . . . П	16.20
1.15 2.00	П/О Джусалы . . . . О/П	13.50 13.10
5.40 6.35	П/О Актюбинск . . . О/П	9.45 8.35
9.15 9.55	П/О Челябинск . . . О/П	5.55 5.15
10.45	П Свердловск . . . О	4.25
12.15	*Время в пути*	**11.55**

ТАШКЕНТ—НОВОСИБИРСК—ТАШКЕНТ

СА 541 Ли-2 н. ч.	**25** Аэропорты	СА 542 Ли-2 ч. т,
3,55	О Ташкент . . . . П	14.50
6.15 6.45	П/О Фрунзе . . . . . О/П	12.30 11.50
7.50 8.45	П/О Алма-Ата . . . . О/П	10.45 9.55
12.15 12.55	П/О Семипалатинск . О/П	6.25 5.45
15.15	П Новосибирск . . О	3.25
11.20	*Время в пути*	**11.25**

АЛМА-АТА—СВЕРДЛОВСК—АЛМА-АТА

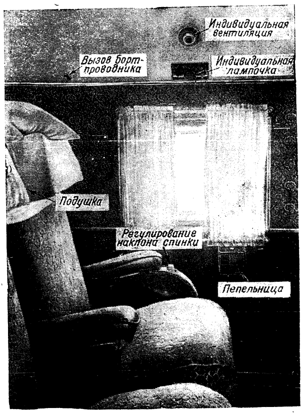
КЗ 483 Ли-2 #	**26** Аэропорты	КЗ 486 Ли-2 #
3.55	О Алма-Ата . . . . П	16.25
5.45 6.25	П/О Балхаш . . . . О/П	14.40 14.00
7.55 8.40	П/О Караганда . . . . . . О/П	12.35 11.45
9.30 10.05	П/О Акмолинск . . . . . . О/П	10.55 10.25
11.15 11.45	П/О Кокчетав . . . . О/П	9.15 8.40
12.35 13.20	П/О Петропавловск . . . . О/П	7.50 7.05
16.00	П Свердловск . . . . . . О	4.45
12.05	*Время в пути*	**11.40**

АЛМА-АТА—НОВОСИБИРСК—АЛМА-АТА

КЗ. 485 Ли-2 #	**27** Аэропорты	КЗ 486 Ли-2 #
6.10	О Алма-Ата . . . . П	13.05
7.05 7.45	П/О Талды-Курган . . . . О/П	12.10 11.30
10.55 11.40	П/О Семипалатинск . . . . О/П	8.00 7.10
14.00	П Новосибирск . . . . . О	4.50
7.50	*Время в пути*	**8.15**

КУЙБЫШЕВ—СВЕРДЛОВСК—КУЙБЫШЕВ

ПВ 519 Ли-2 #	**28** Аэропорты	ПВ 520 Ли-2 #
7.00	О Куйбышев . . . . . . П	16.45
8.40 9.20	П/О Уфа . . . . О/П	15.00 14.20
10.55	П Свердловск . . . . . . О	12.40
3.55	*Время в пути*	**4.05**



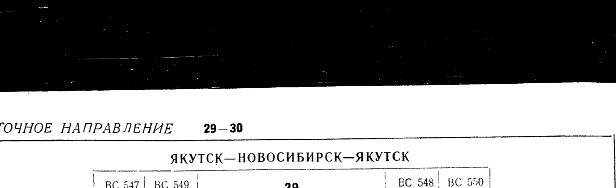
Кресло в пассажирском самолете Ли-2.

ЯКУТСК—НОВОСИБИРСК—ЯКУТСК

ВС 547 Ли-2 #	ВС 549 Ли-2 н. ч		**29** Аэропорты		ВС 548 Ли-2 #	ВС 550 Ли-2 н. ч.
20.25	3.05	О	Якутск	П	19.40	9.10
22.40 23.25	5.20 6.05	П О	Олекминск	О П	17.30 16.50	7.00 6.15
1.35 2.05	8.15 8.55	П О	Витим	О П	14 50 14.10	4 15 3.35
3.30 4.40	10.20 н. 6.00	П О	Киренск	О П	12.55 11.45	2.20 12.25 н.
9.25 10.30	10.45 11.45	П О	Красноярск . . .	О П	7.20 6 20	8.00 7.00
13.35	14.50	П	Новосибирск . .	О	3.25	4.15
17.10	**35.45**		*Время в пути*		**16.05**	**28.55**

ХАБАРОВСК—МАГАДАН—ХАБАРОВСК

ДВ 979 Ил-12 #	ДВ 981 Ил-12 #	ДВ 983 Ил-12 #		**30** Аэропорты		ДВ 980 Ил-12 #	ДВ 982 Ил-12 #	ДВ 984 Ил-12 #
21.00	21.30	22.00	О	Хабаровск	П	15.00	15.35	16.00
23.10 0.10	23.40 0.40	0.10 1.10	П О	Николаевск	О П	12.50 11.50	13.25 12.20	13.50 12.50
3.00 3.45	3.30 4.15	4.00 4.45	П О	Охотск	О П	9.00 8.15	9.30 8.45	10.00 9.15
5.15	5 45	6.15	П	Магадан	О	6.45	7.15	7.45
8.15	**8.15**	**8.15**		*Время в пути*		**8.15**	**8 20**	**8.15**



Хабаровский аэровокзал.

МОСКВА—ЧИМКЕНТ—КАРАГАНДА—АЛМА-АТА—МОСКВА

КЗ 89 Ил-12 # почт.	КЗ 91 *) Ли-2	КЗ 95 Ил-12 #	КЗ 97 Ил-12 # почт.		**31** Аэропорты		КЗ 90 Ил-12 #	КЗ 92**) Ли-2	КЗ. 96 Ил-12 #	КЗ 98 Ил-12 #
7.05	—	3.40	12.20	О	Внуково	П	13.15	—	20.25	6.35
	4.50			О	Быково	П		11.30		
9.30 10.15				П О	Казань	О П	10.35 9.50			
12.55 14.05				П О	Челябинск	О П	6.55 5.45			
	7.15 7.50		14.20 15.00	П О	Пенза	О П		8.55 8.15		
	9.55 10.40	7.20 8.05	16.40 17.40	П О	Уральск	О П		6.00 5.20	16.25 15.25	2.35 1.35
	12.55н 0.45	9.30 10.15	19.05 19.55	П О	Актюбинск	О П		3.25 16.20н	13.55 13.10	0.05 23.25
		12.05 13.15	21.45 23.00	П О	Кустанай	О П	4.50 4.05		11.10 10.05	21.25 20.15
16.10 16.50				П О	Атбасар	О П			8.50 8.20	
		15.00 15.30		П О	Акмолинск	О П			7.20 6.55	
	4.10 4.50			П О	Джусалы	О П		12.40 11.50		
	5.30 6.00			П О	Кзыл-Орда	О П		11.10 10.40		
	7.50 8.35			П О	Чимкент	О П		8.45 8.05		
18.15 18.55		16.10 16.50	1.35 2.25	П О	Караганда	О П	1.20 0.20		6.15 5.30	17.30 16.45
20.05 20.45			3.35 4.15	П О	Балхаш	О П	23.10 22.25		4.20 3.50	15.35 14.55
	10.20 11.00			П О	Фрунзе	О П		6.20 5.40		
22.10	12.00	19.25	5.40	П	Алма-Ата	О	21.00	4.40	2.25	13.30
15 05	**31 10**	**15.45**	**17.20**		*Время в пути*		**16.15**	**30.50**	**18.00**	**17.05**

*) Отпр. из Москвы: 3, 6, 9, 12, 15, 18, 21, 24, 27 и 30-м числам.
**) Отпр. из Алма-Аты: 1, 4, 7, 10, 13, 16, 19, 22, 25 и 28-м числам.

Справки о воздушном сообщении можно получить в справочных бюро на жел.-дор. вокзалах, морских и речных пристанях, автобусных станциях, городских справочных бюро, у дежурных администраторов гостиниц, в санаториях и домах отдыха.

МОСКВА—ТАШКЕНТ—МОСКВА

СА 141 Ил-12 #	СА 143 Ил-12 #	СА 147 Ил-14 ч. т.		32 Аэропорты		СА 142 Ил-12 #	СА 144 Ил 12 #	СА 148 Ил-14 н. ч.
3.20	15.20	3.10	О	Внуково	П	10.15	21.45	14.25
7.00 7.45	19.00 19.45	6.45 7.35	П О	Уральск	О П	6.15 5.30	17.45 17.00	10.35 9.45
9.10 10.10	21.10 22.05	8.55 9.55	П О	Актюбинск . . .	О П	4.00 3.00	15.30 14.30	8.20 7.20
12.55 13.35	0.50 1.30	12.30 13.15	П О	Джусалы	О П	0.05 23.25	11.35 10.50	4.35 3.55
15.40	3.35	15.15	П	Ташкент	О	21.15	8.40	1.50
12.20	12.15	12.05		*Время в пути*		13.00	13.05	12.35

АЛМА-АТА—ТАШКЕНТ—АЛМА-АТА

КЗ. 487 Ли-2 #		35 Аэропорты		КЗ 488 Ли-2 #
4.10	О	Алма-Ата . .	П	13.40
6.55 7.35	П О	Чимкент . . .	О П	10.55 10.20
8.10	П	Ташкент . . .	О	9.45
4.00		*Время в пути*		3.55

ЛЕНИНГРАД—ТАШКЕНТ—ЛЕНИНГРАД

ПВ 383 Ли-2 с I.VII.56 #		33 Аэропорты		ПВ 384 Ли-2 #
1.05	О	Ленинград . . .	П	21.00
4.15 5.20	П О	Быково	О П	17.40 16.40
7.45 8.30	П О	Пенза	О П	14.05 13.25
10.15 11.25	П О	Куйбышев . . .	О П	11.35 10.30
14.15 14.55	П О	Актюбинск . . .	О П	7.40 7.00
18.20 19.00	П О	Джусалы	О П	3.20 2.40
21.30	П	Ташкент	О	23.55
20.25		*Время в пути*		21.05

МОСКВА—НУКУС—МОСКВА

СА 149 Ли-2 *)		34 Аэропорты		СА 150 Ли-2 **)
10.20	О	Внуково	П	15.25
12.50 13.30	П О	Пенза	О П	12.40 11.55
15.35 16.15	П О	Уральск	О П	9.40 9.00
18.00 н 6.00	П О	Актюбинск . . .	О П	7.05 17.10 н
8.05 8.45	П О	Аральск	О П	14.55 14.15
10.55	П	Нукус	О	12 05
24.35		*Время в пути*		27.20

*) отпр. из Москвы: 3, 7, 13, 17, 23 и 29-м числам
**) отпр. из Нукуса: 1, 5, 11, 15, 21 и 27-м числам

Бортпроводник предлагает пассажиру завтрак.

В ПОЛЕТЕ НА САМОЛЕТЕ ОБЕСПЕЧИВАЕТСЯ ПОСТОЯННЫЙ ПРИТОК СВЕЖЕГО ВОЗДУХА. В СТЕНКЕ КАБИНЫ У КАЖДОГО КРЕСЛА ИМЕЮТСЯ ИНДИВИДУАЛЬНЫЕ ВЕНТИЛЯТОРЫ. ВЫДВИНУВ ИЗ ГНЕЗДА И ПОВОРАЧИВАЯ ЦИЛИНДР ВЕНТИЛЯТОРА, МОЖНО ПРИДАТЬ ВОЗДУШНОМУ ПОТОКУ НУЖНОЕ НАПРАВЛЕНИЕ.

МОСКВА—ЛЕНИНАБАД—СТАЛИНАБАД—ФРУНЗЕ—МОСКВА

СА 157 Ли-2 #	СА 163 Ли-2 ч. т.	СА 165 Ли-2 #		36 Аэропорты		СА 158 Ли-2 #	СА 164 Ли-2 ч. т.	СА 166 Ли-2 #
12.40	10.20	14.00	О	Внуково	П	4.55	15.25	21.05
15.10 15.50	12.50 13.30	16.30 17.10	П О	Пенза	О П	2.10 1.25	12.40 11.55	18.20 17.35
17.55 18.35	15.35 16.15	19.15 20.00	П О	Уральск	О П	23.10 22.25	9.40 9.00	15.20 14.40
20.20 21.40	18.00н 6 00	21.45 22.55	П О	Актюбинск . . .	О П	20.30 19.20	7.05 18.25н	12.45 11.45
1.05 1.40	9.25 10.05	2 20 3.05	П О	Джусалы	О П	15.40 15.00	14.45 14.05	8.05 7.25
		4.45 5.25	П О	Туркестан . . .	О П			5.40 5.10
		7.40 —	П О	Фрунзе	О П			2.55 —
4.10 5.10	12.35 13.15	— —	П О	Ташкент	О П	12.15 11.15	11.20 10.20	— —
5.55 6.25	14.00 —	— —	П О	Ленинабад . . .	О П	10.30 9.55	9.35 —	— —
7.30 8.15	— —	— —	П О	Самарканд . . .	О П	8.50 8.10	— —	— —
9.50	—	—	П	Сталинабад . . .	О	6.35	—	—
21.10	27.40	17.40		*Время в пути*		22.20	29.50	18.10

Кресло в пассажирской кабине самолета Ил-12.

МОСКВА—СТАЛИНГРАД—АСТРАХАНЬ—МАХАЧКАЛА— БАКУ—АШХАБАД—МОСКВА

СА 195 Ил-12 #	АЗ 197 Ли-2 ч. т.	АЗ 199 Ил-12 #	АЗ 201 Ил-12 #	МС 209 Ли-2 # почт.	МС 213 Ил-12 #	СК 215 Ли 2 # с 1.VII.56		37 Аэропорты		СА 196 Ил-12 #	АЗ 198 Ли-2 н. ч.	АЗ 200 Ил-12 #	АЗ 202 Ил-12 #	МС 210 Ли-2 #	МС 214 Ил-12 #	СК 216 Ли 2 # с 1.VII.56
9.30	—	4.10	11.00	—	8.20	15.00	О	Внуково	П	17.25	—	22.25	6.00	—	16.45	13.45
	7.40			6.30			О	Быково	П		18.30			14.25		
	9.30 10.10			8.20 9.00		16.55 17.35	П О	Воронеж	О П		16.35 15.55			12.30 11.50		11.40 10.55
12.45 13 30	12.20 13,10	7.25 8.25	14.15 15.15	11.10 11.55	11.35 —	19.45 —	П О	Сталинград	О П	14.05 13.05	13.45 12.55	19.05 18.05	2.40 1.40	9.40 9.00	13.25 —	8.45 —
	14.50 15.30		16.35 17.15	13.35 14.20	— —	— —	П О	Астрахань	О П		11.15 10.35	16.45 16.05		7.20 6.45	— —	— —
				15.40 —	— —	— —	П О	Гурьев	О П					5.25 —	— —	— —
	17.05 —			— —	— —	— —	П О	Махачкала	О П		9.00 —			— —	— —	— —
17.05 18.05	— —	12.00 —	19.40 —	— —	— —	— —	П О	Баку	О П	9.30 8.30	— —	13.40 —	22.05 —	— —	— —	— —
20.45	—	—	—	—	—	—		Ашхабад	О	5.40	—	—	—	—	—	—
11.15	9.25	7.50	8.40	9.10	3.15	4.45		*Время в пути*		11.45	9.30	8.45	7.55	9.00	3.20	5.00

Сталинград. Дворец культуры.

БАКУ—КРАСНОВОДСК—БАКУ

АЗ 455 Ли-2 #	АЗ 457 Ли 2 #		38 Аэропорты		АЗ 456 Ли-2 #	АЗ 458 Ли-2 #
9.15	13.10	О	Баку	П	12.10	16.10
10.20	14.15	П	Красноводск	О	11.00	15.00
1.05	1.05		*Время в пути*		1.10	1.10

КУЙБЫШЕВ—ТАШКЕНТ—КУЙБЫШЕВ

НВ 517 Ли-2 н. ч.		39 Аэропорты		НВ 518 Ли-2 ч. т.
7.40	О	Куйбышев	П	18.05
9.20 10.10	П О	Чкалов	О П	16.10 15.25
11.00 12.00	П О	Актюбинск	О П	14.20 13.20
15.25 16.05	П О	Джусалы	О П	9.40 8.55
18.25	П	Ташкент	О	6.10
10.55		*Время в пути*		11.55

В аэропортах к услугам пассажиров имеются буфеты-рестораны, парикмахерские, гостиницы почтово-телеграфные отделения, книжные и аптекарские киоски, камеры хранения ручного багажа.

На снимке: ресторан для пассажиров в Рижском аэровокзале.

СВЕРДЛОВСК—ТАШКЕНТ—СВЕРДЛОВСК

ЗС 539*) Ли-2 #		40 Аэропорты		ЗС 540*) Ли-2 #
0.30	О	Свердловск	П	13.35
1.20 2.00	П О	Челябинск	О П	12.45 12.05
	П О	Магнитогорск	О П	11.00 10.25
4.40 5.50	П О	Актюбинск	О П	8.40 7.30
9.15 9.55	П О	Джусалы	О П	3.50 3.00
12.25	П	Ташкент	О	0.15
11.55		*Время в пути*		13.20

*) Рейсы 539—540 вводятся особым распоряжением.

МОСКВА— УСТЬ-КАМЕНОГОРСК—МОСКВА

КЗ 101 Ил-12 #		41 Аэропорты		КЗ 102 Ил-12 #
18.30	О	Внуково	П	23.35
21.05 21.45	П О	Казань	О П	20.55 20.10
0.25 1.35	П О	Челябинск	О П	17.15 16.05
3.10 3.50	П О	Петропавловск	О П	14.20 13.40
5.00 5.55	П О	Омск	О П	12.25 11.30
7.10 7.50	П О	Павлодар	О П	10.10 9.30
8.50 9.30	П О	Семипалатинск	О П	8.25 7.55
10.05	П	Усть-Каменогорск	О	7.15
15.35		*Время в пути*		16.20

МОСКВА—КУЙБЫШЕВ—ЧКАЛОВ—САРАТОВ—МОСКВА

ПВ 183 Ли-2 #	ПВ 169 Ли-2 #	ПВ 179 Ли-2 н. ч.	ПВ 175 Ли-2 #	ПВ 173 Ли-2 #	ПВ 187 Ли-2 #		**42** Аэропорты		ПВ 184 Ли-2 #	ПВ 170 Ли-2 #	ПВ 180 Ли-2 ч. т.	ПВ 176 Ли-2 #	ПВ 174 Ли-2 #	ПВ 188 Ли-2 #
13.50	2.20	1.20	7.45	15.45	12.30	О	Быково	П	11.45	20.55	23.05	15.00	13.20	10.10
	4.00 4.45		9.25 10.05			П О	Горький	О П		19.00 18.20		13.05 12.25		
			11.45 12.25			П О	Ульяновск	О П				10.45 10.05		
	6.10 6.50					П О	Казань	О П		16.45 16.00				
16.15 17.00		3.45 4.30		18.10 18.50	14.55 15.40	П О	Пенза	О П	9.05 8.25		20.30 19.45		10.45 10.00	7.35 6.50
	8.05 8.55	6.15 --	13.15 —	20.35 —		П О	Куйбышев	О П		14.45 13.45	17.55 —	9.15 —	8.10 —	
	10.45 —	— —	— —	— —		П О	Чкалов	О П		11 45 —	— —	— —	— —	
17.50	—	-	—	—	16.30	П	Саратов	О	7.35	—	—	—	—	6.00
4.00	8.25	4.55	5 30	4.50	4 00		*Время в пути*		4.10	9.10	5.10	5 45	5.10	4.10

САРАТОВ—КАЗАНЬ—САРАТОВ

ПВ 507 Ли-2 н. ч.		**43** Аэропорты		ПВ 508 Ли-2 н. ч.
8.30	О	Саратов	П	17.30
10.55 10.55	П О	Куйбышев	О П	15.55 15.10
12.10	П	Казань	О	13.55
3.40		*Время в пути*		3.35

КУЙБЫШЕВ—КАЗАНЬ—КУЙБЫШЕВ

ПВ 493 Ли-2 н. ч.		**44** Аэропорты		ПВ 494 Ли-2 ч. т.
7.50	О	Куйбышев	П	11.20
9.05	П	Казань	О	10.05
1.15		*Время в пути*		1.20

ПОЛЬЗУЙТЕСЬ АВИАПОЧТОЙ!
ДЛЯ ПЕРЕСЫЛКИ АВИАПОЧТОЙ ПРИНИМАЮТСЯ ПИСЬМА, БАНДЕРОЛИ, ПОСЫЛКИ. ЗАКАЗНЫЕ И ЦЕННЫЕ ПИСЬМА, БАНДЕРОЛИ-ПОСЫЛКИ И ДЕНЕЖНЫЕ ПЕРЕВОДЫ ПРИНИМАЮТСЯ ПОЧТОВО-ТЕЛЕГРАФНЫМИ ОТДЕЛЕНИЯМИ С УВЕДОМЛЕНИЕМ О ВРЕМЕНИ ИХ ВРУЧЕНИЯ АДРЕСАТАМ.

МОСКВА - СУХУМИ—КУТАИСИ—ТБИЛИСИ—ЕРЕВАН—МОСКВА

ГЗ 229 Ил-12 #	ГЗ 233 Ил-12 #	ГЗ 239 Ли-2 #	АМ 243 Ли-2 #		**45** Аэропорты		ГЗ 230 Ил-12 #	ГЗ 234 Ил-12 #	ГЗ 240 Ли-2 #	АМ 244 Ли-2 #
3.50	21.10	8.35	23.50	О	Внуково	П	13.55	22.15	18.15	18.35
	23.20 0.05	11.15 11.55	2.30 3.15	П О	Харьков	О П		20.05 19.20	15.35 14.30	15.55 14.50
				П О	Воронеж	О П				
		13.00 13.55		П О	Сталино	О П			13.25 12.40	
7.15 8.15	1.40 2.25		5.15 6.15	П О	Ростов	О П	10.25 9.25	17.45 16.55		12.50 12.05
		16.05 16.45		П О	Краснодар	О П			10.30 9.50	
	4.35 5.25	18.15 —	9.00 9.40	П О	Сухуми	О П		14.45 14.00	8.20 —	9.20 8.40
		— —	12.05 —	П О	Ереван	О П			— —	6.15 —
	6.00 6.30	— —	— —	П О	Кутаиси	О П		13.25 12.50	— —	— —
11.40	7.15	—	—	П	Тбилиси	О	6.00	12.05	—	—
7.50	10.05	9.40	12.15		*Время в пути*		7.55	10.10	9.55	12.20

КИЕВ—ТБИЛИСИ—КИЕВ

УК 403 Ли-2 н. ч.		**46** Аэропорты		УК 404 Ли-2 ч. т.
22.45	О	Киев	П	17.30
0.30 1.10	П О	Днепропетровск	О П	15.45 15.10
2.05 2.50	П О	Сталино	О П	14.15 13.30
5.00 5.40	П О	Краснодар	О П	11.20 10.35
7.10 7.45	П О	Сухуми	О П	9.05 8.15
9.15	П	Тбилиси	О	6.45
10.30		*Время в пути*		10. 45

Ереван.

МОСКВА—АДЛЕР—МОСКВА

СК 283 Ли-2 #	47 Аэропорты	СК 284 Ли-2 #
8.05	О Внуково . . . . П	20.10
10.45	П Харьков . . . . О	17.20
11.25	О Харьков . . . . П	16.35
13.25	П Ростов . . . . . О	14.35
14.10	О Ростов . . . . . П	13.55
16.25	П Адлер . . . . . О	11.40
8.20	*Время в пути*	8.30

*) Рейсы 247—248 вводятся особым распоряжением.

МОСКВА—АДЛЕР—СУХУМИ—МОСКВА

МС 247 Ил-12 #*)	МС 249 Ил-12 #	МС 251 Ил-12 # с 1.VII.56	СК 253 Ли-2 #	48 Аэропорты	МС 248 Ил-12 #*)	МС 250 Ил-12 #	МС 252 Ил-12 # с 1.VII.56	СК 254 Ли-2 #
7.35	8.50	1.10	6.15	О Внуково . . . . П	21.35	14.35	16.35	4.05
		3.20		П Харьков . . . . О			14.25	
		4.00		О Харьков . . . . П			13.45	
9.10			8.10	П Воронеж . . . . О	19.55			2.00
9.50			8.50	О Воронеж . . . . П	19.15			1.15
	11.50			П Сталино . . . . О		11.35		
	12.30			О Сталино . . . . П		10.50		
			11.10	П Ростов . . . . . О				22.50
			12.10	О Ростов . . . . . П				21.25
				П Краснодар . . . О				20.05
				О Краснодар . . . П				19.20
13.30	15.00		14.25	П Адлер . . . . . О	15.50	8.20		18.20
			—	О Адлер . . . . . П		—		—
13.50	15.25	7.50	—	П Сухуми . . . . . О	15.10	7.55	9.55	—
6.15	6.35	6.40	8.10	*Время в пути*	6.25	6.40	6.40	9.45

Сочи. На пляже.

МОСКВА—РОСТОВ—МОСКВА

СК 267 Ли-2 #	СК 269 Ли-2 #	49 Аэропорты	СК 268 Ли-2 #	СК 270 Ли-2 #
—	18.20	О Внуково . . . . П	—	6.45
17.35		О Быково . . . . . П	20.40	
	21.00	П Харьков . . . . О		4.05
	21.40	О Харьков . . . . П		3.10
19.25		П Воронеж . . . . О	18.45	
20.05		О Воронеж . . . . П	17.55	
22.25	23.40	П Ростов . . . . . О	15.30	1.10
4.50	5.20	*Время в пути*	5.10	5.35

ОДЕССА—РОСТОВ—ОДЕССА

УК 429 Ли-2 н. ч.	УК 431 Ли-2 ч. т.	50 Аэропорты	УК 430 Ли-2 н. ч.	УК 432 Ли-2 ч. т.
7.30	7.30	О Одесса . . . . . П	18.25	18.25
8.15		П Херсон . . . . . О	17.40	
8.45		О Херсон . . . . . П	17.10	
10.30		П Жданов . . . . . О	15.25	
11.00		О Жданов . . . . . П	14.55	
	9.10	П Запорожье . . . О		16.45
	9.50	О Запорожье . . . П		16.05
	10.40	П Сталино . . . . О		15.15
	11.20	О Сталино . . . . П		14.35
12.15	12.15	П Ростов . . . . . О	13.40	13.40
4.45	4.45	*Время в пути*	4.45	4.45

КУЙБЫШЕВ—РОСТОВ—КУЙБЫШЕВ

ПВ 503 Ли-2 #	51 Аэропорты	ПВ 504 Ли-2 #
7.20	О Куйбышев . . . П	22.20
8.55	П Саратов . . . . О	20.45
9.35	О Саратов . . . . П	20.00
11.00	П Сталинград . . . О	18.35
11.45	О Сталинград . . . П	17.45
13.45	П Ростов . . . . . О	15.45
6.25	*Время в пути*	6.35

Ростов н/Д. Ул. Энгельса.

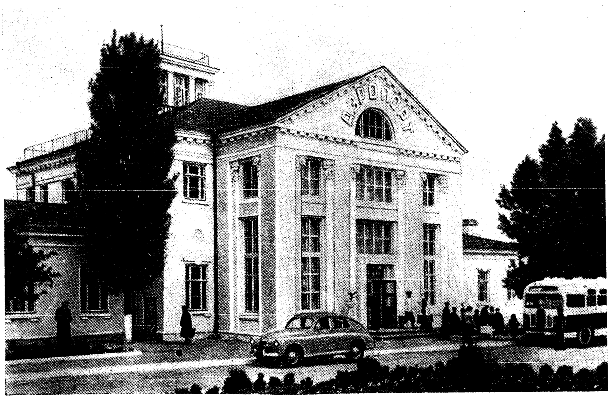
Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

МОСКВА—ГРОЗНЫЙ—МИН. ВОДЫ—МОСКВА

СК 255 Ли-2	СК 257 Ли-2 н. ч.	СК 259 Ли-2		52 Аэропорты		СК 256 Ли-2	СК 258 Ли-2 н. ч.	СК 260 Ли-2
9.10	—	22.20	О	Внуково	П	16.15	—	5.40
	0.50		О	Быково	П		22.35	
		1.00	П	Харьков	О			3.00
		1.40	О	Харьков	П			2.15
11.05	2.40		П	Воронеж	О	14.10	20.40	
11.45	3.25		О	Воронеж	П	13.25	20.00	
14.05	5.45	3.40	П	Ростов	О	11.00	17.35	0.15
14.50	6.45	4.30	О	Ростов	П	10.10	16.30	23.15
16.45	8.40	6.25	П	Мин. Воды	О	8.15	14.35	21.20
—	9.25	—	О	Мин. Воды	П	—	13.50	—
—	10.40	—	П	Грозный	О	—	12.35	—
7.35	9.50	8.05		*Время в пути*		8.00	10.00	8.20

МОСКВА—КРАСНОДАР—МОСКВА

СК 261 Ли-2		53 Аэропорты		СК 262 Л-2 и
23.10	О	Быково	П	15.30
1.00	П	Воронеж	О	13.35
1.45	О	Воронеж	П	12.55
4.05	П	Ростов	О	10.30
5.05	О	Ростов	П	9.15
6.25	П	Краснодар	О	7.55
7.15		*Время в пути*		7.35



На снимке: аэровокзал в Минеральных Водах.

Из аэропорта Минеральные Воды можно быстро проехать автобусом или электропоездом в Ессентуки, Железноводск, Кисловодск и Пятигорск.

КУЙБЫШЕВ—САРАТОВ—АДЛЕР—СУХУМИ—МИН. ВОДЫ—КУЙБЫШЕВ

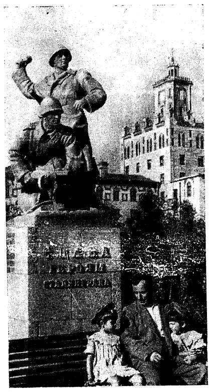
ПВ 511 Ли-2 #	ПВ 513 Ли-2 н. ч.	ПВ 523*) Ли-2 н. ч.	ПВ 525 Ли-2 ч. т.		54 Аэропорты		ПВ 512 Ли-2 #	ПВ 514 Ли-2 н. ч.	ПВ 524*) Ли-2 н. ч.	ПВ 526 Ли-2 н. ч.
6.25	21.00	—	—	О	Куйбышев	П	21.55	18.35	—	—
8.00	22.35	—	—	П	Саратов	О	20.20	17.00	—	—
8.40	23.20	6.30	8.20	О	Саратов	П	19.35	16.15	17.15	16.55
10.05	0.45	7.55	9.45	П	Сталинград	О	18.10	14.50	15.50	15.30
10.50	1.35	8.40	10.25	О	Сталинград	П	17.25	14.00	15.10	15.00
			12.25	П	Ростов	О				13.00
			13.10	О	Ростов	П				12.30
	4.45		14.30	П	Краснодар	О		10.50		11.10
	5.30		15.15	О	Краснодар	П		10.10		10.35
	6.30		16.15	П	Адлер	О		9.10		9.35
	—		16.45	П	Сухуми	О		—		9.05
13.10	—	11.00	—	П	Мин. Воды	О	15.25	—	12.50	—
6.45	9.30	4.30	8.25		*Время в пути*		6.30	9.25	4.25	7.50

СВЕРДЛОВСК—АДЛЕР—МИН. ВОДЫ—СВЕРДЛОВСК

ПВ 529 Ли-2 2.4 6.7 **)	ПВ 533 Ли-2 ч. т.		55 Аэропорты		ПВ 530 Ли-2 1.3.5.7 **)	ПВ 534 Ли-2 н. ч.
23.35	5.00	О	Свердловск	П	21.45	16.10
2.50	8.15	П	Куйбышев	О	18.30	12.55
4.05	9.00	О	Куйбышев	П	17.20	12.15
	10.35	П	Саратов	О		10.40
	11.35	О	Саратов	П		9.50
7.05		П	Сталинград	О	14.20	
7.50		О	Сталинград	П	13.35	
9.45		П	Ростов	О	11.40	
10.35		О	Ростов	П	10.55	
12.50		П	Адлер	О	8.40	
—		О	Адлер	П	—	
—	15.25	П	Мин. Воды	О	—	6.00
13.15	10.25		*Время в пути*		13.05	10.10

*) Рейсы 523—524 вводятся особым распоряжением.

**) Рейсы 529—530 вводятся особым распоряжением.



Сталинград. В Комсомольском парке.

Курортники, отдыхающие в Ахали-Афони или Гудаутах, могут вылететь в Москву и др. города из Аэропорта Сухуми, в Цхалтубо — из аэропорта Кутаиси, в Боржоми — из аэропорта Тбилиси, в здравницах Аджарии — из аэропорта Батуми.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

АЛМА-АТА—АДЛЕР—МИН. ВОДЫ—АЛМА-АТА

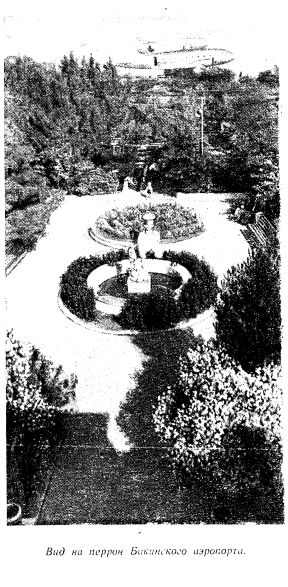
КЗ 479 Ил-12 *)	КЗ 491 Ли-2 н. ч.		**56** Аэропорты		КЗ 480 Ил-12 *)	КЗ 492 Ли-2 н. ч.
18.25	23.25	О	Алма-Ата	П	2.00	20.20
19.50 20.35	0.50 1.30	П О	Балхаш	О П	0.35 23.50	18.55 18.15
21.35 22.35	2.40 3.30	П О	Караганда . . .	О П	22.40 21.50	17.05 16,15
	4.10 4.40	П О	Акмолинск . . .	О П		15.35 15.05
1.20 2.05	6.40 7.25	П О	Кустанай	О П	19.15 18.35	13.05 12.25
4.05 5.15	9.25 10.35	П О	Актюбинск . . .	О П	16.45 15.35	10.35 9.30
7.15 7.50	12.35 13.10	П О	Гурьев	О П	13.35 13.05	7.30 6.55
8.55 9.40	14.15 15.00	П О	Астрахань . . .	О П	12.00 11.20	5.50 5.10
11.10 12.00	**16.30** —	П О	Мин. Воды . . .	О П	9.50 9.00	**3.40** —
13.55	—	П	Адлер	О	**7.05**	—
14.25	—	П	Сухуми	О	**6.35**	—
20.00	**17.05**		*Время в пути*		19.25	16.40

*) Выполняется как дополнительный

ФРУНЗЕ—МИН. ВОДЫ—ФРУНЗЕ

СА 489 Ли-2 *)		**57** Аэропорты		СА 490 Ли-2 **)
7.25	О	Фрунзе	П	13.55
9.15 9.45	П О	Чимкент	О П	12.05 11.35
12.10 13.00	П О	Джусалы	О П	9.10 8.30
16.40Н 5.25	П О	Актюбинск	О П	5.05 17.00н
7.55 8.35	П О	Гурьев	О П	14.30 13.55
9.55 10.40	П О	Астрахань	О П	12.35 11.55
12.35	П	Мин. Воды	О	10.00
29.10		*Время в пути*		27.55

*) Отпр. из Фрунзе: 1, 6, 11, 16 и 21-м числам
**) Отпр. из Мин. Вод. 3, 8, 13, 18 и 23-м числам



Вид на перрон Бакинского аэропорта.

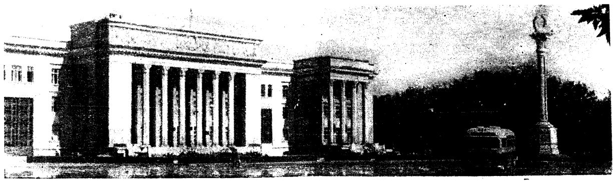
ИЗ АЛМА-АТЫ В МИН. ВОДЫ КУРОРТНИКИ САМОЛЕТОМ ДОСТАВЛЯЮТСЯ ЗА 16 ЧАСОВ 40 МИНУТ, А ПОЕЗДОМ, С ПЕРЕСАДКОЙ В МОСКВЕ — ТОЛЬКО НА СЕДЬМЫЕ СУТКИ.

В АДЛЕР—МИН. ВОДЫ. ВОЗДУШНЫЕ ЛИНИИ ИЗ СТАЛИНАБАДА, ЛЕНИНАБАДА, ТАШКЕНТА, АШХАБАДА

СА 463*) Ли-2	СА 475**) Ли-2	СА 477 Ли-2 н. ч.	СА 465 Ли-2 #	СА 467 Ил-12 #	СА 459 Ли-2 #		**58** Аэропорты		СА 464*) Ли-2	СА 476**) Ли-2	СА 488 Ли-2 ч. т.	СА 466 Ли-2 #	СА 468 Ил-12 #	СА 460 Ли-2 #
—	7.25	—	—	—	—	О	Сталинабад .	П	—	15.05	—	—	—	—
—		6.00	—	—	—	О	Ленинабад . .	П	—		15.20	—	—	—
—			2.15	23.25	—	О	Ташкент . . .	П	—			16.00	18.45	—
— —	8.15 8.55				— —	П О	Термез . . .	О П	— —	14.15 13.30				— —
— —		7.10 7.50			— —	П О	Самарканд . .	О П	— —		14.10 13.30			— —
— —		9.05 9.45	4.45 5.25		— —	П О	Чарджоу . .	О П	— —		12.15 11.35	13.45 13.05		— —
— —	10.55 11.40	10.40 11.20			— —	П О	Мары	О П	— —	11.30 10.40	10.40 10.10			— —
— 6.00	12.50 13.40	12.30 13.10	7.30 8.10	3.00 3.45	— 6.20	П О	Ашхабад . .	О П	— 17.45	9.35 8.45	9.05 8.25	11.10 10.30	15.25 14.35	— 16.15
8.20 9.05					8.40 9.20	П О	Красноводск .	О П	15.35 14.55					14.05 13.25
10.15 11.05	17.15 18.30	16.45 18.45	11.45 12.45	6.35 7.45	10.30 11.15	П О	Баку	О П	13.50 12.55	5.30 4.30	5.10 3.50	7.15 6.15	11.55 10.50	12.20 11.30
13.20 14.05				9.35 10.25		П О	Тбилиси . . .	О П	10.40 10.00				9.00 8.15	
15.35				11.35		П	Сухуми . . .	О	**8.30**				7.05	
—				12.05		П	Адлер	О	—				**6.35**	
—	21.45	22.00	16.00	—	14.30	П	Мин. Воды .	О	—	**1.15**	**0.35**	**3.00**	—	**8.20**
9.35	14.20	16.00	13.45	12.40	8.10		*Время в пути*		**9.15**	**13.50**	**14.45**	**13.00**	**12.10**	**7.55**

*) Отпр. из Ашхабада: 1, 5, 10, 15, 20 и 25-м числам; из Сухуми: 2, 6, 11, 16, 21 и 26-м числам.

**) Отпр. из Сталинабада: 1, 4, 7, 10, 13, 16, 19, 22, 25 и 28-м числам; из Мин. Вод: 2, 5, 8, 11, 14, 17, 20, 23, 26 и 29-м числам.



Сталинабад. Здание Совета Министров Таджикской ССР.

ОДЕССА—МИН. ВОДЫ—ОДЕССА

УК 433 Ли-2 #		59 Аэропорты		УК 434 Ли-2 #
8.00	О	Одесса	П	16.50
10.15	П	Симферополь	О	14.35
11.00	О		П	13.50
12.50	П	Краснодар	О	12.00
13.30	О		П	11.15
15.00	П	Мин. Воды	О	9.45
7.00		*Время в пути*		7.05

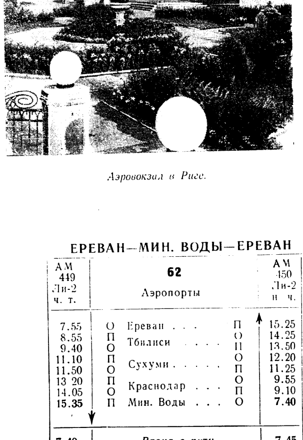
КИШИНЕВ—МИН. ВОДЫ—АДЛЕР—КИШИНЕВ

УК 423 Ли-2 ч. т.	УК 425 Ли-2 н. ч.		60 Аэропорты		УК 424 Ли-2 н. ч.	УК 426 Ли-2 ч. т.
8.30	8.00	О	Кишинев	П	16.10	16.40
9.50		П	Николаев	О	14.50	
10.30		О		П	14.10	
	8.45	П	Одесса	О		15.55
	9.25	О		П		15.10
	10.10	П	Херсон	О		14.25
	10.50	О		П		13.50
12.25	12.25	П	Симферополь	О	12.15	12.15
13.20	13.20	О		П	11.35	11.35
15.10	15.10	П	Краснодар	О	9.45	9.45
15.55	15.55	О		П	9.00	9.00
17.25		П	Мин. Воды	О	7.30	
—	16.55	П	Адлер	О	—	8.00
8.55	8.55		*Время в пути*		8.40	8.40

РИГА—СУХУМИ—РИГА

ЗП 391 Ли-2 *)		61 Аэропорты		ЗП 392 Ли-2**)
3.50	О	Рига	П	20.00
5.55	П	Минск	О	17.55
6.55	О		П	16.50
8.45	П	Киев	О	14.50
9.25	О		П	14.10
12.05	П	Сталино	О	11.30
12.45	О		П	11.00
14.55	П	Краснодар	О	8.50
15.40	О		П	8.20
17.10	П	Сухуми	О	6.50
13 20		*Время в пути*		13 10

*) Отправление из Риги: по 1, 5, 9, 13, 17, 21, 25 и 29-м числам.
**) Отправление из Сухуми: по 2, 6, 10, 14, 18, 22, 26 и 30-м числам.



Аэровокзал в Риге.

ЕРЕВАН—МИН. ВОДЫ—ЕРЕВАН

АМ 449 Ли-2 ч. т.		62 Аэропорты		АМ 450 Ли-2 н. ч.
7.55	О	Ереван	П	15.25
8.55	П	Тбилиси	О	14.25
9.40	О		П	13.50
11.10	П	Сухуми	О	12.20
11.50	О		П	11.25
13 20	П	Краснодар	О	9.55
14.05	О		П	9.10
15.35	П	Мин. Воды	О	7.40
7.40		*Время в пути*		7.45

КИЕВ—МИН. ВОДЫ—АДЛЕР—СУХУМИ—КИЕВ

УК 405*) Ли-2 #	УК 407**) Ли-2 ч. т.		63 Аэропорты		УК 406*) Ли-2 #	УК 408**) Ли-2 н. ч
6.20	12.15	О	Киев	П	22.15	14.00
8.05		П	Днепропетровск	О	21.30	
8.50		О		П	20.50	
	14 20	П	Запорожье	О		11.55
	15.05	О		П		11.00
	16.45	П	Ростов	О		9.20
	17.25	О		П		8.35
	19.20	П	Мин. Воды	О		6.40
11.55	—	П	Краснодар	О	17.45	—
12.40	—	О		П	17.10	—
13.40	—	П	Адлер	О	16.10	—
14.10	—	П	Сухуми	О	15.40	—
7.50	7.05		*Время в пути*		6.35	7.20

*) Рейсы 405—406 вводятся особым распоряжением.
**) Рейсы 407—408 вводятся особым распоряжением.

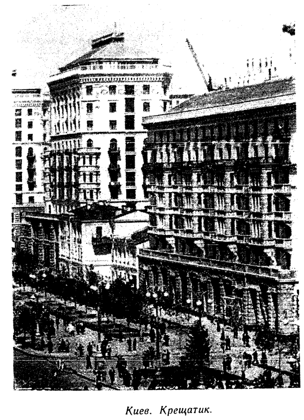
ЛЬВОВ—МИН. ВОДЫ—АДЛЕР—ЛЬВОВ

УК 415 Ли-2 #	УК 417 Ли-2 н. ч		64 Аэропорты		УК 416 Ли-2 #	УК 418 Ли-2 ч. т.
6.40	7.20	О	Львов	П	17.40	18.30
7.10		П	Станислав	О	17.10	
7.50		О		П	16.40	
	8.40	П	Черновцы	О		17.10
	9.20	О		П		16.30
	12.10	П	Херсон	О		13 40
	12.50	О		П		13.00
10.20		П	Одесса	О	14.10	
11.00		О		П	13.05	
13.15	14.20	П	Симферополь	О	10.50	11 30
14.25	15.10	О		П	10.05	10.45
16.15	17.00	П	Краснодар	О	8.15	8.55
16.55	17.40	О		П	7.40	8.10
	19.10	П	Мин. Воды	О		6.40
17.55	—	П	Адлер	О	6.40	—
18.25	—	П	Сухуми	О	6.10	—
11.45	11.50		*Время в пути*		11.30	11.50

СТАЛИНО—МИН. ВОДЫ—АДЛЕР—СТАЛИНО

СА 471***) Ли-2 ч. т.	УК 473***) Ли-2 н. ч.		65 Аэропорты		СА 472***) Ли-2 ч. т.	УК 474***) Ли-2 н. ч.
6.40	15.50	О	Сталино	П	19.25	0.20
7.15		П	Ворошиловград	О	18.40	
7.55		О		П	18.10	
8.35	16.45	П	Ростов	О	16.10	23.25
9.20	17.25	О		П	15.25	22.45
	19.20	П	Мин. Воды	О		20.50
11.35	—	П	Адлер	О	14.30	—
12.05	—	П	Сухуми	О	13.55	—
5.25	3.30		*Время в пути*		5.30	3.30

***) Рейсы 471—472, 473—474 вводятся особым распоряжением.



Киев. Крещатик.

ЛЕНИНГРАД—МИН. ВОДЫ—АДЛЕР—СУХУМИ—ЛЕНИНГРАД

СВ 375 Ил-12 н. ч.	СВ 377 Ил-12 *)		66 Аэропорты		СВ 376 Ил-12 ч. т.	СВ 378 Ил-12 **)
19.20	2.35	О	Ленинград	П	23.40	20.45
21.45 22.25	5.00 5.40	П О	Минск	О П	21.15 20.30	18.20 17.40
23.55 0.50	7.10 8.15	П О	Киев	О П	18.55 17.40	16.05 17.05
3.00 3.40	10.25 11.10	П О	Сталино	О П	15.30 14.45	12.55 12.15
	11.55 12.35	П О	Ростов	О П		11.30 10.45
	14.05 —	П О	Мин. Воды	О П		9.15 —
5.25 6.10	— —	П О	Краснодар	О П	13.00 12.15	— —
7.00 —	— —	П О	Адлер	О П	11.25 —	— —
7.20	—	П	Сухуми	О	11.05	—
12.00	11.30		*Время в пути*		12.35	11.30

*) Отпр. из Ленинграда: 2, 5, 8, 11, 14, 17, 20, 23, 26 и 29-м числам

**) Отпр. из Мин. Вод: 3 6, 9, 12, 15, 18, 21, 24, 27 и 30-м числам

РИГА—МИН. ВОДЫ—РИГА

ЗП 399 Ли-2 *)		67 Аэропорты		ЗП 400 Ли-2 **)
6.05	О	Рига	П	19.00
8.10 9.10	П О	Минск	О П	16.55 15.50
11.00 11.40	П О	Киев	О П	13.55 13.10
13.25 14.05	П О	Днепропетровск	О П	11.25 10.45
15.55 16.40	П О	Ростов	О П	8.55 8.10
18.35	П	Мин. Воды	О	6.15
12.30		*Время в пути*		12.45

*) Отпр. из Риги: 3, 6, 9, 12, 15, 18, 21, 24 и 27 числам

**) Отпр. из Мин. Вод: 4, 7, 10, 13, 16, 19, 22. 25 и 28-м числам

Зал ожидания пассажиров в Рижском аэровокзале.

МОСКВА—СИМФЕРОПОЛЬ—МОСКВА

МС 273 Ил-12 #	УК 275 Ли-2 # почт.	УК 277 Ли-2 #	УК 279*) Ли-2 #	УК 281 Ли-2 #		68 Аэропорты		МС 274 Ил-12 #	УК 276 Ли-2 #	УК 278 Ли-2 #	УК 280*) Ли-2 #	УК 282 Ли-2 #
8.30	—	—	—	10.40	О	Внуково	П	18.55	—	—	—	15.05
	6.10	9.25	2.40		О	Быково	П		18.40	17.30	19.35	
	8.00 8.40	11.15 11.55			П О	Воронеж	О П		16.45 16.05	15.35 14.55		
		13.10 13.50	5.45 6.30	13.20 14.05	П О	Харьков	О П			13.40 12.50	16.25 15.30	12.25 11.40
	11.10 11.50				П О	Запорожье	О П		13.35 12.55			
		14.40 15.20			П О	Днепропетровск	О П			12.00 11.10		
12.45	13.25	17.20	9.20	16.55	П	Симферополь	О	14.40	11.20	9.10	12.40	8.50
4.15	7.15	7.55	6.40	6.15		*Время в пути*		4.15	7.20	8.20	6.55	6.15

*) Рейсы 279—280 — дополнительные.

КУЙБЫШЕВ—СИМФЕРОПОЛЬ—КУЙБЫШЕВ

ПВ 515 Ли-2 # с 1.VII.56		69 Аэропорты		ПВ 516 Ли-2 # с 1.VII.56
20.40	О	Куйбышев	П	22.10
22.15 23.00	П О	Саратов	О П	20.35 19.45
0.25 1.10	П О	Сталинград	О П	18.20 17.35
3.10 4.15	П О	Ростов	О П	15.35 14.30
5.35 6.20	П О	Краснодар	О П	13.10 12.30
8.10	П	Симферополь	О	10.40
12.30		*Время в пути*		11.30

Из Москвы и любого крупного города страны самолет доставит Вас в Симферополь, откуда автобусом или такси можно доехать в крымские здравницы—Алушту, Алупку, Гурзуф, Евпаторию, Ливадию, Мисхор, Саки, Семеиз, Судак, Феодосию, Ялту.

АШХАБАД—СИМФЕРОПОЛЬ—АШХАБАД

СА 461 Ли-2 н. ч.	70 Аэропорты	СА 462 Ли-2 ч. т.
5.00	О Ашхабад . . . . П	11 45
7 20	П Красноводск . . О	9.35
8 00	О Красноводск . . П	8.55
9.10	П Баку . . . . . . О	7.50
10.10	О Баку . . . . . . П	7.05
13.25Н	П Мин. Воды . . . О	3.50
5.50	О Мин. Воды . . . П	16.20Н
7.20	П Краснодар . . О	14.50
8.05	О Краснодар . . П	14.10
9.55	П Симферополь . . О	12.20
28.55	*Время в пути*	23 25

ЛЕНИНГРАД—СИМФЕРОПОЛЬ—ЛЕНИНГРАД

СВ 379 Ли-2 #	71 Аэропорты	СВ 380 Ли-2 #
22.30	О Ленинград . . . . . . П	23.25
1.30	П Минск . . . . О	20.25
2.10	О Минск . . . . П	19.35
4.00	П Киев . . . . О	17.35
5.10	О Киев . . . . П	16.35
6.55	П Днепропетровск . . . О	14.50
7.40	О Днепропетровск . . . П	14.10
9 40	П Симферополь . . . . . О	12.10
11.10	*Время в пути*	11.15

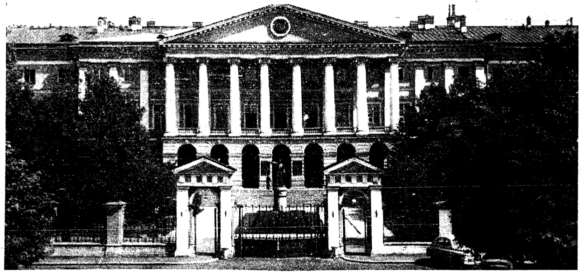
РОСТОВ—СИМФЕРОПОЛЬ—РОСТОВ

СК 443 Ли-2 #	72 Аэропорты	СК 444 Ли-2 #
7.10	О Ростов . . . . . П	16.20
8.30	П Краснодар . . О	15.00
9.15	О Краснодар . . П	14.20
11.05	П Симферополь . . О	12.30
3.55	*Время в пути*	3.50

СВЕРДЛОВСК—СИМФЕРОПОЛЬ—СВЕРДЛОВСК

ПВ 531*) Ли-2 1.3.5.	73 Аэропорты	ПВ 532*) Ли-2 3.5.7
23.35	О Свердловск . . . . . . П	21.45
2.50	П Куйбышев . . . . . . О	18.30
4.05	О Куйбышев . . . . . . П	17.20
7.05	П Сталинград . . . . . . О	14.20
7.50	О Сталинград . . . . . . П	13.35
11 05	П Краснодар . . . . . . О	10.20
11.50	О Краснодар . . . . . . П	9.30
13.35	П Симферополь . . . . . О	7.45
14.00	*Время в пути*	14.00

*) Рейсы 531—532 вводятся особым распоряжением.



Ленинград. Смольный.

МОСКВА—ХАРЬКОВ—ДНЕПРОПЕТРОВСК—ЖДАНОВ—СТАЛИНО—ЗАПОРОЖЬЕ—ВОРОШИЛОВГРАД—МОСКВА

УК 285 Ли-2 н. ч.	УК 289 Ли-2 #	УК 291 Ли-2 #	УК 293 Ли-2 #	УК 295 Ли-2 #	УК 299 Ли-2 #	УК 303 Ли-2 #	74 Аэропорты	УК 286 Ли-2 н. ч.	УК 290 Ли-2 #	УК 292 Ли-2 #	УК 294 Ли-2 #	УК 296 Ли-2 #	УК 300 Ли-2 #	УК 304 Ли-2 #
13.20	15.10	14.10	7.25	7.15	17.00	13.00	О Внуково . . . . . П	11.30	13.35	12.25	20.00	19.40	9.00	11.45
			9.35				П Курск . . . . . . О							
			10.25				О Курск . . . . . . П							
16.00	17.50	16.50		9 55	19.40	15.40	П Харьков . . . . О	8.50	10 55	9.45	17.20	17.00	6.20	9.05
16.40	18.30	17.35		10.35		16.30	О Харьков . . . . П	8.10	10 15	9.00	16.20	16.10		8.25
		18.25	12.10			17.20	П Днепропетровск. О			8.10	15 30			7 35
			12.50			17.50	О Днепропетровск. П				15.[illegible]			7.05
17.45	19.35						П Сталино . . . . О	7 05	9.10			15.05		
18.15							О Сталино . . . . П	6.30				14.05		
18.45							П Жданов . . . . . О	6.00						
							О Жданов . . . . . П				11.30			6.35
			13.20			18.20	П Запорожье . . . О							
							О Запорожье . . . П					13.30		
				12.15			П Ворошиловград . О							
5.25	4.25	4.15	5 55	5.00	2.40	5.20	*Время в пути*	5.30	4 25	4.15	5.30	6 10	2.40	5.10

МОСКВА—КИЕВ—МОСКВА

УК 321 Ил-12 #	УК 323 Ил-12 #	75 Аэропорты	УК 322 Ил-12 #	УК 324 Ил-12 #
12.00	21.00	О Внуково . . . . П	10.25	19.35
14.40	23.40	П Киев . . . . . . О	7.50	17.00
2.40	2.40	*Время в пути*	2.35	2.35

МОСКВА—ЛЬВОВ—КИШИНЕВ—МОСКВА

УК 315 Ли-2 #	УК 317 Ли-2 #	76 Аэропорты	УК 316 Ли-2 #	УК 318 Ли-2 #
16.05	7.10	О Внуково . . . . П	14.05	15.35
19 25	10.30	П Киев . . . . . О	10.50	12.20
20.05	11.20	О Киев . . . . . П	9.50	11.35
22.05		П Львов . . . . . . О	7.50	
		О Львов . . . . . . П		
—	13.05	П Кишинев . . . . О		9.50
6.00	5 55	*Время в пути*	6.15	5.45

На борту пассажирских самолетов имеются буфеты с горячими и прохладительными напитками, кондитерскими изделиями, бутербродами.

МОСКВА—ОДЕССА—МОСКВА

УК 305 Ли-2 почт. #	УК 307 Ли-2 #	УК 311 Ли-2 #	77 Аэропорты	УК 306 Ли-2 #	УК 308 Ли-2 #	УК 312 Ли-2 #
—	13.30	10 00	О Внуково . . . . П	—	11.55	21.25
7.50			О Быково . . . . . П	15.10		
9.40			П Воронеж . . . . О	13.15		
10.20			О П	12.25		
12.25			П Днепропетровск. О	10 20		
13.05			О П	9.40		
14.20			П Николаев . . . . О	8.25		
15.00			О П	7.45		
		12.40	П Харьков . . . . О			18.45
		13.25	О П			18.00
		15.10	П Каховка. . . . . О			16.15
		15.40	О П			15.45
		16.00	П Херсон . . . . . О			15.25
		16.40	О П			14.45
	16.50		П Киев . . . . О		8.40	
	17.45		О П		8 00	
15.40	19.35	17.25	П Одесса . . . . . . О	7.05	6.10	14.00
7.50	**6.05**	**7.25**	*Время в пути*	**8.05**	**5.45**	**7.25**

ЛЕНИНГРАД—ХАРЬКОВ—ОДЕССА—ЛЕНИНГРАД

СВ 381 Ли-2 #	СВ 387 Ли-2 #	80 Аэропорты	СВ 382 Ли-2 #	СВ 388 Ли-2 #
1.00	21.20	О Ленинград . . . П	22.55	15.40
	0.30	П Быково . . . . . О		12.20
	1.30	О П		11.10
4.00		П Минск . . . . . . О	19.55	
4.40		О П	19.10	
6.30		П Киев . . . . О	17 10	
7.30		О П	16.00	
9.15		П Кишинев . . . . О	14.15	
9.55		О П	13.35	
10.40		П Одесса . . . . . . О	12.50	
		О П		
	3.20	П Воронеж . . . . О		9.15
	4.05	О П		8.35
	5.20	П Харьков . . . . О		7.20
9.40	**8.00**	*Время в пути*	**10 05**	**8.20**

МОСКВА—СТАНИСЛАВ—МОСКВА

УК 319 Ли-2 3.5.7	78 Аэропорты	УК 320 Ли-2 2.4.6
9.25	О Внуково . . . . П	18.25
12.45	П Киев . . . . О	15.10
13.25	О П	14.25
15.25	П Станислав . . . О	12.25
6.00	*Время в пути*	**6.00**

МОСКВА—УЖГОРОД—МОСКВА

УК 313 Ли-2 2.4.6	79 Аэропорты	УК 314 Ли-2 1.3.5
9.25	О Внуково . . . . П	18.25
12.45	П Киев . . . . О	15.10
13.25	О П	14.25
15.25	П Львов . . . . О	12.25
16.10	О П	11.45
17.10	П Ужгород . . . . О	10.45
7.45	*Время в пути*	**7.40**

РИГА—КИЕВ—ОДЕССА—РИГА

ЗП 395 Ли-2 #	ЗП 397 Ли-2 #	81 Аэропорты	ЗП 396 Ли-2 #	ЗП 398 Ли-2 #
17.20	5.35	О Рига . . . . П	13.35	23.55
	7.05	П Вильнюс . . . . О		22.25
	7.40	О П		21.55
19.25	8.40	П Минск . . . . . . О	11.35	20.50
20.05	9.25	О П	10.55	20.00
21.55	11.15	П Киев . . . . О	8.55	18.00
	12.05	О П		17.20
	13.55	П Одесса . . . . . О		15.30
4.35	**8.20**	*Время в пути*	**4.40**	**8.25**

РОСТОВ—КИЕВ—РОСТОВ

СК 445 Ли-2 #	82 Аэропорты	СК 446 Ли-2 #
7.30	О Ростов . . . . . П	19.40
8.25	П Сталино . . . . . О	18 45
9.05	О П	18.00
10.00	П Днепропетровск. О	17.05
10.40	О П	16.20
12.25	П Киев . . . . . . О	14.35
4.55	*Время в пути*	**5.05**

КУЙБЫШЕВ—САРАТОВ—ХАРЬКОВ—КУЙБЫШЕВ

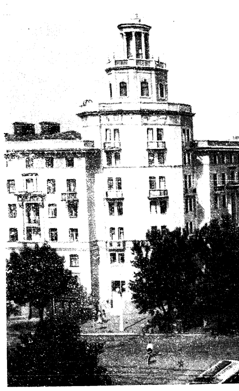
ПВ 509 Ли-2 #	ПВ 535 Ли-2 ч. т.	83 Аэропорты	ПВ 510 Ли-2 #	ПВ 536 Ли-2 ч. т.
21.45		О Куйбышев . . П	12.05	—
	5.30	О Саратов . . . . . П		18.15
23.35	6.20	П Пенза . . . . О	10 20	17.25
0.30	7.05	О П	9.40	16.45
2.20	8.55	П Воронеж . . . . О	7.50	15.00
3.00	9.45	О П	7.10	14.25
4.15	11.00	П Харьков . . . . О	6.00	13.15
6.30	**5.30**	*Время в пути*	**6.05**	**5.00**

БАТУМИ—ОДЕССА—БАТУМИ

ГЗ 451 Ли-2 #	84 Аэропорты	ГЗ 452 Ли-2 #
7.10	О Батуми . . . . . . П	14.55
8.00	П Сухуми . . . . . . О	14.05
9.05	О П	13.05
11.50	П Симферополь . . . О	10.20
13.05	О П	9.30
15.[illegible]0	П Одесса . . . . О	7.15
8.10	*Время в пути*	**7.40**

БАКУ—ХАРЬКОВ—БАКУ

АЗ 453 Ли-2 #	85 Аэропорты	АЗ 454 Ли-2 #
7.25	О Баку . . . . П	16.35
8.55	П Махачкала . . . . . О	15.05
9.40	О П	14.25
11.25	П Мин. Воды . . . . . О	12.40
12.25	О П	11.45
14.20	П Ростов . . . . О	9.50
15.15	О П	9.05
17.15	П Харьков . . . . . . О	7 05
9.50	*Время в пути*	**9.30**



Ростов н/Д.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

МОСКВА—МИНСК—ВИЛЬНЮС—КАЛИНИНГРАД—РИГА—ТАЛЛИН—МОСКВА

ЗП 329 Ли-2 #	ЗП 331 Ли-2 #	ЗП 339 Ли-2 #	ЗП 343 Ли-2 #	СВ 363 Ли-2 #		**86** Аэропорты		ЗП 330 Ли-2 #	ЗП 332 Ли-2 #	ЗП 340 Ли-2 #	ЗП 344 Ли-2 #	СВ 364 Ли-2 #
13.10	5.45	14.40	13.40	2.50	О	Внуково	П	11.20	19.10	12.45	12.05	23.55
16.20	8.55	17.50			П	Минск	О	8.35	16.25			
—	9.40	18.30			О		П	—	15.25			
—		19.35			П	Вильнюс	О	—		9.30		
—		—			О		П	—		—		
—	12.05	—			П	Калининград	О	—	13.15	—		
—	—	—			О		П	—	—	—		
—	—	—	15.40	4.50	П	Великие Луки	О	—	—	—	10.20	
—	—	—	16.20	5.30	О		П	—	—		9.35	
—	—	—	18.10	7.20	П	Рига	О	—	—	—	8.00	20.35
—	—	—	—	8.10	О		П	—	—	—	—	19.45
—	—	—	—	9.35	П	Таллин	О	—	—	—	—	18.20
3.10	6.20	4.55	4.30	6.45		*Время в пути*		2.45	5.55	3.15	4.05	5.35

МОСКВА—ЛЕНИНГРАД—МОСКВА

СВ 349 Ил-12 #	СВ 351 Ил-12 #	СВ 365 Ли-2 #		**87** Аэропорты		СВ 350 Ил-12 #	СВ 352 Ил-12 #	СВ 366 Ли-2 #
20.50	12.10	7.50	О	Внуково	П	19.25	10.45	20.35
23.30	14.50	11.10	П	Ленинград	О	16.55	8.15	17.35
—	—	12.10	О		П	—	—	16.50
—	—	13.50	П	Таллин	О	—	—	15.15
2.40	2.40	6.00		*Время в пути*		2.30	2.30	5.20

КИЕВ—ЛЕНИНГРАД—КИЕВ

УК 409 Ил-12 #		**88** Аэропорты		УК 410 Ил-12 #
9.05	О	Киев	П	20.10
10.40	П	Минск	О	18.40
11.25	О		П	18.00
13.50	П	Ленинград	О	15.35
4.45		*Время в пути*		4.35

В крупных аэропортах имеются комнаты матери и ребенка, где маленьким пассажирам обеспечен хороший отдых и заботливый уход.

МОСКВА—СЫКТЫВКАР—ПЕЧОРА—ВОРКУТА—НОРИЛЬСК—МОСКВА

СВ 81 Ли-2 #	СВ 83 *) Ли-2 ч. т.	СВ 85 Ли-2 #	СВ 87 Ли-2 #		**89** Аэропорты		СВ 82 Ли-2 #	СВ 84*) Ли-2 н. ч.	СВ 86 Ли-2 #	СВ 88 Ли-2 #
20.45	9.50	8.20	0.35	О	Быково	П	4.30	22.05	17.20	6.20
22.25	11.30	10.00	2.15	П	Горький	О	2.35	20.10	15.25	4.25
23.05	12.10	10.45	2.55	О		П	1.50	19.25	14.45	3.40
0.55	14.00	12.35	4.45	П	Киров	О	24.00	17.35	12.55	1.50
1.40	14.35	13.15	5.25	О		П	23.15	16.55	12.15	1.10
3.10	16.05	14.45	6.55	П	Сыктывкар	О	21.45	15.25	10.45	23.40
4.55	16.55	—	8.25	О		П	19.45	14.15	—	21.40
	18.05	—	9.35	П	Ухта	О		13.05	—	20.25
	18.35	—	10.15	О		П		12.25	—	19.35
7.00	19.35	—	11.15	П	Печора	О	17.35	11.20	—	18.30
7.40	—	—	12.00	О		П	16.55	—	—	17.50
9.20	—	—	13.40	П	Воркута	О	15.10	—	—	16.05
10.10	—	—	—	О		П	14.20	—	—	—
15.00	—	—	—	П	Норильск	О	9.15	—	—	—
18.15	9.45	6.25	13.05		*Время в пути*		19.15	10.45	6.35	14.15

КУЙБЫШЕВ—ЛЕНИНГРАД—КУЙБЫШЕВ

ПВ 495 Ли-2 ч. т.		**90** Аэропорты		ПВ 496 Ли-2 н. ч.
8.45	О	Куйбышев	П	16.25
11.05	П	Горький	О	14.05
11.50	О		П	13.20
13.45	П	Быково	О	11.40
14.50	О		П	10.40
18.00	П	Ленинград	О	7.20
9.15		*Время в пути*		9.05

*) Рейс 83 отправляется: из Москвы до Печоры — по четным числам, до Ухты — по нечетным числам, из Печоры в Москву — по нечетным числам, из Ухты в Москву — по четным числам.

РИГА—ТАЛЛИН—ЛЕНИНГРАД—РИГА

ЗП 603 Ли-2 1.2.3.6.7.	ЗП 603 Ли-2 5	ЗП 393 Ли-2 *)		**91** Аэропорты		ЗП 604 Ли-2 1.2 3.4	ЗП 604 Ли-2 5.7	ЗП 394 Ли-2 н. ч.
22.15	3.00	12.15	О	Рига	П	5.15	9.15	20.10
		13.40	П	Таллин	О			18.45
		14.10	О		П			18.15
0.20	5.05	15.50	П	Ленинград	О	3.10	7.10	16.40
2.05	2.05	3.35		*Время в пути*		2 05	2.05	3.30

*) Выполняется как дополнительный

МОСКВА—АРХАНГЕЛЬСК—МУРМАНСК—МОСКВА

СВ 357 Ли-2 почт. #	СВ 361 Ли-2 #		**92** Аэропорты		СВ 358 Ли-2 #	СВ 362 Ли-2 #
8.15	23.40	О	Внуково	П	21.50	19.45
10.05	1.30	П	Череповец	О	20.00	
10.55	2.15	О		П	19.15	
11.30		П	Вологда	О		17.55
12.10		О		П		17.15
14.55	5.10	П	Архангельск	О	16.30	14.35
—	6.20	О		П	—	13.35
—	8.50	П	Мурманск	О	—	11.00
6.40	9.10		*Время в пути*		5.20	8.45

МОСКВА—КРАСНОЯРСК—МОСКВА

МС 23 Ли-2 #		93 Аэропорты		МС 24 Ли-2 #
12.35	О	Быково	П	18.50
15.25 16.05	П О	Казань	О П	15.40 14.55
19.00 19.50	П О	Свердловск	О П	11.35 10.25
21.05 21.45	П О	Тюмень	О П	9.05 8.15
24.00 1.25	П О	Омск	О П	5.40 4.30
3.55 4.35	П О	Новосибирск	О П	1.40 1.00
7.15	П	Красноярск	О	21.55
18.40		*Время в пути*		20.55

Район строительства Братской ГЭС на реке Ангаре.

ТАРИФЫ

на перевозки пассажиров и багажа по международным воздушным линиям

(Тарифы могут быть изменены без предупреждения)

От / До	Класс	В рублях: туда	туда и обратно	багаж за 1 кг	Перевозчик	Маршрут
МОСКВА						
Амстердам	I	893	1608	8.95	АФЛ/САС	Стокгольм или Копенгаген
	T	832	1498			
	I	893	1608	8.95	АФЛ/КЛМ	Стокгольм или Прага или Вена
	T	825	1485			
	I	893	1608	8.95	АФЛ/АУ	Хельсинки
	T	832	1498			
Афины	I	918	1653	9.20	АФЛ/ЮАТ	Белград
	T	846	1523			
Багдад	I	1641	2954	16.45	АФЛ/ЮАТ	Белград—Каир—Стамбул
	T	1363	2454			
Бангкок	I	3290	5922	32.90	АФЛ/САС	Стокгольм или Копенгаген или Вена
	T	2562	4612			
	I	3290	5922	32.90	АФЛ/АФ	Париж
	T	2562	4612			
	I	3063	5514	30.65	АФЛ/ЮАТ	Белград—Каир—Стамбул
	T	2459	4427			
Белград	IT	655	1179	6.55	АФЛ	
Берлин	IT	590	1062	5.90	АФЛ	
Бейрут	I	1339	2411	13.40	АФЛ/ЮАТ	Белград—Афины—Стамбул
	T	1155	2079			
Бирмингам	I	1024	1844	10.25	АФЛ/БЕА	Хельсинки
	T	896	1613			
Бомбей	I	2607	4693	26.10	АФЛ/САС	Стокгольм или Копенгаген или Вена
	T	2013	3624			
	I	2369	4265	23.70	АФЛ/ЮАТ	Белград—Афины—Стамбул
	T	1865	3357			
	I	2644	4760	26.45	АФЛ/АИ	Прага
	T	2018	3687			
Брюссель	I	896	1613	9.00	АФЛ/САС	Стокгольм или Копенгаген
	T	832	1498			
	I	896	1613	9.00	АФЛ/КЛМ	Стокгольм или Прага или Вена или Варшава
	T	825	1485			
	I	896	1613	9.00	АФЛ/СН	Прага
	T	824	1484			
	T	830	1494	8.30	АФЛ/СН	Варшава
Буэнос-Айрес	I	3633	6540	36.35	АФЛ/КЛМ	Прага или Вена или Стокгольм
	I	3633	6540	36.35	АФЛ/АФ	Париж
Будапешт	IT	575	1035	5.75	АФЛ	
Бухарест	IT	565	1017	5.65	АФЛ	
Варшава	IT	435	783	4.35	АФЛ/ЛОТ	
Вена	IT	635	1143	6.35	АФЛ	
Дамаск	I	1339	2411	13.40	АФЛ/ЮАТ	Белград—Афины—Стамбул
	T	1155	2079			

От / До	Класс	В рублях			Перевозчик	Маршрут
		туда	туда и обратно	багаж за 1 кг		
МОСКВА						
Джакарта	I	3102	5584	31.05	АФЛ/КЛМ	Стокгольм или Прага или Вена
	T	2519	4535			
	I	3198	5757	32.00	АФЛ/ЮАТ	Белград—Афины—Стамбул
	T	2593	4668			
Дели	I	2351	4232	23.55	АФЛ/КЛМ	Стокгольм или Вена
	T	1859	3347			
Дели	I	2674	4814	26.75	АФЛ/АФ	Париж
	T	2080	3744			
	I	2447	4405	24.50	АФЛ/ЮАТ	Белград—Афины—Стамбул
	T	1932	3478			
	I	2711	4880	27.15	АФЛ/АИ	Прага
	T	2115	3807			
Женева	I	923	1662	9.25	АФЛ/СР	Прага
	T	853	1536			
	I	862	1552	8.65	АФЛ/СР	Вена
	T	800	1440			
Кабул	IT	910	1638	9.30	АФЛ	
Каир	I	1339	2411	13.40	АФЛ/ЮАТ	Белград—Афины—Стамбул
	T	1145	2061			
Калькутта	I	2593	4668	25.95	АФЛ/ЮАТ	Белград—Афины—Стамбул
	T	2055	3700			
	I	2869	5165	28.70	АФЛ/АИ	Прага
	T	2239	4031			
Кантон	I	2132	3838	22.00	АФЛ/МХД	Пекин
Карачи	I	2291	4124	22.95	АФЛ/ЮАТ	Белград—Афины—Стамбул
	T	1843	3318			
	I	2644	4759	26.45	АФЛ/АИ	Прага—Бомбей
	T	2048	3687			
	I	2565	4617	25.65	АФЛ/АИ	Прага
	T	2026	3647			
Копенгаген	I	667	1201	6.70	АФЛ/САС	
	T	667	1201			
	I	667	1201	6.70	АФЛ/АУ	Хельсинки
	T	667	1201	6.70	АФЛ/ЛОТ	Варшава
Лондон	I	1002	1804	10.05	АФЛ/САС	Стокгольм или Копенгаген
	T	874	1574			
	I	1002	1804	10.05	АФЛ/АФ	Париж
	T	874	1574			
	I	1002	1804	10.05	АФЛ/АУ	Хельсинки
	T	874	1574			
	T	874	1574	8.75	АФЛ/ЛОТ	Варшава
Монреаль	I	2524	4544	25.25	АФЛ/АФ	Париж
	T	1960	3528			
Монтевидео	I	3633	6540	36.35	АФЛ/САС	Стокгольм или Копенгаген или Вена
	I	3633	6540	36.35	АФЛ/КЛМ	Стокгольм или Прага или Вена
	I	3633	6540	36.35	АФЛ/АФ	Париж

От / До	Класс	В рублях			Перевозчик	Маршрут
		туда	туда и обратно	багаж за 1 кг		
МОСКВА						
Нанкин	I	1862	3352	20.05	АФЛ/МХД	Пекин
Нью-Йорк	I	2580	4644	25.80	АФЛ/САС	Стокгольм или Копенгаген
	T	1980	3564			
	I	2580	4644	25.80	АФЛ/КЛМ	Стокгольм или Прага или Вена
	T	1980	3564			
	I	2784	5012	27.85	АФЛ/СР	Прага
	T	2095	3771			
	I	2580	4644	25.80	АФЛ/СН	Прага
	T	1980	3564			
	I	2580	4644	25.80	АФЛ/АФ	Париж
	T	1980	3564			
Осло	I	667	1201	6.70	АФЛ/САС	Рига
	T	667	1201			
Париж	I	898	1617	9.00	АФЛ/АФ	Прага или Вена
Пекин	IT	1662	2992	17.30	АФЛ/МХД	Иркутск
Пхеньян	IT	1760	3168	22.30	АФЛ/УКА	Чита
Прага	IT	665	1197	6.65	АФЛ/ЧСА	Вильнюс
Рангун	I	2942	5296	29.45	АФЛ/МХД	Иркутск—Пекин
Рим	I	1166	2099	11.70	АФЛ/ЮАТ	Белград
	T	1027	1849	11.70		
Рим	I	905	1629	9.05	АФЛ/САС	Вена
	T	832	1498			
	I	905	1629	9.05	АФЛ/КЛМ	Вена
	T	832	1498			
	I	905	1629	9.05	АФЛ/БЕА	Вена
	T	846	1523			
Рио-де-Жанейро	I	3501	6302	35.05	АФЛ/САС	Стокгольм или Копенгаген или Вена
Рио-де-Жанейро	I	3501	6302	35.05	АФЛ/АФ	Париж
Сант-Яго	I	3841	6914	38.45	АФЛ/САС	Стокгольм или Копенгаген или Вена
	I	3841	6914	38.45	АФЛ/КЛМ	Стокгольм или Прага или Вена
Сайн-Шанда	IT	1397	2515	14.65	АФЛ/МХД	Иркутск
София	IT	615	1107	6.15	АФЛ	
Стамбул	I	996	1793	10.00	АФЛ/ЮАТ	Белград
	T	903	1626			
Стокгольм	I	557	1003	5.60	АФЛ/САС	Рига
	T	557	1003			
Стокгольм	I	557	1003	5.60	АФЛ/АУ	Хельсинки
	T	557	1003			
Тегеран	I	1854	3338	18.55	АФЛ/ЮАТ	Белград—Афины—Каир—Стамбул
	T	1507	2713			
Тель-Авив	I	1406	2531	14.10	АФЛ/ЮАТ	Белград—Каир—Афины—Стамбул
	T	1215	2187			
Тирана	IT	755	1359	7.55	АФЛ	
Токио	I	4141	7454	41.45	АФЛ/САС	Стокгольм или Копенгаген или Вена
	T	3178	5721			
	I	3897	7015	39.00	АФЛ/КЛМ	Стокгольм или Прага или Вена
	T	3012	5422			
	I	4141	7454	41.45	АФЛ/АФ	Париж
	T	3178	5721			

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

От / До	Класс	В рублях: туда	В рублях: туда и обратно	В рублях: багаж за 1 кг	Перевозчик	Маршрут
МОСКВА						
Улан-Батор	1Т	1345	2421	13.45	АФЛ/МХД	Иркутск
Харбин	1Т	1490	2682	19.60	АФЛ/УКА	Чита
Хельсинки	1Т	455	819	4.55	АФЛ/АУ	
Цюрих	I	811	1460	8.15	АФЛ/САС	Вена
	Т	763	1374			
	I	872	1570	8.75	АФЛ/СР	Прага
	Т	815	1467			
Цюрих	I	811	1460	8.15	АФЛ/СР	Вена
	Т	763	1374			
	I	811	1460	8.15	АФЛ/БЕА	Вена
	Т	763	1374			
Шанхай	1Т	1918	3453	20.70	АФЛ/МХД	Пекин
Шеньян (Мукден)	1Т	1630	2934	21.00	АФЛ/УКА	Чита
АЛМА-АТА						
Урумчи	1Т	265	477	2.60	МХД АФЛ	
Кульджа	„	110	198	1.10	МХД АФЛ	
БУДАПЕШТ						
Белград	„	166	299	1.65	АФЛ	
Вена	„	118	212	1.25	АФЛ	Москва
Ленинград	„	830	1494	8.30	АФЛ	
Тирана	„	315	567	3.15	АФЛ	
БУХАРЕСТ						
Ленинград	„	820	1476	8.20	АФЛ	Москва
София	„	175	315	1.75	АФЛ	
ВАРШАВА						
Берлин	„	250	450	2.50	АФЛ	
Ленинград	„	690	1242	6.90	АФЛ	Москва
ВЕНА						
Ленинград	„	890	1602	8.90	АФЛ	Москва
ВИЛЬНЮС						
Берлин	„	385	693	3.85	АФЛ	
Варшава	„	225	405	2.25	АФЛ	
Прага	„	435	783	4.35	АФЛ	
ИРКУТСК						
Пекин	„	652	1174	6.50	АФЛ МХД	
Улан-Батор	„	220	366	2.20	АФЛ МХД	
КАБУЛ						
Берлин	„	1500	2700	15.20	АФЛ	Москва
Белград	„	1565	2817	15.85	АФЛ	Москва
Будапешт	„	1485	2673	15.05	АФЛ	Москва
Бухарест	„	1475	2655	14.95	АФЛ	Москва

От / До	Класс	В рублях: туда	В рублях: туда и обратно	В рублях: багаж за 1 кг	Перевозчик	Маршрут
КАБУЛ						
Варшава	1Т	1345	2421	13.65	АФЛ	Москва
Вена	„	1545	2781	15.65	АФЛ	Москва
Прага	„	1575	2835	15.95	АФЛ	Москва
София	„	1525	2745	15.45	АФЛ	Москва
Стокгольм	„	1467	2641	14.90	АФЛ	Москва
Ташкент	„	255	459	2.55	АФЛ	
Термез	„	140	252	1.40	АФЛ	—
Тирана	„	1665	2997	16.85	АФЛ	Москва
Хельсинки	„	1365	2457	13.85	АФЛ	
КИЕВ						
Белград	„	475	855	4.75	АФЛ	—
Будапешт	„	390	702	3.90	АФЛ	—
Бухарест	„	355	639	3.55	АФЛ	—
Вена	„	450	810	4.50	АФЛ	
Прага	„	435	783	4.35	АФЛ	
София	„	435	783	4.35	АФЛ	
Тирана	„	585	1053	5.85	АФЛ	
ЛЬВОВ						
Белград	„	350	630	3.50	АФЛ	
Будапешт	„	255	459	2.55	АФЛ	
Вена	„	320	576	3.20	АФЛ	
Тирана	„	455	819	4.55	АФЛ	
ОДЕССА						
Бухарест	„	225	405	2.25	АФЛ	
София	„	310	558	3.10	АФЛ	
ПЕКИН						
Белград	„	2317	4171	23.85	МХД/АФЛ	Иркутск—Москва
Берлин	„	2252	4054	23.20	МХД/АФЛ	Иркутск—Москва
Будапешт	„	2237	4027	23.05	МХД/АФЛ	Иркутск—Москва
Бухарест	„	2227	4009	22.95	МХД/АФЛ/ЛОТ	Иркутск—Москва
Варшава		2097	3775	21.65		
Вена	„	2297	4135	23.65	МХД/АФЛ	Иркутск—Москва
Ленинград	„	1917	3451	19.85	МХД/АФЛ	Иркутск—Москва
Париж	„	2492	4486	25.60	МХД/АФЛ/АФ	Иркутск—Москва
					ЧСА, АФ	Иркутск—Москва
Прага	„	2327	4189	23.95	МХД/АФЛ/ЧСА	Иркутск—Москва
София	„	2277	4099	23.45	МХД/АФЛ	Иркутск—Москва
Стокгольм	„	2219	3994	22.90	МХД/АФЛ	Иркутск—Москва
Тирана	„	2417	4351	24.85	МХД/АФЛ	Иркутск—Москва
Улан-Батор	„	460	828	4.60	МХД/АФЛ	
Хельсинки	„	2117	3811	21.85	МХД/АФЛ	Иркутск—Москва
	„				МХД/АФЛ	Иркутск—Москва

От / До	Класс	В рублях: туда	туда и обратно	багаж за 1 кг	Перевозчик	Маршрут
ПРАГА						
Варшава	1Т	216	389	2.15	АФЛ ЧСА	—
Ленинград	1Т	920	1656	9.20	ЧСА	Москва
Париж	Т	229	411	3.15	АФЛ ЧСА	
РИГА						
Лондон	1	644	1160	6.45	АФЛ/САС	Стокгольм или Копенгаген
	Т	527	949			
Москва	1	347	625	3.50	АФЛ/САС	Стокгольм или Копенгаген
Нью-Йорк	1	2233	4020	22.35	АФЛ/САС	Стокгольм или Копенгаген
	Т	1633	2940			
Осло	1Т	348	627	3.50	АФЛ/САС	Стокгольм
	1Т	392	706	3.95	АФЛ/САС	Копенгаген
Стокгольм	1Т	210	378	2.10	АФЛ/САС	—
Копенгаген	1Т	334	602	3.35	АФЛ/САС	—
ТАШКЕНТ						
Кабул	1Т	255	459	2.55	АФЛ	
ТЕРМЕЗ						
Кабул	1Т	140	252	1.40	АФЛ	
ТИРАНА						
Белград	1Т	215	387	2.15	АФЛ	Москва
Ленинград	1Т	1010	1818	10.10	АФЛ	
УЛАН-БАТОР						
Берлин	1Т	1935	3483	19.35	АФЛ	Иркутск Москва
Белград	1Т	2000	3600	20.00	АФЛ	Москва
Будапешт	1Т	1920	3456	19.20	АФЛ	Москва
Бухарест	1Т	1910	3438	19.10	АФЛ	Москва
Варшава	1Т	1780	3204	17.80	АФЛ	Москва
Вена	1Т	1980	3564	19.80	АФЛ	Москва
Киев	1Т	1605	2889	16.05	АФЛ	Москва
Ленинград	1Т	1600	2880	16.00	АФЛ	Москва
Прага	1Т	2010	3618	20.10	АФЛ	Москва
София	1Т	1960	3528	19.60	АФЛ	Москва
Стокгольм	1Т	1902	3424	19.05	АФЛ	Москва
Тирана	1Т	2100	3780	21.00	АФЛ	Москва
Хельсинки	1Т	1800	3240	18.00	АФЛ	Москва
ЧИТА						
Пхеньян	1Т	665	1197	6.65	УКА/АФЛ	Шеньян (Мукден)
Харбин	1Т	395	711	3.95	УКА/АФЛ	
Шеньян	1Т	535	963	5.35	УКА/АФЛ	
ПХЕНЬЯН						
Берлин	1Т	2350	4230	28.20	УКА/АФЛ	
Белград	1Т	2415	4347	28.85	УКА/АФЛ	
Будапешт	1Т	2335	4203	28.05	УКА/АФЛ	
Бухарест	1Т	2325	4185	27.95	УКА/АФЛ	Москва
Варшава	1Т	2195	3951	26.65	УКА/АФЛ	Москва
Вена	1Т	2395	4311	28.65	УКА/АФЛ	Москва
Прага	1Т	2425	4365	28.95	УКА/АФЛ	Москва
София	1Т	2375	4275	28.45	УКА/АФЛ	Москва
Тирана	1Т	2515	4527	29.85	УКА/АФЛ	Москва
Хельсинки	1Т	2215	3987	26.85	УКА/АФЛ	Москва

ТАРИФЫ

на перевозки пассажиров, багажа и грузов по внутренним воздушным линиям Аэрофлота

От / До	Пассажирский в руб.: жесткий	мягкий	Багажный за 1 кг, руб. и коп.	Грузовой за 1 кг, руб. и коп.
МОСКВА				
Адлер	425	470	5.25	3.10
Акмолинск	540	620	6.20	4.30
Актюбинск	330	385	4.15	2.45
Алма-Ата	680	750	7.50	4.40
Арзамас	150	165	1.65	1.30
Архангельск	345	385	3.85	3.10
Астрахань	305	340	3.65	2.15
Атбасар	545	605	6.05	4.55
Ашхабад (через Баку)	685	765	10.20	6.00
Баку (через Сталинград)	450	495	6.80	4.00
Балхаш	660	730	7.30	4.40
Барнаул	705	785	7.85	6.30
Великие Луки	165	185	1.85	1.50
Вильнюс	185	215	2.15	1.75
Владивосток	1445	1700	21.25	12.50
Вологда	140	155	1.55	1.25
Воронеж	140	155	1.70	1.00
Ворошиловград	210	230	2.90	1.70
Воркута	620	685	6.85	5.50
Горький	160	180	1.95	1.15
Грозный	455	525	5.85	3.45
Гурьев	480	530	5.30	3.85
Джусалы	450	520	5.60	3.30
Днепропетровск	255	285	2.85	1.85
Ереван	550	610	6.10	4.90
Жданов	255	295	3.25	1.90
Запорожье	265	305	3.30	1.95
Ижевск	335	370	3.70	2.50
Иркутск	850	980	10.80	6.35
Казань	250	280	2.80	1.65
Калининград	320	355	3.55	2.85
Караганда	550	635	6.35	4.40
Каховка	265	295	2.95	2.00
Кемерово	725	805	8.05	5.85
Киев	220	245	2.80	1.65
Киров (через Горький)	250	275	2.75	2.20
Киренск	1430	1590	15.90	11.90
Кишинев	340	375	4.25	2.50
Краснодар	370	410	5.10	2.95
Красноярск	730	810	8.15	4.80
Куйбышев	240	265	3.00	1.75
Курган	455	525	5.60	3.30
Курск	150	165	1.65	1.30
Кустанай	455	520	5.20	4.15
Кутаиси	465	540	6.20	3.65
МОСКВА				
Ленинабад	625	700	7.00	4.60
Ленинград	185	240	2.45	1.45
Львов	340	375	4.25	2.50
Магдагачи	1160	1285	18.20	10.70
Магнитогорск	420	470	5.10	3.00
Магадан (через Якутск)	2340	2600	26.00	19.50
Махачкала	395	420	6.30	3.70
Мин. Воды	425	470	5.25	3.10
Минск	155	180	1.80	1.40
Молотов	390	435	4.35	2.90
Мурманск	450	500	5.00	4.00
Норильск (через Воркуту)	1185	1315	13.15	10.50
Николаев (через Днепропетровск)	270	300	3.55	2.05
Новосибирск	595	680	7.65	4.50
Нукус	760	845	8.45	6.75
Одесса	280	315	3.75	2.20
Олекминск	1925	2140	21.40	16.05
Омск	540	605	6.30	3.70
Охотск (через Якутск)	2145	2385	23.85	17.90
Павлодар	630	700	7.00	5.60
Печора	510	565	5.65	4.50
Пенза	160	185	2.05	1.20
Петрозаводск	285	315	3.15	2.50
Петропавловск (Казах)	495	570	5.85	3.45
Рига	250	280	2.55	2.00
Ростов	270	300	3.85	2.25
Самарканд	700	780	7.80	6.25
Саратов	215	240	2.70	1.60
Свердловск	410	470	5.10	3.00
Семипалатинск	700	770	7.70	6.15
Симферополь	310	340	4.25	2.50
Сталинабад	800	885	8.85	6.90
Сталинград	220	255	3.00	1.75
Сталино	350	390	3.90	3.10
Сухуми	440	505	6.10	3.60
Сыктывкар (через Горький)	390	430	4.30	3.45
Таллин (через Ленинград)	270	340	3.40	2.00
Таллин (через Ригу)	325	360	3.60	2.90
Ташкент	555	640	6.90	4.05
Тбилиси	485	580	6.40	3.75
Ужгород	415	460	5.00	3.20
Улан-Удэ	895	985	12.60	7.40

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

От / До	Пассажирский в руб. жесткий	Пассажирский в руб. мягкий	Багажный за 1 кг, руб. и коп.	Грузовой за 1 кг, руб. и коп.
МОСКВА				
Ульяновск	235	260	2.60	2.10
Уральск	300	335	3.35	2.35
Усть-Каменогорск	740	820	8.20	6.55
Уфа	370	410	4.70	2.75
Ухта	455	505	5.05	4.05
Фрунзе	645	715	7.15	4.20
Хабаровск	1325	1460	20.15	11.85
Харьков	195	215	2.90	1.70
Херсон	270	300	3.45	2.05
Челябинск	450	500	5.20	3.50
Чимкент	640	710	7.10	5.70
Чита	960	1065	15.65	9.20
Чкалов	325	360	3.60	2.90
Ю.-Сахалинск	1850	2045	26.00	16.25
Якутск	1970	2205	22.90	16.60
АЛМА-АТА				
Адлер	895	985	9.85	7.90
Акмолинск	300	335	3.35	2.50
Актюбинск	580	665	5.80	3.40
Астрахань	730	810	8 10	6.50
Балхаш	210	235	2.35	1.75
Гурьев	700	770	7.70	6.15
Караганда	260	290	2.90	2.15
Кокчетав	320	355	3.55	2.65
Курган	400	445	4.45	3.35
Кустанай	430	475	4.75	3.60
Мин. Воды	780	865	8 65	6.90
Новосибирск	420	470	5.10	3.00
Петропавловск (Каз)	350	390	3.90	2.95
Свердловск	460	510	5.10	3.85
Семипалатинск (через Аягуз)	305	340	3.40	2.70
Талды-Курган	120	135	1.35	1.10
Ташкент	270	305	3.50	2.05
Чимкент	205	250	2.50	1.60
АШХАБАД				
Баку	255	295	3.65	2.15
Краснодар	520	575	5.75	4.60
Красноводск	180	205	1.50	1.00
Мин. Воды	475	525	5.25	4.20
Симферополь	610	675	6.75	5.40
Ташкент	300	330	3.30	2.65
БАКУ				
Красноводск	140	160	1.50	1.00
Махачкала	120	140	1.55	0.90
Мин. Воды	220	255	2.80	1.65
Ростов	325	360	4.35	2.55
Ташкент	470	520	5.20	4.15
Харьков	410	470	5.25	3.15

От / До	Пассажирский в руб. жесткий	Пассажирский в руб. мягкий	Багажный за 1 кг, руб. и коп.	Грузовой за 1 кг, руб. и коп.
БАТУМИ				
Одесса	375	415	4.15	3.30
Симферополь	300	330	4.15	3.30
Сухуми	100	110	1.10	0.90
ЕРЕВАН				
Краснодар	315	350	3.50	2.80
Мин. Воды	340	375	3.75	3.00
Сухуми	240	265	2.65	2.10
КИЕВ				
Адлер	365	405	4.05	3.25
Днепропетровск	145	165	1.80	1.05
Запорожье	165	180	2.15	1.25
Краснодар	340	375	3.75	3.00
Мин. Воды	395	435	4.35	3.15
Минск	180	200	2.00	1.60
Ростов	295	325	3.25	2.60
Сталино	205	235	2.55	1.50
Сухуми	385	425	4.25	3.40
Тбилиси	460	510	5.10	4.10
КИШИНЕВ				
Адлер	325	360	3.60	2.90
Краснодар	280	310	3.10	2.50
Мин. Воды	350	390	3.90	3.10
Николаев	130	145	1.45	1.15
Одесса	70	80	0.80	0.65
Симферополь	195	215	2.15	1.70
Херсон	130	145	1.45	1.15
КУЙБЫШЕВ				
Адлер	400	445	4.45	3.55
Актюбинск	190	220	2.40	1.40
Воронеж	240	270	2.70	2.15
Горький	225	245	2.15	1.70
Джусалы	350	400	4.35	2.55
Казань	120	135	1.60	0.95
Краснодар	350	390	3.90	3.10
Мин. Воды	325	360	3.60	2.90
Пенза	150	165	1.65	1.30
Ростов	300	335	3.35	2.70
Саратов	135	155	1.35	1.10
Свердловск	285	315	3.15	2.55
Симферополь	430	480	4.80	3.85
Сталинград	220	240	2.40	1.90
Сухуми	430	475	4.75	3.80
Ташкент	425	490	5.35	3.15
Уфа	155	190	1.55	1.30
Харьков	330	365	3.65	2.90
Чкалов	155	170	1.70	1.30

От / До	Пассажирский в руб. жесткий	Пассажирский в руб. мягкий	Багажный за 1 кг, руб. и коп.	Грузовой за 1 кг, руб. и коп.
ЛЕНИНГРАД				
Адлер	520	575	5.75	4.60
Актюбинск	515	570	5.70	4.55
Воронеж	310	345	3.45	2.70
Днепропетровск	375	415	4.15	3.30
Джусалы	665	740	7.40	5.90
Киев	375	415	4.15	3.30
Киров (через Череповец)	305	340	3.40	2.70
Кишинев	435	480	4.80	3.85
Краснодар	470	520	5.20	4.15
Куйбышев	430	475	4.75	3.80
Мин. Воды	510	565	5.65	4.50
Минск	260	290	2.90	2.30
Молотов (через Череповец)	390	430	4.30	3.45
Новосибирск	795	885	8.85	7.10
Одесса	485	540	5.40	4 30
Омск	675	750	7.50	6.00
Пенза	355	395	3.95	3.15
Ростов	415	460	4.60	3.70
Рига	185	205	2.45	1.45
Свердловск (через Череповец)	455	505	5.05	4.05
Симферополь	455	505	5.05	4.05
Сталино	385	425	4.25	3.40
Сухуми	535	595	5.95	4.75
Ташкент	795	885	8.85	7.10
Тюмень	515	570	5.70	4.55
Харьков	335	370	3.70	2.95
Череповец	165	185	1.85	1.50
ЛЕНИНАБАД				
Ашхабад	295	325	3.25	2.60
Баку	530	590	5 90	4.70
Мары	250	275	2.75	2.20
Мин. Воды	700	770	7.70	6.15
Самарканд	70	80	0.95	0.55
Чарджоу	195	215	2.15	1.70
ЛЬВОВ				
Адлер	445	495	4.95	3.95
Краснодар	400	445	4.45	3.55
Мин. Воды	465	515	5.15	4.10
Одесса	220	245	2.45	1.95
Симферополь	315	350	3.50	2.80
Станислав	65	70	0.70	0.55
Сухуми	500	555	5.55	4.45
Херсон	260	290	2.90	2.30
Черновцы	110	120	1.20	0.95

От / До	Пассажирский в руб. жесткий	Пассажирский в руб. мягкий	Багажный за 1 кг. руб. и коп.	Грузовой за 1 кг. руб. и коп.
ОДЕССА				
Жданов	195	215	2.15	1.70
Запорожье	150	165	1.65	1 30
Киев	180	195	2.20	1.30
Краснодар	260	290	2.90	2.30
Мин. Воды	315	350	3.50	2.80
Минск	305	340	3.40	2.70
Николаев	75	85	1.20	0.70
Ростов (через Жданов)	235	260	2.60	2.10
Симферополь	160	175	1.75	1.40
Сталино	205	230	2.30	1.85
Херсон	95	105	1.05	0.85
РИГА				
Вильнюс	125	140	1.40	1.10
Днепропетровск	370	410	4.10	3.30
Киев	250	280	2.80	2.25
Мин. Воды	535	595	5.95	4.75
Минск	170	185	1.85	1.50
Одесса	350	390	3.90	3.10
Ростов	450	500	5.00	4.00
Таллин	85	100	1.20	0.70
РОСТОВ				
Днепропетровск	150	165	1.65	1.30
Краснодар	100	115	1.25	1.00
Саратов	230	255	2.55	2.05
Свердловск	490	545	5.45	4.40
Симферополь	200	225	2.25	1.80
Сталино	60	70	0.70	0.55
САРАТОВ				
Адлер	325	360	3.60	2.90
Воронеж	170	190	1.90	1.50
Краснодар	280	310	3.10	2.50
Мин. Воды	250	280	2.80	2.25
Пенза	70	80	0.85	0.50
Сталинград	120	135	1.60	0.95
Сухуми	340	380	3,80	3.05
Харьков (через Пензу)	270	300	3.00	2.40
СВЕРДЛОВСК				
Адлер	590	655	6.55	5.20
Актюбинск	230	270	2.70	2.15
Джусалы	395	440	4.40	3.50
Краснодар	540	600	6.00	4.80
Магнитогорск	195	215	2.55	1.50
Мин. Воды	520	575	5.75	4.60
Саратов (через Куйбышев)	345	385	3.85	3.10

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

От / До	Пассажирский в руб. жесткий	Пассажирский в руб. мягкий	Багажный за 1 кг, руб. и коп.	Грузовой за 1 кг, руб. и коп.
СВЕРДЛОВСК				
Симферополь	620	690	6.90	5.50
Сталинград	415	460	4.60	3.70
Сухуми	610	680	6.80	5.45
Челябинск	100	120	1.45	0.85
Ташкент	535	595	5.95	4.75
СТАЛИНАБАД				
Ашхабад	315	350	3.50	2.80
Баку	520	580	5.80	4.65
Мары	230	255	2.55	2.05
Мин. Воды	655	730	7.30	5.85
Термез	80	90	0.90	0.75
СТАЛИНО				
Адлер	185	205	2.20	1.30
Ворошиловград	70	80	0.85	0.50
Мин. Воды	225	250	2.50	2.00
Сухуми	270	300	3.60	2.40
ТАШКЕНТ				
Адлер	675	750	7.50	6.00
Актюбинск	355	410	4.50	2.65
Джусалы	190	220	2.40	1.40
Мин. Воды	630	700	7.00	5.60
Новосибирск	630	700	7.00	4.35
Семипалатинск	495	550	5.80	3.50
Сухуми	655	730	7.30	5.85
Чарджоу	205	235	2.55	1.50
Челябинск	495	550	5.50	4.40

От / До	Пассажирский в руб. жесткий	Пассажирский в руб. мягкий	Багажный за 1 кг, руб. и коп.	Грузовой за 1 кг, руб. и коп.
ТБИЛИСИ				
Ереван	160	185	1.30	1.20
Ташкент	580	645	6.45	5.15
ФРУНЗЕ				
Актюбинск	450	500	5.25	3.10
Астрахань	600	665	6.65	5.30
Гурьев	480	535	5.35	4.30
Джусалы	315	350	3.05	1.80
Мин. Воды	680	755	7.55	6.05
Ташкент	185	205	2.65	1.55
Чимкент	180	200	1.70	1.35
ХАБАРОВСК				
Иркутск	475	525	9.35	5.50
Магадан	1110	1235	12.35	9.30
Новосибирск	945	1045	15.20	8.95
Николаевск	305	340	3.40	2.55
Охотск	920	1020	10.20	7.65
Ю.-Сахалинск	525	585	5.85	4.40
ХАРЬКОВ				
Воронеж	125	140	1.40	1.10
Ижевск	380	420	4.20	3.35
Казань	310	345	3.45	2.75
Пенза	230	255	2.55	2.05
Свердловск	470	520	5.70	4.55
ЯКУТСК				
Витим	680	755	7.55	6.05
Красноярск	1330	1475	14.75	11.80
Киренск	850	940	9.40	7.50
Новосибирск	1375	1525	15.25	12.20
Олекминск	375	415	4.15	3.30

Ташкент. Театр Навои.

СПРАВКИ, ПРОДАЖА БИЛЕТОВ И ПРОЕЗД В АЭРОПОРТЫ

Город	Почтовый адрес агентства. Телефон.	Аэропорт. Тел. спр. бюро	Расстояние от аэропорта до города (км)	Время в пути (час. мин.), транспорт	Стоимость проезда (руб., коп.)	Место отправления транспорта из города	Местное время: + или — к моск. времени
Алма-Ата	ул. Фурманова, 58, тел. 37-12	Алма-Ата тел. 9-63-80	15	Авт. 30 мин.	1.80	От агентства	+3
Архангельск	ул. Набережная, 64, тел. 3-84-16	Архангельск, тел. 3-94-70	3	Парах. 15 мин.	1.00	Речная пристань	0
Ашхабад	ул. Карла Либкнехта, 49, тел. 48-57	Ашхабад, тел. 20-18	4	Авт.	1.00	Маршрут № 3	+2
Астрахань	ул. Ильича, 6, тел. 22-72	Астрахань, тел. 33-47	12	20 мин.	1.65	От агентства	+1
Баку	Проспект Ленина, 16, тел. 3-71-21	Баку, тел. 4-16-48	32	1.10	4.80	От агентства	+1
Батуми	ул. Карла Маркса, 42, тел. 3-26	Батуми, тел. 3-26	7	15 мин.	1.00	От агентства	+1
Берлин	Францозишештрассе, 53-56, тел. 220171	Шенефельд тел. 64-40-91	30		2 марки ГДР	От агентства	—2
Белград	Бульв. Революции, 17, тел. 26-612	Земун, тел. 37-414	5		50 динар	От агентства	—2
Будапешт	пл. Вереш Марти, 5, тел. 184-649	Ферихедь, тел. 140-051	16			От агентства	—2
Бухарест	Бульв. Республики, 16, тел. 6-33-46	Баняса, тел. 7-75-16	7			От агентства	—1
Варшава	пл. Конституции, 3, тел. 8-75-80	Окенце, тел. 4-02-41	10			От агентства	—2
Вена	Таборштрассе, 1/3, тел. 8-75-80	Швехат, тел. М 65350, доб. 016	17				—2
Вильнюс	Проспект Сталина, 31, тел. 2-27-46	Вильнюс, тел. 32-31	4	25 мин.	1.20	От агентства	0
Владивосток	ул. Пограничная, 2-8, тел. 31-77	Озерные Ключи, тел. 3-77	55	Пригор. поезда 2.00	5.00	Жел. дор. вокзал	+7
Вологда	ул. Сталина, 6, тел. 16-17	Вологда, тел. 12-00, доб. 7	7	Авт. 15 мин.	0.80	От агентства	0
Воронеж	Плехановская ул., 23, тел. 51-01	Воронеж, тел. 41-01	6	30 мин.	1.00	Жел. дор. вокзал	0
Ворошиловград	ул. Пушкина, 3, тел. 30-01	Ворошиловград, тел. 39-51	4	10 мин.	0.60	От агентства	0
Горький	ул. Свердлова, 6, тел. 3-14-10	Горький, тел. 6-03-17	30	45 мин.	3.00	Маршрут № 12	+1
Грозный	Первомайская ул., 119, тел. 2-19-46	Грозный, тел. 2-11-12	7	15 мин.	1.50	От агентства	+1
Днепропетровск	Пр. Карла Маркса, 82, тел. 4-62-42	Днепропетровск, тел. 4-13-36	16	40 мин.	2.40	От агентства	0

Город	Почтовый адрес агентства. Телефон.	Аэропорт. Тел. спр. бюро	Расстояние от аэропорта до города (км)	Время в пути (час. мин.), транспорт	Стоимость проезда (руб., коп.)	Место отправления транспорта из города	Местное время: + или — к моск. времени
Ереван	ул. Энгельса, 4	Ереван, тел. 2-35-58	9	Троллейбус		Пл. Шаумяна	+1
Ессентуки	Интернациональная ул., 2, курбюро, тел. 1-24	Мин. Воды, Аэропорт		Электропоезд от ст. Мин. Воды 1.00	3.60	Электропоезда	+1
Жданов	Проспект Республики, 40, тел. 13	Жданов, тел. 1-64	3			От агентства	0
Железноводск	Горизонтальная ул., 6, тел. 1-38	Мин. Воды, Аэропорт		Электропоезд от ст. Мин. Воды. 18 мин.	2.05	Электропоезда	+1
Запорожье	Проспект Ленина, 123, тел. 33-94	Запорожье, тел. 25-29	6	Авт. 30 мин.	1.05	Пл. Свободы	0
Иркутск	ул. Горького, 29, тел. 23-86	Иркутск, Аэропорт	7	Авт. 15 мин.	1.00	Центральный рынок	+5
Кабул	АФЛ, Представительство, тел. 1181	Кабул	8				+1,5
Казань	Университетская ул., 7, тел. 2-34-73	Казань, тел. 2-12-32	5	Троллейбус 20 мин.	0.80	Пл. Куйбышева	+1
Киев	ул. Карла Маркса, 6, тел. 5-31-82	Киев, тел. 5-41-52	10	Троллейбус 30 мин.	1.40	Крещатик, 50	0
Кисловодск	Привокзальная пл., тел. 5-05-83	Мин. Воды, Аэропорт		Электропоезд от ст. Мин. Воды 1.30	5.90	Электропоезда	+1
Кишинев	ул. Ленина, 132, тел. 28-62	Кишинев, тел. 10-85	3,5	Авт. 15 мин.	0.60	ул. Ленина	0
Копенгаген	Догмарус, Редхусплад-сен, тел. централь 8800	Каструп	10		2.50 дат кр.	От агентства	−2
Красноводск	Морской вокзал, тел. 1-25	Красноводск, тел. 3-84	10	20 мин.	1.50	Морской вокзал	+2
Краснодар	ул. Гоголя, 52, тел. 43-93	Краснодар, тел. 33-46	17	45 мин.	2.55	угол Красноармейской и ул. Гоголя	+1
Красноярск	ул. Карла Маркса, 78, тел. 33-28	Красноярск, тел. 20-01 доб. 0-14	5	15 мин.	0.45	Маршрут № 2	+4
Куйбышев	ул. Куйбышева, 115, тел. 15-85, 2-13-64	Куйбышев, тел. 2-11-00 доб. 11	30	Поезд от ст. Зудчаниновка		Жел. дор. вокзал	+1
Кутаиси	пл. Сталина, 1 тел. 95	Кутаиси, тел. 95	8	Авт. 15 мин.	1.00	От агентства	+1
Ленинград	Невский проспект, 54, тел. А 4-08-04,	Ленинград, К 2-59-27	17	45 мин.	2.20	Манежная пл. автобус № 39	0
Львов	ул. Первого Мая, 45, тел. 2-82-53	Львов, тел. 2-95-17 доб. 68	7	20 мин.	1.05	От агентства	0

Город	Почтовый адрес агентства. Телефон.	Аэропорт. Тел. спр. бюро	Расстояние от аэропорта до города (км)	Время в пути (час. мин.), транспорт	Стоимость проезда (руб., коп.)	Место отправления транспорта из города	Местное время: + или — к моск. времени
Магадан	ул. Горького, 33, тел. 15-98	Магадан	13	30 мин.	2.20	Пл. М. Горького	+8
Махачкала	ул. Эмирова, 6, тел. 1-70	Махачкала	8	15 мин.	1.00	От агентства	+1
Минск	Просп. Сталина, 48, тел. 2-18-82	Минск, тел. 2-16-21	3	15 мин.	0,75	Просп. Сталина	0
Молотов	ул. Ленина, 43, тел. 54-00	Молотов, тел. 2-63-49	7	15 мин.	0.90	Центр города	+2
Москва	Мал. Черкасский пер., 1/3, тел. Б 3-46-45	Внуково, тел. К 5-66-00	До а/п Внуково автобус, 30	1.10	4.50	Пл. Свердлова, гостиница «Метрополь»	0
		Быково, тел. К 5-30-46	до а/п Быково электропоезда с Казанского вокзала	30 мин.	2.55	Казанский вокзал	
Мурманск	Просп. Сталина, 48, тел. 33-29	Мурманск, тел. 1-35	25	Авт. 1.00	5.00	От агентства	0
Николаев	Плехановская ул., 63, тел. 3-47	Николаев, тел. 16-01	11	18 мин.	1.00	От агентства	0
Новосибирск	ул. Советская, 28, тел. 3-67-79	Новосибирск, тел. 30-070, доб. 10	6	15 мин.	0.90	Кр. Проспект, 46	+4
Норильск	ул. Б. Хмельницкого, 6, тел. 20-11	Надежда				От агентства	+4
Одесса	ул. Карла Маркса, 1, тел. 2-23-00	Одесса, тел. 20-60-11	13	40 мин.	1.80	Пл. Мартыновского	0
Омск	ул. Ленина, 4, тел. 7-73	Омск, тел. 66, 2 зв.	5	25 мин.	0.75	От агентства	+3
Осло	Торденскельдсгате, тел. 429874	Форнебю	10		2 норв. кр.	От агентства	−2
Париж	Елисейские Поля (VIII), 119, тел. Balzac 70-50	Орли Gobelins, тел. 51-41	18		200 франк.	От аэровокзала Париж Эксплананад де-Инвалид	−2
Пекин	Просп. Дунчананьцзе, 15, тел. 5-78-78	Пекин	18			От агентства	+5
Прага	Пл. Республики, 655/8, тел. 65741	Рузине, тел. 321541	14			От агентства	−2
Пхеньян	Просп. Сталина	Пхеньян	5				+5,5
Пенза	Московская ул., 61, тел. 37-62	Пенза, тел. 21-05	12			От агентства	+1
Пятигорск	Октябрьская ул., 7, тел. 27-86	Мин. Воды, тел. Аэропорт		Электропоезд от ст. Мин. Воды 20 мин.	2,30	Электропоезда	+1
Рига	Бульвар Райниса, 11, тел. 2-13-95	Рига, тел. 6-71-29	7	Авт. 20 мин.	1.20	От агентства	0

Город	Почтовый адрес агентства. Телефон.	Аэропорт. Тел. спр. бюро	Расстояние от аэропорта до города (км)	Время в пути (час. мин.), транспорт	Стоимость проезда (руб., коп.)	Место отправления транспорта из города	Местное время: + или — к моск. времени
Ростов н/Дону	ул. Энгельса, 58, тел. 36-33	Ростов н/Дону, тел. 45-33	11	35 мин.	1.50	От агентства	0
Самарканд	ул. Ленина, 37, тел. 9-50	Самарканд, тел. 2-57	8	20 мин.	1.20	Пл. Регистан	+2
Саратов	ул. Ленина, 84, тел. 2-03-06	Саратов, тел. 2-19-56	5			От агентства	+1
Свердловск	Банковский пер., 3, тел. Д 1-78-03	Кольцово, тел. Д 2-10-25 доб. 3-10	20	45 мин.	3.50	Гостиница «Центральная»	+2
Симферополь	Севастопольская ул., 18, тел. 1-06	Симферополь, тел. 12-17	14	30 мин.	2 00	От агентства	0
Сочи	Проспект Сталина, 19, тел. 29-36	Адлер, тел. 33-11	30—до Сочи			От агентства	+1
София	Пл. Народного собрания, 12, тел. 7-01-82	Враждебна	12			От агентства	-2
Сталинабад	ул. Ленина, 15, тел. 15-53	Сталинабад, тел. аэропорт	6	25 мин.	1.50	ул. Ленина	+3
Сталинград	Пушкинская ул., 21, тел. 3-46-00	Сталинград, тел. 3-28-90	18	40 мин.	3.00	Жел. дор. вокзал	+1
Сталино	ул. Артема, 119, тел. 3-27-09	Сталино, тел. 3-34-29	8	25 мин.	1.20	От агентства	0
Стокгольм	Флюгсити, Нормальмсторг, 1, тел. 233720, Флюгпавильоген, Нибороплан, тел. 233720	Бромма	10		2 шв. кроны	— —	—2
Станислав	ул. Чапаева, 12, тел. 4-04	Станислав, тел. 6-93	2	10 мин.	0.45	От агентства	0
Сухуми	ул. Ленина, 1, тел. 5-97	Бабушеры, Аэропорт	24	1.00	3.50	От агентства	+1
Таллин	пл. Победы, 10, тел. 4-43-84	Таллин, тел. 12-65	5	15 мин.	1.00	От агентства	0
Ташкент	Пушкинская ул., 18, тел. 3-20-40	Ташкент, тел. 3-58-05	7	20 мин.	1.10	Жел. дор. вокзал	+3
Тбилиси	Просп. Руставели, 20, тел. 3-59-66	Тбилиси, тел. 4-04-53	18	40 мин.	2.55	От агентства	+1
Тирана	Представительство АФЛ, тел. 2792	Тирана	2				—2
Тюмень	Первомайская ул., 8, тел. 6-95	Тюмень, тел. 5-68 доб. 38	7	20 мин.	1.05	От агентства	+2
Улан-Удэ	Читинская, 24, тел. 22-48	Улан-Удэ	18			Читинская, 24	+5

Город	Почтовый адрес агентства. Телефон.	Аэропорт. Тел. спр. бюро	Расстояние от аэропорта до города (км)	Время в пути (час. мин.), транспорт	Стоимость проезда (руб. коп.)	Место отправления транспорта из города	Местное время: + или — к моск. времени
Ужгород	ул. Шолохова, 5, тел. 21-65	Ужгород, тел. 00-06 доб. 48	3	10 мин.	0.45	Пл. Корятовича	0
Усть-Каменогорск	ул. М. Горького, 57, тел. 5-79	Усть-Каменогорск, тел. 1-14	18	45 мин.	2.10	От агентства	+4
Уфа	ул. Ленина, 25/29, тел. 2-86-55	Уфа, тел. 2-86-66	6			От агентства	+2
Улан-Батор	Аэропорт, тел. 1072	Улан-Батор	15				+5
Фрунзе	ул. Сталина, 97, тел. 31-17	Фрунзе, тел. 38-01	7	25 мин.	0.90	Гостиница «Киргизия»	+3
Харьков	Пл. Тевелева, 22, тел. 3-13-41	Харьков, тел. 2-80-01 доб. 230	12	25 мин.	1.65	От агентства	0
Хабаровск	ул. Пушкина, 46, тел. 3-20-71	Хабаровск, тел. 3-44-88	10	35 мин.	1.50	Пл. Сталина	+7
Хельсинки	Мальминкату, 16, тел. 11491	Хельсинки, тел. 832961	19			От агентства	—1
Челябинск	ул. Тимирязева, 28, тел. 3-49-61	Челябинск, тел. 3-82-41	25	45 мин.	3.50	Гостиница «Южный Урал»	+2
Черновцы	Центральная пл., 4, тел. 18-26	Черновцы	4			Центр. площадь	0
Чита	угол ул. Калинина и Нерчинской 17, тел. 43-81	Чита, тел. 43-81	18	35 мин.	3.00	ул. Калинина	+6
Чкалов	ул. Советская, 42, тел. 30-90	Чкалов, тел. 5-46	16			От агентства	+2
Ю.-Сахалинск	Торговая ул., 102, тел. 30-90	Ю.-Сахалинск, тел. 30-90	6	25 мин.	1.00	Торговая ул.	+7
Якутск	ул. Ярославского, 11, тел. 7-44	Якутск, тел. 7-44	8	15 мин.	1.50	ул. Ярославского	+6
Ялта	Коммунальная ул., 1, тел. 4-91	Симферополь, тел. Аэропорт	—				0

Примечание. Сокращенный телеграфный адрес городских агентств Аэрофлота: название города, «Авиаагентство».

ОБЩАЯ ИНФОРМАЦИЯ ДЛЯ ПАССАЖИРОВ МЕЖДУНАРОДНЫХ ВОЗДУШНЫХ ЛИНИЙ АЭРОФЛОТА

УСЛОВИЯ ПЕРЕВОЗКИ

К полету на международных авиалиниях допускаются лица, имеющие билеты, а также документы, выданные в соответствии с установленными паспортными, таможенными и санитарными правилами.

Международные воздушные перевозки по воздушным линиям Аэрофлота подчиняются действию правил об ответственности, установленных международной конвенцией для унификации некоторых правил, касающихся международных воздушных перевозок, подписанной в Варшаве 12 октября 1929 года.

ПРОДАЖА БИЛЕТОВ

Пассажир может приобрести билет заблаговременно как в прямом направлении, так одновременно «туда и обратно». При покупке билета «туда и обратно» предоставляется скидка в размере 10%. Срок действия билета один год со дня выдачи.

Заявка на получение места в самолете по обратному билету с открытой датой подается за 5 дней до вылета. Пассажиры с обратными билетами, имеющие бронированные места, при обратном вылете из аэропортов Аэрофлота обязаны подтвердить свою бронь агентству накануне вылета не позднее 12 часов дня.

ТРАНЗИТ

При полете из СССР за границу транзитом через Белград, Вену, Прагу, Стокгольм, Копенгаген, Пекин, Варшаву, Хельсинки и другие города, необходимо не позднее как за 5 дней подать письменную заявку в агентство Аэрофлота для бронирования мест в самолетах других авиакомпаний. Продажа транзитных билетов в этих случаях производится только после подтверждения брони авиакомпанией.

При покупке билета транзитом через Москву необходимо забронировать место в самолете с указанием даты вылета и номера рейса от Москвы. Пассажиры, имеющие транзитные билеты на полет через Москву, должны зарегистрировать их в Московском аэропорту не позднее чем через час после прибытия.

ПЕРЕВОЗКА ДЕТЕЙ

Дети в возрасте до 12 лет перевозятся только при взрослом пассажире.

За перевозку ребенка в возрасте до 2 лет, если он не занимает отдельного места, взимается 10% полного тарифа; за перевозку ребенка в возрасте от 2 до 12 лет, если он не занимает отдельного места, взимается 50% тарифа.

Двум детям, следующим с одним взрослым пассажиром, предоставляется отдельное место, независимо от того, перевозятся ли они с оплатой 50% или 10% тарифа.

БАГАЖ

При покупке билета необходимо сообщить вес багажа. Незаявленный при покупке билета багаж может быть принят к перевозке в одном самолете с пассажиром только при наличии свободного тоннажа. По одному полному билету и детскому билету, оплаченному в размере 50% тарифа, разрешается бесплатный провоз багажа в количестве 20 кг., а на линиях Москва—Стокгольм и Москва—Копенгаген — 30 кг.

При перевозке большого количества багажа необходимо сдавать его к отправке не позднее, чем за час до вылета. Прием багажа заканчивается за 30 минут до отправления самолета.

Размеры отдельных мест багажа не должны превышать 40×60×100 см.

Пассажирам разрешается провозить без оплаты сверх установленной нормы бесплатного багажа следующие предметы: дамскую сумочку или небольшой портфель, пальто, плед, зонтик или трость, несколько книг или журналов для чтения, питание для ребенка и дорожную колыбельку.

Не принимаются к перевозке взрывчатые, отравляющие и легковоспламеняющиеся вещества.

БИНОКЛИ И ФОТОАППАРАТЫ

Бинокли и фотоаппараты разрешается провозить только упакованными в багаж.

ВОЗВРАТ БИЛЕТА

Пассажир может отказаться от полета и получить стоимость за неиспользованную перевозку, для чего он должен заявить в пункт выдачи билета или в аэропорт первоначального отправления не позднее чем за 3 часа до вылета самолета.

Если пассажир отказался от полета позже чем за 3 часа до вылета самолета или не прибыл в аэропорт в назначенное время и не использовал забронированное для него место в самолете или прибыл в аэропорт с неправильно оформленными документами, вследствие чего не смог совершить полет, то с него удерживается сбор в размере 25% тарифа в одном направлении (но не более 280 руб. и не менее 28 рублей) за неиспользованную перевозку до места назначения или до промежуточного пункта, где остановка по расписанию более 6 часов.

ОБСЛУЖИВАНИЕ В ПУТИ СЛЕДОВАНИЯ

Пассажиры заграничного следования получают бесплатное горячее питание в промежуточных аэропортах, а в полете горячие и прохладительные напитки, кондитерские изделия, фрукты. В случаях вынужденной задержки самолета в аэропортах, пассажиры заграничного следования получают бесплатно горячее питание три раза в сутки, место в гостинице и право хранения багажа.

Транзитные пассажиры, имеющие забронированные места на определенную дату и номер рейса, пользуются в аэропортах пересадки бесплатным питанием и гостиницей в течение 24 часов. Пассажирам, следующим без предварительного бронирования мест или прибывшим за несколько дней до отправления самолета, на который забронировано место, питание и гостиница бесплатно не предоставляются.

ОБЩАЯ ИНФОРМАЦИЯ ДЛЯ ПАССАЖИРОВ ВНУТРЕННИХ ВОЗДУШНЫХ ЛИНИЙ АЭРОФЛОТА

ПРОДАЖА БИЛЕТОВ

Продажа пассажирских билетов на самолеты производится во всех городских агентствах Аэрофлота, аэропортах, курортах Крыма и Кавказа.

Для удобства пассажиров введена предварительная продажа билетов за 5 дней до вылета, на курортах за 10 дней. Пассажиры могут заказывать билеты по телефону для доставки на дом. Предоставляется право приобретать билеты одновременно в оба конца, т. е. и на обратный путь.

Военнослужащие могут пользоваться воздушным транспортом по воинским требованиям, выписанным на проезд жел. дор. или водным транспортом. При обмене требований на авиабилет доплачивается разница в стоимости авиационного и железнодорожного (водного) тарифа.

При продаже билетов взыскивается страховой сбор — 2 руб. 50 коп., а в городских агентствах и комиссионный сбор в сумме 4 руб. 50 коп.

СРОК ГОДНОСТИ БИЛЕТА

Билет годен только на тот рейс и число, на которые он выдан.

Обратный билет годен в течение 45 дней.

Пассажир может сделать остановку в промежуточном аэропорту на срок до 3 дней, о чем необходимо заявить при приобретении билета.

ПЕРЕВОЗКА ДЕТЕЙ

Дети в возрасте до 10 лет перевозятся только со взрослыми пассажирами.

Один ребенок в возрасте до 5 лет перевозится бесплатно

За перевозку двоих детей в возрасте до 10 лет взимается 50% стоимости билета с каждого, с предоставлением обоим одного места. За провоз детей, занимающих отдельные места, независимо от их возраста взимается полная стоимость авиабилета.

ПЕРЕВОЗКА ТРАНЗИТНЫХ ПАССАЖИРОВ

Пассажиры, имеющие транзитные билеты, должны зарегистрировать их в аэропорту пересадки не позднее, чем через час после прибытия.

Транзитным пассажирам гарантируется отправка из аэропорта пересадки в течение 36 часов с момента регистрации.

БАГАЖ

Пассажиры имеют право перевозить бесплатно ручную кладь в количестве до 10 кг. За излишек веса ручной клади сверх этой нормы пассажиры уплачивают по багажному тарифу.

ОФОРМЛЕНИЕ ВЫЛЕТА В АЭРОПОРТУ

По прибытии в аэропорт пассажир не позднее, чем за 30 минут до вылета должен зарегистрировать в билетной кассе свой билет, взвесить ручную кладь и багаж.

При перевозке большого количества багажа его следует сдавать к отправке в аэропорту не позднее, чем за час до вылета.

Посадка в самолет начинается за 15 минут и заканчивается за 5 минут до вылета самолета по расписанию.

Выход пассажиров на летное поле для посадки в самолет разрешается только в сопровождении дежурного по аэровокзалу.

При посадке в самолет в первую очередь проходят пассажиры с детьми и женщины.

При извещении родных и знакомых о вылете самолета следует в телеграмме сообщить дату вылета и номер рейса. Это дает возможность встречающим получить точную справку о времени прибытия самолета в аэропорт назначения.

ДОСТАВКА ПАССАЖИРОВ ИЗ АЭРОПОРТА В ГОРОД

Из аэропорта в город и обратно пассажиры доставляются городскими автобусами, трамваями и такси (стр. 53).

ГАБАРИТЫ ВХОДНЫХ И ЗАГРУЗОЧНЫХ ДВЕРЕЙ САМОЛЕТОВ

При приемке к перевозке багажа и груза необходимо учитывать размеры дверей и загрузочных люков, приведенные в следующей таблице (в *см.*):

Наименование двери (люка)	Ли-2	Ил-12	Ил-14
1. Входная дверь пассажирской кабины:			
ширина	65	69	69
высота	143,5	143,5	143,5
2. Дверь переднего багажного отделения **(с пассажир. кабины):**			
ширина	50	50	50
высота	170	172	172
3. Загрузочный люк переднего багажного отделения (с борта):			
ширина	69	—	95
высота	58	—	65
4 Дверь заднего багажного отделения **(с пассажир. кабины):**			
ширина	48	48	48
высота	129	172	169
5. Загрузочный люк заднего багажника (с борта):			
ширина	71	68	70
высота	57	61	65
6 Загрузочная дверь грузового самолета (фюзеляжа):			
ширина	149	238	—
высота	164	159	—

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

ПОЛЬЗУЙТЕСЬ ВОЗДУШНЫМ ТРАНСПОРТОМ ДЛЯ ПЕРЕВОЗКИ СРОЧНЫХ ГРУЗОВ

МОСКОВСКИЕ АЭРОПОРТЫ ВНУКОВО и БЫКОВО
ежедневно принимают к перевозке самолетами товаробагаж и грузы во все столицы союзных республик, крупные города, промышленные центры и на курорты.

ПРИЕМ ГРУЗОВ ДЛЯ ОТПРАВКИ САМОЛЕТАМИ
производится также Московской городской транспортной базой „МОСУКТЭК"—Трифоновская ул., 47а, тел. И 1-48-16, ст. Москва Товарная-Ржевская Калининской ж. д.

ОПЛАТА ПЕРЕВОЗОК ГРУЗОВ
производится по безналичному расчету: чеками из лимитированной книжки и банковскими поручениями, акцептованными Госбанком.

Расчетный счет Московского агентства воздушных сообщений № 150034 в Свердловском отделении Госбанка г. Москвы

ОФОРМЛЕНИЕ ПРИЕМА ТОВАРО-БАГАЖА И ГРУЗОВ ПРОИЗВОДИТСЯ
Московским агентством воздушных сообщений — Малый Черкасский пер., д. 13, рядом с метро Дзержинская.

ВСЕ СПРАВКИ—ПО ТЕЛЕФОНУ Б 3-41-44

Во всех других городах СССР грузы к перевозке воздушным транспортом принимаются в аэропортах.

Пассажирский реактивный самолет Ту-104.

25X1

Page Denied

25X1

ECONOMICS OF THE USSR ORE MINING INDUSTRY

Ekonomika gornorudnoy promyshlennosti SSSR [Economics of the USSR Ore Mining Industry], 1955, Moscow, Pages 7-115, 187-260

S. Ya. Rachkovskiy

[Pages 7-115]

FOREWORD

In the present book the sequence in which the individual subjects are treated differs somewhat from the syllabus for the course approved in 1954 for technical schools of the nonferrous metallurgy industry.

At the beginning of the course, after outlining the history of the development of the ore mining industry, we deal with raw materials resources and their distribution, and then with the principles of organizing administration and planning production. Subsequently in all sections (technical progress, fixed and working capital, labor, production costs, etc) problems of planning are treated. The section entitled "Capital Construction," for a study of which the student must be familiar with matters of production costs, profitableness, labor planning, etc, is found at the end of the course.

Individual sections of this book were read by the following specialists, who made valuable comments and rendered great assistance to the author: S. Ya. Gol'braykh (on fixed and working capital); I. G. Gorelik (on organizing administration and planning); Ye. B. Grudskiy (on labor and wages); A. I. Milovanov, A. K. Banketov, G. N. Popov, and O. O. Sosedov (on the development of the technical base); S. A. Pervushin (on mineral raw materials resources); I. B. Pekels' and L. M. Churilovich (on finances); N. D. Romanovich and N. I. Skorubskiy (on production costs); and Ye. M. Faerman (on the science of mining).

The author also received a great deal of help from N. A. Grigor'yev and V. V. Tyrin, as reviewers, and A. A. Zvorykin, as the editor of the volume.

To all these persons the author expresses gratitude for their friendly assistance.

INTRODUCTION

Section 1. The Subject and Aims of the Course, "Economics of the USSR Ore Mining Industry

The course, "Economics of the USSR Ore Mining Industry," is one of the scientific disciplines concerned with studying production under the conditions of a socialist economy. There are 2 aspects to social production: (a) the relationships between human beings and the forces of nature in a struggle with which the requisite material benefits are obtained; and (b) the relationship among human beings in the productive process, that is, production and economic relations.

The study of the methods by which man acts on the forces of nature is in the sphere of the technical sciences. The economics of the ore mining industry, considered as a part of the economics of socialist industry, is grouped with those scientific disciplines concerned with studying the production and economic relations of human beings.

The laws of economic development are objective laws reflecting a process of economic development which takes place independently of human will. But human beings can understand these laws and utilize them in the interests of society.

Political economy studies the laws of social production and the distribution of material goods at various stages in the development of human society and production relations in their interaction with productive forces. These laws manifest themselves with regard to social production as a whole and with regard to individual spheres of production, that is, individual branches of industry, and enterprises.

But in addition to the things they have in common, individual branches of production have their own special characteristics. These characteristics are manifested in differences in technology and economics. Individual branches have their own structure of fixed and working capital and their own branch and intrabranch division, which reflects concrete forms of the social division of labor. Individual branches are distinguished by their own technical bases, organization of production, amount of labor input, skilled personnel, wage system features, and the nature of their relationships with other branches of the national economy.

The mining industry includes several branches of industry engaged in extracting minerals from the earth (ores, coal, petroleum, salts, etc).

The growth of the most important branches of the national economy and, above all, of the production of producer goods depends upon the development of the mining industry. The state and rate of development of ferrous and nonferrous metallurgy, machine building, electric power, chemistry, and other basic branches of the national economy depend upon the state and development of the mining industry.

One of the special characteristics of the development and geography of the mining industry is its connection with the existence of explored reserves of mineral resources. Under socialism public ownership of mineral resources and the planned development of the national economy make it possible to carry out prospecting and exploration work in order to discover reserves of mineral resources in regions where the raw materials are consumed. This ensures the juxtaposition of industry to the sources of raw materials, and its planned distribution in the USSR.

Despite the high level of its technical equipment, the mining industry of the USSR is still very labor consuming. Therefore the further development of technology is of very pressing significance for the mining industry.

In capitalist countries the owners of the mineral resources exact payment for the right to work the deposits belonging to them. This raises the cost of working the deposits, and limits the possibilities of their exploitation.

Under the private property system, the exploration and exploitation of deposits are frequently carried out, not within the limits of the natural contour, but only within the limits of the private property, which fact makes for inefficient exploitation of these deposits. It is only where there is public ownership of the mineral resources that there exist all possibilities for the planned and efficient exploitation of all natural resources, the correct organization of exploration, and of the working of individual deposits.

The mining industry is concerned with the extraction of raw materials. This makes for a special structure of working capital in the mining industry.

It is only on the basis of a thorough study of the special characteristics of the mining industry that one can find the most effective way of utilizing its possibilities in the interests of society, that is, in the interests of building communism.

For example, the law of the planned development of the national economy makes it possible for the USSR's planning organs to plan social production correctly. But, in order to convert this possibility into reality, it is necessary to understand this law and apply it scientifically. With respect to the mining industry this means the necessity of studying the national economy's demand for the given mineral, the resources of the branches, its production capacities and their development, the special characteristics of technical improvement, etc.

Marxist-Leninist economic theory is further developed in the decisions of the KPSS [Kommunisticheskaya partiya sovetskogo soyuza -- Communist Party of the Soviet Union]. A course in the economics of a branch of industry must involve a study of the decisions of the party relative to the organization and development of the given branch, and it must familiarize the student with the economic policy of the KPSS and of the Soviet Government. This policy, which guides the development of the entire national economy of the USSR and its individual branches through the agency of national economic plans, establishes the principles of the economic activity of the individual enterprises.

A course in concrete economics must equip economic cadres with economic knowledge and thereby promote the most effective management of the socialist economy. Production problems must be decided on the basis of strict khoz raschet, and on the tasks of cutting costs, raising labor productivity, and utilizing hidden reserves.

In accordance with these tasks, the course on the economics of the ore mining industry involves a study of the significance of the branch, the means of its development and technical progress, its raw materials resources, means of improving the utilization of the fixed and working capital of the branch, increasing labor productivity, expanded reproduction, cost reduction, and increasing profitableness.

Although concrete economics is based on the Marxist-Leninist concept of profitableness, which requires that profitableness be considered not only from the viewpoint of the individual enterprises or branches of production but also from the viewpoint of the entire national economy, this concept of profitableness in no way decreases the importance of the profitableness of the individual enterprises and branches of production. The TsK [Tsentral'nyy komitet -- Central Committee] of the KPSS and the Soviet Government have constantly emphasized the importance of the profitableness of the individual enterprises and branches of production for the development of the entire national economy. The plenum of the TsK KPSS which was held in July 1955 proposed that the necessary steps be taken for the organization of profitable activity on the part of all enterprises.

The wealth of experience of the USSR's leading enterprises and the experience of our production innovators should be taken into account in the presentation of the course.

Section 2. Industry: The Basis of the Development of the National Economy of the USSR

Socialist industry is the leading branch of the national economy of the USSR, unified on the basis of public property on a nationwide scale. Socialist industry is characterized by a high level of concentration of production and an advanced technology. Socialist industry equips all branches of the national economy, including industry, agriculture, and trade, with advanced technology.

Industry produces the great mass of instruments of labor and consumer goods. Industry is the main basis of the socialist economy.

Industry effects the extraction of minerals from the earth (ore, coal, petroleum, etc), and processes industrial and agricultural raw materials.

According to the function of the products turned out, the entire industry of the USSR may be divided into 2 groups.

Group A covers the production of producer goods, including for the most part the branches of heavy industry (the metallurgical, machine building, coal, petroleum, and other industries).

Group B covers the production of consumer goods, including the branches of light industry, for the most part producing consumer goods (the textile, footwear, food, and many other industries).

The special characteristics of the development of socialist industry include not only the high rate of socialist industrialization and its development as a whole but the predominant development of heavy industry, that is, the production of capital goods, as the basis for the growth of all the branches of the national economy.

The decisions of party congresses and the decrees of the TsK KPSS and of the Soviet Government have repeatedly emphasized the special concern of the Soviet state for the rapid and constant development of heavy industry. Over a period of 28 years (from 1924-1925 through 1953) the production of capital goods has increased as a whole approximately 55 times.

This had led to a radical change in the branch structure of socialist industry. Whereas in 1924-25 the share of capital goods in the product of the entire industry of the USSR was 34%, by the end of the second 5-year plan, in 1937, it was 58%, and by 1953 it was about 70%.

The correctness of the policy of the KPSS, based on a deep understanding of the objective economic laws of socialism, has made it possible to develop Soviet industry at an exceptionally high rate. In terms of the rate of development the production of the industry of the USSR has long since surpassed the industry of the capitalist countries.

In the Soviet Union the volume of industrial production in 1954 exceeded the 1929 level 18 times. In the US the industrial product increased 2.1 times during this period, while in England it increased 72%, in France 14%, and in Italy 77%.

The successes achieved in all branches of socialist industry were possible owing to the fact that the KPSS and the Soviet Government continued the Leninist policy of the priority development of heavy industry, which includes the ore mining industry.

Section 3. The Concept of a Branch of Industry

Industry is divided into individual independent branches. A branch of socialist industry is the totality of enterprises specialized in the production of a homogeneous product. A branch is characterized by the existence of a specialized technical production base and skilled cadres in specific trades.

The ores of the nonferrous metals usually contain several valuable components which are extracted in the process of their subsequent processing. For example, the ores of the Urals copper deposits contain sulfur, zinc, and other components in addition to copper.

In such cases the branch of industry to which an enterprise belongs is determined on the basis of the most important metal. In accordance with this, the Urals copper mines are included in the copper industry.

In addition to the basic enterprises specializing in the production of a definite product, many branches of industry include auxiliary and ancillary enterprises which turn out various products for the basic enterprises of the branch. Enterprises of this kind in the mining industry include those producing explosives, those engaged in the repair of equipment, etc, serving the mining enterprises.

In the USSR the division of industry into individual branches is effected under planned procedure. In proportion as the scale of production of individual products increases, the organization of their production into an independent branch becomes effective.

In the national economic sense the concept of a "branch" does not always coincide with its administrative subdivision at any given period of time. For example, the copper industry branch does not consist merely of those enterprises under the main administration of copper industry ("Glavmed'") of the Ministry of Nonferrous Metallurgy USSR. It also includes several enterprises engaged in producing copper which are under other main administrations. In particular the smelting of copper is also done at enterprises of the lead-zinc, etc branches of industry.

Several branches of industry which did not exist prior to the Great October Socialist Revolution have come into being in the USSR during the Soviet era. For example, several branches of machine building (automobile production, tractor production, etc) and branches of nonferrous metallurgy (the nickel, aluminum, and other branches).

Industry is divided into the extracting and processing industries. The extracting branches of industry include those branches engaged in the extraction of minerals and other products which nature makes available to man. These branches include the mining industry (the coal, ore, and petroleum industries), the timber industry, etc. Those branches of industry engaged in the further processing of raw materials into finished products from the processing industry (machine building, textile, etc).

Each branch of industry in the USSR develops in accordance with the state plan for the development of the national economy and the general political and economic goals of the state, and the development of each branch of industry is coordinated with other branches. For example, the iron ore industry develops in accordance with the requirements of the ferrous metallurgy industry, which it supplies with raw materials. Ferrous metallurgy supplies the needs of machine building and transport. Machine building and transport serve all the branches of the national economy. The coordination of the plans of individual branches prevents the formation of disproportions in the national economy.

The mining industry includes those branches of industry in which minerals are extracted from the earth.

Depending upon the function and character of utilization of the minerals extracted, the mining industry may be divided into the following basic branches.

(1) The mining and fuel branches, which supply the needs of power and transport and constitute for the most part the fuel base of the national economy (coal, petroleum, peat, oil shales, natural gas).

(2) The ore mining branches, which embrace the extraction of ores for the metallurgical industry (iron ore, manganese ore, chromium ore, and the ores of nonferrous and noble metals).

(3) The mining-chemical branches, which extract the basic raw materials for the chemical industry (sulfur, saline minerals, apatites, phosphorites, etc).

(4) The mining-construction branches, which embrace the extraction of materials for construction, such as cement, ceramics, silicates, and other branches of industry (limestone, fire clay, chalk, sandstone, granite, building stone, etc).

(5) Branches of other minerals [sic] extracting the raw materials used in various branches of industry (mica, asbestos, graphite, optical quartz, fluxing limestone, molding sands, etc).

CHAPTER I. THE ORE MINING INDUSTRY IN THE NATIONAL ECONOMIC SYSTEM OF THE USSR AND THE BASIC STAGES IN ITS DEVELOPMENT

Section 1. The Importance of the Ore Mining Industry

The ore mining industry is of great importance in the national economy of the USSR. It provides the basic raw materials for such important branches of the national economy as ferrous and nonferrous metallurgy, the chemical industry, etc.

The rapid increase in the extraction of iron ores and the ores of the nonferrous, noble, and rare metals in the Soviet era has made possible the rapid development in the USSR of the production of pig iron, steel, copper, lead, zinc, tin, nickel, tungsten, and molybdenum, gold, silver, and other metals.

In his report on the results of the Fourteenth Party Conference on 9 May 1925, I. V. Stalin characterized the importance of the metallurgical industry in the task of socialist building in the USSR as follows.

"The development of our metal industry and the importance of its growth are colossal, since it means the growth of the entire industry and the entire national economy, since the metal industry is the basic foundation of industry in general, and since neither light industry, transportation, fuel, electrification, nor agriculture can be put on its feet without a substantial development of the metal industry. The growth of the metal industry is the basis for the growth of all industry in general, and of the national economy in general" (I. V. Stalin, Soch. [Works], Vol 7, page 130).

The ferrous and nonferrous metals are the most important materials for the most varied branches of industry, and they are widely used in agriculture and daily life.

The ferrous metals pig iron and steel, serve as the basic material in machine building, railroad transport, shipbuilding, the power industry, industrial, communal, and housing construction, and in the defense industry.

In addition to the mining of iron ores, great importance for ferrous metallurgy attaches to the mining of manganese, chromium, and other ores.

Manganese ores are used almost exclusively (about 90%) in the metallurgical industry. They are used as an additive to charges for blast furnaces in the smelting of pig irons for steel manufacture, as a raw material for the production of ferromanganese, specular cast iron, and other needs. Chromite is used in the production of ferroalloys (ferrochromium, silicochromium) and in refractory materials and chromium salts. The greatest share of chromites consumed in the USSR (more than 50%) goes for the production of ferroalloys. Ferrochromium is one of the basic alloying additives in the smelting of high grade steels.

Together with manganese and chromium, such metals as nickel, tungsten, molybdenum, and many others are widely used in ferrous metallurgy as alloying additives in the smelting of special purpose high grade steels. They endow the steels with corrosion resistance, heat resistance, strength, and many other properties. Tungsten and molybdenum are used in the production of high speed steels and especially hard alloys used in the manufacture of high speed cutting tools, and bits for drills, cutters, etc. Under conditions of modern technology, steels and the alloys of ferrous and nonferrous metals are assuming an increasing national economic importance. The development of modern machine building, motor building, tank building, and aircraft building would have been impossible without the nonferrous and rare metals and their alloys.

The nonferrous and rare metals, copper, zinc, lead, nickel, tin, aluminum, magnesium, tungsten, and molybdenum, have a high degree of corrosion resistance, that is, they are distinguished by low oxidizability by the atmospheric oxygen of the air or by another oxidizing medium, a high degree of heat resistance, and electroconductivity, and a capacity for elastic deformation (the resumption of the original state after elimination of the cause of deformation) and for plastic deformation.

The use of the various nonferrous and rare metals in different branches of industry is determined by their specific properties.

Thus because of its great conductivity, copper is the predominant metal in the electrotechnical industry, for whose needs 40-50% of all copper mined is consumed.

To a great extent zinc is used for galvanizing iron (sheets, pipe, wire) in order to protect it from corrosion. A considerable quantity of zinc is used to make alloys with copper (brass).

Lead is widely used in the production of storage batteries, insulation for cables, in the refining of high octane aviation gasoline, in the chemical industry, etc.

Tin, because of its chemical stability with regard to oxygen, is used to cover sheet iron and for containers in the food industry. A considerable quantity of tin is used in the production of solders and antifriction (friction counteracting) alloys (babbits) used in casting bearings.

Aluminum, owing to its low specific weight, has acquired very great importance in aircraft building, and is also used in the production of tank cars, charging skips, and stands. Aluminum competes successfully with copper in the production of cables.

Magnesium, which is the lightest metal (its specific gravity is 1.6 times less than that of aluminum), is used in the production of extra light alloys for aircraft building and for many other purposes.

The mining industry is of great importance in the development of agriculture and in increasing the production of consumer goods. Every year hundreds of t of ferrous and nonferrous metals are used in the production of consumer goods. Sulfates and other salts of copper, zinc, and sulfur are widely used to combat pests in agriculture, in order to increase the yield of crops.

Gold, silver, platinum, and the platinoids (palladium, iridium, etc) are of great national economic importance. These metals are used in the chemical and jewelry industries, in dentistry, and in electronics. Gold and silver are also used in minting money.

The importance and character of the use of the individual metals are not stable. Thus prior to the twentieth century nickel was used almost exclusively for nickel plating, and its production was limited to a few thousand t. After nickel began to be widely used as an alloying additive in the production of high grade steels and for the production of alloys, its production increased 10-fold. The same thing is true of aluminum. Prior to World War I aluminum was used in relatively small quantities, chiefly in the manufacture of dishes. But with the development of aviation and other branches of industry it became one of the most important metals, and its production increased hundreds of times.

The development of the ore mining industry is closely related to the development of transport and the construction of electric power stations in the USSR.

The construction of numerous ore mines has necessitated the construction of new railroads and electric power stations in the Kazakh SSR, in the Urals, in the north, and in other regions of the USSR.

Shipments of ore account for a considerable part of the freight hauled by the railroads.

The ore mining industry is a big consumer of timbers, which are used to reinforce mine workings.

Owing to the development of the mechanization of mining operations and the large scale introduction of open pit mining, the mining industry has become a big consumer of machinery and mechanisms.

Thus the mining industry is closely related to all of the most important branches of the national economy of the USSR.

Section 2. A Brief Survey of the Development of the Ore Mining Industry in Russia

In order to understand how far the ore mining industry of the USSR has come, and its successes during the Soviet era, it is essential to describe, however cursorily, the rise, development, and state of the ore mining industry in Russia prior to the Great October Socialist Revolution.

The origin of mining goes back to the most ancient period in the history of mankind. For man, the earth was "... the original arsenal of his instruments of labor. It provided him, for example, with rocks, which he used in throwing, in creating friction, in exercising pressure, in cutting, etc" (K. Marx, Kapital, Vol 1, 1952, page 186).

Man's first acquaintance with metals, chiefly with copper and gold, dates back to the fourth and third centuries B. C. The transition to a quasiagrarian economy, the development of livestock raising and the beginnings of agriculture, and also the necessity for defense against attack, required the manufacture of tools and weapons. Man had to seek out the most suitable materials for this purpose. Given the existence of numerous outcroppings of oxidized

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

and native copper, he quite naturally turned his attention to it and used it to make production tools.

On the territory of the USSR the extraction and processing of minerals, gold, copper, lead, and tin, also dates back to antiquity. Mentions of the use of gold and copper on the territories north of the Black Sea and the Sea of Azov are encountered in the works of the Greek historian, Herodotus (fifth century B. C.), and the geographer, Strabonius (first century B. C.). Vestiges of old mine workings (Chudskye excavations) have been found in several mining regions, in the Altai Mountains, Dzhezkazgan, and elsewhere.

In the Transcaucasus the mining of iron dates back to the second millenium B. C., and in the central part of Russia it dates back to the seventh and fifth centuries B. C.

Later, during the first centuries of our era, copper was mined in the region near the Urals, in the Azov and Black Sea steppes, and in the Nagol' Mountains of the Donbas.

Documentary historical data indicate the existence of iron ore mining in the ninth century A. D. The iron was produced in blooming furnaces or small manually operated furnaces located along the edges of forest and on the banks of rivers.

The formation of a centralized Russian state in the fifteenth century, the expansion of its territory, and problems of defense led to an increase in the demand for metals, especially for military needs. Ivan the Third (1440-1505) and Ivan the Fourth (1530-1584) took effective steps in seeking out reserves of ores.

In the first half of the sixteenth century the first blast furnaces, operating on charcoal, made their appearance in Russia.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

The first government plant for the smelting of copper was built in 1638-1640. In 1650 construction was begun on a plant in Kazan' with a capacity of 200 poods of copper per year. But these plants were soon closed down owing to exhaustion of the reserves of rich copper ore.

By the end of the seventeenth century, and the beginning of the rule of Peter the First, Russia had 10 metallurgical plants, whose production went primarily to meet the needs of the state. However, the production of metal increased at an extremely slow rate, and the nation's requirements for metal were met for the most part by imports.

Mining was greatly developed under Peter the First, when work was begun on the creation of a large metal industry in the Urals on the basis of the Ural deposits of iron ores.

In 1727 there were 48 iron smelting plants and 15 copper smelting plants in Russia. The mining of lead and silver was also expanded in the Nerchinsk region of the Transbaikal.

In addition to the establishment of government owned plants, private capital was also attracted into the mining and metallurgical industries. In order to encourage the expansion of private mining enterprises, the government made large grants of land to their owners. The peasants living on these land holdings were attached to the enterprises to be used as a labor force ("possession peasants").

In order to stimulate the domestic mining of metal, Peter the First placed very high tariffs on pig iron and iron products imported from abroad.

The eighteenth century was characterized by a considerable development of the ore mining industry in Russia. The amount of pig iron smelted annually increased from 74,000 t in 1727 to 130,000 t by the end of the eighteenth century. By the beginning of the nineteenth century the amount of pig iron being smelted in Russia was in excess of 165,000 t, that is, Russia was producing as much pig iron as England and considerably more than France and Prussia.

By the middle of the eighteenth century the copper being smelted in Russia amounted to almost 3,000 t. There was an increase in the mining of lead, which was obtained along with silver. By the end of the eighteenth century the production of lead amounted to 1,300 t (as compared to 100 t in the middle of the century), while the production of silver amounted to 28.7 t, and the production of gold amounted to 400 kg.

Russia changed from a country which had been an importer of metal to a large scale exporter of ferrous metals and copper on the world market. Exports of ferrous metals, which in 1760 had amounted to only 13,660 t, reached 50,000 t in 1793-1795.

The development of the Russian ore mining and metallurgical industries in the nineteenth century, despite a rather substantial growth (especially in the last quarter century), was characterized by a falling off of Russia's share in the world production of metal.

In 1820 Russia was smelting 166,000 t of pig iron and about 3,200 t of copper. Russia's share in the world production of pig iron was 12%, and in the world production of copper it was 15%. In 1830 Russia still held second place in the world production of pig iron, being ahead of Prussia and Belgium. In 1850-1860 Russia's share in the production of pig iron amounted to only 4% and only 10% in the case of copper. And by 1860 Russia was one of the world's smallest producers of pig iron and copper.

The basic cause of Russia's lagging behind the countries of Western Europe technically and economically was the serf system. Whereas the development of capitalist relations was going ahead at a rapid pace in several of the Western European countries, in Russia the serf system was hindering the development of productive forces, Russia's basic metallurgical region, the Urals, had gone into a decline. On the subject of the decline in the ferrous metallurgical industry of the Urals, V. I. Lenin wrote: "... the same serf system which helped the Urals region to reach such heights in the era of the embryonic development of European capitalism was the cause for the decline of the Urals region in the era of the flowering of capitalism" (V. I. Lenin, Soch., fourth edition, Vol 3, page 424). The availability of cheap serf labor made for a low level of technical development and low labor productivity.

The abolition of the serf system in 1861, which cleared the way for the development of capitalism in Russia, did not bring about a rapid growth in the ore mining and metallurgical industries. At the outset there was even a certain drop in the amount of pig iron smelted and the amount of copper mined. Thus the amount of pig iron being smelted dropped from 330,000 t in 1860 to 250,000 t in 1862. For the most part this decrease was accounted for by the Urals region, where the amount of pig iron being smelted dropped from 238,000 t to 171,000 t. However, the reform period as a whole was characterized by a rapid development of capitalism in Russia. There was an increase in the number of factories and in the volume of the industrial product. Railroad construction expanded at a rapid rate in the last quarter of the nineteenth century. More than 22,000 km of new railroad track was laid in the decade between 1890 and 1900. The end of the nineteenth century was also characterized by the construction of electric power stations, electric streetcar lines, and the use (albeit on a very small scale) of electric power for industrial purposes.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

The growth of industry and railroad construction made for an increase in the demand for ferrous and nonferrous metals, and thus for an increase in the demand for ores. In the period between 1887 and 1899 alone the per capita demand for pig iron in Russia increased from 8.6 kg to 29.7 kg, that is, more than a 3-fold increase. For the most part the increasing demand for pig iron was met by expanding domestic production. In a period of 12 years (from 1887 to 1899) the amount of pig iron being smelted increased from 595,000 t to 2,901,000 t, that is, more than 4-fold.

The expansion of ferrous metallurgy during this period took place chiefly in south Russia. The rich deposits of the Donets coking coal, the Krivoi Rog iron ores, and the Nikopol' manganese ores had been explored in that area. All of these sources of raw materials were connected by railroad, which fact created favorable conditions for the development of the metallurgical industry.

The mines of Krivoi Rog not only supplied ore to the metallurgical plants in the south but provided considerable quantities of ore for export to other regions of the country and even abroad.

At the beginning of the twentieth century the metallurgical industry of the south accounted for 50% of all pig iron smelted in the country. The enterprises in the south were built on the level of the advanced technology of that day.

The mining of chromite in the Urals deposits was begun in the second half of the nineteenth century. By the beginning of the twentieth century Russia was world leader in the mining of chromite. Thus in 1901 Russia mined 22,169 t of chromite, which amounted to 47% of world production.

After the reform of 1861 there was a certain degree of stagnation in the mining of the nonferrous metals. There was a drop in the amount of copper mined, and a sharp falloff in the mining of lead

and silver

The production of copper continued to decline until the 1890's, and did not revive until the last decade of the nineteenth century. Nickel, tin, and tungsten were mined sporadically, and in amounts not exceeding dozens of t or even single t. Bauxites, tungsten ores, and molybdenum ores were not mined at all.

The basic cause for the lag in the mining of nonferrous metals behind the general development of industry in Russia was the existence in the Urals region of vestiges of the serf system, which made for extreme technical backwardness in these branches of industry.

V. I. Lenin described the situation in the Urals during the Reform Period in the following words: "Thus the most direct carry-overs from the prereform system, a marked development of statute labor, the indenturing of workers, low labor productivity, technical backwardness, low wages, a predominance of manual production, the primitive and predatory exploitation of the region's natural resources, monopolies, the squeeze of competition, insularity, and isolation from the general trade-industrial movement of the times, such is a general picture of the Urals" (V. I. Lenin, Soch., fourth edition, Vol 3, page 427).

Mining was the most backward sector of industry. All of the basic processes, drilling loading, hauling, were being done manually. The ore was removed in tubs raised to the surface by a horse-powered windlass. There was a predominance of the least effective mining systems, involving reinforcing by means of square liners and rubbish from the worked area. Copper was being smelted in shaft furnaces with a huge consumption of charcoal and huge losses of metal.

There was also a decline in the lead and silver industry. This was due to the predatory exploitation of the deposits, the exhaustion of the reserves of rich ores in the oxidized zone suitable for direct smelting at the plant, the predatory destruction of the forests in the regions where the lead and silver deposits were located; the unfavorable transportation conditions (the Nerchinsk Mining District, Altai), and the sharp drop in the price of silver on the world market and the domestic market. Also, one of the most important causes of the decline in the lead and silver industry was the extremely low level of technology in the smelting of lead and silver, as a result of which losses of lead amounted to as much as 66.5%, and losses of silver to 28%.

The amount of gold mined cannot be calculated with any accuracy until 1814, when the registration of all gold mined in the country became mandatory. The dynamics of the mining of gold from 1814 to 1900 are shown by the data in Table 1.

TABLE 1

AVERAGE AMOUNT OF GOLD MINED ANNUALLY IN THE YEARS 1814-1900

Years	Average Amount Mined
1814-1820	0.32
1821-1830	3.5
1831-1840	7.17
1841-1850	22.5
1851-1860	26.2
1861-1870	27.6
1871-1880	38.6
1881-1890	36.5
1891-1900	41.0

In the course of the nineteenth century the average amount of gold mined yearly increased 128 times. This increase was due to the discovery and working of several very rich deposits of placer gold on the Yenisey, in the Bitim River region, in the Transbaikal, the Primorya, Western Siberia, and the Urals.

The industrial crisis which developed in Europe at the beginning of the twentieth century also embraced Russia. In Russian industry the economic crisis of 1900-1903 also affected the ferrous metallurgical industry. In particular there was a decline in the production of iron ore and pig iron. The ferrous metallurgical industry revived again in 1911-1913.

At the beginning of the twentieth century there was a considerable increase in the mining of copper and gold, but as for lead and zinc this period was characterized by a continued lag and a low volume of smelting of these metals, as is shown in Table 2.

TABLE 2

DEVELOPMENT OF THE PRODUCTION OF FERROUS AND NONFERROUS METALS DURING THE YEARS 1901-1913

Average Annual Production

	thousands of t				t	
Years	pig iron	copper	lead	zinc	silver	gold
1901	2,830	8.5	-	6.0	-	34.4
1901-1905	2,717	9.6	0.3	8.5	-	37.6
1906-1910	2,846	17.4	0.5	9.0	2.2	46.8
1911	3,600	26.0	1.2	10.0	15.4	52.1
1912	4,200	34.0	1.6	9.0	18.8	48.0
1913	4,220	33.7	1.5	11.0	14.0	49.2

Russia led the world in the mining of manganese ore. In 1913 Russia's share in the world production of manganese was 53%, amounting to 1,265,000 t. The most important regions for the mining of manganese ore were the Chiatura (which accounted for 76% of all the ore mined in 1913) and Nikopol'. The Chiatura deposit was worked by foreign capitalists, and most of its output was exported. The ores of the Nikopol' deposit were used for the needs of the metallurgical industry of the south.

By the beginning of the twentieth century the mining of chromite had been stabilized at a level of 25,000-30,000 t. But Russia's share in the world production of chromite dropped from 47% in 1901 to 15% in 1913, since during these years the mining of chromite was expanded in New Caledonia and Southern Rhodesia.

The 4-fold increase in the production of copper in Russia during a period of 13 years (1901-1913) was due to the increase in the requirements of the domestic market because of the development of the electrical industry and the rise in the price of copper. In 1907 the price of copper in London was 681 rubles per t, while in St. Petersburg, owing to the high tariff on copper, the price was 931 rubles per t.

The technical level in the nonferrous metallurgical industry was extremely low. Manual labor was used almost exclusively at the mine workings.

The richest deposits, the ores from which could be used directly in smelting, had been for the most part worked out.

The gold industry was also on an extremely low technical level. Most of the gold (85%) was mined from placer deposits. Only 15% of the gold mined was gold ore. For the most part, the placer deposits were worked by manual means involving the use of the most primitive tools, including picks, shovels, and washing pans. The number of dredges and hydraulic giants was very small. Only 5% of the gold mined in 1913 was obtained by these methods. For the most part, the processing of ores containing gold was carried out at crusher plants. The tailings, crushed gold ore and slurry, were processed at seasonal crushed ore plants and slurry plants. There were no plants with a complete cycle for processing gold ores and separating tailings.

Section 3. The Decline of the Ore Mining Industry During World War I

The imperialist war of 1914-1918 led to a sharp decline in Russia's ore mining industry. As early as 1914 there was a noticeable drop in the smelting of pig iron and copper, and with each year of the war this drop became more obvious (Table 3).

TABLE 3

DYNAMICS OF THE PRODUCTION OF PIG IRON AND NONFERROUS METALS DURING WORLD WAR I

	Millions of t	Thousands of t		
Year	pig iron	copper	lead	zinc
1913	4,220	33.7	1.5	11.0
1914	4,200	32.4	1.1	6.8
1915	3,700	26.0	0.8	5.0
1916	3,600	21.0	1.5	2.4
1917	3,022	14.0	0.1	2.4

Despite the increased demand for ferrous and nonferrous metals during the war years, the production of these metals sharply declined. The production of lead remained at its previous very low level, and the production of zinc dropped sharply owing to the fact that the zinc industry in the western regions was put out of commission as a result of military actions. There was a 2-fold drop in the smelting of copper, accounted for by the Transcaucasus, which was in the war zone. During this period almost all of Russia's demand for nonferrous metals was met by imports.

The sharp drop in the amount of nonferrous metals mined was due to the loss of a part of the skilled labor force, owing to their mobilization, by the disorganization of transport, the lack of fuel, the fact that the plants were not adequately supplied with equipment, and above all by the predatory manner in which the ore deposits were worked by the foreign capitalists, who owned the greater part of the enterprises of the ore mining and metallurgical industries.

By the end of the nineteenth century, foreign capital was taking over the natural resources of Russia at a rapid rate.

Foreign companies owned almost the entire ferrous metallurgical industry of the South and a great part of the nonferrous metallurgical industry (Table 4). One group of French bankers alone controlled 55.8% of the iron smelting (including 83.24% of the iron smelting industry in the south) and 51.6% of the mining of all iron ore in Russia (including 71.5% of the ore mining in the south).

TABLE 4

THE SHARE OF FOREIGN CAPITAL IN THE RUSSIAN ORE MINING AND METALLURGICAL INDUSTRIES

(Data for the Year 1913)

Branch	Total Capital (millions of rubles)	Share of Foreign capital (millions of rubles)	Foreign Capital in % of total capital
Ferrous metallurgy	334.0	268.7	80.0
Gold-platinum	93.4	51.1	55.0
Copper	79.2	60.9	76.0
Lead-zinc	37.1	32.4	87.0

In addition to their predatory exploitation of Russia's mineral deposits, the foreign capitalists subjected the miners to cruel exploitation. The length of the working day at the mines was 11.5 hours, and the pay was extremely low. The average wages amounted to about 25 rubles per month, which was below the minimum necessary for survival. There was no accident prevention. The workers' living conditions were unbearable. At the Second All-Russian

Congress of Miners in 1913, one doctor Nikol'skiy, who had taken part in the study of the miners' living conditions, said: "The human dwellings were often worse than buildings used for livestock. They frequently lacked both floor and ceiling."

The following 3 paragraphs from the contracts signed with the gold miners are quoted in order to give an idea of the conditions under which they worked.

"Section 3. Although the number of hours a hired hand must work each day, on the basis of the rules in effect at the mines, is counted from 0500 to 2000 (including 2.5 hours for meals and relaxation), we will have no claims or cause of complaint against the administration if occasionally our work is continued beyond the above-mentioned hours ...

"Section 6. The construction of our dwellings at the mines, our sheds and huts, and likewise the repairing of our footwear and clothing, will be done by us during our off hours and with the permission of the superintendent, without our demanding any pay therefor ...

"Section 10. If anyone of us becomes ill, he will have no right to demand pay for the time during which he is sick."

These working conditions remained virtually unchanged up until the Great October Socialist Revolution.

This cruel exploitation provoked constant protests and strikes on the part of the workers, which were pitilessly suppressed by the czarist government. In the spring of 1912 a strike broke out at the Lena Gold Mines in Siberia. Upon orders from a czarist gendarmery officer, the peaceably demonstrating workers, who were on their way to hold talks with the administration, were fired upon. More than 500 workers were killed or wounded. The events at the Lena mines was the starting point for a new revolutionary upsurge which manifested itself in mass strikes and demonstrations throughout the country.

The predatory exhaustion of the natural resources of Russia and the cruel exploitation of the workers made it possible for the foreign capitalists to secure maximum profits. The British capitalists and their Russian partners made an annual profit of about 7 million rubles from the Lena mines. Between 1910 and 1915 the English concessionaire, Urkvart, made a profit of 23.5 million rubles from the enterprises of the Kyshtymsk mining district.

Only the Great October Socialist Revolution put an end once and for all to the predatory plundering of Russia's natural resources and eliminated the exploitation of man by man in Russia.

Section 4. The Revival of the Ore Mining Industry

During World War I Russia's economic position deteriorated badly. The rottenness of the czarist regime became especially manifest under the conditions of the war. The nation's industry was incapable of meeting the needs of the front. A shortage of the ferrous and nonferrous metals required for military needs became apparent in the very first years of the war.

The bourgeois Provisional Government, which succeeded to power as a result of the February bourgeois-democratic revolution, was not only incapable of arresting the decline of the national economy but accelerated it even more.

By 1917 the production of pig iron and copper had dropped sharply, amounting to 65% of the 1913 level in the case of pig iron and 40% in the case of copper.

The proletariat of Russia, who had carried out the Great October Socialist Revolution and taken power into their own hands, was faced with the problem not only of abolishing the old social system but of creating new socialist relations, rehabilitating the national economy, and building a socialist economy.

On 14 (27) November 1917 the VTsIK [Vsesoyuznyy tsentral'nyy ispolnitel'nyy komitet -- All-Union Central Executive Committee] passed the decree on worker control. The substance of worker control was that, although the enterprises and the income therefrom remained in the hands of the private owners, the workers were authorized to keep control of the entire activity of the enterprise, the filling of orders, the selling of products, and the utilization of finances. Worker control was the first step toward nationalization, and it played an important role in training the workers for the administration of industry after its nationalization.

The decree on worker control provoked sharp resistance from the capitalists. Their organizations declared worker control to be illegal, and they sabotaged the measures of the Soviet regime, even going so far as to close down enterprises.

The month of December 1917 saw the establishment of the VSNKh [Vysshiy sovet norodnogo khozyaystva -- Supreme Council of the National Economy], which was made responsible for managing the entire economic life of the country.

On 28 June 1918 there was promulgated a decree on the nationalization of all of the largest enterprises, including the ore mining enterprises of the ferrous and nonferrous metallurgical industries.

International imperialism and domestic counterrevolutionary forces did not allow the young Soviet state to set about the building of the national economy immediately. Beginning in the summer of 1918, the foreign military intervention and the civil war required the mobilization of all of the nation's manpower and resources to defend the gains of the Great October Socialist Revolution. This fact posed very serious problems for the national economy. It was necessary to mobilize available resources and provide the young Red Army with everything required to gain a victory over the enemy. The Communist Party declared the country a military camp and rebuilt its economic life on a wartime footing.

The foreign military intervention and the civil war dealt tremendous damage to the national economy and led to a further curtailment of industrial production.

Russia's ore mining industry, which at that time was largely concentrated in the Ukraine, the Urals, Siberia, and the Transcaucasus, was in the hands of the interventionists and the White Guard counterrevolutionaries and was destroyed by them to a considerable extent.

The amount of pig iron smelted dropped from 4,220,000 t in 1913 and 3,022,000 t in 1917 to 115,000 t in 1920, that is, it amounted to only 2.7% of the 1913 level. The mining of manganese ores, chromite, and the nonferrous metals virtually stopped.

In his speech to the Ninth All-Russian Congress of Soviets in December 1921, V. I. Lenin had the following to say about the state of the ferrous metallurgical industry: "In this respect Russia's position is especially grave. We are producing perhaps 6% of what we were producing in prewar times. Such is the state of ruin, such is the poverty, to which the imperialist war and the civil war have brought Russia! But we shall of course recover" (V. I. Lenin, Soch., fourth edition, Vol 33, pages 142-143).

By early 1920, as a result of the heroic efforts of the Red Army and the entire Soviet people, a considerable part of the territory of Soviet Russia had been cleared of the interventionists, and Kolchak and Denikin had been defeated. Russia had a temporary breathing spell. This made it possible for the Soviet state to set about rehabilitating the national economy.

In March 1920, at the Ninth Party Congress, a detailed resolution on the tasks of economic building was passed. The congress considered it necessary to draw up and implement consistently a single economic plan for the country. Figuring prominently in this plan was the problem of the electrification of the national economy, and improving transportation, the fuel industry, and metallurgy.

The resolutions of the Ninth Party Congress served as the basis for elaborating the plan known as GOELRO -- the State Plan for the Electrification of Russia -- which was approved by the Eighth Congress of Soviets (December 1920). This historic document, together with the plan for the electrification of the country, sketched out the prospects for the development of the most important branches of the national economy, including metallurgy. The GOELRO plan provided for a considerable expansion of metallurgy in the south and in the Urals on the basis of utilizing local raw material resources. It formulated for the first time the tasks of creating a metallurgical industry in Western Siberia on the basis of the coking coal of the Kuznets Basin. Plans called for an increase in the annual amount of pig iron smelted in the country to 8.2 million t; copper, 5 million poods (about 83,000 t); and aluminum, 600,000 poods (about 10,000 t).

With respect to the lead-zinc and nickel industries, the plan posed the problem of "studying deposits of these metals and their stepped-up production." In order to increase Russia's purchasing power on the foreign market, it was planned to step up the mining of precious metals.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

The victorious conclusion of the civil war and the defeat of the interventionists enabled the Soviet land to switch to peaceable economic building. This transition had to be effected under very trying conditions.

The national economy had been ruined by the 4-year imperialist war and the 3-year war with the interventionists. In 1920 the product of heavy industry was 1/7 what it had been before the war.

The ore mining industry was in a state of ruin. Ores were virtually not being mined at all. In 1921 the total amount of iron ore mined was 195,000 t, or 2.1% of the 1913 level. In 1921, in the Urals, 4,700 t of copper ore was mined, representing 0.52% of the prewar output. (In 1913, 880,600 t of copper ore was mined in the Urals.)

The Communist Party and the Soviet Government took heroic steps to rehabilitate and develop the national economy.

In the sphere of the metallurgical industry and its raw materials base they posed the problem of restoring immediately the production which had been destroyed during the imperialist war and the foreign intervention. The stepped-up rehabilitation of the ore mining industry proved to be an extraordinarily big and complex job. The mines and the workings were to a large extent flooded. The machinery, of which there was a small quantity in the mines, was completely worn out. There were very few skilled workers. For example, of the 24,000 workers who had been at Krivoi Rog in 1913, there were only 1,021 left as of 1 July 1920, and of these 365 were guards.

It was necessary not only to restore the old mines but to reconstruct them to a considerable extent, which involved large capital outlays and the necessity of importing equipment.

Despite the considerable difficulties, the ore mining industry achieved great successes in the course of the rehabilitation period. Through the efforts of the working class, under the guidance of the Communist Party, without outside help, the ore mining industry was rehabilitated in a very short time. The rehabilitation of the ore mining industry was accompanied by the technical reconstruction of the majority of the enterprises by means of the electrification and mechanization of the production processes.

However, the rate of expansion of the ore mining industry lagged considerably behind the needs of the country and behind the rate of development of other branches of industry.

By 1928 the volume of production of heavy industry had increased 55% relative to 1913, while the production of producer goods had increased 64%. But the amount of iron ore mined in 1928 was only 63% of the 1913 figure, and the production of copper was only 57.5%.

The historic task posed by the Fourteenth Party Congress (in 1925) that of converting Russia from an agrarian country into an industrial country capable of producing the necessary equipment on its own, required the development of several new branches of industry, chief among which was machine building. To this end it was necessary to accelerate the expansion of the ferrous and nonferrous metallurgical industries.

Section 5. The Expansion of the USSR Ore Mining Industry During the Prewar Five-Year Periods

The completion of the rehabilitation period and the successes in the expansion of industry in Russia made it possible to go over to a basic socialist reconstruction of the entire national economy.

The Fifteenth Party Congress, which met in December 1927, promulgated a directive on the preparation of the First Five-Year Plan for the National Economy, which laid special emphasis on machine building, ferrous and nonferrous metallurgy, and the gold and platinum industries.

The First Five-Year Plan was approved at the Sixteenth Party Congress, which met in early 1929. This plan was a program for building the foundations of a socialist economy. The basic task for the five-year period was the creation in the USSR of a heavy industry capable of reequipping not only industry itself but transport and agriculture. The basic link in the five-year plan was the development of heavy industry and its leading branch, machine building.

The growth of heavy industry, transport, electric power, and machine building called for in the five-year plan imposed tremendous demands upon metallurgy and its raw materials base. In order to step up the expansion of ferrous and nonferrous metallurgy, it was planned to construct large combines consisting of ore mines, dressing plants, and metallurgical plants, plus a complex of auxiliary shops (machinery repair services, power plants, etc).

In a series of resolutions, on the work of Yugostal (August 1929), on the expansion of the Krivoi Rog iron ore basin, and on the work of Uralmet (1930), the TsK KPSS indicated the main directions to be followed in the further development of ferrous metallurgy and its ore mining base. The historic resolution of the Sixteenth Party Congress (1930) on the creation of a new coal-metallurgical base for the USSR in the east, the construction of a Uralo-Kuzbas, was of tremendous significance in the development of ferrous metallurgy and the ore mining industry.

The First Five-Year Plan was fulfilled ahead of schedule, in 4 years and 3 months. This was a tremendous world-historic victory for the working class and the laboring peasantry of the USSR.

The gross product of heavy industry increased from 16.8 billion rubles in 1928 (in 1926-1927 prices) to 38.8 billion rubles in 1932, that is, 2.3 times. The product of machine building was quadrupled in 4 years, and increased 8-fold relative to 1913. As early as 1931 the product of the machine tool building industry had increased 15-fold relative to 1913.

Substantial successes were achieved in ferrous and nonferrous metallurgy and in the ore mining industry.

The amount of iron ore mined in 1932 was 1.3 times that mined in 1913 and more than twice the amount mined in 1927-1928. The amount of manganese ore mined exceeded the 1927-1928 level by 15%. The amount of chromite mined in 1932 was more than double the the 1913 level. The 1932 copper production exceeded the 1913 level 1.5 times, and the 1927-1928 level 2.4 times.

The production of lead increased 13.0 times and 8.1 times with respect to these same years, and the production of zinc increased 4.7 times and 6.2 times.

On the basis of party and government directives, large scale construction of new mines and plants was launched during the First Five-Year Period, and the reconstruction of old mines and plants was carried out. One of the greatest victories in the task of industrializing the USSR was the construction of the Magnitogorsk and Kuznets metallurgical combines. Construction was begun in 1929. By February 1932 at Magnitogorsk, and by April 1932 at Kuznetsk, the big blast furnaces were in operation and the first metal had been obtained. A huge ore mine was constructed at Magnitogorsk.

The iron ore deposits which were first worked during the First Five-Year Period include, in addition to the Magnitogorsk, the Telebesskaya group in Western Siberia and the Kerchen deposit in the

Crimea. The ore mines at Krivoi Rog and in the Urals were completely reconstructed. In the course of the First Five-Year Plan the productivity of the mines at Krivoi Rog was doubled.

Great successes were achieved by the USSR manganese industry. New deposits of manganese ore in the Urals and Western Siberia were brought under exploitation during the First Five-Year Plan.

The same period saw the construction of new mines for producing copper ore in the Urals and mines for other nonferrous metals, including the Achisay Polymetal Mine (Kazakh SSR), the Tikhvin Bauxite Mine (Leningrad Oblast), and the Baley Gold Mine (Transbaikal), and mines for rare metals. The existing copper mines in the Urals, polymetallic mines in the Altai, etc, were completely reconstructed.

The first Soviet aluminum enterprises, the Volkhov Aluminum Plant, the Tikhvin Aluminum Oxide Plant, etc, were put into operation during the First Five-Year Plan.

A rare metals industry was created during the First Five-Year Plan.

Despite the successes achieved, ferrous and nonferrous metallurgy and the ore mining industry did not fulfill the quota for the First Five-Year Plan. In the resolutions of the Seventeenth Party Congress it was emphasized that the basic priority task of the industrial plan was the unconditional overcoming of the lag in ferrous metallurgy.

A rapid growth of the metallurgical industry and its raw materials base was required in order to ensure the stepped-up growth

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

of machine building and other branches of industry which were the biggest consumers of ferrous and nonferrous metals. The Seventeenth Party Congress (January 1934) posed the problem of completely eliminating the lag between ferrous metallurgy and the general rate of expansion of the national economy, of doubling the capacity of the metallurgical industry in the course of the five-year plan, of effecting the reconstruction of the iron ore industry, with large scale introduction of methods of dressing and sintering ores, of achieving an especially rapid rate of development and technical reequipping of nonferrous metallurgy, of organizing the production of tin, nickel, magnesium, and broadly developing the production of aluminum, and of completely satisfying the requirements of the entire national economy, and especially the needs of electrification, as regards the products of metallurgy.

In order to overcome the lag of ferrous and nonferrous metallurgy, the rate of expansion for these branches of industry was set considerably higher in the Second Five-Year Plan than the rates for other branches of the national economy. Thus as against a general increase of 2.14 times in the industrial product as per the 1937 plan, relative to 1932, the amount of pig iron smelted was to increase 2.6 times, the amount of copper mined was to increase 3 times, lead 6.2 times, and zinc 6.5 times.

As a result of the implementation of party policy in the sphere of technical reconstruction and the introduction of new technology, and as a result of the self-sacrificing labor of the Soviet people, the Second Five-Year Plan for industry was successfully fulfilled by 1 April 1937, that is, in 4 years and 3 months, and by the end of the Second Five-Year Plan the plan for industry as a whole and for several of its most important branches was considerably overfulfilled. The amount of pig iron smelted increased from

6.2 million t in 1932 to 14.5 million t in 1937, that is, 2.35 times. No other country in the world has known such rates of growth.

The rapid rate of development in the production of ferrous metals required a considerable increase in the mining of ore, refractory materials, and coke. During the Second Five-Year Plan these branches of industry increased their production more than 2-fold.

There was a considerable increase in the amount of manganese ores mined during the Second Five-Year Plan. The amount of chromite mined in 1937 was 217,200 t, or more than triple the 1932 level and more than 8 times the 1913 level.

Nonferrous metallurgy achieved great successes in the Second Five-Year Plan. During these years the Urals and Transcaucasian copper industries were reconstructed. The years of the Second Five-Year Plan saw the beginning, for the first time in the USSR, of the mining of porphyritic ores from the Kounrad deposit.

The lead and zinc industry acquired a completely new look. The Chimkent Lead Plant, the largest in Europe, was put into operation, as were the mining and ore dressing enterprises in Central Asia which supplied the former with raw materials. The expansion and reconstruction of the Altai lead and zinc enterprises were continued. The lead and zinc industry in the northern Caucasus was expanded and reconstructed.

A Soviet nickel industry was created during the Second Five-Year Plan. In 1934 the Ufaley Nickel Plant was put into operation, and exploitation of the copper and nickel deposits in the northern regions was begun.

The mining of bauxites in the northern Urals bauxite mines was begun in 1934. Using electric power from the Dneprogez [Dnepr Hydroelectric Power Plant], an aluminum plant in Zaporozh'ye had begun to function as early as 1933. And shortly thereafter a magnesium plant and an electrodes plant were put into operation.

The Second Five-Year Plan saw the launching of large scale construction in the gold industry and the rare metals industry.

Deposits of tungsten, molybdenum, and tin ores were surveyed in the Kazakh SSR, in the Caucasus, in Siberia, and in other regions of the USSR, and the exploitation of these deposits was begun.

The production of the ferrous metallurgical industry increased considerably during the Second Five-Year Plan. The amount of black copper being smelted was more than doubled. In 1937, 37,700 t of aluminum were smelted, as against 900 t in 1932. The production of the polymetals industry increased considerably.

The Eighteenth Party Congress (March 1939) posed a new problem, namely to overtake and surpass the most advanced capitalist countries of Europe and the United States in an economic sense, that is, in terms of the per capita volume of production.

The Third Five-Year Plan for the years 1938-1942 called for further substantial expansion of the technical equipment of all branches of the national economy, the all-round expansion of heavy industry, especially of machine building, and a decisive improvement in the organization and technology of production, with large scale introduction of the latest achievements of science and technology.

The congress promulgated a directive concerning a constant and substantial expansion of ferrous metallurgy, the development of which to a considerable extent determines the growth of all industry and the national economy as a whole.

With respect to nonferrous metallurgy the Seventeenth Party Congress posed the problem of increasing the production of nonferrous metals to an extent which would ensure the satisfaction of the rapidly growing requirements of the national economy and national defense.

As a result of the self-sacrificing labor of the Soviet people under the guidance of the Communist Party and the Soviet Government, the Third Five-Year Plan was successfully fulfilled. During the years 1938-1940 alone the nation's industrial product increased almost 1.5 times.

Ferrous and nonferrous metallurgy achieved great successes. The number of operating enterprises was considerably increased during the first 3.5 years of the Third Five-Year Plan. Enterprises of the nickel, aluminum, tungsten-molybdenum, and other branches of the industry of nonferrous, rare, and precious metals were put into operation during these years.

During the prewar five-year plans the ore mining industry, like other branches of the national economy, was technically reconstructed. Thanks to the mechanization of mining operations, manual drilling was almost entirely eliminated. Loading work, subsurface and surface hauling, water drainage, and hoisting were mechanized. Large mechanized dressing plants were built.

The introduction of the flotation method of concentrating copper and polymetallic ores, and, in particular, the introduction of selective flotation, was of great importance in the development of the nonferrous metallurgical industry. Owing to the polymetallic nature of the majority of the ores of the nonferrous metals, the introduction of selective flotation made it possible to extract from the ores not only the basic valuable component but the accompanying metals, the value of which sometimes exceeds that of the basic components. Thus in the copper-pyrite ores of the Urals the value of the copper represents only about 35-40%, while the remaining value is accounted for by the sulfur, gold, silver, and zinc. Selective flotation of the copper ores of the Urals, which has made it possible to recover copper, zinc, and pyrite concentrates from the ore, has considerably increased the effectiveness of their utilization.

The nation's gold and platinum industry was considerably reconstructed during the prewar five-year plans. At several placer mines, manual mining was replaced by hydraulic, drag, and excavator mining. During the Second Five-Year Plan the number of dredges, especially electric dredges, and of hydraulic giants increased several times. The percentage of mechanization increased from 25 in 1928 to 70.

Section 6. The Ore Mining Industry of the USSR During the Years of the Great Patriotic War and in the Postwar Period

In June 1941 the peaceable labor of the Soviet people was broken off by the treacherous attack of Hitlerite Germany. The war which was beginning demanded the radical reconstruction of the entire Soviet industry and the shifting of the entire national economy to a new, wartime footing.

The development of industry for defense needs put a heavy demand on ferrous and nonferrous metallurgy. At the same time production possibilities were greatly curtailed during the first phase of the war, especially as regards pig iron, aluminum, magnesium, nickel, and zinc.

The fascist invaders, who temporarily occupied a considerable part of the territory of the USSR, did great damage to the ore mining, metallurgical, and other branches of industry in the USSR.

Temporarily deprived of the metallurgical industry in the south, the USSR underwent serious difficulties. However it succeeded in overcoming them. The results of the wise policy of the Communist Party in the distribution of industry were especially evident during the years of the war. The large metallurgical and mining industry which had been created in the east (in the Urals and Siberia) during the prewar five-year plans made it possible to a considerable extent to supply the needs of the front and the rear areas.

Exploitation work in the Bakal', Goroblagodat, and other mines was expanded in order to supply the metallurgical plants of the east with iron ore on a continuous basis. When the Tashtagol' and Odrabash mines were put into operation there was a considerable increase in the amount of local iron ore being supplied to the Kuznets Combine.

The development of several local deposits of manganese ore in the east was of great importance. During the war the amount of manganese mined in the east increased 3-fold.

Great successes were achieved in the aluminum industry during the war. By the end of the war the productive capacity of the aluminum industry exceeded the prewar level. Also a great deal of effort was expended during the war in stepping up the expansion of the nickel industry.

Hundreds of thousands of miners, and metallurgical plant workers, filled with a common aspiration to ensure the victory of their fatherland, entered into socialist competition for above-plan production of ore, metal, and coke, for increased labor productivity, and for economizing on material production resources. As a result of the heroic labor of the Soviet miners and metallurgical plant workers, the following production indexes were achieved in 1945, relative to 1940: tin -- 222%; nickel -- 176%; magnesium -- 145%; aluminum -- 144%; molybdenum -- 409%.

Following the great, world-historic victory of the Soviet Union over Hitlerite Germany and imperialist Japan, the peoples of the USSR were able to return to their peaceable labor. The victory of the USSR demonstrated to the whole world the advantages of the Soviet social and state systems.

The conclusion of the war posed for the peoples of the Soviet Union the task of rehabilitating the national economy in order to move further ahead to a new, powerful economic upswing.

The basic tasks of the Fourth Five-Year Plan for the years 1946-1950 were to rehabilitate those regions of the country which had suffered from the Hitlerite occupation, and to restore the prewar level of industry and agriculture, and then to surpass that level.

The broad expansion of heavy industry, the electrification of the country, the increase in machine building, and the growth in consumer goods industry called for in the Fourth Five-Year Plan, together with the task of further strengthening the nation's defense capacity, required the rapid rehabilitation and development of the ore mining industry. An increase of 48% in the industrial product was planned for the five-year period of 1946-1950. In the sphere of ferrous metallurgy it was planned that by 1950 the prewar level of 1940 for the smelting of pig iron would be surpassed by 35%, and that the amount of iron ore mined would be increased to 40 million t. Also plans called for a rapid rate of expansion in the production of nonferrous and rare metals on the basis of improving the work of existing enterprises, the construction of new mines and plants, the rehabilitation of enterprises in regions which had been occupied, and the introduction of advanced technology.

In order to effect the production increase called for in the five-year plan provision was made to increase the capacity of mines and dressing plants at existing enterprises and to construct new mines and dressing plants.

The Fourth Five-Year Plan was successfully fulfilled and the most important quotas of the plan were overfulfilled. By 1950 the industrial product was 73% greater than in 1940, in lieu of the 48% provided for in the plan. Great successes were achieved in the metallurgical industry.

The ferrous metallurgical industry of the south was rehabilitated on a new technical base, and in 1950 it turned out more metal than in 1940. The Krivoi Rog Basin was rehabilitated by the heroic efforts of the miners.

The ferrous metallurgical industry in the eastern regions of the country achieved new successes during the Fourth Five-Year Plan. By 1950 the production of pig iron in the Urals had increased 2.6 times relative to 1940. In Siberia the production of pig iron increased 1.2 times. As a result of the construction of new mines, concentrating mills, and plants, and improvement in the work of existing enterprises, the production of copper, lead, zinc, aluminum, nickel, and other nonferrous and rare metals increased substantially during the Fourth Five-Year Plan.

The growth in the production of pig iron and several of the nonferrous metals during the years 1946-1950 is characterized by the following data on the production of these metals in 1950 in percentages relative to the 1945 production, taken as 100%.

Pig iron	216.9
Copper	183.0
Zinc	232.0
Lead	238.0

The postwar period was characterized by a more rapid rate of production growth than was the case in the prewar period. During the 3-year period (1949-51), after the prewar level of production had been not only regained but surpassed, the increase in the production of pig iron amounted to 8 million t. There was a corresponding increase in the amount of iron ore mined.

During the Fifth Five-Year Plan the industrial production of the USSR has continued to increase rapidly. The Fifth Five-Year Plan with respect to the overall volume of industrial production was fulfilled by 1 May 1955, that is, in 4 years and 4 months.

The USSR ore mining industry has achieved substantial successes in the course of the Fifth Five-Year Plan. Relative to the Fourth Five-Year Plan, there has been a 3-fold increase in the production capacities put into operation in the iron ore industry. In addition to the expansion of ferrous metallurgy in the regions of the Urals, the south, Siberia, the center, and the northwest, work has been carried on in connection with the expansion of the metallurgical industry in the regions of the Transcaucasus, as well as planning and surveying work on the iron ore deposits of the Karelo-Finnish SSR.

In 1954, 41 million t of steel was poured, amounting to more than twice the 1940 production. In 1954 the USSR poured more steel than England, France, Italy, and Japan put together.

Relative to 1950 the 1954 production of lead showed a 2-fold increase, zinc 1.71, and aluminum 2.4 times. There was also an increase in the production of copper, nickel, and other non-ferrous and rare metals.

During the Fifth Five-Year Plan measures were carried out for the further mechanization of mining and labor consuming operations, increasing the overall extraction of metals from ores, and expanding and improving the utilization of the capacities of existing enterprises, and new enterprises were built.

At the plenum of the TsK KPSS which met in January 1955, the necessity of the priority expansion of heavy industry was heavily emphasized. A decree of the plenum states: "The Communist Party, guided by the teachings of the great Lenin on the all-round expansion of heavy machine industry and the electrification of the country, considers, as it has in the past, that its chief task is a further upswing in heavy industry, which constitutes a solid basis for the entire national economy and the invincible defense capacity of our fatherland and a source of constant improvement of the well-being of the Soviet people" (Pravda, No 33 (13331), 2 February 1955).

The implementation of the resolutions of the July Plenum of the TsK KPSS (1955) necessitates the further rapid expansion of the ferrous and nonferrous metallurgical industry and its raw materials base, the ore mining industry of the USSR.

Section 7. Russian Mining Science

Despite the backwardness of the Russian ore mining industry, Russian scientific and technical thought made a great contribution to world science. Russian scientists laid the scientific basis for mining in opposition to the views of many foreign scientists, who felt that mining was based merely on mining practice and practical skills. While working out the very complex problems of mining, the Russian scientists also devoted a great deal of attention to the economics of the mining industry.

The basic principles of the science of mining were worked out as early as the middle of the Eighteenth Century by the great Russian scientist, M. V. Lomonosov. In 1742 Lomonosov wrote a remarkable book, published in 1863, Pervye osnovaniya metallurgii, ili rudnykh del [First Principles of Metallurgy, or the Ore Industry], which constituted the basis of the science of mining.

The development of capitalism in Russia after the abolition of serfdom, which increased the national demand for metals and fuel, caused scientists to pay more attention to the problems of developing the mining industry.

These problems were heavily emphasized in the writings of G. P. Gel'mersen (on the exploitation of coal deposits), of the great Russian scientist, D. I. Mendeleyev, and others.

Characteristic of this period was the effort made by Russian scientists toward a study of the natural phenomena associated with mining operations, and toward providing a scientific basis for the most important production processes in mining.

Russian scientists, inventors, and engineers tirelessly advanced Russian mining science.

However the socioeconomic conditions in Russia, the bourgeois-landowner system, hampered the practical application of scientific achievements. It was only after the Great October Socialist Revolution that the conditions were created for the flowering of science, for the establishment of a close bond between science and practice, and for the broad utilization of the achievements of science in practical activity.

The Communist Party and the Soviet Government took every possible step for the development of science and for the application of its achievements to practice. As early as 1920 the Ninth Party Congress pointed out, in a resolution on the priority tasks of economic building: "... all scientific resources must be called upon for working out problems of the technology and scientific organization of industry, and institutes for scientific research and inventions must be created and supported in every possible way" (VKP(b) v rezolyutsiyakh i resheniyakh s'yezdov, konferntsiy i plenumov TsK [The VKP(b) [Vsesoyuznaya kommunisticheskaya partiya (bol'shevikov) -- All-Union Communist Party (Bolsheviks)] in the Resolutions and Decisions of Congresses, Conferences, and Plenums of the TsK], 1940, Part I, page 329).

The tasks of the development of Soviet science, and of the utilization of scientific research institutes and technical institutions of higher education in solving the technical problems of the economics organs are reflected in the decisions of the July Plenum of the TsK VKP(b) in 1928 and in the resolution of party congresses and conferences.

The implementation of the decisions of the party and the government ensured the broad development of all branches of science in the USSR, including the science of mining, and the application of scientific achievements in socialist industry. Whereas during the 125 years immediately preceding the Great October Socialist Revolution only one mining institute had been established, during the Soviet era dozens of special institutes and departments for the training of mining engineers have been established.

Prior to the great October Socialist Revolution there was not even one special scientific research institution dealing with the mining industry. Scientific institutions of this kind were established only under the Soviet regime. Today the USSR has several specialized scientific research institutes at which large staffs of scientists and scientific workers deal with problems associated with the development of the mining industry. Institutions dealing directly with problems of the ore mining industry include the Krivoi Rog Scientific Research Institute, which studies problems of mine exploitation and the mechanization of mining operations, Mekhanobr [Scientific Research Institute for Mechanical Concentration of Minerals], which deals with problems of the concentration and dressing of ores, Gintsvetmet [State Institute of Non-Ferrous Metals], which deals with problems of the concentration of nonferrous metal ores, Nigrizoloto [Scientific Research Institute for Geological Prospecting of Gold], which deals with problems of surveying and working deposits, the All-Union Aluminum and Magnesium Institute, Giproruda [State Institute for the Planning of Mining Establishments for the Iron Ore, Manganese, and Nonmetallic Ores Industries], Giprotsvetmet [State Institute for the Planning of Establishments of the Non-Ferrous Metals Industry], and numerous other scientific and planning institutes. Problems of mining economics are handled by the Academy of Sciences USSR (Council for the Study of Productive Forces), by mining scientific research and planning institutes, with economic groups under them, and by the Ministry of Ferrous Metallurgy USSR, the Ministry of Non-Ferrous Metallurgy, USSR, and Gosplan, USSR.

As scientific research work in the field of mining developed, it became necessary to coordinate these activities and the work being done on general theoretical problems. To this end the Institute of Mining of the Academy of Sciences USSR was established in 1935. In subsequent years similar institutes were established under the academies of science of the Ukrainian, Georgian, and Kazakh republics, and under branches of the Academy of Sciences USSR in the Urals region and in the Kuzbas.

In the USSR scientific work has extended beyond the walls of scientific institutions. Large staffs of technical engineering workers and thousands of miners, rationalizors, and production innovators have been brought into the sphere of scientific research. This creative collaboration between the workers of science and those of industry constitutes an inviolable source for the development of technical progress in the USSR.

In the mining industry it is extremely difficult to carry out experiments under laboratory conditions with regard to certain problems. Therefore the connection between science and production is especially important and necessary. Liaison between scientific institutions and industry is effected on the basis of contracts for scientific research work, by means of rendering technical assistance, participation in the work of the technical councils of enterprises and ministries, and assistance in the matter of improving the skills of personnel.

Creative collaboration between scientists and industrial workers not only helps industry to accomplish the tasks imposed upon it more rapidly and fruitfully but constantly enriches scientific theory with experience from practice, and helps to train specialists who know not only the theoretical side of their work but the practical side as well.

Problems of the economics and history of the mining industry are treated in the writings of academicians I. P. Bardin and S. G. Strumilin, and corresponding members of the Academy of Sciences USSR P. I. Lyashchenko, N. I. Pavlenko, and A. D. Breyterman. The writings of these scientists are devoted to both the history of the mining and metallurgical industries and their present state and the problems of their further development.

The contributions of Soviet scientists in the development of the science of mining consist not only of the solutions of many very important problems but of the founding of scientific schools of thought whose representatives are advancing Soviet mining science and technology. The July Plenum of the TsK KPSS (1955) called for the large scale expansion of scientific research work and planning and instruction work in connection with the invention of mining equipment and instruments for automatic control and direction of production processes. The most important task of the scientific research institutes is a more complete utilization of scientific personnel in solving the most important problems of the development of the national economy, and the dissemination of advanced work practices, ensuring the large scale application of scientific discoveries to industry.

CHAPTER II. RAW MATERIALS RESOURCES AND THE GEOGRAPHIC DISTRIBUTION OF THE USSR ORE MINING INDUSTRY

Section 1. Raw Materials Resources and Their Importance

The production of material goods requires instruments of labor, objects of labor, and the labor of man.

Instruments of labor include all of those things by means of which man acts on the objects of labor and transforms them with a view to endowing them with the necessary properties for utilization in production or for direct consumption.

Instruments of labor include both instruments of production (machinery, equipment, tools) and land, plant buildings, structures, etc.

The object of labor is that on which the labor of man is expended. Objects of labor may be furnished directly by nature (ore and coal deposited in the earth, timber, etc).

Objects of labor which have previously been acted on by labor are called raw materials, that is, ore at the dressing plant or at the metallurgical plant.

It is often the case that several kinds of raw material are used in producing the finished product. For example, iron ore, fluxes, and coke are used in smelting pig iron. Copper ore, quartz, fuel, etc, are necessary in the smelting of copper. Depending upon the nature of their participation in the formation of the product, materials are classified as: (a) direct raw materials and direct materials; and (b) indirect raw materials and indirect materials.

Raw materials and direct materials form the material basis of the product. For example, iron ore forms the material basis of pig iron. Raw materials and materials which do not form the basis of the product are called indirect. They are consumed by instruments of labor (as, for example, coal is consumed by a steam engine) or are added to the raw material in order to make some change in it (as, for example, coke is added to iron ore). Or, finally, they facilitate the labor operations (for example, materials for illuminating and heating the working space).

The raw materials used in various branches of industry may be subdivided into 2 basic groups: (1) industrial raw materials (ore, minerals which are not ores, etc); and (2) agricultural raw materials (flax, cotton, wool, etc).

Among the industrial raw materials a distinction is made between those raw materials which are extracted from the earth (the raw materials of the extraction industry) and the raw materials which are obtained by artificial means (synthetic fuels, plastics, etc). The basic kind of industrial raw material is raw material extracted from the earth. It is called mineral raw material. The concept of a mineral product is associated with the concept of a mineral raw material. A mineral product is a mineral raw material which is extracted from the earth and has economic value.

The concept of a mineral product has changed at various stages in the development of human society. A mere half century ago only some 20 chemical elements were being utilized. Many chemical elements which today are considered useful components in ore were formerly considered to be foreign matter (sulfur, arsenic, and nickel in copper ore; niobium, titanium, etc).

The qualitative requirements imposed upon raw materials change as technology grows. A considerable portion of metals is obtained from ores which in the early twentieth century were still considered of no industrial value because of the low metal content. Technical progress means the replacement of one kind of raw material by another. For example in the nineteenth century coke replaced charcoal in the ferrous metallurgical industry. In the aluminum industry, aluminum oxide is obtained not only from bauxites but from other kinds of raw material (nephelines and alunites).

Under a capitalist economy a systematic study of natural raw materials resources is impossible. In capitalist countries, geological survey work is carried out by private entrepreneurs strictly in the interests of profit. Ore deposits are worked, not within the limits of their natural contours, but within the limits of a contour confined by private ownership of the land and the deposit. Capitalist monopolies frequently delay geological survey work and the development of new deposits in order to keep prices high. For example, the New Caledonia Nickel Company delayed for a long time the development of the largest nickel deposits in Canada because it feared competition. Since World War II the US monopolies have been trying to seize the most important sources of raw materials, squeezing out the old colonial powers such as England, France, Holland, and Belgium, which fact is leading to an aggravation of the imperialist conflicts in the camp of capitalism.

In a socialist economy the development of the mineral raw materials base, like that of the national economy as a whole, is carried out systematically and on a scientific basis. The chief factors determining the advantages in the development of the raw materials base of the USSR are as follows: (1) public ownership of the producer goods, the earth, and the deposits; (2) the systematic and constant growth of socialist production; and (3) large scale geological prospecting and geological surveying work carried out by state organizations in accordance with a plan for the development of the entire national economy.

The development of a raw materials base is of decisive importance in the development of the whole national economy and in strengthening the economic independence of the USSR. Therefore, the party and the government constantly devote a great deal of attention to the development of the raw materials base of the USSR.

As early as 1918, in an article titled "Outline of a Plan for Scientific and Technical Work," V. I. Lenin posed before the Academy of Sciences the problem of making provision in this plan for the Russian Soviet Republic to be most fully assured of "... the possibility of independently supplying itself with all of the most important kinds of raw materials and industry" (V. I. Lenin, Soch., fourth edition, Vol 27, page 288).

The Sixteenth Party Congress (1930) pointed out in its resolutions that "To ensure the development of the national economy, it is necessary to step up the tempo of geological surveying work to such an extent that it will considerably surpass the rate of development of industry so that mineral raw materials can be prepared in advance" (VKP(b) v rezolyutsiyakh i resheniyakh s'yezdov, konferentsiy i plenumov TsK, 1953, Part II, page 58).

During the Great Patriotic War and the postwar years a great deal of work was done in connection with finding new deposits and further increasing the reserves of iron and manganese ores, nonferrous metals, and rare metals, especially in the eastern regions. In order to meet the national economy's growing requirements for raw materials and fuel resources, it is planned to expand work in connection with surveying natural resources in the earth, and finding reserves of minerals, above all, reserves of nonferrous and rare metals, coking coal, aluminum raw materials, petroleum, rich iron ores, and other kinds of industrial raw materials.

Section 2. The Development of the Mineral Raw Materials Base of the USSR

The territory of the USSR covers more than 1/6 of the earth's surface. The natural resources of the USSR are colossal. Our earth is rich in minerals, including the ores of ferrous, nonferrous, rare, and precious metals.

The old Russian ore specialists (of the seventeenth and eighteenth centuries), Khripunov, Antonov, Yerofey Markov, Brusnitsyn, and many others, did a lot of work in prospecting for deposits of minerals. Russian scientists made a great contribution to the study of the ore resources of the USSR.

However it was only after the Great October Socialist Revolution that there was a real possibility for finding and utilizing the country's natural resources. Prior to the revolution the geological knowledge of the country was very poor, owing to Russia's general economic backwardness. Although the Geological Committee was founded in Russia in 1895, its activity prior to the Revolution was very limited.

Before the Great October Socialist Revolution, geological surveying was done primarily in the European part of Russia and in the Urals. For the most part, the work of the Geological Committee consisted of a 10-verst geological survey. Such a small scale survey yielded very little for a detailed study of the geological structure of individual regions, especially the mountainous regions with a complex geological structure.

As a result of the lack of geological data and the limited scale of the geological surveying work, the explored [razvedannye] reserves of minerals in our country were very small, and their share in the world reserves was negligible. For example, the reserves of iron ore were figured at 1.6 billion t, which was about one% of the world reserves. The explored reserves of copper amounted to less than one% of the world reserves. Although reserves of lead and zinc were known in several regions of the country, in the Altay, the Caucasus, and Siberia, the amount of exploration work done on them was negligible.

The growth of the national economy of the USSR and the transformation of the USSR from an agrarian one into an industrial one required large scale development of geological surveying work in prospecting and exploring deposits of minerals. By virtue of their self-sacrificing labor, and thanks to the solicitude of the party and the government, Soviet geologists have successfully carried out the tasks given them.

One of the basic indexes of the success of the Soviet geologists is furnished by data on the extent to which the USSR has been studied geologically. Whereas on 1 January 1918 only 14% of the territory of the country had been covered by surveys on various scales, by 1 January 1947 75% of the territory had been covered. More than 14 million sq km of territory has been surveyed during the Soviet era.

There has been a substantial increase in the number of surveys on detailed scales. Between 1917 and 1937 Soviet geologists covered 2.9 million sq km with this kind of survey. Detailed surveys have been carried out primarily in the most promising regions. The surveying work has had a comprehensive character. A comprehensive survey is not confined to noting outcroppings of rock on a map. It gives a complete description of the geological structure of the region under study, the history of its geological development, and the processes causing the formation of various elements in the geological structure.

The preparation of general and detailed maps is the basis for effective prospecting and surveying work. The various methods of geological study worked out by the Soviet geologists, the instruments designed by them for this purpose, and the development of the technology of drilling and mine excavating work have all been of great importance.

As a result of this work, hundreds of new deposits of the most varied minerals have been surveyed and developed in the USSR. New deposits of coal, iron, nickel, tungsten, molybdenum, bauxites, chromium, noble metals, and other very valuable minerals have been discovered and developed. The discovery of new deposits and the surveying of formerly known deposits has enabled the Soviet Union to assume world leadership with regard to reserves of the most important minerals (Table 5).

TABLE 5

THE USSR'S SHARE IN WORLD RESERVES OF MINERAL RESOURCES AS OF 1 JANUARY 1937

Resource	Share, in % of world reserves	Share, in % of European reserves	Place in the world	Place in Europe
Petroleum	55	96	1	1
Iron ore	53.44	75.2	1	1
Manganese ore	30.6	100	2	1

On the basis of the surveys that were carried out, the location on the territory of the USSR of surveyed reserves of minerals was determined with considerable accuracy. Many regions which before the revolution had either no explored raw materials resources, or very limited resources, moved into first place with respect to reserves of the most important kinds of minerals (the Kazakh SSR, copper, lead, zinc; the Uzbek SSR, copper and rare metals; the Tadzhik SSR, lead, zinc, bismuth; the Buryat-Mongolian ASSR, tungsten (Figure 1)).

New iron ore deposits were discovered and explored in the Urals, Kazakhstan, and Siberia. Large iron ore deposits were discovered on the Kol'sk Peninsula. Substantial reserves of manganese were discovered in Western Siberia, the Bashkir ASSR, and the Kazakh SSR. Deposits of copper were explored in the Urals, and deposits of polymetallic ores in the Altai, southern Kazakhstan, and the Uzbek SSR, together with deposits of bauxites in the Urals and Western Siberia.

During the Soviet era substantial reserves of tungsten, molybdenum, cobalt, bismuth, antimony, mercury, gold, platinoids, and other minerals were explored in various regions of the country.

No capitalist country is in a position to meet its own requirements for all varieties of minerals fully. Thus the US, which is the country best supplied with raw materials, is compelled to resort to imports to cover a good share of its requirements for tin, nickel, tungsten, bauxites, and other minerals.

The national economy of the USSR is supplied with all varieties of minerals.

In order to meet the national economy's need for various kinds of minerals, numerous specialized geological organizations are doing prospecting and exploration work on new deposits of minerals on the territory of the country, while at the same time they are studying deposits which have already been discovered and are being worked. This provides the preconditions for a further upswing of the entire mining and metallurgical industry of the USSR.

The basic features in the development of the mineral raw material base in the USSR are as follows.

(1) A constant and systematic increase in the explored reserves of minerals (in contrast to their slow rate of increase in capitalist countries). Whereas over a period of 20 years (1929 to 1949) overall reserves of metals in the capitalist countries increased 34.5% for copper, 42% for zinc, and 57% for lead, in the USSR during the same period the explored reserves of these metals increased by multiples of 10.

(2) The discovery of reserves in various regions of the USSR, which fact makes it possible to distribute industry more evenly

(in contrast to the concentration of surveyed reserves in a small number of regions in the capitalist countries).

In 1929, of the overall reserves of the capitalist countries, 67.8% of the world reserves of copper (not counting the USSR) was accounted for by the 2 basic copper ore regions, namely the western American (including the southwestern states of the US, Mexico, and Chili) and the central African (including Northern and Southern Rhodesia and the Belgian Congo). In 1949 these same regions accounted for 83.5%.

In 1929 reserves of copper in the USSR were calculated for only 3 regions. Today reserves have been discovered in a large number of regions.

In prerevolutionary Russia the mining of iron ores was for the most part done in 2 regions, in the south and in the Urals. These regions accounted for 95.1% of all iron ore mined in 1913. Today iron ore is being mined in several other regions of the USSR in addition to the south and the Urals (in Siberia, the northwest, the Transcaucas, etc).

(3) The discovery of various types of deposits.

In the capitalist countries at the present time 84% of all explored reserves of copper are accounted for by 2 basic types (porphyritic ores and stratified cuprous sands). In the USSR during the Soviet era, new types of deposits have been found in addition to the above, namely deposits of copper-nickel ores, pyrrhotine ores, skarn ores, and several others.

(4) The fact that existing enterprises of the mining industry, and also enterprises under construction, are better supplied with explored reserves. (In particular, they are additionally supplied with prospective reserves.)

(5) A planned sequence in the working of individual deposits, taking into account the interests of the national economy as a whole.

Section 3. The Classification of the Reserves of Deposits of Solid Minerals

The classification of reserves of solid minerals establishes the principles for calculating and accounting for the reserves in the earth and the principles for determining the extent to which reserves are ready for industrial utilization.

Reserves of minerals are calculated on the basis of the quantity in the deposit, without allowing for losses in mining, concentration, and processing, or for possible working out in the process of mining.

Reserves of ferrous and nonferrous metals are estimated in terms of weight.

Reserves of minerals are divided into 2 groups which are accounted for separately: (1) balance reserves, which satisfy the requirements of industry and the mining engineering conditions of exploitation; (2) ultrabalance reserves, which because of the low content of the useful component or mineral, the slight thickness of the vein, the particular difficulty of the conditions of exploitation, or the lack of industrial methods for processing the mineral in question, cannot be utilized at the present time but may be considered as the object of development, on an industrial scale in the future.

Reserves of ultrabalance ores are classified in accordance with the extent of exploration which determines the probable amounts thereof in the deposit.

The only ores excluded from ultrabalance reserves are those with a poor mineralization which cannot reasonably be considered as raw materials for the immediate future.

For example, in the gold and platinum industry ores with a content of one g per t or with a content of 40 mg per cm of mass in the case of placer deposits are not included in the estimate of ultrabalance reserves.

Determining Balance and Ultra-Balance Reserves

The correct determination of balance and ultrabalance reserves is of great national economic importance. Within the limits of the explored raw materials base it determines the extent to which socialist industry is supplied with mineral raw materials. It leads to a reduction of losses and of exhaustion of deposits, has an effect on the boundaries of workings and the contours of dress being worked, provides a guarantee that work will be carried out in a systematic manner, and has an effect on the methods of development and systems of working deposits and, in the final analysis, on the cost of the metal.

In capitalist countries the quality of ore is determined merely on the basis of the possibility of securing a maximum profit. Thus according to the definition given by the US Geological Survey, "an ore is an aggregation of one or more minerals from which useful metals may be profitably extracted."

Such a definition of balance ores is completely unsuitable under the USSR's socialist conditions. In the USSR deposits are worked in accordance with the national economy's need for certain ores. Therefore, even unprofitable deposits may be worked temporarily, if the need for the ore in question is of great importance to the USSR's industry.

In the USSR many factors determine whether reserves of ore are classified as balance or ultrabalance reserves. The chief factors include the following.

(1) The importance of the mineral in question to the national economy.

(2) The extent to which the country is supplied with the mineral in question, and the overall reserves of it.

(3) The content of the useful component and of foreign matter.

(4) The thickness of the vein and the conditions of the occurrence.

(5) The mineralogical and physicochemical analysis of the ore, which determine the method of processing.

(6) The extent to which the technological procedure for processing the ores has been studied.

(7) The economic conditions in the region.

(8) The hydrogeological conditions, etc.

These factors, which determine whether ores are classified as balance or ultrabalance, may conflict. For example, an ore may have a high content of metal but the thickness of the vein may be negligible, or vice versa.

It is the usual practice to take the content of useful components in the ore as an index in determining the influence of these factors on the matter of classifying ores as balance or ultrabalance. For example, the instructions of the Ministry of Geology on classifying reserves of solid minerals establish 2 concepts, (1) the minimal average content, and (2) the minimal marginal content. The minimal average content means the lowest content of metal that an ore can have and still be utilized for processing. Ores with a metal content below this minimum are not sent for processing.

For example, the iron ores used in blast furnace smelting must have the following minimal limits of average content of iron, in percentages.

For siderites, not below	30-35
For vivianites, not below	45-50
For hematites and martites, not below	54-58
For magnetic iron ores	56-60

The minimal marginal content means the lowest metal content that an ore can have and still be included in the category of balance reserves.

However, an ore must not be classified with balance reserves or ultrabalance reserves merely on the basis of the content of useful components considered in isolation from the other factors. For example, it is possible to have large reserves of rich ores occurring at a great depth and under conditions of a large influx of water, that is, under conditions which render the mining of the ores economically impracticable in several cases.

The technological procedure for processing the ore in question is of great importance. For example, in the case of easily concentrated iron ores where there is a yield of high grade concentrate of no less than 30-33%, the minimal industrial content of iron is reduced to 25-32%.

Where there is a content of several valuable components all of which are being extracted, the minimal allowable industrial content of each of the components is reduced. Thus when an iron ore contains vanadium and nickel, the minimal content of iron may be considerably reduced. For example, in the case of certain titanomagnetic ores it may be reduced to 39% (as against an average norm of 45% of iron) and even to 25% of iron (as against an average norm of 33-40%), and for vivianites containing nickel it may be reduced to 30% of iron (as against an average norm of 36%).

The requirements as to the content of iron in the ore also depend upon the type of useful mineral, the analysis of the barren rock, and other factors. Academician M. A. Pavlov cites the following example. Magnetic iron ore with an iron content of 48% is considered poor ore (difficult to reduce), while vivianite with the same iron content is considered very good ore (easily reducible).

Deposits of nonferrous, noble, and rare metals are distinguished by great variety in terms of the size of the reserves, the metal content in the ore, the thickness of the veins, and the mineralogical and physicochemical analysis of the ores. They are located in different regions of the USSR which vary sharply in terms of the geographic and economic conditions. Therefore the level of the minimal average and minimal marginal content will be different for the different deposits.

In order to classify ores as balance or ultrabalance, it is necessary in the case of each deposit or area to collate the production expenses against the results. Production expenses and their results are synthetic indexes which reflect all of the above factors determining whether ores should be classified as balance or ultrabalance (the content of useful components, the conditions of occurrence, the thickness of the vein, the analysis of the ore, etc).

In order to decide whether a particular ore should be classified as balance or ultrabalance it is necessary to compare the production expenses with the value of the product obtained on the basis of current wholesale prices.

Under socialism the requirements of the law of the systematic (proportional) development of the national economy make it necessary to work deposits where the production expenses may temporarily be higher than the value in established prices. The greater the nation's need for a certain metal, the greater the number of deposits and areas which must be developed to satisfy this demand. The latter may also include deposits and areas where the per unit production costs are higher. In such cases, when the approved cost exceeds the wholesale prices, the approved cost must be used in calculating minimal content.

In determining the minimal marginal content of metal it is necessary to bear in mind that the reserves of a deposit must be exploited over a period of several years.

The ore mining industry of the USSR is developing at a rapid rate and on a large scale, which requires the expansion of existing mines and the development of numerous new deposits. One of the special characteristics of the development of the ore mining industry is the ever increasing importance of poor ores in proportion as metallurgical production is expanded.

The tasks of developing ferrous and nonferrous metallurgy and of improving methods of mining, concentrating, and smelting ores make for remarkable prospects in the sphere of the utilization of poor ores.

In the USSR the reserves of rich ores, especially of iron ores, are very great. However, if only the rich ores are used, several problems remain unsolved, for example the planned geographic distribution of enterprises of ferrous metallurgy, the preparation of raw materials bases for smelting metal on a huge scale in the future, etc.

If ferrous metallurgy were based only on the rich ores the industry would be located in only 2 or 3 regions, namely the south (the Krivoi Rog deposit), the center (the rich ores of the Kursk magnetic anomaly), and in the Urals (where the reserves of rich ores are relatively small). The development of the metallurgical industry in other regions inevitably requires that relatively poor ores be used for processing.

A constant increase in the productivity of social labor is a law of the development of a socialist economy. This increase is ensured by a broad development of mechanization, the improvement of technological processes, progress in the technology of dressing ores, the comprehensive utilization of ores, a socialist attitude toward labor, and other factors. The increase in the productivity of social labor makes possible the future profitable processing of poor ores. Therefore, in computing the technicoeconomic indexes for a specific minimal marginal content, one must use the advanced and most progressive indexes with regard to both the cost of individual processes and the coefficients of extraction.

At operating enterprises where main mine workings and development workings must be worked without regard to whether ores with a minimal marginal content are to be mined, prorated expenses in connection with mining development work and the amortization of capital mine workings may be excluded from the operating expenses in computing the minimal metal content in ores. The same thing applies to other kinds of expenses (water drainage, illumination, etc), if they are not specially associated with the mining of poor ores. At operating enterprises the classification of ores with a low metal content as ultrabalance may lead to the nonutilization of dressing plants and metallurgical plants. In such cases it is necessary to determine the possible cost reduction by means of providing a full load for existing installations in connection with using poor ores for processing, and to exclude the amount of the saving from the operational expenses. This ensures the inclusion among balance reserves of the maximal part of the reserve, and thereby the preservation and full utilization of the USSR's deposits.

Consequently the level of the minimal average content and of the marginal content is determined by the working conditions, not only at the mine but at the dressing plant and at the metallurgical plant, by the importance to the national economy of the metal in question, the demand for it, the balance of reserves, the geographic and economic conditions in the region where the deposit is located, etc.

The minimal average content and minimal marginal content are not constant values. They vary with progress in technology, changes in the economic conditions of the region in which the deposit is located, the nation's requirements, and the balance of reserves. The development of the economies of several regions in the USSR has already brought about a situation whereby many ores and deposits which were formerly considered nonindustrial are now classified as industrial.

However the inclusion of a maximum of reserves among balance reserves should not mean that under all conditions ores with a minimal content are included in plans for priority extraction.

In drawing up plans for the working of a deposit the minimal content of metal in ores, below which the ores should not be sent for processing, is established by the method of variants.

Relative to individual variants, the levels of minimal content are determined by the reserves of the ore mass to be worked, the average metal content in them, losses and exhaustion, the yearly productivity for the ore mass and the metal, capital outlays, overall and per unit of production capacity, and the cost of the metal. The selection of the optimum variant is determined on the basis of a comparative evaluation of these indexes, but with the condition that the correct technical exploitation of the deposit must be adhered to.

Determining the minimal industrial content of metal in an ore

The minimal industrial content of metal in an ore may be ascertained in the following manner.

We use the following designations:

C_p -- cost of mining and transporting one t of ore;

C_o -- cost of dressing one t of ore;

C_t -- cost of transporting one t of concentrate from the concentration mill to the plant;

C_m -- cost of processing one t of concentrate;

f, R_1 и R_3 -- content of the useful component in the basic raw material (according to data from assays of mine samples), in the plant concentrate, and in the finished product;

i_o и i_m -- coefficient of recovery of the useful component at the concentration mill and the plant, in parts of unity.

q -- coefficient of exhaustion of the ore in the process of mining (Cf. pages 96 and 97).

The per t cost of the finished product will be:

$$C = \frac{R_3 (C_p + C_o)}{f \cdot i_o \cdot i_m (1-q)} + \frac{R_3 (C_t + C_m)}{R_1 \cdot i_m}$$

The first member of the second part of the equation represents expenses in connection with the mining, transportation, and dressing of the entire quantity of raw material expended per t of the finished product.

The second member of the equation represents expenses on the transportation and metallurgical reduction of the entire quantity of concentrate required for obtaining one t of metal. If the quantity of concentrate does not change in accordance with the metal content in the basic raw material (f), the second member will represent a constant value not dependent upon f.

Denoting for this case the second member of the second part of the equation by a, the cost or necessary expenses established under planned procedure for obtaining a unit of metal by Ts, the cost of mining and dressing one t of ore with a minimal content in the ore by C_r and $C_{об}$, the coefficient of extraction when dressing a poor ore by i_o, and the minimal industrial content corresponding to the cost or established level of expenses by f_{min}., we may determine that:

$$Ц = \frac{R_3(C'p + C'o_{б})}{f_{min} \cdot i_o \cdot i'_m(1-q)} + a,$$

from which it follows that:

$$f_{min} = \frac{R_3(C'_p + C'_{oб})}{(Ц - a) \cdot i'_o \cdot i'_m (1-q)} .$$

In computing the cost of mining the ore (C"r) and dressing it (C"oБ.), one should take into account only those expenses which are entailed in the working of the area with the minimal content of metal in the ore, and where the increased productivity of the concentration plant results from dressing poor ores.

The recovery of all of the valuable components contained in an ore lowers the level of the minimal content of each of the components by comparison with monometallic ore, since several expense items (mining, transportation, and dressing of the ore) apply to all of the components extracted from the ore.

In order to determine whether the ore in question is balance or ultrabalance in the case where there is complex recovery of the useful components in the ore, it is necessary to compare the value of all of the components extracted from one t of the ore with the expenses for the mining and processing of one t of the ore.

This may be determined by the following formula:

$$f'_{min} Ts' \cdot i_o \cdot i_m + f'_{min} \cdot Ts'' \cdot i''_o \cdot i''_m + \dots + f^n_{min} Ts^n \cdot i^n_o \cdot i^n_m \geqslant W,$$

where the meaning of the symbols f_{min}., T_s, i_o, and i_m is the same as for a monometallic raw material, and where W represents the operational expenses on the mining and processing of one t of the ore.

The value of W is determined by means of the following formula:

$$W = \frac{C_r + C_{ob}}{(1-q)} + \frac{a'f'_{min} \cdot i'_o \cdot i'_m}{R'} + \dots \frac{+a^n f^n_{min} \; i^n_o \cdot i^n_m}{R^n}$$

where the denotations of the symbols are the same as in the preceding formulas. The first element of the second part of the equation ($\frac{C_a + C_{ob}}{(1-q)}$) represents the expenses on the mining and dressing of one t of ore referred to all of the useful components, and the remaining elements of the second part of the equation represent the expenses entailed in transporting and processing the different concentrates obtained from one t of the ore.

An example of a calculation using this method under conditions where:

$f' = 3\%$; $Ts = 30$; $i'_o = 0.9$; $i'_m = 0.95$;

$f'' = 2\%$; $Ts'' = 20$; $i''_m = 0.85$; $i''_m = 0.9$; $W - 53.72$ rubles.

Then the value of the metals extracted will be:

$$3 \cdot 30 \cdot 0 \cdot 9 \cdot 0 \cdot 95 = 76.95 \text{ rubles}$$

$$2 \cdot 20 \cdot 0 \cdot 95 \cdot 0 \cdot 9 = 30.60 \text{ rubles}$$

Total 107.55 rubles

In the given case the value of the metals extracted from one t of the ore exceeds the operational expenses, and the reserves of this ore may be classified as balance reserves. The level of the minimal marginal content of metal in the ore, with the given content of metals, will be determined from the ratio between their value where there is an average content in the ore and the operational expenses per t of ore. In the given case this amounts to:

$$\frac{107.55}{53.72} = 2,$$

that is, the level of the minimal marginal content of metals in the ore is twice as low as the average. For the given case this amounts to:-

$$f_{min.} = 3:2 = 1.5\%;$$

$$f''_{min.} = 2:2 = 1\%.$$

With this ratio of metal content the reserves may be classified as balance. The coefficient of recovery of the metals, i_o, which may be lower for poor ores, will have a certain effect on the level of the minimal marginal content of the metals. This should be taken into account in computing the value of the components extracted from one t of ore with a minimal content of metals.

Where there is complex recovery, the minimal content of metals in an ore may be considered in the totality of the metals. Deviations in the content of each of the metals, provided they are of equal value to the national economy, may be compensated for by a corresponding deviation in the content of other metals in the ore.

In those cases where the ratio of metals in the assays varies from their average content in the deposit, the metals may be equated with one another on the basis of the ratio between their values.

Let us assume that we have an assay with a metal content in the ore amounting to:

$f' = 1\%$ and $f'' = 2\%$

On the basis of the value of the individual components in the above example, we determine that 1% of the content of the metal, f', is equal to 1.5% of the content of the metal f'', that is, $30:20 = 1.5$.

Classifying Reserves By Categories

In accordance with the extent to which the deposits have been studied, reserves of minerals are subdivided into 5 categories: A1, A2, B, C1, and C2.

Category A1 includes those reserves which have been thoroughly studied and mapped by development workings or operational exploration boreholes. The distribution of industrial grades of minerals has been established in each block. The technology of concentrating the mineral is known on the basis of industrial use. The hydrogeological conditions for working the deposit are also known.

Reserves in category A2 must for the most part correspond to the same conditions as category A1 reserves. However, the quality, the technological properties of the mineral, and the technology of concentrating it may be established on the basis of the scientific research work which has been done.

Reserves in category B must correspond to the same conditions as those in category A2, but the natural types and industrial grades of the mineral may be established without detailing their distribution.

Category C1 includes: reserves which have been determined on the basis of a sparse network of boreholes or workings; reserves adjacent to contours of reserves in categories A1, A2, and B; reserves in especially complex deposits for which, despite a dense network of exploratory workings, the distribution of the valuable component or mineral has not been ascertained; the industrial grades and technology have been ascertained tentatively by analogy with known deposits; the general conditions for working the deposit and the hydrogeological conditions have been tentatively studied.

Category C2 includes reserves adjacent to working areas of deposits explored in categories A2, B, and C2, and reserves assumed on the basis of geological and physical data which have been confirmed by assays of samples of the mineral from individual boreholes and workings (Klassifikatsiya zapasov mestorozhdeniy tverdykh poleznykh iskopayemykh [The Classification of the Reserves of Deposits of Solid Minerals], 1953, Gosgeolizdat).

The classification of reserves in individual categories depends upon the form, structure, and size of the deposit, the character of the minerals, their distribution, and other factors. For example; the only ore reserves which can be classified as category A1 are those in a large deposit of simple and complex form with even and uneven distribution of the components; prepared for stoping by development workings; and mapped on 4 sides or 3 sides by workings the distance between which corresponds to the plan of the system for working the deposit in question.

Deposits of this type include the largest deposits of iron and manganese ore like the Kerchen, Chiatura, Nikopol', the ores of the mountain of Magnitnaya, of Krivoi Rog, or of the Kursk magnetic anomaly, seams of cuprous sands, deposits of silicate nickel ore, etc.

The reserves of deposits in these groups which have been explored by workings on boreholes, or by a combination of workings and boreholes, etc may be assigned to category A2.

In the case of pocket type deposits of varying (frequently small) size, and of differing form, with an uneven distribution of ore, the reserves may be classified not higher than category C1, and for the most part they remain prospective reserves (category C2). This group includes deposits represented by irregular accumulations of ore beds of the pocket type, platinum bearing druses, pockets of tin ore in pegmatites, etc.

Reserves in categories A1 and A2 serve as the basis for planning exploitation work, and reserves in categories A2, B, and C1 serve as the basis for planning and constructing mining enterprises. Reserves in category C2 are taken into account in planning mining enterprises, for purposes of determining the prospects for their expansion.

The ratio between individual categories of balance reserves for working out plans for the construction of mining enterprises is determined in accordance with the character of the deposit, the size and form of the ore body, its extent along the strike and dip, the constancy of the thickness, and the evenness of distribution of the useful components.

For example, in the case of deposits of iron ore which have large, stratified deposits of simple form with an even distribution of the useful component, the following ratio between the balance reserves has been established for purposes of working out plans and allocating funds for the construction of the mining enterprise: A2 plus B no less than 35%, including A2, 10%, and C1, 65%. In the case of deposits of nonferrous and rare metals represented by very complex and noncontinuous ore bodies with sporadic impregnation and an uneven distribution of the valuable components, the elaboration of plans and the allocating of capital outlays for construction are permissible on the basis of category C1 balance reserves, but the conditions for working the deposits, the quality of the mineral, and the technology for dressing it must be ascertained quite thoroughly.

The Classification of Reserves in Accordance with Their Readiness for Mining

In terms of the extent to which they have been prepared for mining, reserves may be classified as opened up, developed, and ready for removal.

Reserves are placed in one category or another, depending upon the extent to which they have been developed and the method used in working the deposit. For example, in the case of ore deposits to be worked by underground methods the opened up reserves of a deposit or a part thereof are those which are above the horizon of the intersection with the main workings, of the shaft with the cross-cut, or of the underground shaft with the drift, from which it is planned to drive the subsequent development workings necessary to work the deposit (Figure 2). (Instruktsiya po uchety podtogovlennykh k dobyche zapasov. [Instructions for Calculating Reserves Prepared for Exploitation], 1944, Narkomtsvetmet).

Developed reserves are those reserves of ore in blocks or units in which all of the development workings provided for in the development system adopted, and dividing the sheets into blocks or units, have already been driven.

Reserves ready for removal are reserves in blocks or units in which the workings necessary for commencement of stoping have already been driven, that is, when a system of stopes has been driven in the block or the unit (Ibid.).

Where the system of operation is by open stope with irregularly or regularly spaced pillars, reserves ready for removal are the reserves of ore in those units and blocks in which the ore chutes, chambers for chute drawers and for scraper hoists, and the advanced stopes in the chamber (the latter where the ore body is very thick), etc, have already been excavated (figures 3 and 4).

For ore deposits being worked by the open pit method, opened up reserves are the reserves of those units of the bench the upper part of which has been cleared of overburden, or which has been laid bare as a result of the natural conditions of the occurrence, provided that the exit trench or the trench for the hoisting equipment has been dug. In those cases where the scheme of organization adopted does not call for the digging of a trench (for example where a dragline is being used), opened up reserves are those which have been cleared of the overburden.

Reserves considered as developed and also ready for removal are those in that part of the bench where the upper and side areas have been exposed, making possible the commencement of removal operations.

In classifying the degree of readiness for removal of reserves in alluvial deposits, a distinction is made among (1) deposits worked by the underground method, (2) deposits worked by the open pit method, and (3) deposits worked by means of draglines and hydraulic giants.

The conditions for defining opened up reserves in the case of alluvial deposits worked by the underground method are basically the same as those for other deposits worked by this method.

Reserves considered as developed and ready for removal include reserves of sands in the contour shaft zones or individual units, the limits of which have been determined by sampling in the levels and crosscuts which have been driven. In order that the reserves be classified as ready for removal, the number of workings must be adequate for commencement of stoping.

Where alluvial deposits are being worked by the open pit method, the reserves are classified as opened up and developed (the latter are considered as ready for removal) and are determined in accordance with the method of work. For example, where such reserves are being worked with excavators with a straight dipper, the reserves of a slice are considered to be opened up if a ditch for draining ground water (in the case of artificial drainage, a borehole with a sump in the pit) and a raised ditch have been dug, and if the cut for installing the excavator has been made. The reserves of slices from which the peat has been stripped and in which the cut has been dug are considered as developed.

In working a deposit with dredges the reserves of a unit of the deposit in the initial phase of work are considered as opened up and ready for removal, if the pond for assembling the pontoons of the dredge has been dug, if it is supplied with water, and if provision has been made for draining the water from it.

In working with hydraulic giants under an artificially supplied head of water, the deposits are considered as opened up and ready for removal, if the cut for installing the equipment has been made, and if a ditch has been dug for draining water from the bed (in the case of natural drainage), or if a sump has been dug (in the case of artificial drainage).

Section 4. Combatting Losses

Losses of mineral products may take place both in mining the ore and in processing it.

The chief cause of losses in mining is leaving mineral products in the form of tailing or untouched blocks around the workings. Losses of mineral products may also take place in transporting the ore, in the dressing process, and in metallurgical processing. The negative consequence of losses is the wasting of the nation's natural resources on the prospecting and development of which definite sums have already been expended. Also, an increase in losses and the resultant decrease in the extracted reserves lead to a rise in the cost of paying off capital outlays per t of mined ore, and the useful life of the mines is shortened. An increase in losses can lead to nonfulfillment of the mining plan. If, in the mining of copper and sulfur pyrites, untouched blocks thereof are left behind, this can lead to underground fires. Therefore it is necessary to strive for a maximum reduction in losses.

The basic measures to be taken to this end in the process of mining include the introduction of improved systems of working, the supplementary working of untouched blocks of ore, and controlling shipments of ore.

It is essential to achieve a maximum recovery of the valuable components contained in the ores, and to introduce progressive norms for the expenditure of raw materials, by introducing the most improved systems for the technological process.

In certain cases it is desirable to organize the processing of slag and tailings in order to extract the valuable components contained therein, with a view to the fullest utilization of the USSR's natural resources.

The economic valuation of the damage resulting from losses depends upon the nature of the latter.

Losses in the ore body (in blocks and pockets of untouched ore) should be valuated on a basis of the expenses involved in prospecting, main workings, and development workings. Losses of the mineral product lead to an increase in the per t cost of the mined ore. The amount of these losses may be determined with the following formula:

$$y_1 = \left(\frac{a}{P_1 - \Pi_1} - \frac{a}{P_1}\right) \cdot (P_1 - \Pi_1),$$

where y_1 -- amount of the loss in the ore body, in rubles;

a -- total expenses of prospecting, main workings, and development, in rubles;

P_1 -- reserves of the mineral, in t;

Π_1 -- losses of the mineral in the ore body in t.

Losses of stoped ore should be valuated on the basis of the actual cost of mining. The value of these losses may be found with the following formula:

$$y_2 = \left(\frac{c}{P_2 - \Pi_2} - \frac{c}{P_2}\right) \cdot (P_2 - \Pi_2),$$

where y_2 -- value of lost stoped ore, in rubles;

C -- cost of mined ore, in rubles;

P_2 -- quantity of stoped ore, in t;

Π_2 -- stoped ore lost, in t.

Accountability and Balance of Reserves

The planning and industrial construction of ore mines are carried out when approved reserves are available. In the case of large and medium sized deposits, the approval of reserves is the responsibility of the state commission on reserves of minerals (GKZ), while in the case of small deposits it is the responsibility of territorial commissions on reserves (TKZ).

Accountability for all mineral reserves and the preparation of the balance sheet for reserves are the responsibility of the administration of geological resources. Once each year, on the basis of the geological reports received and their critical and statistical processing, the main administration of geological resources prepares a summary of all mineral reserves with a breakdown by regions by categories of prospecting and categories of economic importance (balance reserves and ultrabalance reserves).

The balance of reserves of raw materials is determined by the ratio between the balance reserves and the annual volume of production, and may be found with the following formula:

$$B_o = \frac{Q}{P} k \cdot i_o \cdot i_m ,$$

where B_o -- balance of supply, in years;

Q -- total balance reserves;

k -- coefficient of extraction in mining;

i_o -- coefficient of recovery of metal in dressing;

i_m -- coefficient of recovery of metal in metallurgical processing;

P -- total annual production of metal.

For example, the balance reserves of copper in the earth amount to 20 million t, and the average annual production amounts to 400,000 t. The coefficient of extraction in mining is 0.95%. The coefficient of recovery in dressing is 0.9%, and the coefficient of recovery in metallurgical processing is 0.95%. Thus the balance of supply will be:

$$B_o = \frac{20,000,000}{400,000} \cdot 0.95 \cdot 0.9 \cdot 0.95 = 40.6 \text{ years.}$$

The same method is used in determing the balance for an individual mine. In this case the reserves of the given deposit or group of deposits supplying the given metallurgical plant are taken as the numerator.

The extent to which a plant is supplied with reserves is determined by the ratio between the actual reserves available to the plant (in years) and the normal amortization period. Let us assume that the given plant has available a 30 years' supply, while the normal amortization period for the plant has been fixed at 28 years. In this case it may be considered that the plant is fully supplied with reserves.

It is essential to calculate the extent to which branches of industry and individual plants are supplied with reserves, with a breakdown into types of ore.

The extent to which reserves are located near the plant should also be taken into consideration, since dispersion of the raw materials base involves the necessity of long hauls.

Finally, in evaluating the state of the balance for individual branches, the existence of reserves of metal in unexploited deposits is important.

In determining the balance of reserves, it is essential to ascertain the extent of availability of reserves in individual categories. For example, the planned capacity of a mine is supplied with balance reserves for 15 years, but with high category reserves (A plus B) for only one year. This fact testifies to a strain on the balance reserves, and the necessity of stepping up detailed prospecting and development work.

In determining the balance of reserves for the nation, the calculations include not only the reserves in the earth but the possibilities for obtaining amortization scrap, as well as the extensive dumping grounds of old mine workings and the slag heaps of metallurgical plants (keki, residual slag in zinc distillation, etc), which contain a large quantity of valuable components.

Taking these sources of raw material into account, the national economic balance of supply for any given metal can be expressed in the following formula:

$$B_o = \frac{Q \cdot k \cdot i_o \cdot i_m + Rt + \Pi}{P},$$

where R -- reserves of second run metal in the USSR in the form of scrap and waste products from own production;

t -- coefficient of yield of metal;

Π -- quantity of metal which can be obtained from other sources of raw materials (refuse ore, tailings from dressing plants, and slag, taking into account the loss in processing).

The denotation of the other symbols is the same as in the preceding formula.

Section 5. The Geographic Distribution of the USSR Ore Mining Industry

The National Economic Importance of an Efficient Geographic Distribution of Industry

The geographic distribution of industry means the distribution of production capacities, manpower, and production of products by individual regions of the USSR.

An efficient distribution of industry is of great national economic importance. It ensures savings of labor, the systematic and effective utilization of raw material resources, and economic progress in national frontier areas and republics which were economically backward in the past.

The Communist Party and the Soviet Government attribute prime importance to the correct distribution of industry in the USSR. As early as 1918, V. I. Lenin called for solution of the problems of an efficient distribution of industry for the economic improvement of the country.

The July Plenum of the TsK KPSS proposed that the geographic distribution of industrial enterprises be improved, that industry be brought closer to sources of raw material and fuel and to the consumer regions, that the correct specialization and the comprehensive development of the economy of economic regions be ensured, and that a more rapid development of industry in the eastern regions of the country be ensured.

As a rule, industry in capitalist countries is distributed unsystematically, anarchistically, and spontaneously. This leads to an unequal distribution, both among countries and within individual countries.

In prerevolutionary Russia more than 3/4 of the industrial product was produced in 4 regions, in the Moscow, Ivanov, and St. Petersburg regions, and in the Ukraine. In 1913 the plants of the Donbas and the region along the Dnepr River accounted for 73% of the pig iron produced in the country, while 87% of the coal mining was concentrated in the Donbas.

The spontaneous process of distributing industry under capitalist conditions and the artificial delaying of the process of industrialization in colonial and dependent countries results in a separation of industry from its raw material bases. Thus the processing of tin concentrates is for the most part concentrated in England, Holland, and the US, and not in the areas where the tin is mined, in Malaya, Indonesia, Bolivia, and elsewhere. The refining of African copper and Canadian nickel is concentrated for the most part in England and the US.

Up to World War II Germany accounted for 35% of the world production of aluminum (not counting the USSR), while England and the US accounted for 40%. And yet Germany itself had no raw material for the production of aluminum, while the US and England had only about 4% of the world reserves of this raw material.

The importing of raw materials from the colonial and dependent countries is one of the methods by which the latter are plundered by the big capitalist countries.

The principles of the distribution of industry are totally different under socialism. In the USSR the distribution of industry is effected in a systematic manner, in the interests of the development of the national economy and improving the well-being of the workers.

The basic principles of distribution of the socialist industry of the USSR are as follows.

(1) The all-round development of the economy of regions of the USSR.

(2) Bringing industry as closely as possible to sources of raw material and to consumer regions.

(3) The intensified development of industry in national and frontier regions of the country which were backward in the past.

(4) The even territorial distribution of industry and consideration for the defense interests of the nation.

The economic development of regions of the USSR is characterized by comprehensiveness, that is, by the development in the given region of several interrelated branches of the national economy with the leading role assigned to that branch whose development is most favored by the conditions in the given region, and by its raw material, fuel, and power resources. Comprehensive development means the fullest and most efficient utilization of all resources in the individual economic regions and in the country as a whole, a reduction in the volume of shipments, and, in the final analysis, acceleration of the general rate of production growth.

However, the comprehensive development of the economy does not mean that in a given region an industry will be established in order to satisfy all local requirements. The possibilities for, and desirability of, economic ties between the given region and other regions of the USSR are established with a view to the national economic interests as a whole.

During the plan era industrial construction has clearly illustrated this principle.

Together with the growth of industry in the central industrial regions, the construction of new enterprises has been carried forward in the eastern regions, in the Baltic Soviet republics, in Central Asia, and in the Transcaucasus. Plans have been made for the comprehensive utilization of the power resources of the Angara in order to develop the aluminum, chemical, ore-mining, and other branches of industry on the basis of cheap electric power and local sources of raw materials.

The juxtaposition of industry with sources of raw materials is of great economic importance. In April 1918, in an article titled "Outline of a Plan for Scientific Technical Work," V. I. Lenin wrote: "This plan should include the efficient distribution of industry in Russia from the viewpoint of the proximity of raw materials and the possibilities for minimum losses of labor ..." (V. I. Lenin, Soch., fourth edition, Vol 27, page 288).

The large scale organization of the geological service in the USSR opened up great possibilities for bringing industry closer to raw materials sources. Many deposits which in prerevolutionary Russia were unknown or were considered noncommercial came to be included in the raw materials resources of the USSR during the Soviet era, after they had been systematically investigated. These include the Kounrad deposit, the Tikhvin Deposit, etc.

The principle of eliminating the economic backwardness of formerly underdeveloped national frontier regions and their intensified industrial development are products of the national [minorities] policy of the Communist Party. The development of the mining and metallurgical industries played an important role in the industrialization of the national frontier regions. The founding of coal, copper, and lead-zinc industries in the Kazakh SSR, the Uzbek SSR, and other formerly backward regions contributed greatly to the economic development and general cultural improvement in these regions.

The intensified development of industry in all regions of the Soviet Union and the founding of new industrial centers in the Povolzh'ye, the Urals, Siberia, Kazakhstan, the republics of Central Asia, the Transcaucasus, and elsewhere ensured the systematic distribution of industry and strengthened the defense capacity of the USSR.

The basic conditions determining the distribution of the ore mining industry are the existence of explored reserves of minerals in combination with power resources, the transport and economic conditions of the region where the deposit is located, and the location of metallurgical plants.

Let us consider the geographic distribution of individual branches of the USSR ore mining industry.

The Mining of Iron, Manganese, and Chrome Ores

Iron Ores. The basic iron ore mining regions are the South, the central regions of the European USSR, and the Urals.

In addition to these regions, iron ore is mined on a small scale in regions of the Kuznets Alatau, the Caucasus, and the northwestern part of the European USSR.

The main explored reserves of iron ore and the main iron mining industry are concentrated in the southern part of the European USSR. The most important regions in this zone are as follows.

(1) The Krivoi Rog region, with tremendous explored reserves of both rich iron ores and ores which require dressing (ferrous quartzites). Krivoi Rog is the primary base of the iron ore industry in the south of the USSR.

(2) The Kerchen region, with large deposits of brown hematite.

Second in importance for the mining of iron ores is the Urals, where many iron ore deposits of varying origin are being worked.

The largest of these deposits are the Magnitogorsk, the Goroblagodat, the Vysokogorsk, the Pervoural'sk, the Kusinsk, the Alapayevsk, the Bakal'sk the Khalilovsk, and others.

The deposits of the Urals constitute the raw materials base for the Urals metallurgical plants, while the mine of the Magnitogorsk Combine also supplies iron ore to the Kuznets Metallurgical Combine.

The most important region in Western Siberia is the Gornaya Shoriya, located in the southern part of the western foothills of the Kuznets Alatau. The exploitation of the deposits in this region supplies a part of the raw materials for the Kuznets Metallurgical Combine, which is located in the same region, and reduces the number of long hauls of Magnitogorsk ore. The expansion of iron ore mining at these deposits will make it possible in the future fully to supply the Kuznets Metallurgical Combine with local raw materials.

In the northwest the creation of a ferrous metallurgical industry is based on the exploitation of the iron ore deposits of the Kol'sk Peninsula.

The development of the North Pechora coal basin with its multibillion t reserves of coking coal will provide the fuel resources for the metallurgical enterprises in this region.

The northwest consumes up to 10% of all rolled iron produced in the USSR. It is brought in over distances of thousands of km, which causes great transportation expense and raises the cost of the metal products. The creation of a metallurgical industry in the northwest is of great economic importance.

In the Caucasus the most important iron ore deposit is the Dashkesan, on the basis of which the ferrous metallurgical industry of the Transcaucasus is being developed.

The mining of iron ores in the Kazakh SSR is limited to the Ata Su group of deposits.

Prospective regions for the mining of iron ores include the deposits of Siberia, Kazakhstan, the Angara-Baikal region, etc.

For the most part, the metallurgical plants are located near the sources of raw materials. Before the beginning of the nineteenth century, when as much as 5 t of coal was consumed per t of pig iron, it was more economical to build the plants near the coal mines, and haul the ore to the coal deposits. In several countries the majority of plants were built near deposits of coking coal, at a considerable distance from the deposits of iron ore. In the US there are plants of this kind in the Pittsburgh region, in Germany in the Ruhr Basin, etc.

Today, when the consumption of coal per t of pig iron is 1.3 t, the consumption of coke has been reduced to 0.8-0.9 t, and from 1.7 to 2 t of ore are used per t of pig iron, it is more desirable to locate the plants, not near the source of fuel, but near the source of the raw material. Many metallurgical plants in the USSR, the Magnitogorsk, Kerchen, the Tagil'sk, the Krovoi Rog, etc, are located near the iron mines.

The metallurgical plants of the southern part of the European USSR are located under especially favorable conditions. The rich iron ore deposits of Krivoi Rog and the deposits of coking coal of the Donbas are located in this region. The metallurgical plants are located in the Donbas, in Krivoi Rog, and in the region along the

Dnepr between the Donbas and Krivoi Rog. This distribution of the plants ensures an efficient loading of transport, reduces the length of haul for empty freight cars, and means a reduction in the cost of pig iron.

Manganese Ores. The basic regions for the mining of manganese ores are the Transcaucasus (the Chiatura manganese deposit), the Ukraine (the group of Nikopol' deposits), the northern Urals, and Kazakhstan.

The Chiatura manganese deposit is located in the Georgian SSR. It is one of the largest in the world and is rich in high grade ores.

The group of Nikopol' deposits of manganese ore is located in the right bank of the Dnepr. In terms of quality, these ores are inferior to the Chiatura ores, but, thanks to ease in dressing and the proximity to the metallurgical plants of the south, they are of great importance in the development of the ferrous metallurgical industry.

The exploitation of the manganese deposits in the Urals and Kazakhstan (the Marsyat, Polunochnyy, etc) is of great importance in supplying the plants of the east.

Chromite Ores. The mining of chromite ores in the USSR is for the most part concentrated in the south Kimpersay and Saranov deposits.

The south Kimpersay deposits are located within the boundaries of the Aktyubinsk Oblast of the Kazakh SSR. They have large reserves of high grade chromite ores and constitute the primary base for the production of ferroalloys and chromic salts.

The Saranov deposit of chromite ores is located on the western slope of the Urals. These ores contain much iron (18-20%), which is an undesirable admixture, and consequently they are not used in the production of ferroalloys but for the most part are used in the chemical and refractory materials industries.

The Mining of Non-Ferrous Metal Ores

Copper Ores. The chief copper mining regions of the USSR are as follows.

(1) Kazakhstan, the deposits of central Kazakhstan and the Karaganda Oblast.

(2) The Uzbek SSR, the Almalyk copper-porphyry deposit.

(3) The Urals, the deposits with the most intensive concentration of ores, within the limits of the eastern slopes of the central and southern Urals.

(4) The Transcaucasus, the deposits concentrated in the Armenian SSR.

In addition, considerable reserves of copper are concentrated in the Altai polymetallic deposits (eastern Kazakhstan) and in other regions of the USSR.

At the present time copper is being mined in almost all of the above regions. As a rule the small copper content in the basic raw material and even in the concentrates, makes it necessary to locate the metallurgical plants near the mines and the dressing plants. Long railroad hauls of ore and concentrates mean the overloading of the transportation facilities and an increase in the cost, and are associated with still other disadvantages, namely the freezing of moist concentrates in the winter.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

In the Kazakh SSR the mining of copper ores is carried on at the Kounrad Mine, which is the raw materials base for the Balkhash Combine, and at the Dzhezkazgan mines.

The mining of copper ore at the numerous copper mines in the Urals provides raw materials for the Krasnoural'sk, Kirovgrad, Sredneural'sk, Karabash, Sibayevsk, Baymak, and Mednogorskiy copper plants, which are located in the Urals region.

In the Transcaucasus (Armenia) the mining of copper is carried on at the Zangezursk and at other deposits in this region.

Lead-Zinc Ores. In natural occurrences, lead and zinc are found together, often combined with silver. Therefore these ores have been called polymetallic. (In the Greek language the word 'poly' means many.)

The most important regions for the mining of lead and zinc ores are as follows.

(1) The eastern Kazakhstan polymetallic region.

(2) The southern Kazakhstan region with the adjacent ore bearing regions of the Tadzhik SSR.

(3) The Tetyukhe region.

(4) The northern Caucasus.

(5) Salair (the Kemerovo Oblast).

Zinc is also contained in the copper-pyrite ores in the regions of the central Urals, Bashkiria, and Kazakhstan.

The mining of the polymetallic ores of the eastern Kazakhstan region is done at several large deposits.

The ores of the deposits in the southern Kazakhstan region are distinguished by a predominance of lead over zinc, and serve as the raw materials base for the largest lead plant in the USSR.

A dressing plant and a lead plant operate on the basis of the deposit on the Tetyukhe region.

The exploitation of the deposit in the northern Caucasus ensures a supply of raw material for the Elektrotsink Plant in the city of Ordzhonikidze.

The ores mined at the Salair deposit, which have a predominant content of zinc, are sent to the Belov Zinc Plant, located near the deposit.

Before being smelted, the polymetallic ores are dressed. The dressing does not increase the content of metal in the raw material (because of the removal of waste rock) but it results in obtaining selective concentrates (lead, zinc, and copper), which ensures all-round utilization of the raw material.

Lead and zinc concentrates contain 40-50% and more of metal, and are easily transportable. Therefore lead and zinc plants are sometimes located at a considerable distance from the raw materials bases.

In the production of zinc as much as 2 t of sulfuric acid may be obtained per t of zinc. Therefore it is sometimes advantageous to locate zinc plants in regions where sulfuric acid is consumed.

Aluminum Ores and Minerals. Bauxites constitute the basic raw material for the production of aluminum. Also, such forms of aluminous raw materials as nepheline and alunites have acquired important industrial significance.

For the most part, the mining of bauxites in the USSR is done in the northern Urals region, where large reserves of high grade bauxite ores are concentrated. Also, bauxites are mined at the deposits of the Tikhvin group in the Leningrad Oblast.

Nepheline, a raw material for the production of aluminum, is obtained in the process of dressing apatites. In addition to aluminum oxide, cement, potash, and soda are obtained from the processing of nephelines.

The production of aluminum involves a large consumption of electric power. Up to 18,000 kwh of power are consumed per t of aluminum. Therefore the aluminum plants are predominantly located in regions where cheap electric power is produced.

The expansion of the aluminum industry in the USSR requires the organization of the mining of aluminous raw material at several deposits in the Urals and in other regions of the USSR (Western and Eastern Siberia, Kazakhstan, and Transcaucasus, etc) where considerable reserves of bauxites and alunites have been explored.

Nickel Ores. The mining of nickel ores is being done in the central Urals, the southern Urals, the Krasnoyarsk Kray, and in the northern regions. As a rule nickel ores are processed near the deposits. Usually they are smelted with feinstein and, if it is impossible to carry out locally, the entire process of conversion to metallic nickel, they are shipped to other regions for refining.

Tin Ores. Before the revolution there were no enterprises in Russia for the mining and smelting of tin. The nation's requirements for tin were met entirely by imports. During the Soviet era the mining of tin has been developed in the Transbaikal, the Altai, the Yakutsk ASSR, and other regions.

Gold-Bearing Ores and the Ores of Rare Metals

Gold is mined in the Urals, in Western and Eastern Siberia, in Kazakhstan, and in other regions of the USSR from ores and placer deposits.

Metals of the platinum group are mined from placer deposits and are also extracted as a by-product in the processing of copper and nickel ores.

Several large enterprises for the mining of tungsten, molybdenum, and other rare metals have been built during the Soviet era in various regions of the USSR.

The new geographic distribution of the ore mining industry in the USSR has played a big role in the economic development of several regions of the USSR, in the rise of large industrial centers in those regions, the industrialization of national republics, and in bringing industry closer to the sources of raw materials.

CHAPTER III. THE ADMINISTRATION AND PLANNING OF THE USSR ORE MINING INDUSTRY

Section 1. The Basic Principles of the Planned Administration of Socialist Industry

Under socialism, where the means of production are the property of the public, the systematic (proportional) development of the national economy is a law of socialist economics.

A large socialized industry cannot develop in the absence of a general plan which indicates the unity of aims and activities for its implementation.

It is essential to establish the requisite proportions in the production process between individual interrelated branches of industry, between metallurgy and machine building, the production of electric power and the requirements therefor, between capital construction and the production of equipment and building materials, between the volume of shipments and the development of transport, etc.

The requirements of the basic economic law of socialism and the law of the systematic (proportional) development of the national economy are implemented by the Communist Party and the socialist state through the agency of plans for the development of the national economy and the individual branches thereof. At each stage the Communist Party and the socialist state establish the most important economic and political goals of the plans in accordance with which the rate of development of individual branches of the national economy, the size of capital outlays, the wage level, etc are determined.

Planning in the USSR is scientifically based. The USSR's plans are in the nature of directives, and they play a tremendous mobilizing role. The broad participation of the masses in the preparation and implementation of the plans constitutes a very important feature of national economic planning.

In the preparation of plans any attempts to minimize production capacities or to let "bottlenecks" set the level of planning are completely inadmissible.

The Communist Party teaches that the plans for the development of the national economy of the USSR must be based on advanced progressive norms.

Progressive norms must be determined not by arithmetical calculations but on the basis of analyzing and generalizing the practices of the leading enterprises and production innovators, taking into account the planned organizational and technical measures for introducing new equipment, improving technology, and improving the organization of production.

The USSR's production plans are at the same time plans for technical improvement. Planning is integrally related to the development of science and technology. The nation's scientific and technical personnel participate in the preparation of economic plans.

In the USSR planning embraces not only the preparation of the plan but its organization and follow-up on its implementation. Therefore in all links of administration the planning organs constitute an integral part of the organs administering the national economy. This ensures the unity of all stages of planning work, from the evaluation of the fulfillment of current plans, the elaboration of directives and quotas, through the preparation of plans to follow-up on the fulfillment of plans.

Together with planning, the state organs do a great deal of organizing work in the administration of industry aimed at the implementation of plans both quantitatively and qualitatively (increase in labor productivity, cost reduction, improving utilization of fixed and working capital, etc).

The organization of the administration of socialist industry should ensure the solution of the following problems.

(1) The fulfillment and overfulfillment of state plans for the development of production.

(2) A constant increase in and improvement of production, the development of equipment and production technology, raising labor productivity, cutting costs, and improving the quality of products.

(3) The development of socialist competition, and the participation of the masses in administering industry.

The successful solution of these problems is possible only with the elaboration of the correct organizational forms and methods of administering industry, something to which the Communist Party and the Soviet Government attribute prime importance.

The organization of the planned administration of socialist industry is based on the following principles: the unity of political and economic leadership; one-man management, combined with the participation of the masses in organizing the work of industry; efficiency and concreteness in administration; the correct selection and training of personnel; follow-up, khoz raschet, and the territorial production system of administration.

The solution of economic problems should not be approached merely from the viewpoint of the interests of the enterprise or of the given branch of industry. Any economic problem should be attacked with due consideration for the interests of the national economy as a whole in accordance with the policy of the party and of the government.

One-man management is an inviolable principle of organization of the administration of an industrial enterprise. Under one-man management, every administrator is granted full authority and bears full responsibility for the given area of work.

In a socialist economy, one-man management is based on a precise definition of the responsibilities of each administrator and the concentration of the main levers of administration in the hands of the executive. One-man management requires a thorough knowledge of technology and economics on the part of the director of an enterprise.

Soviet one-man management is combined with control by the party organization of the economic activity of enterprises. It is based on a close contact between the director on the one hand and the aktiv and entire collective of the enterprise on the other. One-man management consists of the ability to issue orders skillfully, select personnel, issue corrective directives, require reports, and eliminate irresponsibility and carelessness. The executive can achieve these things only if he draws skillfully upon help from the party organization, the trade-union aktiv, and the entire collective of the plant as a whole, in all of his work.

The participation of the workers in the administration of production is effected in various forms: production meetings, participation in party control over various aspects of the activity of economic organs, meetings of the aktiv, the conclusion of collective agreements and follow-up on their implementation, etc. The activity of the masses in economic building is manifested in their creative participation in the struggle for the fulfillment and overfulfillment of established plans, for raising labor productivity, cutting costs, and improving the quality of products. The Soviet trade-unions play a big role in the task of encouraging the broad masses to participate in the administration of production.

Diverse forms of the creative participation of the masses in the administration of industry have come into being in the course of socialist competition. Such, for example, is the participation of the masses in the preparation of tekhpromfinplans, the purpose of which is the mobilization of the reserves of enterprises, better utilization of production capacities, and material and labor resources. In the postwar period the participation of the masses in planning was manifested in the form of the preparation of individual and collective plans on the part of leading workers and production innovators. In the course of socialist competition there developed a movement for economizing on raw materials, materials, power, and labor, a movement for high quality performance in each operation, etc.

The creative activity of the masses is expressed in criticism and self-criticism, which constitute a propelling force in the USSR's development and a mighty weapon in the hands of the party. Directors of enterprises are required to pay close heed to the voice of the masses, to their criticisms and advice.

Efficiency and concreteness constitute an important goal of economic administration. This requires of economic administrators that they master the technology of the job and know the details of production thoroughly. Concrete administration is possible only on the basis of a personal study of the work of both the best production areas and the lagging ones.

The successful accomplishment of the tasks given to industry by the party and the government requires the correct selection and training of personnel, the prompt promotion of personnel who are advancing in their work, and the rendering of assistance to them. The study of personnel is carried out by means of personal contact with individuals, observing their work, and checking the results of their work. The party requires that personnel be patiently trained, that they be treated with consideration, that they be assisted in their work, that their shortcomings be boldly criticized, and that they be taught from their mistakes.

The political ideological indoctrination of key personnel is of great importance. The administrator who does not work to heighten his own political ideological level will inevitably lag in his own development and will not be able to accomplish his tasks successfully in administering an enterprise.

Follow-up is a very important task in the sphere of administration. To administer does not mean simply to issue directives. It also means following up on their implementation. Follow-up means organizing personnel for a concrete job, ensuring the practical implementation of the directives of the party and the government, preventing mistakes and correcting them on the basis of a detailed study of the facts, and taking concrete steps for further improvement of the work. In order for follow-up to be effective it should be carried out promptly, within the period of fulfillment of the assignment, and not when the period for fulfillment has already lapsed. Follow-up must be carried out systematically and not sporadically. It is important that the follow-up be carried out in the working area with the aid of a broad aktiv of workers, and not merely on the basis of reports and summaries. Follow-up makes it possible to study personnel. In the process of following up the practical implementation of directives, one can ascertain how correct the directives themselves were.

Conformity to the economy system and khoz raschet is of great importance in the correct organization of industrial administration. The economy system is a method of socialist management aimed at achieving the optimum production results with the least expenditures of labor and production resources.

The July Plenum of the TsK KPSS ordered strict conformity to the economy system and strengthening of khoz raschet.

The economy system requires the careful handling of public property, a systematic struggle for reducing expenditures of live and embodied labor on the production of products on the basis of introducing new equipment and technology, improving it, and the efficient utilization of all of the resources of the enterprise.

The introduction of khoz raschet is of great importance in the struggle for the economy system. Khoz raschet is a method of planned management at socialist enterprises based on the monetary measurement of expenses and the results of production, on covering production expenses out of the enterprise's own revenue, and ensuring the profitableness of production.

As early as 5 December 1939 a decree of the TsK VKP(b) on the reorganization of industrial administration stated that "the shifting of an enterprise to khoz raschet has fully justified itself. Khoz raschet individualizes the enterprise, makes for the rationalization of production and correct organization of marketing and supply services, and at the same time promotes resistance to bureaucratism and red tape."

The khoz raschet system means greater rights and independence for each administrator and a heightened responsibility. Khoz raschet is a method of administering socialist industry which stimulates the creative initiative of administrators and the entire collective of the enterprise for the fulfillment and overfulfillment of established plans with minimum costs.

The territorial production principle of administration is an important factor in strengthening one-man management and the efficiency of administration. The administrative apparatus of all branches of the national economy of the USSR is built on the basis of this principle.

The administering of large branches of the national economy is the responsibility of the corresponding ministries. Thus the administering of the ferrous metals industry is the responsibility of the Ministry of Ferrous Metallurgy USSR. The administering of the nonferrous metals industry is the responsibility of the Ministry of Non-Ferrous Metallurgy USSR. The administering of the chemical industry is the responsibility of the Ministry of Chemical Industry USSR, etc.

Individual branches within a ministry are administered by main production administrations (glavks). For example, all enterprises of the gold and platinum industries are administered by Glavzoloto.

Enterprises of the iron ore industry are administered by the main administration of the iron ore industry (Glavruda) of the Ministry of Ferrous Metallurgy USSR and the Ministry of Ferrous Metallurgy Ukrainian SSR. Also, certain ore mining enterprises are directly subordinated to large metallurgical combines and plants (for example, the subordination of ore mining enterprises to the Magnitogorsk Combine). The ore mining industries of branches of nonferrous metallurgy (lead-zinc, tin, etc) are administered by the main administrations which administer the given branch of industry as a whole (Glavtsinksvinets, Glavolovo, etc) and ~~which~~ come under the Ministry of Nonferrous Metallurgy USSR.

If a large number of similar enterprises are located in the same region, their administration may be assigned to the corresponding territorial main administrations.

The principles on the basis of which the territorial production system for administering mines was to be built were defined in a decree of the SNK [Sovet Narodnykh Komissarov -- Council of Soviet Commissars] USSR and TsK VKP(b) dated 21 May 1933 entitled, "The Work of the Coal Industry of the Donbas." This decree proposed that the direct administration of the mining and shipping of coal be made the responsibility of the mine director and his deputy, that the total number of employees in the administrative apparatus be reduced, that several unnecessary positions be eliminated, and that all production functions for each area be made the responsibility of the area supervisor. The territorial production principle for the structure of the administrative apparatus replaced the functional system.

The functional system, whereby each executive has under him several administrators for various specialities, led to negligence in administrative work, a lack of responsibility toward the job assigned, and inflation of personnel staffs. Functional administrations frequently issued contradictory directives which led to irresponsibility on the job and in effect did away with one-man management.

On the basis of the resolutions of the Seventeenth Party Congress (January 1934) on the liquidation of "functionalism," the number of functional organs was reduced to a minimum. They were given the task of the preliminary treatment of problems relating to the given function and the preparation of materials for the appropriate decisions and orders. The functional organs were deprived of the authority to issue direct orders and instructions to enterprises. This authority is exercised only by operative production administrations.

The territorial production system, which concentrates all aspects of administration in the hands of the director of the main administration, enterprise, or department, eliminates negligence, strengthens administration, and ensures the possibility of reducing the apparatus.

Section 2. Administrative and Planning Organs of the Ore Mining Industry

The basic principles of organization of the administration of socialist industry and the long range plans for its development are approved by the Supreme Soviet USSR.

The supreme executive organ of the USSR is the Council of Ministers USSR. According to the Constitution of the USSR, the Council of Ministers USSR coordinates and directs the work of the all-union and union republic ministries, and takes steps to implement national economic plans.

Several committees and commissions have been established under the Council of Ministers USSR. The state commission of the Council of Ministers USSR for the long range planning of the national economy of the USSR (Gosplan USSR) and the state economic commission of the Council of Ministers USSR for the current planning of the national economy (Gosekonomkomissiya USSR) were established to carry out planning work.

The state committee of the Council of Ministers USSR on matters of labor and wages was established in order to improve the work and control of the ministries and departments in the sphere of the organization of labor and wages.

The state committee on construction under the Council of Ministers USSR was established in order to improve the capital construction industry. This committee was made responsible for passing on plans for large construction projects and working up normative materials for the organization and planning of construction.

By directive of the Presidium of the Supreme Soviet USSR, dated 28 May 1955, the state committee of the Council of Ministers USSR on new equipment (Gostekhnika USSR) was established to organize the introduction of advanced science, equipment, and technology into the national economy, and intensify technical scientific propaganda.

The Ministry and Its Structure

Depending upon their importance in the national economy and the scale of their production, state industrial enterprises are divided into enterprises on the union, republic, and local level.

The ore mining industry is an industry on the union republic level. The supreme administrative organs for branches of the ore mining industry which supply raw materials for the ferrous and non-ferrous metallurgical industries are the union republic Ministry of Ferrous Metallurgy USSR and the union-republic Ministry of Non-Ferrous Metallurgy USSR.

A ministry is an organ of state administration, a technical production staff for the administration of the enterprises subordinated to it. The responsibilities of a ministry include: study and approval of plans for production and capital construction for individual branches of the industry on the basis of the general plan for the ministry which has been approved by the Government; follow-up on the fulfillment of these plans; the preparation of summary plans for the ministry; rendering technical aid to enterprises in the introduction of new equipment and improvements; the realization of inventions; the organization of technical material supply and the marketing of products; administering the organization of labor and wages; the selection, training, and advanced training of the labor force; appointing the directors, chief engineers, and chief accountants of enterprises; administering the educational institutions, scientific research institutes, and planning institutes of the given branch of industry.

The ministry is headed by a minister who deals with the most important problems relating to the development of the branch and its current activity in accordance with the directives of the party and the government. The minister issues directives and instructions, appoints and replaces the heads of departments, main administrations, large trusts, and enterprises.

The deputy minister is in charge of individual areas of work within the ministry. The Council of Ministers USSR approves a collegium of the ministry under the chairmanship of the minister. The collegium of the ministry deals with all of the most important problems in the work of the branch of industry and hands down decisions on these problems.

Within the ministries are main production administrations (glavks) and functional administrations and departments.

The main production administrations administer individual branches of industry. For example, Glavalyuminiy, a production glavk of the Ministry of Non-Ferrous Metallurgy, administers all enterprises of the aluminum industry.

A main administration is a part of the central apparatus of a ministry. Predominating in its work is economic operative activity, which embraces the entire complex of problems related to the activity of enterprises.

In addition to industrial enterprises, a main administration may have jurisdiction over scientific research and planning institutes, transportation organizations, etc.

Main administrations handle the direct and operative administration of the enterprises subordinated to them. Main administrations examine the plans of enterprises, check on their fulfillment, render technical aid to enterprises, and introduce advanced practices and advanced technological processes into production. They are also responsible for approving the plans and estimates of enterprises where the cost of the industrial construction is less than 20 million rubles; for administering the organization of labor and wages, and the selection, training, and advanced training of personnel; for administering scientific research and planning institutes directly subordinated to the main administration; and for submitting appointments of directors and chief accountants.

The chief tasks of ministries and main administrations are organizational work, the inspection of enterprises, and the dissemination and application of advanced practices and the achievements of science and technology.

For example, the chief functions of Glavruda are as follows.

(1) Working up production plans and supervising their implementation.

(2) Administering the introduction of new equipment and modern technology on the basis of the achievements of science and a study of the practices of leading enterprises and production innovators.

(3) The organization and administration of capital construction and capital repairs, and checking on the work of contracting organizations.

(4) Technical material supply and the marketing of products.

(5) The selection of executive personnel and the implementation of measures to supply enterprises with complete, permanent staffs

of workers, and the improvement of their technical qualifications; handling problems of organizing labor and wages; follow-up on conformity to regulations for accident prevention; overseeing the conclusion of collective agreements and follow-up on their fulfillment.

(6) Financing subordinate enterprises and administering their financial activity.

A main administration exercises financial control, audits the books of subordinate enterprises and organizations, and approves their reports and accounting statements.

The organs of the state mining inspection commission occupy a special place in the administrative organization of the USSR ore mining industry. The organs of the state mining inspection commission check on compliance with safety regulations in mining work and on the correct exploitation of deposits in accordance with approved plans. Their functions include checking on the implementation of measures to protect the surface area and the buildings and structures thereon from the harmful effect of mine workings, controlling the accounting of production, losses, and the movement of reserves in the deposits, etc. The state mining inspection commission is authorized to impose fines and indict individuals for violations of the regulations governing mining, geological surveying, and mine surveying work, and safety regulations.

The functional administrations of the Ministry of Ferrous Metallurgy USSR and the Ministry of Non-Ferrous Metallurgy USSR, are as follows: the planning administration, the technical administration, the executive personnel administration, the central accounting office, etc.

The tasks of the functional administrations include the preliminary treatment of problems relating to their functions, the preparation of materials for the directives and rulings of the administrators of the ministry, controlling and analyzing the work of subordinate links, and rendering them direct aid in their work.

The Trust and the Enterprise

A trust is an intermediate link of industrial administration between a main administration and the enterprises. It is not an integral part of the central apparatus of the ministry but a khoz raschet organization which administers the economic activity of several enterprises which are homogeneous in terms of the nature of their production.

The functions of trusts include administering all aspects of the economic activity of subordinate enterprises (except for marketing functions). Trusts are responsible for relieving the glavk of some of the burden of administering individual enterprises.

In the ore mining industry there are trusts in the gold industry, the iron ore industry, and other branches.

A socialist industrial enterprise is an economic unit organized for the production of an industrial product in accordance with an approved plan. The enterprise is the basic link in the system of socialist industry.

An enterprise is characterized by technical production unity and administrative autonomy. The technical production unity consists in the fact of technically complete production processes for the extraction of raw materials and the manufacture of

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

semifinished articles or products. In cases where, as a result of the comprehensive utilization of the raw materials, several kinds of products are obtained, there must accordingly be several technological processes.

The economic production activity of an enterprise is carried out in accordance with a plan approved for it as an integral part of a branch plan which forms a part of the general national economic plan. Planning and follow-up on plan fulfillment are done for individual enterprises. An enterprise has definite funds at its disposal. For purposes of fulfilling the plan, it is authorized to acquire property, conclude agreements for the delivery of the requisite materials and for the sale of products, and to sue and be sued in a court of law. An enterprise has its own balance sheet and operates on a khoz raschet basis. The administration of an enterprise is responsible for the fulfillment of the plan and for economic management.

A mining enterprise with a single administrative and technical administration, organized for the mining of one or several minerals, is called a mine. A mine at which the mineral product is extracted by the open pit method is called a quarry or pit.

Mines are called iron mines, copper mines, gold mines, etc, depending upon the kind of mineral being extracted.

Every mine represents a totality of mine workings (shafts, drifts, quarries, etc) appropriately equipped with technical and service structures both above and below the surface.

The production buildings, repair shops, electric power plants, service buildings, and administration buildings are located on the surface.

It is often the practice to build a dressing plant at the mine site.

The majority of mines in the mining industry are independent enterprises. However certain mines come under combines, where ore is not only mined but processed. This is true of the majority of gold mines, certain polymetallic mines, etc. In these cases the mine is not an independent enterprise but a shop.

The term shop is usually applied to an administratively separate enterprise which handles technologically homogeneous or equivalent work.

A shop receives its production quota from the head of the enterprise. The superintendent of the shop is directly subordinated to the director and chief engineer of the enterprise.

Generally a shop superintendent is not authorized to assume any obligations without the authorization of the director of the enterprise.

Section 3. Planning in the USSR Ore Mining Industry

It is the function of a branch plan to provide a program of measures which will ensure the fulfillment of the quotas fixed by the party and the government in terms of quantitative and qualitative indexes for the plan period for the given branch of industry.

A branch plan contains the following basic sections: (a) production plan; (b) plan for development of technology; (c) labor and wages plan; (d) costs plan; (e) technical material supply plan; (f) finance plan; and (g) plan for capital construction and capital repairs.

A branch plan should be based on the latest achievements of science and technology and the best practices of production leaders and innovators, so that with the given material resources and on the basis of economy and the optimum utilization of production possibilities it will be possible to give the country large scale production of the best quality.

The basic goal in planning for the mining industry is that of providing the national economy with raw materials for the development of ferrous and nonferrous metallurgy.

The plan for the ore mining industry should ensure not only the planned production of raw materials but the excavation of main workings and development workings, the expansion of mining in subsequent periods, and an increase in productive capacities.

Therefore plans for prospecting main workings and development workings, and for auxiliary departments in the branch, should be drawn up with a view to the prospects for developing the branch in succeeding years.

The ore mining industry embraces several individual branches of industry (the iron ore, copper, lead-zinc, nickel, tin, and other industries). Each branch, in its turn, is a diversified complex including mining enterprises, dressing plants, subsidiary and auxiliary enterprises (electric power stations, machine repair shops and plants, transport, etc). The planning must cover all of the production processes of each branch, from the geological surveying work through the development and working of deposits to the production of the finished product, as well as the work of all subsidiary and auxiliary enterprises of the branch (power, transport, etc).

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

Drawing Up the Plan

Plans are divided into long range plans (10-year, 5-year) and current plans (yearly, quarterly).

Long range plans indicate the basic line of economic development over a period of several years. Current (yearly) plans represent a concrete program of work for a shorter period. Current plans are worked up on the basis of long range plans.

The work done in connection with drawing up a branch plan may be arbitrarily divided into separate stages.

The first stage in the preparation of a branch plan involves summarizing the results of plan fulfillment for the preceding period (five-year plan, year, quarter) and analyzing the level of development attained. For the national economy as a whole this work is done by Gosplan and Gosekonomkomissiya SSSR. For individual branches of industry the evaluation of plan fulfillment for the preceding period is made by the main administrations of the ministry on the basis of data reported by the enterprises.

A tentative summary of the results of plan fulfillment is drawn up before the end of the current period (five-year plan, year, quarter) on the basis of the results for the past period and the anticipated fulfillment before the end of the plan period. These results give an idea of the level attained in the development of production, in labor productivity, costs, and fulfillment of the plan for capital construction and the introduction of new capacities. They reveal bottlenecks, lack of coordination and disproportion to be eliminated during the plan period, and the reserves for the further development of the branch. The results of the fulfillment of socialist obligations on the part of leading enterprises are studied, and the advanced practices of innovators are disseminated, as a very important reserve for increasing production and raising labor productivity.

The next stage in planning involves the elaboration of draft plans for individual branches and for the national economic plan and their approval. They are worked up by Gosplan and Gosekonomkomissiya USSR jointly with the ministries. For purposes of the preparation of draft plans the enterprises submit to the ministry their suggestions and estimates on a limited number of indexes. The draft plans are worked up by the higher planning organs on the basis of general national economic goals and the concrete goals for the given branch which derive therefrom.

In working up the national economic plans, Gosplan and Gosekonomkomissiya USSR follow the directives of the party and the government. They take into account the national economy's requirements for the products in question, the available raw materials resources, available productive capacities, and their expansion during the plan period.

For purposes of drawing up plans, Gosplan and Gosekonomkomissiya USSR work up numerous indexes and balances, and take into account the ratio between consumption and accumulation, the planned ratio between individual branches of the national economy, labor productivity indexes, and tentative balances of basic kinds of raw materials, materials, and power. These balances and indexes make it possible to ascertain the internal national economic relations and to establish a procedure for the most effective utilization of material and power resources.

At the present time the following deadlines are in effect for the submission of yearly draft plans.

(a) Ministries, departments, and the councils of ministers of union republics submit draft plans to the Council of Ministers USSR, with a copy to Gosekonomkomissiya USSR, by 15 August.

(b) Gosekonomkomissiya USSR submits to the Council of Ministers USSR a draft plan for the development of the national economy of the USSR by 1 October.

(c) The Ministry of Finance USSR submits a draft financial plan to the Council of Ministers USSR, with a copy to Gosekonomkomissiya USSR, by 10 October.

When the plan has been approved by the government it acquires the force of a law which is binding for purposes of fulfillment upon all state economic organizations in the USSR.

These plans are then issued as quotas to the ministries, main administrations, and enterprises in the form of directives the implementation of which is mandatory.

The distribution of the plan to each enterprise, shop, and crew develops the initiative of the workers, stimulates socialist competition, and mobilizes the masses for the fulfillment and overfulfillment of the plan.

On the basis of the plan approved by the government, the ministries and their main administrations promulgate to the enterprises the following basic plan indexes.

(1) Production indexes in terms of value and physical measurement.

(2) Basic technical economic indexes for the utilization of equipment, etc (within the limits of the indexes given in the overall state plan).

(3) Number of workers and employees and payroll fund.

(4) Labor productivity quota.

(5) Cost of commodity production.

(6) Quota for cutting costs of commodity production.

(7) Balance of income and expenses.

(8) Plan for capital construction.

(9) Plan for capital repairs.

The raw materials resources, progressive norms for the utilization of the productive capacities of enterprises, plans for the construction and introduction of new capacities, the necessity for mobilizing the internal resources of the branch and the enterprises, the possibility of cooperative operations among individual branches and enterprises, and other conditions ensuring the most successful fulfillment of the plan are taken into consideration in distributing quotas among main administrations and enterprises.

In addition to the yearly plans, ministries and departments establish quarterly plans for their subordinate enterprises. In distributing the yearly production by quarters and months, provision should be made for a systematic production increase from quarter to quarter and month to month. In this connection the production for the first quarter should as a rule be higher than for the fourth quarter of the preceding year.

In the case of mines it is essential to drawup a schedule for development and stoping work so as to ensure both the fulfillment of the plan for mining ore of the appropriate quality and development work for the following period. The production increase in the course of the year must be founded on improved utilization of the stoping area by means of using a graph of cycles, speeding up drilling operations, the mechanization of processes, and putting new shafts, units, and cuts into operation.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

Tekhpromfinplans are drawn up at enterprises after promulgation of the plan indexes. The tekhpromfinplan is approved by the director of the enterprise and submitted for control purposes to the immediately superior organization no later than 6 weeks after receipt of the approved plan indexes.

The tekhpromfinplan is a detailed plan of the production, economic, and financial activity of an enterprise, drawn up in order to fulfill the quotas of the socialist state for the plan period. In addition to the resources for the fulfillment and overfulfillment of these quotas, this plan makes provision for technical organizational measures aimed at discovering the utilizing of the reserves of the enterprise, improving technology, and improving production organization.

The governing idea in the tekhpromfinplan, which is based on progressive technical economic norms, should be the optimum utilization of all intraplant possibilities and reserves for increasing production, improving its quality, cutting costs, increasing socialist accumulations, and accelerating capital turnover.

The tekhpromfinplan should cover all aspects of the enterprise's activity and coordinate the work of all of its links. Therefore the tekhpromfinplan should not only be a general plan for the activity of the enterprise as a whole but a plan for its component links. The tekhpromfinplan should spell out specific quotas for individual shops, showing the deadlines for their fulfillment. This makes it possible to have a follow-up in each individual area of production.

The production plan is not just a list of figures and quotas. It is essential to organize a struggle for its fulfillment, and to make adjustments in the plan after it has been drawn up. The organization of a struggle for the fulfillment of the approved plan involves the necessity of distributing the plan to each executive and maintaining constant follow-up on its fulfillment. This makes it possible to take prompt steps to eliminate factors which might hinder the successful fulfillment of the quantitative and qualitative indexes in the plan.

On the basis of the plans distributed to the supervisor, the workers and employees undertake socialist commitments. Mastering equipment, manifesting creative initiative, and rationalizing production, the workers find ways of overfulfilling the plans. Thus the prompt distribution of the plan to each supervisor promotes the development of socialist competition, which is a very important method in the struggle to overfulfill state plans.

The Balance Sheet Method of Planning

The basic method of working up plans is the balance sheet method.

All balance sheets are divided into 3 groups: (1) materials balance sheets, which comprise material resources and the requirements therefor; (2) cost [or value] balance sheets, which comprise the proportions in the distributions of financial resources ensuring a correspondence in the distribution of the social product in terms of cost; (3) manpower balance sheets, which reflect the reproduction of manpower.

Materials balance sheets establish the production and utilization of equipment, raw materials, materials, electric power, and other elements of material production.

The essence of the balance sheet method in planning for a branch consists of discovering all possible reserves for producing the given product and of drawing up a plan for the proper utilization of the product.

Materials balance sheets must take complete and comprehensive account of all factors affecting the volume of production. These factors include the full utilization of productive capacities, capital construction and the introduction of new capacities, increase in equipment, specialization, cooperation, combination, changing the nature of the raw materials base, improving technology, etc.

In the process of drawing up balance sheets, planning organs seek out means of increasing the volume of production by means of mobilizing internal resources, improving the utilization of existing capacities, installing new capacities, reducing consumption of the given product for secondary purposes, the utilization of substitutes, cutting down losses, waste, and spoilage of all kinds, and establishing progressive norms for the consumption of materials per unit of production.

The preparation of materials balance sheets promotes the elucidation of relationships between individual branches of industry and the establishment of proper proportions in their development.

The planning of state reserves is of very great importance in the process of working up materials balance sheets to ensure proper proportions in the development of the national economy. A strong socialist economy cannot be developed without reserves. The existence of reserves insures the national economy against hazard, and constitutes a very important precondition for the prevention of those disproportions which might develop.

Balance sheets drawn up in terms of monetary values include the balance sheets for the monetary income and expenses of the population, the balance sheet for the national income and its distribution, etc.

Balance sheets of manpower establish the requirements for manpower and skilled personnel and provide means of recruiting new workers for industry.

Section 4. The Production Plan for the USSR Ore Mining Industry

The purposes of drawing up a production plan for a branch of industry are to establish the volume and assortment of products and the rate of increase in the production of individual products, in accordance with the directives of the Communist Party and the Soviet Government.

The plan for the volume and assortment of products is the basic and determining section of the branch plan. The planned volume of production determines the requisite increase in productive capacities, the expansion of the technical base, the requirements for raw materials, fuel, power, and indirect materials, the requirements for manpower, etc.

The Indexes of the Production Plan

The production plan for a branch of industry is drawn up in terms of physical and monetary units of measure.

In the ore mining industry the most important physical indexes for the production plan are as follows: the volume and quality of the ore [see Note] mined; the volume of prospecting work; the volume of development ~~work~~; the movement of reserves; and the volume of filling work. The units of physical measure in the plan are of prime importance. They specify what kinds of products, what grade of products, and what quantity of products must be produced during the plan period, and what kinds of workings must be driven in order to ensure normal exploitation of the mine in the future.

([Note] An ore is the totality of minerals in rock from which it is possible to extract one or several metals which are of national economic importance because of their physical and chemical properties (content of useful components, foreign matter, etc). Frequently the term ore is applied to rock from which it is possible to extract non-metallic products (apatite ore, sulfurous ore, etc). The ore mass is the ore brought to the surface, which includes, in addition to ore, some barren rock or ores low in metal content which make for exhaustion of the ore in the process of mining).

The product turned out must meet established specifications or technical conditions.

([Note] A specification model is a typical kind of product which meets specific conditions as to quality, size, weight, form, etc.

(Technical specifications are the conditions and regulations which must be complied with in manufacturing an article with respect to its quality, method of processing, etc.)

Although the products of the ore mining industry are not commodities, that is, they are not something which is freely bought and sold but something which is utilized and distributed according to plan, this production must nonetheless be planned in terms of monetary values.

Accounting for and planning production and production expenses

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

in monetary terms ensures control of the activity of enterprises, promotes the implementation of khoz raschet, and provides a stimulus in the struggle to cut costs and increase profitableness. Because of the yearly change in the structure of production, and sometimes in the catalogue listings, the volume of industrial production should be planned in monetary units, in order to determine the dynamics of the production volume and compute labor productivity.

The monetary valuation of the planned production takes various forms. The planned figure for production expenses is determined on the basis of the planned cost. The income from the sale of products is determined on the basis of current state wholesale prices. And the value of the gross production is determined on the basis of the wholesale prices of the enterprise.

The basic production program for a branch is the output of commodity production. The term commodity production is applied to that production of the enterprise which is intended for sale on the outside and which goes into the national economic trade. Commodity production includes the value of the finished articles and semifinished products sold on the outside and the value of the services of basic shops on the outside and of their capital construction.

Commodity production is evaluated on the basis of costs and the wholesale prices of the enterprise, that is, without the turnover tax.

In addition to commodity production, the gross production of enterprises and branches of industry is planned and accounted for.

The gross production characterizes the total volume of an enterprise's industrial production minus the products consumed by the enterprise itself.

The production of an ore mining enterprise of the ferrous or nonferrous metallurgical industry should be characterized not by the quantity of ore mined but by the quantity of metal contained in the ore. Therefore, in calculating the gross and commodity production of an ore mining enterprise of the nonferrous metallurgical industry, the quantity of metal in the ore mined is taken as the basis.

For example, the reported data for 2 mines are characterized by the following figures.

Mine	Quantity ore (1,000 t)	Quantity metal content (t)	Cost (1,000 rubles)	Commodity production (1,000 rubles)
Mine A	1,000	10,000	25,000	40,000
Mine B	1,000	15,000	25,000	60,000

With the same quantity of mined ore and the same expenses, Mine B produced 1.5 times more commodity production than Mine A, because of the fact that the ore mined was richer.

The gross production of an enterprise includes the value of all finished articles and semifinished products (ores and concentrates), consumer goods, etc manufactured either from the enterprise's own material or from the client's material and the value of the industrial work done on outside orders, for the enterprise's own capital construction, and for various nonproduction needs of the enterprise, minus the value of finished articles and semifinished products of the enterprise's own manufacture required during the reported period for the production needs of the enterprise, regardless of when they were produced.

Finished articles include products manufactured at the given enterprise which do not undergo further processing there.

Semifinished products of the enterprise's own manufacture include articles produced in shops or in individual processing areas which have not yet passed through all operations established in the technological process and are therefore subject to further processing in other shops (processing areas) of the same enterprise or are subject to being made into articles. Thus for a mine at which the ore is not subject to further processing, it is a finished product. For a combine which includes mines and a dressing plant, the ore is a semifinished product, while the concentrate is a finished product. And for a metallurgical combine which includes a dressing plant and a metallurgical plant, the concentrates will in their turn be semifinished products.

The value of timber, coal, and peat felled, mined, and hauled out by the enterprise itself and consumed by the enterprise, is not deducted from the value of the gross production. Also, monetary expenses for the production of ore, refractory materials, coke chemical products, and non-ore raw materials consumed for the enterprise's own production are not deducted from the gross production of combined enterprises of ferrous metallurgy.

Gross production does not include the value of products rejected by the department of technical control; the value of the capital construction, rehabilitation, or reconstruction of the enterprise or installation and repair work done on equipment; the value of capital repairs on the buildings and structures of the home enterprise; the value utilities services and the services of all types of transport; the value of the products turned out by auxiliary and ancillary establishments of a nonindustrial nature; and the value of electric power and water sold outside or materials acquired outside.

Mine development work, on which hundreds of millions of rubles are spent annually, is of great importance at the mining enterprise. The volume of this kind of work is constantly growing because of the changeover to methods involving caving and shrinkage stoping, which require a large volume of development work. But the volume of development work completed is not reflected in the fulfillment of the plan for gross production. A mine which has not achieved the planned volume of development work will as a result have better indexes for labor productivity and the expenditure of the payroll fund, whereas a mine which has overfulfilled the plan for development work will by the same token have lower economic indexes.

Essentially, development workings and ore shrinkage stopes represent work in progress. In such branches of industry as machine building the difference between the work in progress outstanding at the beginning of the plan period and that outstanding at the end is included in the enterprise's gross production.

It is to be recommended that ore mining enterprises, too, include in their gross production the difference between the development work outstanding at the beginning and end of the plan period.

The gross production and commodity production of a trust or main administration represent the total gross production of the enterprises under the trust or glavk.

With this method of accounting for the commodity production and gross production of a branch of industry, the value of the products of certain enterprises which have been processed at other enterprises in the same branch may be counted twice in the volume of commodity or gross production of the branch. For example, concentrates from the Sadon Mine are processed at the Elektrotsink Plant. With this method of accounting, the commodity production and gross production of the lead-zinc industry comprises both full value of the Sadon concentrates and the full value of the products from the Elektrotsink Plant, including the value of the Sadon concentrates. In order to analyze the actual volume of the trust's or glavk's commodity production and gross production, it is necessary to take into account the internal turnover of the trust or main administration.

The overall output of industrial products turned out during a given period by all of the basic and auxiliary shops of a mine, expressed in monetary units, constitutes the gross turnover of the mine. The gross turnover of a mine also includes that portion of the production consumed by other shops of the enterprise. For example, the overall turnover of a mine includes the value of the electric power produced by the mine's electric power station and the value of the compressed air. Thus in the value of the gross turnover, the value of the products consumed within the enterprise is counted twice.

At the present time the index for gross turnover is not used in the production program for an enterprise, but it is used in practice for the intramine planning and analysis of productive activity.

Determining Ore Requirements in Drawing up the Production Plan

In the USSR the ore requirements of the appropriate branches of the metallurgical industry are taken into account in effecting the expansion of the ore mining industry. For example, given a knowledge of the plan for the expansion of ferrous metallurgy and the specific norms for the amount of iron ore used in smelting one t of pig iron or steel, one can determine the requirements for iron ore.

The average content of metal in the ore and the progressive norms for recovering metals from ores are taken into account in fixing the specific norms governing the consumption of ore per t of metal.

The quantity of ore mass which must be mined in order to fulfill the yearly program for metal is determined in accordance with the following formula:

$$P = \frac{Q \cdot 100}{f(1-q)\ i_o \cdot i_m}$$

where P -- yearly volume of ore mass mined, in t;

Q -- yearly program for smelting of metal, in t;

f -- content of metal in the ore according to assay data from mine samples, in %;

q -- coefficient of exhaustion;

i_o -- coefficient of recovery in dressing;

i_m -- recovery of metal at the metallurgical plant.

The decline in the amount of useful components in the mined ore relative to the content thereof in the same kind of ore in the ore body is referred to as the exhaustion of ore in the process of mining. It takes place as a result of admixtures of a certain percentage of waste rock and barren rock in the ore, and contamination with low grade ores, and as a result of the rich minerals' breaking off from the ore and being lost in the drift.

The rate of exhaustion (coefficient of exhaustion), q, is based on the ratio between the content of useful components in the mined ore mass and the content thereof in the ore body according to data from assays of mine samples, and is determined by the following formula:

$$q = \frac{f-a}{f},$$

where a equals content of the useful component in the mined ore mass. For example, the copper content in the ore body, f, equals 2.18%. The copper content in the mined ore mass, a, equals 1.967%.

The coefficient of exhaustion will be:

$$q = \frac{2.18-1.967}{2.18} = 0.1.$$

This formula may be used if the exhaustion takes place because of the admixture of barren rock or the breaking off of rich minerals from the ore. If however the exhaustion takes place because of the presence of phenocrysts or other kinds of ores and rocks containing a certain quantity of the useful component, the coefficient of exhaustion should be computed according to the formula:

$$q = 1-\frac{a-r}{f-r},$$

where r equals the content of the useful component in the masses which are working out.

For example, r may equal 0.3. In this case, for the example given above, the coefficient of exhaustion, q, will equal 0.12 according to the following calculation:

$$1-\frac{1.967-0.3}{2.18-0.3} = 0.12.$$

The following is an example of calculating ore requirements. (All figures are hypothetical.)

The plan for copper production has been established at 100,000 t.

The average copper content in the ore in the ore body is 2.18%.

The coefficient of recovery, using progressive methods of concentrating, is 0.9, and the recovery in metallurgical processing is 0.96. The coefficient of exhaustion is 0.1.

$$P = \frac{100,000 \cdot 100}{2.18 \cdot 0.9 \cdot 0.96(1-0.1)} = 5,900,000 \text{ t.}$$

By comparing the quantity of metal in the ore which can be extracted from all mines and pits operative or to be opened during the plan period against the requirements, we establish the extent to which the national economy is supplied with raw materials resources.

In order to ascertain the supplies of raw materials being produced which will be available for the scheduled plan for the production of metal, we make an overall calculation for the mining of ore and the recovery of metal for all deposits in the following form. (All figures are hypothetical.)

FORM FOR OVERALL PLAN FOR PRODUCTION OF ORE AND METAL

Mine	Annual production of ore mass (dry weight) in t	Average content of metal as per assays of mine samples in %	Exhaustion (1-q)	Coefficient of recovery concentration	smelting	Annual recovery of metal, 1,000 t
No 1	1,400,000	2.0	0.9	0.9	0.94	21.4
No 2	3,000,000	1.0	0.9	0.8	0.94	20.2
No 3	8,000,000	0.8	0.9	0.75	0.94	40.6
Total	12,400,000					82.2

If the amount of raw material planned for extraction is inadequate to fulfill the planned production program for metal, it may be necessary to increase the production of raw materials by expanding the workings, intensifying the exploitation, constructing new mining enterprises, etc.

In order to determine requirements for individual metals, it is necessary to take as a basis the plans for the development of those branches of industry which consume the metals in question. In order to determine metals requirements for the current period of one year (and, in those cases when the appropriate data are available, for long range planning), one employs the requisition balance method, based on the consumption norms for the given metal per unit of product and on the output plan for this product.

The greater part of the products of ferrous and nonferrous metallurgy are distributed on a quota basis and are issued to consumers only on the basis of planned distribution. All consumers of metals submit advance requisitions to Gosekonomkomissiya USSR. These requisitions must be substantiated both by the plan for the output of products and by the consumption norms per unit of production. When all requisitions have been checked and adjusted, and the balances on hand at the beginning and end of the plan period have been accounted for, an overall plan for metals requirements and the balances of these metals is drawn up. In this connection provision is made for maximum saving on metals, especially nonferrous metals, and for replacing them with less scarce materials without damaging the quality of the product being turned out.

However, in drawing up the production program for the ore mining industry, it does not suffice to determine the nation's requirements for metals and ore.

The production plan depends upon the existence of raw materials and power resources and their development during the plan period, and upon production capacities and the possibilities of improving their utilization and expanding them.

Production Capacities

The production plan is intended for specific addresses, that is, the plan specifies which enterprises are responsible for fulfilling a certain part of the program and the deadlines for fulfillment.

In order to plan the production program for a branch of industry, it is necessary to possess very complete data on the capacity of the existing enterprises. The capacities are specified in the certificates of the individual enterprises. The certificate of an enterprise gives a complete description of all of the basic elements determining the production capacity (raw materials resources, number of shafts, drifts, quarries, and their throughput capacity, reserves of ore prepared for mining, etc).

The production capacity of a mine is determined by the maximum possible annual production of ore calculated on a basis of the full utilization of the stoping area, the capacity of the shafts, drifts, and pits and all existing equipment, given the achievement of progressive technical norms of productivity for the equipment, taking into account the enterprises' experience in mastering advanced equipment and the technology of production and labor organization, and making allowance for the elimination of production "bottlenecks."

In the case of mining enterprises which do not operate the year round (open pit workings in regions where the climatic conditions are harsh; dragline and hydraulic workings), the maximum daily capacity multiplied by the planned number of days of operation per year at the mine is taken as the index for the production capacity.

The basic elements determining the production capacity of a mine are: (a) the quantity of reserves explored and prepared for mining; (b) the number of shafts, drifts, and pits; (c) the number of blocks which can be mined and the quantity of ore which can be recovered from one block (in this connection allowance is made for the necessity of leaving reserve blocks); (d) the organization of work; the extent to which work is done in complete cycles; and the speed with which development work is being done; (e) the number of machines and mechanisms already installed and their capacity; (f) the mine's working schedule (the number of days and number of shifts).

The most advanced stable indexes achieved by leading workers of the enterprises must be taken as a basis in determining production capacities in accordance with these elements.

In computing the production program allowance is made not only for the capacity of existing enterprises but also for new shafts, pits, units, equipment, etc which are scheduled to be put into operation. Consequently the computation of the production program must be closely tied in with the plan for capital construction and the schedule for putting individual enterprises and units into operation, and for the development of the technical base of the branch.

The selection of plan norms for the productivity of equipment per unit of time (for example, the load per excavator, the production per dredge, the haulage per mine locomotive) should be based on a careful study of the results of the work during the preceding period, taking into account the work indexes of the leading enterprises and the practices of the leading production workers.

The number of days the enterprise works per year and the number of shifts per day also have a great effect on the production capacity of the enterprise. Mines usually have an interrupted work week, a 2-shift schedule for stoping work, and a 3-shift schedule for driving main workings and development workings. Practice has shown that this kind of schedule is best for ensuring repair and development work.

In the case of dredging and hydraulic operations and other workings, the work schedule is adapted to the local climatic conditions. Special measures for lengthening the working season (thawing out, protection against snow, etc) can play an important role in increasing the utilization time for equipment.

Concentration mills usually have a 3-shift work schedule and an uninterrupted work week. Allowance is made for the time required for planned and preventive maintenance in establishing the number of working days per year. Certain important pieces of equipment, for example, the crushers, are often operated for only one or 2 shifts. This reserve of production capacity ensures the uninterrupted functioning of the mill. The working time for individual units of equipment is determined in accordance with the schedule and graphs for planned and preventive maintenance. The working time of equipment, in hours, is figured as the difference between the established number of days' work for the equipment and the time required for inspection and planned and preventive maintenance.

In determining the capacity of concentrating mills it is necessary to make a distinction between the production capacity of enterprises as regards raw materials and their capacity as regards the output of concentrates. The quantity of concentrates produced by them depends upon the quantity of raw material processed, the content of useful components therein, and the achieved coefficients of metal recovery. Therefore the production capacities of concentration mills are planned and accounted for in 2 units of measure, in terms of the raw material processed and in terms of the quantity of ideal concentrate produced (that is, with a certain metal content).

In order to draw up the production plan, it is necessary to

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

ensure the proper ratio between the production capacities of individual enterprises within the branch. For example, the capacity of the mines must ensure a full load for the concentration mills. On the other hand, the production capacity of the dressing plants must not limit the work of the mines. If in the course of drawing up the balance of capacities it becomes apparent that there is a disparity between the capacities of the mines and concentration mills and the quantity of ore planned for mining and processing, concrete measures must be taken to eliminate the disproportions (by means of cooperative operations, reconstruction, or new construction).

In the ore mining industry great importance attaches to coordinating the capacity of the mines with that of the metallurgical plants. As mining is expanded, increasing quantities of poor ore are used in production. This means that, in order to obtain one t of metal, it is necessary to mine a larger quantity of ore. Therefore the production capacity of the mining enterprises must increase relatively more rapidly than the production capacity of the metallurgical plants. Overlooking this factor can lead to disproportions and nonutilization of the production capacities of metallurgical plants.

Planning Raw Materials Resources

The extent to which the raw materials base has been explored and developed is a very important factor in the fulfillment of the production program by the mining industry and in the possibilities for its further development. The task is one of exploring and developing high category reserves accessible for removal, the mining and dressing of which can be done during the plan period, while at the same time covering the national economy's requirements for the immediate future.

In order to expand the raw materials base of the USSR, to provide reserves for new enterprises under construction, to expand the reserves for existing enterprises, and to provide reserves for current production, geological surveying work is essential.

In the USSR, geological surveying work is carried out on the basis of approved plans. The plan for geological surveying work includes surveying, prospecting, geophysical work, aerological work, hydrogeological work and drilling, excavating, and other kinds of work associated with prospecting and exploring mineral deposits. This plan includes physical indexes for the volume of work (drilling in running m, excavating in m^3, cartographic surveys in sq m or sq km, etc), and their cost.

The plan for geological surveying work is drawn up with a breakdown by regions and important deposits.

The ministries and main administrations fix plan quotas for geological work in accordance with the yearly plan for geological work approved by the government.

The plan quota shows the function and character of the work, the results anticipated, the schedule for doing it, and the estimated cost for each project. On the basis of the plan quotas, work plans or programs are drawn up and their cost is determined.

The approved plans and estimates serve as a basis for drawing up detailed title lists of these projects with a breakdown by objects and kinds of work.

In addition to exploring deposits of the basic mineral product and the concomitant valuable components, it is essential to carry out prospecting and exploration work to obtain information on the existence, in the region where the deposit is located, of local building materials fluxes, sources of water supply, and on the hydrogeological conditions of the deposit.

The movement of reserves during the plan period, with a breakdown into individual categories, is established on the basis of the planned volume of prospecting and exploratory work and the planned production of mineral products.

Planning Changes in Reserves

Quantitative changes in balance reserves, if they are ascertained beyond the limits of the contours of counted reserves in categories A, B, and C, are called an increase in reserves. The increase in balance reserves is planned and accounted for in terms of these categories. An increase may be the result of discovering new reserves. The increase of category C2 reserves is planned and accounted for on a separate basis.

Reserves may not only increase but decrease as a result of geological surveying work (in cases where formerly counted reserves are not confirmed by more or less detailed exploration). Because of this, a + sign (plus) is placed before the figures on the change in reserves in the event of an increase, and a - sign (minus) is used if there is a decrease.

A transfer of reserves from lower categories to higher (to A from B or C, or to B from C) does not count as an increase in reserves. The increase and changes in balance reserves by categories are reflected in the form shown in Table 6.

TABLE 6

CHANGES IN RESERVES (1,000 t)

Deposit	Available Reserves by Categories, As of 1 January 1955						Planned Change in Reserves in 1955, by Categories (±) Not Counting Production										
	categories						from new explorations					from transfers to new categories					
	A1	A2	B	C1	C2	total	A	B	C1	C2	total	A1	A2	B	C1	C2	total
Mine A	100	100	300	800	800	2,100	-	-	+200	+300	+500	+25	+25	+100	-150	-	-
Mine B	100	200	500	900	1,100	2,800	-	-	+300	+400	+700	-	-	+100	-100	-	-

Deposit	1955 Planned Production (not counting losses)	Losses	Remaining Reserves As of 1 January 1956, By Categories					
			A1	A2	B	C1	C2	total
Mine A	145	5	25	75	400	850	1,100	2,450
Mine B	220	10	20	50	600	1,100	1,500	3,270

Total:

Planning Reserves in Terms of Their Readiness for Mining

In addition to planning reserves in terms of their degree of exploration and economic importance, a plan is also drawn up on the basis of the extent to which reserves are ready for mining.

The plan shows the amounts of reserves opened up, developed, and ready for removal in accordance with the planned volume of capital construction, development, and stoping work.

The movement of opened up reserves and developed reserves is shown in the plan using the form shown in Table 7.

Planning Mine Operations

A mine's production plan for mine operations includes development and stoping work, timbering, and geological surveying work, ensuring current production and associated with the operational activity of the mining enterprise in taking samples, ascertaining the shape of the ore body, and guiding development work.

Mine exploration work and capital construction work financed out of the state budget by way of special allocations for capital construction are covered by the plan for geological surveying work and capital construction.

Development work (operational) includes workings which have a useful life of no more than 4 years (levels, rises, cross-cuts, winzes, ore chutes, etc). The volume of this work depends upon the size and category of the reserves scheduled for mining and preparation during the plan period. The volume of development work must be planned so as to ensure a constant carry-over reserve of ore ready for removal.

TABLE 7

CHANGES IN EXPLOITATION RESERVES (1,000 t)

Name of Mine or Pit	On Hand As of 1 January 195-			Supply of Reserves, in Months, As of 1 January 195-				Planned for 195-		
	total reserves exploitable	Of Which: developed	Of Which: ready for removal	Developed: as per norm	Developed: actual	Ready for Removal: as per norm	Ready for Removal: actual	total reserves exploitable	Of Which: developed	Of Which: ready for removal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Mine A	600	400	200	6	4	4	4	1,200	1,020	720

Name of Mine or Pit	Production as per plan for 195-	Losses in process of mining	On Hand As of 1 January 195-: total reserves opened up	Of Which: developed	Of Which: ready for removal	Supply of Reserves, in Months, as of 1 January 195-: developed, as per norm	developed, as per plan	ready for removal, as per norm	ready for removal, as per plan
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Mine A	650	110	1,140	595	240	6	6	5	5

Total for the ore mining administration

The absolute magnitude of the reserves to be developed during the plan period is determined for each mine in accordance with the planned norms for future supply, the developed reserves on hand as of the end of the current year, the quantity of ore mass mined, losses in the process of mining, and the developed reserves on hand at the end of the plan year, and is calculated by means of the formula:

$$Z_p = Z_k + b + v - Z_n,$$

where Z_p -- reserves to be developed, as per plan, in t;

Z_k -- exploitation reserves as of the end of the plan period, in t;

b -- amount of the mineral products (ore mass) to be mined, as per plan, in t;

v -- losses of the mineral product in the process of mining, in t;

Z_i[sic] -- exploitation reserves on hand at the end of the current year, in t.

For example, the reserves on hand as of 1 January 1955 are 200,000 t; 500,000 t are to be mined in 1955; losses in the process of mining are figured at 20,000 t; and the developed reserves on hand as of 1 January 1956 will be 300,000 t.

The absolute figure for the reserves to be developed during the plan period will be:

$$300{,}000+500{,}000+20{,}000-200{,}000 = 620{,}000.$$

The volume of development work to be done during the plan period is determined in accordance with the volume of development work per t of developed reserves and the absolute figure for the reserves to be developed, on the basis of the exploitation system and work plans being used.

Where there is an increase in the productivity of the mines and the norm for reserve supply remains the same, there must be an increase in the absolute figure for developed reserves. To this end the development work must be kept ahead of the stoping work. The value of the coefficient of advance depends upon the existing supply of developed ores, the prospects of the deposit, the nature of the ore body, the speed with which development work is done, and other factors ensuring an adequate preparation of reserves for removal.

The extent to which the mine is actually supplied with developed reserves is determined by the following formula:

$$0 = \frac{3}{b} \cdot 12,$$

where Q -- mine's supply of developed reserves, in months;

Z -- reserves of the mineral product (developed or ready for removal), in t;

b -- amount mined in the corresponding year, in t;

12 -- number of months in the year.

The plan for development work and operational workings is given in total figures by kinds of workings (levels, rises, cross-cuts, inclines, etc) for individual mines and for the ore mining administration as a whole. The size of the workings is given in sq m of cross-section. The volume of workings is given in running m of headway and in [redacted], with separate calculations for the ore mass and for country rock. Also, the plan shows the amount of ore mass to be mined from the development workings and the stopes.

In the case of open workings the volume of work is given in cu m and t, with separate calculations for the ore mass and country rock.

The volume of horizontal workings and the volume of vertical workings are shown separately in the overall volume of work. Also, the change in the amount of development and stripping workings due to operational activity are shown. These data are broken down by individual kinds of workings, by mines, and by pits, and are given in physical units of measure and in monetary units (Table 8).

One of the tasks in planning stoping work is to establish the quantity and quality of ore to be mined during the plan period. The factors serving as a basis for calculating the amount of ore to be mined include the amount of ore required to fulfill the assigned program for the smelting of metal, the technical production possibilities of the individual mines, the extent to which they are provided with reserves, and the possibility of processing the mined ore. The determination of the quantity of ore to be mined is based on the quantity and quality of the ore to be mined during the plan period, not only from stopes but from development workings and main workings.

Quotas for the production of ore are distributed among individual mines on the basis of the quantity and quality of their reserves, the extent to which they have been prepared for removal, and the possibilities for development during the plan period. The quantity of ore which may be obtained from an individual mine in one year (its production capacity) depends not only on the size of the reserves but, most important, on the extent to which operational workings have been prepared, the degree of mechanization, the organization of work at the mine, the work schedule, the proper distribution of manpower, labor productivity, etc. Given data on the area of the deposit and the increase in the mechanization mining operations, it is possible, on the basis of reported data, to determine roughly the mine's production capacity for the plan period.

TABLE 8

FORM OF PLAN FOR DEVELOPMENT AND STOPES

Name of Mine or Pit	Section sq m	To be Driven (running m) total	Of Which: through country rock	Of Which: through ore body	To be Removed (1,000 cu m) total	Of Which: country rock	Of Which: ore
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mine A Development workings:							
Levels	6.5	200	110	90	1,300	715	585
Rises, etc	4	800	-	800	3,200	-	3,200
Stopes	3	1,200	-	1,200	3,600	-	3,600

	Weight (one cu m/t) country rock	Weight (one cu m/t) ore	Volume of Work (1,000 t) total	Of Which: country rock	Of Which: ore	Coefficient for Writing off development workings (cu m/ t)
	(9)	(10)	(11)	(12)	(13)	(14)
Levels	3	2.5	3,607.5	2,145	1,462.5	0.001
Rises, etc	-	2.5	8,000	-	8,000	0.002
Stopes	-	2.5	9,000	-	9,000	-

Separate production plans are drawn up for production by underground methods and production by open pit methods.

The production plan for mines being worked by the underground method shows the production from the stopes, with a breakdown into individual systems of workings (sublevel drifts, sublevel caving, etc); the production from development workings; and the production from the driving of main workings. Of the total mined ore mass, raw materials for dressing and agglomeration and shipping ore are given separately. The production plan also shows the number of stopes currently being worked and the number of reserve stopes for each system of workings.

The production plan for mines worked by the open pit method shows the volume of work in thousands of cu m of ore and country rock and stripping work done for operational purposes and by way of capital construction. The overall production of the mineral product (the ore mass) is broken down into raw materials for dressing and agglomeration and shipping ore.

The production plan shows the total number of levels at the mines, with indication of the number of working levels. The plan shows the work schedule for each mine or pit, including the work week (interrupted or uninterrupted), the number of shifts, and the number of hours per shift.

The quantity of ore mass, M, which according to the mining conditions can be extracted from all mines in the given branch, is determined by the total amount of mined ore and barren rock at each mine, and may be found with the fomula

$$M - \Sigma(P + \Pi),$$

where P -- quantity of the ore mass mines from individual mines;

Π -- same, for barren rock;

Σ -- total production from all mines, in t.

Filling work is done at mines which use systems involving filling with waste to prevent the caving in of the workings and to make it possible to mine untouched pockets of ore. The plan for filling work gives the volume of the workings (in cu m) to be filled in, the quantity of filler material to be produced for this purpose, and the cost of such work.

Trusts and ore mining administrations also draw up overall work plans for open pit and underground work, with a breakdown into production processes. These plans show the overall volume of work, the proportion of different kinds of work (stoping, development, etc) and of the different methods of doing the work (mechanized, manual, etc) in percentages of the overall volume, for each process, including mining, stripping, breaking, loading in the stope, gathering, underground and surface tramming, the transportation of shipping ore, and loading into railroad cars.

The collation of data on the plan for the mechanization of individual processes against indexes from the report for the preceding period gives an idea of the progress in the mechanization of individual processes and of impending tasks in this area.

Planning the Work of Concentration Mills

The content of valuable components in the ores of the nonferrous metals is relatively low. In order to recover one t of copper, it is necessary to process from 70 to 120 t of ore. In order to obtain one t of zinc, it is necessary to process from 20 to 30 t of ore, etc. Therefore, the ores of the nonferrous metals are usually sorted and concentrated prior to smelting in order to obtain ores or concentrates with a high content of metal. The concentrating process is also indispensable in order to obtain selective concentrates from polymetallic raw materials.

The economic advantages of the preliminary concentration of ores are especially evident in the case of processing low grade ores and polymetallic ores. For example, it is not economical to smelt copper ore with a one% content of copper without preliminary concentration. If unconcentrated copper ore were to be subjected to pyrometallurgical processing, it would be necessary to smelt 100% of the rock, of which 97-99% would be barren and consequently to use large quantities of fuel and spend large sums of money in hauling the barren rock from the mine to the metallurgical plant. When this ore is concentrated, a 20% copper concentrate is obtained, and from it no less than 95% of the copper from the overall content in the ore is recovered. As a result, the concentration of the ore makes for a substantial reduction in smelting and transportation costs.

The concentration process is also of great importance in ferrous metallurgy. The dressing plants of the ferrous metallurgy industry prepare ore for smelting (washing, crushing, agglomeration, and briquetting).

In 1954, 30-35% of the ferrous metal ores mined were given dressing treatment. By 1960, 70% of the iron ores will be subjected to more or less complex processing at dressing plants.

The production plan for concentration mills specifies the quantity of ore to be dressed, establishes the capacities of existing concentration mills and those scheduled to be put into operation, and distributes among them the quotas for dressing ores from individual mines.

The plan shows the work schedule for each mill; the calendar and nonworking time in accordance with the work schedule; the idle time for planned preventive maintenance; and the nominal working time in days, shifts, and hours. The plan also specifies the quantity of raw material to be processed, the output of finished products and the yield of concentrated products in percentages of raw materials, the recovery of the valuable component from the raw material, and the content of the components in the raw materials and in the concentrate, agglomerate, or other kinds of finished products.

Reported data for the preceding year, the fourth quarter, and the best month are given in the plan for purposes of comparison. This makes it possible to collate the plan indexes against the progressive indexes for the current period.

The throughput capacity of all concentration mills is determined in accordance with the formula:

$$M = \sum Fv,$$

where M -- annual production capacity of all concentration mills, in t;

F -- same for individual mills, in t;

v -- nominal number of working days at the mill in the course of a year.

The percentage of recovery of the components is calculated by means of the following formula:

$$i_o = \frac{V\gamma}{f},$$

where i_o -- planned coefficient of recovery of the metal when the ore is concentrated, in %;

V -- yield of concentrated ore or concentrate, in %;

f -- content of metal in the ore mass, in %;

γ -- content of metal in the concentrate.

For example, $V = 15$; $f = 2$; $\gamma = 12$

$$i_o = \frac{15 \cdot 12}{2} = 90\%.$$

In planning the work of metallurgical plants it is necessary to determine not only the quantity of ore to be processed at the plant but the yield of concentrate and the content of metal in the concentrate.

The yield of concentrate is determined in accordance with the following formula:

$$K = \frac{Pfi_0}{\gamma},$$

where K -- quantity of concentrates, in t;

P -- quantity of ore mass processed, in t;

f -- content of metal in the ore mass, in %;

γ -- content of metal in the concentrate, in %;

i_0-- planned coefficient of recovery of metal when the ore is concentrated, in %.

For example, $P = 100{,}000$; $f = z$; $\gamma = 12$; $i_0 = 90\%$

$$K = \frac{100{,}000}{12\cdot 100} \quad = 15{,}000 \text{ t.}$$

The content of metal in the concentrate is determined in accordance with the degree of recovery of the metal in the concentration process and the yield of the concentrate per t of the ore mass, and is found by means of the following formula:

$$\gamma = \frac{fi_0}{t},$$

where γ -- content of metal in the concentrate, in %;

f -- content of metal in the ore mass, in %;

i_0-- coefficient of recovery of the metal when the ore is concentrated, in %;

t -- yield of concentrate per t of ore mass, in t.

For example, $f = 2$; $i_0 = 90$; $t = 0.15$

$$\gamma = \frac{2\cdot 90}{0.15\cdot 100} = 12\%.$$

Where there is complex recovery of metals from ores and selective concentrates are obtained, a similar calculation is made for each concentrate individually.

Follow-Up on Plan Fulfillment

The struggle for the implementation of the plan requires a systematic follow-up on its fulfillment.

Follow-up on plan fulfillment makes it possible to ascertain to what extent the plan and its fulfillment accurately reflect the requirements of the objective economic law of the systematic (proportional) development of the national economy. This kind of follow-up makes it possible to discover existing disproportions promptly and to prevent their occurrence, to discover production reserves, and to make the necessary adjustments in the plan.

To struggle for fulfillment of the plan, to ensure the fulfillment of the plan, and to work according to plan means: (a) to implement the yearly, quarterly, or monthly plan for the output of products, not on an average, but systematically according to the plan, according to a previously prepared schedule for the production of the finished product; (b) to fulfill the plan not only on an average for the branch of industry but for each enterprise individually; (c) to fulfill the plan not only on an average for the enterprise but daily in each shop, in each crew, ~~for~~ each machine tool, and on each shift; (d) to fulfill the plan not only in terms of quantitative indexes but also, obligatorily, in terms of quality, of units, and of assortments, with conformity to established specifications and the established plan for costs.

The fulfillment of the production must be systematically checked and analyzed. Control and analysis make it possible to prevent failures in fulfilling the plan. They point up weak points in the work of the enterprise, and make it possible to correct and adjust the plan, and to elaborate measures for its successful implementation.

On the basis of an analysis of the activity of an enterprise it is possible to take steps during the current or the impending economic period. For example, let us assume that the data in the reports indicate a considerable exhaustion of the ore and a consequent drop in the metal content as against the plan figure. By means of taking steps to change the system of exploitation, a more careful grading of the ore, etc, this shortcoming may be eliminated during the current period. If, however, the elimination of a given shortcoming requires scientific research work or capital outlays, the necessary steps cannot be taken until the following economic period.

Data from enterprises and from the branch constitute a source for analyzing the fulfillment of the production program. At appropriate times enterprises turn in data on the production of the most important kinds of articles and semifinished articles in physical units of measure and by kinds and grades, on the fulfillment of the plan for gross and commodity production, and on the production of consumer goods. Their work is evaluated by means of collating the reported data for the current period against the plan figures and against the reported data for the preceding period.

In analyzing the fulfillment of a production plan special attention must be paid to the output of products in physical units of measure and in the assortment fixed by the plan. It is incorrect to account for plan fulfillment in terms of the gross output of products. The plan fulfillment of each industrial enterprise must be evaluated primarily on the basis of the output of finished and complete assortments of products which correspond accurately to established standards of quality and the technical specifications for the assortment of the given enterprise.

The procedure in accounting for production should be as follows. Together with accounting for plan fulfillment with respect to all products in monetary terms, the most important kinds of products for each branch of industry and each enterprise are accounted for separately. The program is considered as having been fulfilled only if the plan has been fulfilled not merely in terms of monetary indexes but also in terms of the most important kinds of products as measured in physical units.

In the case of mining enterprises the plan for commodity production may be considered as having been fulfilled only if the mine has produced ore of the requisite quality in the amount stipulated in the plan.

In analyzing fulfillment it is essential to check on the progress in certain kinds of work which, although they do not effect the current fulfillment of the plan for commodity production in the plan period, are of great importance to the future work of the enterprise. Such work includes: the fulfillment of the plan for exploration and development work; work in connection with filling in worked out stopes; the state of reserves developed and ready for removal; and the degree of mechanization of operations. The failure to fulfill the plan in these respects leads in the final analysis to poor work in the future. Therefore even the fulfillment of the plan for commodity production cannot be evaluated positively, if the plan for the kinds of work listed above has not been fulfilled.

In analyzing the fulfillment of the plan for geological surveying work, it is necessary to ascertain: (a) the ratio between the volume of geological surveying work and the schedule therefore as against the plan; (b) the cost of the work done, relative to the approved estimates; and (c) the results of geological surveying work in terms of the increase in reserves, transfer to higher categories, and quality and grade of ore.

In analyzing the fulfillment of the plan for development work and exploration work, it is essential to pay attention to the correspondence between the section of these workings and the sections established by the plan.

At mining enterprises of the copper and lead-zinc industries a deviation of 15% from the planned section is allowed. Workings driven in excess of these limiting norms are considered as rejected work and are not included in the volume of work done when figuring plan fulfillment.

In analyzing the fulfillment of the plan by a ministry or main administration, it is essential to check the fulfillment of the plan by individual enterprises within the branch. Average figures on fulfillment of the plan as a whole may sometimes conceal unsatisfactory work on the part of individual enterprises.

In the majority of cases the production of mines is determined on a basis of the quantity of ore mass developed and mined. But what is important to the national economy is the quantity of metal developed and mined. Therefore the volume of work done by a mine must be figured not only on the basis of the ore but also on the basis of the metal.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

In analyzing the fulfillment of a production plan by a mining enterprise on a basis of the metal it is essential to ascertain the effect on this fulfillment of the quantity of ore mined, the recovery of metal, and the average content of metal in the ore.

For example, the reported data of an enterprise relative to the plan are characterized by the following indexes.

	Plan Figure	Reported Figure	Reported Figure in % of Planned Figure
Ore mined, 1,000 t	2,500	2,250	90
Average metal content in the ore, in %	2.0	2.2	110
Recovery of metal from concentration, %	90.0	85.5	95.0
Recovery of metal from metallurgical processing, in %	95.0	9.50	100.0
Fulfillment of plan as regards metal, in t	42,750*	40,206.4**	94.05

* $2,500,000 \cdot 0.02 \cdot 0.9 \cdot 0.95 = 42,750.0$

** $2,250,000 \cdot 0.022 \cdot 0.855 \cdot 0.95 = 40,206.4$

Whereas the plan for the production of ore was fulfilled 90%, the plan for metal was fulfilled 94.05%. The failure to fulfill the plan for metal, despite the fact that the average metal content in the ore was 10% higher than in the plan, was due chiefly to the unsatisfactory work of the concentration mill. If the plan for the recovery of metal at the concentration mill had been fulfilled, the program for metal would have been fulfilled 99%, as is evident from the following calculation:

$$\left[\left(\frac{2,250,000 \cdot 2.2}{100} \, 0.9 \cdot 0.95 \right) : \left(\frac{2,500,000 \cdot 2 \, 0.9 \cdot 0.95}{100} \right) \right] \cdot 100 = 99\%.$$

Thus the failure to fulfill the program for the production of ore accounted for one% of the underfulfillment of the plan as regards metal (100-99 = 1), and the insufficient recovery of metal at the concentration mill accounted for 4.95% (5.95-1 = 4.95). This shows that in the given instance it was necessary to devote attention to improving the technological process at the concentration mill.

The work of concentration mills is evaluated on a basis of the quantity of ore processed and of concentrates produced. However in this connection, not only is the quantity of concentrates important, but the content of metal therein is also important, since the higher the content of metal in the concentrates, the more successfully and economically are they processed at the metallurgical plant. Therefore the production of concentration mills is accounted for in terms of ideal concentrates as well (for copper, 15%; for zinc, 45%; etc). For example, a concentration mill has turned out 200,000 t of copper concentrates with an 18% copper content. Converted to ideal 15% concentrate this represents 240,000 t of concentrate according to the following calculation:

$$\frac{200{,}000 \cdot 18}{15} = 240{,}000.$$

In addition to the analysis of plan fulfillment as regards the volume of products turned out, the qualitative indexes of the work should also be carefully analyzed. The coefficients of loss and exhaustion, the degree of recovery of metals at separate stages of the technological process, the extent of introduction of progressive norms for the utilization of equipment, materials, and power, and other qualitative indexes determine to a considerable extent the volume of production turned out.

In analyzing the work of enterprises, it is essential to check on how systematically the plan was implemented. Failure to meet the schedule by days, 10-day periods, etc inevitably means a danger that the established plan for output of products will not be fulfilled. Only rhythmic work according to a strictly established schedule ensures the prompt fulfillment of the production plan.

In the process of analysis a great deal of attention must be devoted to the quality of the reported data and their reliability and accuracy. Checking on reported data is a very important phase of analysis work.

The result of the analysis should be the preparation of summary analytical tables, and graphs with explanatory notations characterizing the fulfillment of the production plan by the branch as a whole and by the individual enterprises therein. The conclusion should contain an analysis of the causes for deviations from the plan and proposed measures for the elimination of the shortcomings uncovered.

This kind of analysis of plan fulfillment requires not only a study of the data in the reports and accounting statements but direct familiarization with practical work on the spot, a study of the practices of the best enterprises and the poorest ones, and of advanced working methods, and of the introduction of progressive norms. A thoroughgoing study of reported data and on-the-job practices makes it possible to uncover shortcomings in the work and to prescribe means of eliminating them for the successful implementation and overfulfillment of established plans.

[Pages 187-260]

CHAPTER VIII. LABOR PRODUCTIVITY, WAGES, AND PERSONNEL

The increase in the productivity of social labor has been a powerful factor in the development of human society.

An increase in labor productivity means a reduction in expenditures of working time on producing a unit of the social product and consequently an increase in the quantity of products turned out per unit of working time.

V. I. Lenin wrote that in the last analysis labor productivity was the most important and most essential thing for the victory of the new social system.

A constant increase in labor productivity in the USSR is a necessary condition for strengthening the nation's economic might and improving the well-being of the Soviet people. It would be impossible to ensure the maximal satisfaction of the constantly growing material and cultural requirements of society without a systematic increase in production on the basis of advanced technology and increasing the productivity of social labor.

An increase in labor productivity ensures a fast rate of expansion for socialist reproduction, the reduction of production costs, and an increase in socialist accumulations used for the constant expansion of production and for improving the well-being of the workers.

Under socialism an increase in labor productivity creates the necessary conditions for reducing the length of the working day and for the all-round development of the physical and mental capacities of the members of society.

Commenting upon the squandering of live labor under a capitalist system, V. I. Lenin wrote that tremendous amounts of labor go to waste because of the disorderliness and chaotic state of the entire capitalist society. Under conditions of a general crisis in the capitalist economic system, especially in periods of economic crisis, the squandering of live labor and the destruction of productive forces increase even more. This is borne out by chronic mass unemployment, the lack of a workload for fixed capital, and the militarization of the economy of capitalist countries.

There is no unemployment in the USSR. All citizens of the USSR have the right to obtain work which is paid for on a basis of the quantity and quality of their labor. The socialist economic system ensures the possibility of a systematic and rapid increase in labor productivity.

In order to convert that possibility into reality, the Communist Party and the Soviet Government, taking advantage of the objective laws of development of the socialist economy, systematically implement a system of measures ensuring a constant increase in labor productivity. The measures of the party and the government in connection with increasing labor productivity follow these basic directions: the introduction of new equipment and improved technology; raising the cultural level of the workers; the efficient organization of labor; the systematic improvement of the material position of the workers; heightening labor discipline; and organizing socialist competition.

By 1953 labor productivity in the industry of the USSR had increased almost 9 times relative to the 1913 level (allowing for the shortening of the working day), and 6 times relative to 1928.

By 1955 labor productivity in the industry of the USSR had almost doubled relative to 1940. In the ore mining industry labor productivity increased about 3-fold during these years. However a further substantial increase in labor productivity is required for the maximal satisfaction of the growing needs of the people and for making the transition from socialism to communism.

Increasing labor productivity is of especially pressing significance for the ore mining industry, since, despite the great successes achieved in the sphere of mechanizing basic processes, the ore mining industry is one of the most labor consuming branches of the national economy. This is due to the inadequate comprehensiveness of mechanization, to the fact that manual labor is still employed to a large extent on such labor-consuming operations as erecting supports, repair work, etc.

Section 1. Basic Factors in Increasing Labor Productivity

The basic factors governing labor productivity in the ore mining industry are (a) the development of equipment and the mechanization of operations, (b) improving technology, (c) improving the skills of the labor force, (d) the organization of production and labor, (e) the development of socialist competition and the introduction of advanced working methods, and (f) the organization of wages. Also, natural conditions may have an effect on the level of labor productivity in the ore mining industry.

The conditions under which the ore body occurs, the hardness of the ore and the wall rock, the depth of the deposit, the thickness of the overburden, and the influx of water, all of these things have an effect on the selection of the system of exploitation and thereby on the level of labor productivity. The existence of large reserves in one deposit makes it possible to construct a mine of great capacity, which (other things being equal) ensures lower expenditures of auxiliary and ancillary labor in mining the same quantity of ore as would be mined from several small mines.

The quality of the ore, the content of useful components in it, determines the system of processing the ore. Rich ores may be sent directly to the smelter, bypassing the dressing stage, which means lower expenditures of labor.

Labor productivity is also affected by the climatic and geographic conditions in the region where the deposit is located. Where the conditions are unfavorable, seasonal variations have an effect on labor productivity. The fact that extra leave is granted to workers in several regions makes for an increase in the number of workers, which means a slight drop in the average indexes of labor productivity. However it must be emphasized that in proportion as equipment is being developed there is a considerable lessening in the influence of natural factors on the level of production and of labor productivity.

The Expansion of Equipment and the Mechanization of Labor

The expansion of equipment, the mechanization and electrification of labor processes, and the supplying of technical and electric power equipment to the workers constitute the basis for increasing labor productivity in the USSR.

Between 1929 and 1948 the coefficient of the actual amount of electrical equipment supplied to workers in all of the industry of the USSR increased 2.3 times. (The coefficient of the actual amount of electrical equipment supplied for labor is determined by the ratio between the amount of electric power consumed and the number of man-days worked.) In the copper industry of the Urals the amount of technical equipment supplied to the workers (on the basis of the value of fixed capital per worker) increased 12.3 times between 1913 and 1948.

In the prewar period, in the course of only 6 years (1933-1939), the labor productivity per worker increased 2-fold on the average, while the labor productivity of basic categories of workers, drillers and miners, increased 2-fold and more.

In the postwar period, owing to the further mechanization of labor consuming processes and the introduction of more effective systems of mining involving breaking out ore by means of deep bore-holes and also by means of level (block) caving, a further increase in labor productivity has been achieved as indicated by the following data (Table 17).

TABLE 17[1]

LABOR PRODUCTIVITY PER SHIFT, IN t

	1940		1950	
Mine	drill runner	miner	drill runner	miner
Imeni Dzerzhinskiy	68.0	32.9	91.8	45.3
Imeni Komintern	62.2	32.1	76.5	39.6
Imeni Liebknecht	45.7	23.8	58.3	29.9
Ingulets	71.5	35.3	90.5	38.5

[1] V. V. Nedin and A. G. Shostak, "For a Further Increase in the Mining of Ore in the Krivoi Rog Basin," Gornyy zhurnal [The Mining Journal], No 2, 1952.

At the ore mining enterprises of the copper industry, labor productivity rose 71.6% between 1946 and 1953.

The concentration of the production of the ore mining industry creates the conditions for the introduction of new machinery, which is a vital factor in ensuring an increase in labor productivity. The introduction of powerful drills, especially core drills and telescope drills, whose share in the total number of drills employed rose from 10-12% in 1941 to 31% in 1950, has had a great effect on the growth of labor productivity in underground operations in the ore mining industry.

The introduction of loading machines for the mechanization of ore loading in the stopes is of great importance. This is one of the most labor consuming processes. It was usually the case that up to 20% of the total number of workers at a mine would be employed in loading ore by manual methods in the stope.

Powerful electric excavators, electrified transportation, large capacity trucks, dredges, and hydraulic giants are being introduced at open mine workings. However the percentage of workers engaged in manual operations is still considerable.

The automation of drilling, a more extensive use of hard alloys for drills, the introduction of scraper and machine loading in the drift, the mechanization of the preparation of supports, the automation and organization of the remote control of machinery, the mechanization of excavation work, the introduction of mechanized truck transport, and the further mechanization of surface operations, all of these things will lead in the end to the comprehensive mechanization of mining operations and a further increase in labor productivity.

Perfecting Technological Processes

The improvement of technological processes in the ore mining industry should be effected by a changeover to more effective systems of exploitation, by the rationalization of existing systems, by a more complete utilization of reserves of mineral products in the earth, and by cutting down losses in the process of mining and in subsequent processing. The further expansion of open pit workings and the introduction of systems of underground mining involving caving, changing over to deep drilling using bar-mounted drills; and the use of explosives of greater brisance is of great importance to the growth of labor productivity.

TABLE 18

LABOR PRODUCTIVITY WITH VARIOUS SYSTEMS OF MINING

System	Labor Productivity of driller, in t per shift
Square set stoping with filling	4 - 6
Horizontal slice and fill	5 - 7
Shrinkage stoping	8 -20
Sublevel caving	20 -30
Slice caving	8 -15
Level or block caving	80 -100

Highly productive systems of underground mining, sublevel and block caving, have been introduced at the mines of the Dzerzhinskrud Trust. In 1952 75% of the total production was mined by these methods. At the same time a considerable increase in labor productivity has been achieved, as is evident from the following data.

LABOR PRODUCTIVITY OF ONE WORKER PER SHIFT, IN t

	1946	1952
Drill runner	65.1	90.9
Miner	29.7	43.7

The comprehensive utilization of the raw materials produced at ore mining enterprises is not reflected directly in the labor productivity of the miners, but the improvement of technology, ensuring a more complete recover of all valuable components contained in the ores, constitutes a means of increasing labor productivity in the mining and metallurgical industry as a whole.

Increasing the comprehensive utilization of raw materials and increasing labor productivity require the further development in the ore mining industry of cooperative operations and combined operations which ensure a more complete utilization of production capacities and the processing of by-products and waste products.

Personnel Training

The mechanization of the ore mining industry requires the training of highly skilled personnel. In order for new equipment to yield the proper results, it is necessary to have cadres of workers capable of handling this equipment and improving on its use.

The socialist economic system ensures not only a constant increase in the number of workers and employees but a constant improvement in their cultural and technical level. During the plan era great successes have been achieved in the sphere of training skilled personnel. In the USSR, elementary education has been made compulsory, and a system for training state labor reserves has been established, along with an extensive system of schools, training centers, and technical training groups.

It is planned that by the end of the Fifth Five-Year Plan the transition from 7-year education to general high school education (10 years) will have been completed in the large cities and industrial centers, and that conditions will have been created for the complete implementation during the following five-year plan of general high school education in all cities and rural areas. The Nineteenth Party Congress directed that polytechnical education be instituted in high schools and that the necessary steps be taken to make the changeover to general polytechnical education.

The mining industrial, mining technical, and plant factory schools constitute the chief means of supplying skilled personnel for mining enterprises. Also, personnel training is given at training centers and units at enterprises and construction projects of the ore mining industry. A great deal of work in improving the skills of workers is being done by way of courses given at schools of advanced labor methods.

Each passing year sees an increase in the number of engineering technical workers at enterprises of the USSR ore mining industry. In prerevolutionary Russia the number of engineers for the mining and metallurgical industry which was graduated annually did not amount to more than a few dozen. The number of technicians graduated each year was also extremely low. The Urals School of Mining, one of the few mining and metallurgical schools in prerevolutionary Russia, graduated only 811 technicians in the entire 70 years of its existence. At the present time thousands of specialists for branches of the mining industry are graduated every year in the Soviet Union. Also, engineering technical workers are taking advanced training at special schools or mining technical schools and institutes.

The average level of skill of workers in the mining and metallurgical industries has been raised considerably during the postwar period.

The training of miners and their creative mastery of new equipment has progressed to the point where, in the awarding of Stalin Prizes for inventions and radical improvements, miners invariably are among the Stalin Prize winners.

The mastery of equipment and the improvement [illegible] of workers' skills are impossible without the creation of permanent, stable cadres, without a struggle against labor turnover. Turnover includes cases where workers voluntarily leave their jobs for reasons not associated with the nature of the production activity of the enterprise.

In the absence of detailed data on the reasons for turnover, it may be calculated approximately on the basis of collating the data on the number of workers hired and the number of workers who have left. In this case the smaller of the 2 figures, the figure for workers hired and that for workers who have left, is taken as an index of the absolute magnitude of turnover. The ratio between the absolute magnitude of turnover and the average number of workers on the payroll determines the percentage of turnover. For example:

Average number of workers on the payroll:	
Enterprise No 1	2,400
Enterprise No 2	3,000
Hired:	
Enterprise No 1	50
Enterprise No 2	90
Left work:	
Enterprise No 1	48
Enterprise No 2	110

Turnover of workers:

Enterprise No 1: $\frac{48 \cdot 100}{2,400} = 2\%$

Enterprise No 2: $\frac{90 \cdot 100}{3,000} = 3\%$

The elimination of labor turnover is achieved by means of an extensive expansion of housing construction, the correct organization of wages, concern for improving the skills of workers, political indoctrination work, a system of extra pay for seniority, and the establishment of pensions.

Socialist Competition

Socialist competition is a method of increasing labor productivity and improving production on the basis of a maximum of activity on the part of the laboring masses. Socialist competition is opposed to the capitalist principle of competition. Whereas the principle of competition means the defeat of the weak by the strong, the principle of socialist competition on the contrary means that the weak are helped by the strong in the interests of achieving a common upswing.

In the very first days of the existence of the young Soviet state, V. I. Lenin posed the problem of organizing competition. Lenin said that despite the claims of the bourgeoisie and its hangers-on, socialism not only does not abolish competition but on the contrary was the first to create the possibilities for genuine competition among the masses, for the most extensive manifestation of talents.

Socialist competition presupposes the rapid and extensive dissemination of advanced practices. This is achieved by active assistance to all workers on the part of the innovators, by the workers' striving to catch up with the leading individuals, and by widespread publicizing of competition. In the USSR socialist competition has become a communist method of building socialism on the basis of a maximum of activity on the part of the millions of the laboring masses.

A mass movement of innovators and production leaders has come into being on the basis of mastering new equipment, improvement in the well-being of the masses, and a rise in the cultural and technical level of the working class.

Today this movement has become a great force and has been enriched by various forms of highly productive labor.

In the ore mining industry the movement of innovators and production leaders is characterized by the following basic directions.

(a) A division of labor which makes it possible to provide each worker with a maximum load according to his skills. For example, the method of multistope and multiperforator drilling, based on relieving the drill runner of auxiliary and incidental work, makes possible a more productive utilization of the drill runner's labor directly on the job of drilling, and almost completely eliminates losses and expenditures of time on preparatory and clean up work. In this respect the following data on the work of the Urals drill runners are characteristic (Table 19).

TABLE 19

BALANCE SHEET FOR THE WORKING DAY OF MULTIPERFORATOR DRILL RUNNERS IN THE COPPER MINES OF THE URALS, IN PERCENTAGES

Drill Runner's Name	Basic and Auxiliary Work	Preparatory and Clean up Work	Uneliminated Losses	Eliminated Losses	Total
Golubyatnikov	95	5.0	-	-	100
Baukin	98.75	1.25	-	-	100
Naymushchiy	88.32	11.68	-	-	100
Kashcheyev	83.20	11.70	1	4.1	100

(b) Doubling up on jobs and organizing complex crews for the full utilization of working time by all members of the crew. It is

advisable to have a division of labor when it is possible to provide a full workload in the worker's own speciality throughout a shift. When this is not possible it is better to organize complex crews, where the workers take one another's places.

(c) Improving the technology of production, equipment, and tools; the efficient spacing of blastholes; improvement of the methods of blasting, gathering, and timbering; the combining of operations; etc.

(d) The introduction of strict cycles of work.

(e) A maximum recovery of ore per sq m of stope area per unit of time.

(f) Speeding up technological processes; in particular, the rapid driving of main and development workings.

The workers A. I. Semivolos, I. P. Yankin, I. A. Mitrofanov, S. G. Golubar', etc have been initiators of advanced methods of working.

Using the method of multistope drilling, A. I. Semivolos (Krivoi Rog) drilled 22.5 running m in ore of medium hardness in the course of one shift. The special feature of his method consists in working on a broad front of stopes, which makes it possible to carry on the drilling process continuously, to prepare the working area carefully, and to have a reserve supply of bits on hand when needed.

I. P. Yankin (Urals), a drill runner at the Krasnogvardeyskaya Mine, studied A. I. Semivolos's method and then developed it further by way of multiperforator drilling. Using telescopic hammer drills (perforators), Yankin attained a rate of advance of 3 running m per shift, as against a norm of 0.47 running m.

Comrades Mitrofanov, Doronin, Usenko, etc, all innovators at Krivoi Rog, have used the multistope method of drilling, and have improved it. In particular, comrade Mitrofanov, after advancing a face for its entire length, used 2 hammer drills working simultaneously to drill the bar-drill blastholes.

The blastholes were drilled in sequence along the entire face. The distance between them, in rows, was 2.7 m. The line of least resistance was 2.5 m. After setting up the 2 telescopic hammer drills and putting them in operation, Mitrofanov drilled the downholes with a hand held drill in the intervals between rotations. Upon completion of drilling all holes were blasted simultaneously. In the course of one shift comrade Mitrofanov attained a record productivity of 2,800 t of ore. During the shift he drilled 3 bar-drill blastholes 8 m in depth, 3 blastholes 6 m in depth, and 7 other blastholes with the hand held drill of 3 m depth each. In the course of the whole shift he drilled 63 running m of blastholes. Of the total working time of the shift, 93.5% was spent on the basic operation (drilling). As a result of the wide application of this practice at the Krivoi Rog mines, the labor productivity of the drill runners has increased from 130-140 t per shift to 200 t, and the productivity of the stope has increased 2.5 times.

Innovator A. F. Zin'kov suggested a new method for sublevel stoping. Formerly the drilling was done from manways driven from the sublevel drifts along the width of the stope from the hanging wall to the foot wall. With this method stoping was labor consuming, dangerous, and not sufficiently productive. Zin'kov's method eliminated these shortcomings. Essentially it consists in the following. From sublevel drifts located approximately along the middle of the ore body's width, deep funnel shaped holes are drilled with heavy KTsM-4 column-mounted drills. The stoping in the sublevel is done through these holes. A. F. Zin'kov has been awarded a Stalin Prize.

In 1946 M. Minzaripov and I. Pronichkin, foremen of the drilling crews at the North Urals Bauxite Mines, won a Stalin Prize for developing and introducing high speed drilling methods. Their method was based on the consolidation of several operations and a full utilization of mechanisms.

In 1953 excellent results were achieved by the crew under N. P. Butserovskiy, which in the course of one quarter drove a crosscut with a section of 9 sq m for a distance of 314 running m through rock with a hardness of 12 to 14 (according to professor Protod'yakonov's scale), as against a monthly average of 20 m for all of the mines in the ferrous metallurgy industry.

Multistope and multiperforator drilling have necessitated high speed mucking and timbering operations. The initiators of high speed mucking and timbering up include the innovators, comrades Bondar', Grigorenko, Golubar', etc. Innovator S. G. Golubar', who is a deputy to the Supreme Soviet, Ukrainian SSR, differentiated the jobs of timbermen and introduced multistope timbering. For the 2 crews of 16 men working under him, the work was divided up as follows. Two workers brought up the timbers and other materials, 2 handled auxiliary operations, and 4 erected supports. Thanks to correct organization and division of labor, S. G. Golubar's crew timbered up 1.6 km of workings during the first quarter of 1947.

A mass movement for a changeover to advanced methods of working on the part of entire collectives, that is, crews, units, and shops, has developed in the postwar years.

At the end of 1952, upon the initiative of mining crew foremen K. Vetoshkin and V. Russkikh of the Krasnoural'sk Ore Mining Administration, daily technological graphs of work cycles were introduced at many mining enterprises. The daily graph coordinates the work of all shifts, units, and crews in a clear manner, and ensures an increase in labor productivity.

At the Kapital'naya Mine imeni Third International the crew under comrade N. Kolesnev, working in 2 stopes, organized their work in such a way that each shift was able to handle the mucking work in one stope and the timbering in the other. In this way each shift, while doing its own job, was at the same time setting things up for the next shift.

Graphs of work cycles for stoping operations are shown in figures 6a and 6b.

According to the graph shown in Figure 6a, 2 men on one shift are working in 2 stopes. During the first 2 hours of the shift these workers timber up one stope with fresh timber supports, after which one of them drills the timbered stope while the other picks up ore with a scraper in the other stope. Thus drilling and mucking are completed in 4 hours, as a result of which one stope has been prepared for blasting and the other for timbering up.

During the following shift the procedure is as before and the cycle is recommenced.

Under this kind of schedule the miners cover the whole graph; 3 cycles per day in 2 stopes. The output norms are overfulfilled 50% and more.

With the other graph, shown in Figure 6b, 3 men on a shift work in 2 stopes. During the first 2 hours 2 miners in the first stope do timbering work, and during the next 4 hours they drill it and prepare it for blasting with 2 perforators. The third miner (a scraper operator) works in the other stope. Throughout the shift he picks up ore with the scraper, and must finish cleaning up and preparing the stope for timbering. During the following shift the cycle is repeated, but 2 miners work in the second stope while one (the scraper operator) works in the first stope. The graph provides for 3 cycles per day. If the schedule is adhered to, the output norms are overfulfilled 150% and more.

When work is organized according to a graph the crew's working day is utilized to a maximum. The basic work accounts for 95% of the working time. Adherence to technological graphs for stoping work substantially increases the labor productivity of the miners and consequently their wages. A changeover to technological graphs of work cycles leads to improvement in production conditions.

The organization of complex crews for both stoping and development work is one of the forms of advanced methods of working. Crews of this kind handle the entire complex of jobs constituting a completed cycle involved in mining the ore or in driving workings: drilling, timbering, the tramming or loading of ore, laying mats, and laying temporary track in development workings. The crew's job usually does not include blasting or installing equipment in the drift. These jobs are done by workers servicing the area as a whole.

In many cases however it would be advisable that the blasters and machinists responsible for the functioning of the equipment be included in the crew, in order to create a greater degree of material interest on their part.

The makeup of a complex crew depends upon the volume, character, and schedule of work. Usually there are from 4 to 12 men in a crew. Interchangeability and mutual assistance in the work constitute the basic principle of the complex organization of labor in the drift. Each crew member, having mastered the other specialties related to his own, is capable of replacing another worker in the crew on any kind of work.

The work of the complex crews at the Achisay Mine has resulted in a substantial increase in labor productivity. Between 1946 and 1951 the labor productivity per worker at the mine was doubled. The crews under comrades Ayaybekov, Kalotayev, Zhumabekov, etc achieved high productivity indexes. The fulfillment of the yearly plan by individual crews is characterized by the following data (Table 20).

TABLE 20

FULFILLMENT OF THE YEARLY PLAN, IN PERCENTAGES

Crew	1948	1949	1950	1951
Ayaybekov's	103	131	148	132
Kolotayev's	115	125	131	132

The postwar years have seen a great increase in the importance of socialist competition for raising qualitative indexes of work, for reducing the labor input required for operations, for improving the quality of products, for reducing losses and the exhaustion of ore, for the full utilization of all components contained in the raw materials and increasing the recovery of individual metals, for cutting costs on operations, for reaching full rated capacity ahead of schedule, etc.

The development of socialist competition in the ore mining industry has placed great demands upon the engineering technical personnel of enterprises. The latter's task is one of organizing the efficient and rational servicing of working areas, the creation of safe working conditions, the prompt organization of repair work on equipment, etc.

In order that the practices of innovators be disseminated to all workers, the former must be studied systematically. To this end the method suggested by Kovalev, an engineer in the textile industry, is being used at many enterprises. This method consists in the following. The methods of individual advanced workers are studied by means of time studies and photographing the working day. The best methods, those which ensure a high productivity with a normal rate of work, are selected and then taught to all workers at the enterprise.

The employment of engineer Kovalev's method at the Degtyarka Mine showed that several potential means were available at the mine for increasing the labor productivity of the development drillers and the timbering crews in underground track laying work, in timber haulage in the mine, and in the auxiliary shops.

Thus the time studies made on the work of 2 leading drill runners, P. F. Kovyazin and T. G. Labutin, brought to light considerable differences in the methods of drilling with column type drills mounted on BK-2 drill carriages.

By means of eliminating the diagonal shifting of the drill hammer when changing from one row of blastholes to another, drill runner Kovyazin achieved a greater saving of time than Labutin. For example, in drilling a stope in a 2-track crosscut with a section of 14 sq m he consumed only 52 minutes and 48 seconds. Also, comrade Kovyazin saved time in shifting to a new blasthole, combining a part of this operation with the drilling of the new hole. Combining operations in this way, comrade Kovyazin saved 20 seconds in shifting to each new hole, which on the 50 blastholes in the stope in the crosscut meant a saving of 16 minutes and 40 seconds.

At the Magnitogorsk Mine Kovalev's method was used to study the methods of the basic production workers, that is, the excavator operators, the drilling rig operators, the drill runners, the track repair workers, etc.

The advanced working methods which had been studied and disseminated were discussed at shop technical meetings. Then, diagrams of advanced methods or technical instructions were drawn up for each speciality.

The innovators whose methods are being studied give lectures, and schools of innovators are organized whose directors teach advanced working methods to other workers on the job.

The dissemination of work practices is also effected by means of organizing schools, training centers for masters of socialist labor, individual study on the job, etc.

The norms for the utilization of equipment, and norms for the expenditure of working time, are periodically revised on the basis of work practices. Progressive norms mobilizing the collectives of enterprises for the fulfillment and overfulfillment of state plans as regards both the increase in volume of production and labor productivity are established in this way.

The party and social organizations at the mines are in charge of developing socialist competition and disseminating the practices of innovators. The practices of the best workers, of production innovators, are widely publicized in the central and local press.

Creative collaboration between the workers of science and industry has been strengthened in the course of socialist competition in the postwar period. The collaboration between scientists and production innovators is enriching science with practical experience and at the same time ensuring the successful application of scientific achievements in socialist industry.

Production Organization and Technical Norming

Efficient production organization is a condition precedent to an increase in labor productivity. The full utilization of the capacities of equipment and of working times requires rhythmic work on the part of all production links, the prompt supplying of materials, and timber supports, the uninterrupted functioning of auxiliary and ancillary shops (the compressor shop, the drill repair shop, etc) and transport, prompt planned preventive maintenance work, etc.

In 1953 time losses for the development drillers at the Krivoi Rog mines due to poor preparation of drifts, lack of coordination in the supplying of materials, bits, and compressed air, unsatisfactory organization of transportation, etc, amounted to 15-25%.

In the second half of 1952 time losses for the miners at certain Urals mines due to a lack of materials and tools and to poor ventilation amounted to 25-30%.

At mining enterprises the coordination of the work of the different production areas is ensured by means of its organization on a planned basis. Not merely yearly operational plans, but monthly and daily plans as well, are drawn up at mining enterprises. The purpose of these plans is the coordination and strict integration of all production processes in order to fulfill the plan for mining work. Daily technological graphs, which include control technical indexes as regards the volume and rate of work on a shift basis, create the conditions necessary for setting up operational control over the progress of the work. Strict adherence to the schedule obviates the possibility of idle time.

Complex crews consisting of 6 men were organized at a mine where a large deposit of copper pyrite was being worked, in order to organize the mining of ore from interstope pockets by the slice caving method. The crews' duties included all operations (drilling, timbering, mucking, laying flooring) except for caving in the worked out strips. The crews worked in one or 2 stopes with a section of 7 sq m each. The coefficient of hardness of the rock was 10 (on professor Protod'yakonov's scale). The length of the working day was 6 hours.

The advanced crews of comrades Salakhov and Sushchov, which had organized their work according to a graph, achieved reductions in expenditures of time per cycle amounting to 12-14%, and from 90 to 59.2 minutes (comrade Salakhov's crew) per cu m of ore mined.

The work done by these crews during October 1954 is characterized by the following figures.

Index	F. Salakhov's crew	A. Sushkov's crew
Monthly quota for mining ore, in cu m	600	550
Ore mined, in cu m	983	722
Headway, in running m	140	103
Labor productivity per worker, (per shift), in cu m	6.07	4.9
Fulfillment of output norm, in %	223	199
Number of cycles completed	100	86
Advance of drift per cycle, in m	1.4	1.2
Volume of ore mined per cycle, in cu m	9.8	8.4

Having studied the practices of the leading crews, all of the crews at the mine which were engaged in mining isolated pockets of ore achieved substantial increases in labor productivity and in the productivity of the drift.

At the Magnitogorsk Mine one graph covers the entire complex, the pit, the dump, the concentration plants, etc. The operational administration of the whole plant is exercised through a dispatcher who has radio communications with the excavator operators and the mine locomotive operators. The efficient administration of the work of the mine is ensured by daily and weekly graphs.

The organization of dispatcher services at mines is of great importance in ensuring the fulfillment of the schedules. The dispatcher service exercises direct control and supervision over the work of all of the basic links of the mine, including stoping and development work, underground and surface haulage, hoisting, ventilation, electric power system, etc.

The basic task of the dispatcher is to keep a systematic check on the course of production processes and to take prompt steps to

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

prevent work interruptions, idle time, and other abnormalities. To this end the dispatcher must be provided with the necessary operational equipment and authority. Depending upon the requirements of the situation, the dispatcher sends additional workers to the area in question, transfers equipment, or issues organizational technical instructions.

The quality of the operational work of the dispatcher service is ensured by telephonic communications and by other technical equipment, including switchboards where the apparatus of dispatcher control is assembled. The broad employment of the dispatcher system is one of the preconditions to the uninterrupted functioning of a mine in accordance with an established schedule.

Technical norming is of great importance in increasing labor productivity.

Technical norming is a method of studying and analyzing production processes, in order to more effectively utilize all production resources and to establish technically sound norms.

Technical norming includes (a) a study of the structure of production processes, (b) a classification of working time, (c) methods and techniques for analyzing working time, (c) calculating progressive output norms for workers and norms for the productivity of equipment and machinery.

State plans must be based on progressive norms, and not on arithmetically average norms.

Arithmetically average norms are the average norms which have actually been achieved in production by all workers.

Advanced norms are the norms attained by advanced production workers.

Progressive norms must come as close as possible to advanced norms, and must mobilize the entire collective of workers at the enterprise for the mastery of the working methods of the advanced workers and the norms attained by them.

The purpose of technical norming is to work out on a scientific basis technical norms which establish the amount of labor to be expended on individual operations or on the production of a unit of production. The fixing of progressive technical norms promotes the optimum utilization of machinery and equipment.

Under capitalism, technical norming is a means of stepping up exploitation and of the unchecked intensification of the labor of the workers so that the capitalists can obtain maximum profits. Under socialism, technical norming subserves the better organization of labor, increasing labor productivity on the basis of a more effective utilization of equipment, and applying the best advanced methods and procedures of production innovators. The increase in labor productivity achieved in this way is concomitant with a lightening of the workers' labor. Specifically, the mechanization and automation of heavy and labor consuming jobs are being widely introduced. All of the workers have a material interest in raising labor productivity, since this constitutes a very important means of improving the well-being of the Soviet people.

Technical norming plays an important role in the socialist organization of labor. In the absence of technical norms it would be impossible to have a planned economy. Technical norms serve as a stimulus to the laggards up to the level of the advanced workers.

All of the main sections of the plan for an ore mining enterprise are based on technical norms. The number of workers and the payroll fund required are based on technical output norms. The number of equipment units is based on progressive norms for their utilization.

At the outset of the Second Five-Year Plan the TsK KPSS and the Soviet Government discovered substantial shortcomings in the procedure for establishing technical norms for mining work. These included the complexity of the methods for establishing technical norms; the tendency to take into account in the norms even negligible peculiarities and deviations in the state of the rock being mined; disparities in norms for identical kinds of work; a preponderance of experimental statistical norms; and a reluctance on the part of technical supervisors to participate in norming work.

The July Plenum of the TsK KPSS (1955) pointed out that there were grave shortcomings in the organization of technical norming. The practice of establishing minimized, so-called experimental statistical, output norms was being widely employed at numerous enterprises. Because of the fact that the wage schedules and rates were obsolete and lagged behind the rising wage level, output norms were not being established on a basis of the achievements of technology and the practices of advanced workers, but were being artificially adjusted to the wage level which had been reached. Even today a considerable part of the norms at many mines, especially in the auxiliary shops, are experimental statistical norms. For example, in 1953 at the Sadon Ore Mining Administration, more than 90% of the output norms in the auxiliary shops were experimental statistical norms.

Success in the fulfilling and overfulfilling of state plans is something which is decided by human beings. The plan must be based on the achievements of the leading workers, engineers, and technicians who, through their creative labor, point up the tremendous possibilities for attaining progressive norms for the utilization of machinery and equipment, and thereby ensuring the overfulfillment of state plans.

The establishment of progressive norms and the elaboration of plans containing organizational technical measures for their introduction constitute a condition precedent to raising labor productivity.

Wages

The correct organization of wages is a very important material stimulus to raising labor productivity.

Under socialism wages are an expression in monetary form of the worker's share of that part of the social product which the state pays out to the worker or employee in accordance with the quantity and quality of the labor of each worker.

"From each according to his abilities, to each according to his labor;" such is the principle of socialism. Adherence to this principle requires that skilled labor be paid for at a higher rate than unskilled labor, that heavy labor be paid for at a higher rate than light labor. The principle of socialism is completely incompatible with wage levelling.

The Eighteenth Party Congress emphasized in its resolutions the necessity of a strict application of the principles of wages relative to the quantity and quality of work. The congress demanded strict and consistent implementation of the principle of the material encouragement of those who work well, manifested in the form of a special wage system for workers, a premium system for executives, and in the form of better wages for skilled workers than for unskilled workers.

At the July Plenum of the TsK KPSS it was noted that there are several shortcomings in the organization of wages. The current wage scale does not provide for the requisite differences between the wages of workers with different degrees of skill, nor for higher wages for labor performed under difficult conditions. There is a sharp disparity between the wage scale and the actual wages. Various corrective coefficients for wages have come into wide use. The Plenum of the TsK KPSS directed that these shortcomings be eliminated in order to achieve a constant increase in labor productivity in industry and on that basis to ensure a constant growth in the real income of workers and employees.

The aim of socialist production is the maximum satisfaction of the constantly growing material and cultural needs of the entire society. Therefore in the USSR the real income of the workers is constantly increasing. The chief factors making for an increase in real wages are the constant growth and perfection of socialist production, the rise in labor productivity, the complete absence of unemployment, the systematic reduction in prices of consumer goods, the improvement of the cultural technical level of the workers and of their skills, the improvement of housing conditions, and the large sums allocated by the state and social organizations for sociocultural measures.

In addition to the quantity and quality of labor, the national

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

economic importance of the given branch of industry, the importance of individual kinds of production within the branch, the specific conditions in the region where the enterprise is located, and the difficulty and harmfulness of the work are taken into account in establishing the wage level.

The ore mining industry, as a leading branch of the national economy of the USSR, has a higher wage level than the average level for industry as a whole.

Higher wage scales have been established for enterprises located in the east, the north, and mountainous regions, in order to attract workers to these regions and to keep them on a permanent basis. Several kinds of extra pay and privileges in connection with the payment of compensation for temporary disability, pensions, etc have been established for workers in the ore mining industry. Within the industry workers in the leading specialities and piece workers receive higher pay than other workers.

The wages of workers at mining enterprises in various specialities and with varying degrees of skill are established on the basis of current wage systems. The wage system is made up of wage scales and wage rates.

A wage and qualifications handbook is an indispensable element of a wage system.

For each trade and each category of skill, the wage and qualifications handbook gives a description of the elements and characteristic aspects of the job, shows the amount of formal knowledge and production skill required, gives examples of individual jobs, defines the worker's responsibility for the quality of the work, and indicates the category assigned to the trade in question.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

The wage and qualifications handbook covers all trades and jobs in the given branch of industry. A worker's trade is a permanently specialized production activity requiring specific knowledge and professional skills.

The level of skill of labor is determined by the degree of its complexity, precision, and autonomy, and by the consequent special technical and practical training. A worker's qualifications mean the degree of skill in working and the extent to which he has mastered both practical skills and theoretical knowledge in the sphere of the given trade.

For example, in the case of a drill runner using a machine drill for blasthole drilling, the wage and qualifications handbook states that his responsibilities include inspecting and preparing the stope, laying out and drilling the blastholes, lubricating the hammer drill (perforator), changing bits, and clearing out the blastholes. A drill runner must know the design and operating principles of several types of hammer drills and automatic feeding devices and the regulations governing their maintenance, the physical properties of rocks and the conditions under which they are deposited, the mining systems in use at the mine, systems for the best layout of blasthole rounds, how to do blasting work, and accident prevention regulations. A drill runner should be able to dismantle and assemble hammer drills; to use various devices to facilitate drilling, in particular, to use automatic feeding devices; to select the pattern for a round of blastholes in accordance with the stoping conditions and the physical properties of the rock; and to distinguish country rock from the ore mass.

A drill runner is responsible for the working out of a vein and for the complete removal of the ore, for conforming to the regulations governing operations and accident prevention regulations, and for safeguarding the drilling bits. Category 8 is assigned to drill runners.

The purpose of the wage and qualifications handbook is to ensure that the appropriate category in the wage scale is assigned to normed and evaluated jobs, and also to individual workers, in accordance with the skill and hardships involved in the work.

A wage scale is a scale of the ratios between the wages of workers in different categories. Wage scales are characterized by the number of wage categories and the magnitude of the scale coefficients. The wage scale established for the wages of production workers in the basic shops of ore mining enterprises has 10 scale categories. That for workers in auxiliary shops and those engaged in geological surveying work has 8 categories, and that for construction workers has 7 categories.

The ratio between the wages of workers in different trades and with different degrees of skill, depending upon the category established for them, is measured by the scale coefficient. A specific scale coefficient is fixed for each category, with the coefficient of one being assigned to the first category in every wage scale. As the category number rises, the scale coefficient increases. The rates for the remaining categories are determined by multiplying the rate for the first category by the appropriate coefficient. A wage scale for production workers in the basic shops of the ore mining industry is shown by way of illustration (Table 21).

TABLE 21

WAGE SCALE FOR ORE MINING ENTERPRISES

Scale Categories	I	II	III	IV	V
Scale coefficients	1	1.12	1.27	1.43	1.66
Absolute differences between adjacent categories	-	0.12	0.15	0.16	0.23
Relative differences between categories, in %	-	12.0	13.4	12.6	16.0

Scale Categories	VI	VII	VIII	IX	X
Scale coefficients	1.98	2.36	2.8	3.35	4.0
Absolute differences between adjacent categories	0.32	0.38	0.44	0.55	0.65
Relative differences between categories, in %	19.2	19.1	18.6	22.0	19.4

The absolute differences represent the arithmetical difference between the scale coefficients for continguous categories. The relative differences are determined by the ratio between the absolute category difference and the preceding scale coefficient, in percentage.

For example, the absolute difference between the scale coefficients for the seventh and sixth categories is 0.38, while the relative difference between the seventh and sixth categories is:

$$\frac{0.38}{1.98} \cdot 100 = 19.2\%$$

This ratio characterizes the degree of increase in scale coefficients in going from the lower category to the higher.

In the given table, the ratio between the coefficients for the lowest and highest categories is 1:4. However this ratio has been changed somewhat because of the inclusion in the 1947 wage scales of cost-of-living increases, owing to the change in planned prices of food products and industrial goods.

The progressive increase in the scale coefficients from the lowest category to the highest stimulates the workers to improve their skills and the level of their technical knowledge.

The wage scale determines the amount of pay a worker receives per unit of time (hour, shift, month). It is the usual practice to fix a wage rate for category I and determine the rates for the other categories by multiplying the rate for category I by the scale coefficient for the category in question.

Two basic forms of wages are employed in industry, piece wages and time wages. With the piece rate form, 2 main systems are used, straight unlimited piece wages and progressive piece wages. Under the time wage system there is straight time and premium time. Piece wages is the basic form of wages in the industry of the USSR, including the ore mining industry.

Today more than 70% of all miners are under the piece rate wage system.

With the piece rate system a worker's earnings are found by multiplying the volume (quantity, weight, etc) of work done by the piece rate:

$$x = mV,$$

where x -- worker's earnings, in rubles;

m -- piece rate per unit of output, in rubles;

V -- volume of work done in corresponding units.

The piece rate per unit of work is found by dividing the wage rate per unit of time (shift, hour) by the output norm established for the same unit of time. In those cases where the norms are established in units of time, for example, the number of hours or shifts per cu m of development work, the worker's rate is found by multiplying the rate per unit of time (shift, hour, minute) by the amount of time taken as a norm:

$$m = H \cdot T,$$

where H -- time norm per unit of output (in shifts, hours, or minutes);

T -- worker's wage rate per unit of time (shift, hour, or minute).

The wage rate for a pieceworker is higher than the wage rate for a time worker.

The piece rate system provides the worker with a material interest in raising labor productivity and increasing the output of products per unit of working time.

The progressive piecework wage system stimulates a rise in labor productivity to an even greater extent. The essence of this system is that payment for output is based on several differentiated rates. For the base there is one rate, and for output above the base there are increased, progressively growing rates. The monthly output norm for the worker in question is taken as a base.

At ore mining enterprises the progressive piecework system is used chiefly for workers in the leading trades engaged in geological surveying work, mine construction work, development work, and stoping.

One of the scales in effect in the copper mining industry for workers in the stoping group in actual mining operations is shown by way of example (Table 22).

TABLE 22

SCALE OF PROGRESSIVE WAGES FOR WORKERS IN THE COPPER INDUSTRY

Percentage of fulfillment of output norms	Rate Increase in % beyond the Overfulfilled Part of the norm, beginning with the first % of overfulfillment, where the monthly plan is fulfilled	
	up to 110%	above 110%
From 100 to 120	60	70
From 120 to 135	120	140
From 135 to 150	220	250
Above 150	320	350

Where the plan for the drift or the unit is not fulfilled, the amount of progressive wages is reduced by 50%.

This kind of progressive piecework wage system creates for the worker a material interest not only in overfulfilling norms but in overfulfilling the plan, since the level of progressive increase in rates depends upon both of these indexes.

The chief factors ensuring the effectiveness of the progressive piecework system are the following.

(1) The existence of technically based output norms for jobs paid for at progressive rates.

(2) The use of the progressive piecework system in the leading and decisive areas of work (stoping and other underground work) which determine the fulfillment of the production plan by the mine.

(3) The prompt and accurate accounting of the actual output of the workers who have been put on a progressive piecework basis.

The economic effectiveness of using the progressive wage system, because of its effect on production costs, may be determined by the following calculation.

At a certain mine, prior to the introduction of the progressive piecework system, one million t of ore was being mined every year. The per t cost of the ore was 40 rubles, including 6 rubles in wages for the workers scheduled for transfer to the progressive wage system. The overall production expenses of the mine included so-called "permanent expenses" amounting to 25 million rubles per year. Of the payroll fund 8.6 % went for social insurance, and the workers averaged 100% fulfillment on their output norms. Following the introduction of the progressive wage system the workers began to average 125% fulfillment on their output norms, which resulted in a 25% increase in production, and the workers began to receive extra progressive pay based on the scale with a coefficient of K-3. Under these conditions the results of introducing the progressive wage system will be as follows.

Yearly production: $1{,}000{,}000 \cdot 1.25 = 1{,}250{,}000$ t

Yearly savings on fixed expenses:

$$\left(\frac{25{,}000{,}000}{1{,}000{,}000} - \frac{25{,}000{,}000}{1{,}250{,}000}\right) \cdot 1{,}250{,}000 = 6{,}250{,}000 \text{ rubles}$$

Extra pay to workers under progressive wage system:

$$6 \cdot 1{,}000{,}000 \cdot 0.25(3-1) = 3{,}000{,}000 \text{ rubles}$$

Extra social insurance payments:

$$3{,}000{,}000 \cdot 0.086 = 258{,}000 \text{ rubles}$$

Mine's annual savings minus extra social insurance payments and extra wages:

$$6{,}250{,}000-3{,}000{,}000-258{,}000 = 2{,}992{,}000 \text{ rubles, or}$$

per t:

$$\frac{2{,}992{,}000}{1{,}250{,}000} = 2.39 \text{ rubles.}$$

Reduction in cost as a result of using progressive wage system: $\frac{2.39 \cdot 100}{40.0} = 5.98\%$

This example shows a reduction of 5.98% in production costs as a result of cutting fixed expenses per t of ore mined.

This method of calculation may be used both for preliminary calculations in planning progressive norms and for analyzing the effect of current progressive piecework systems on production costs.

At ore mining enterprises using the piece rate wage system, either an individual or a crew wage system is employed, depending upon the organization of the system and the possibilities for keeping books on the results of the work.

The individual wage system is used in those cases where the results of the work of each individual worker are subjected to precise measuring and accountability. Under these conditions, this system is the most desirable, since it creates a material interest on the part of each individual worker in the results of his work.

The crew wage system is employed in those cases where, because of the conditions of the production process, the work is done on a collective basis. The crew wage system is established in order to create a common material interest in the final results of the work of all members of the collective (crew).

In the case of crew work the earnings are distributed among the members of the crew in proportion to the wage rates and the time worked by each crew member in the course of the pay period.

For the fulfillment and overfulfillment of established plans for stripping, stoping, development work, and mine construction work, workers in the leading trades at basic shops, shafts, pits, and mines receive, in addition to their basic earnings computed on the basis of the progressive piecework system, a collective premium for all production turned out above 90% of the monthly plan quota. Each unit of production (t, running m, etc) produced above 90% of the monthly quota is paid for on the basis of a double collective rate, but the amount of the collective premium is distributed only among those workers who have fulfilled their monthly output norms 100% and more.

Time wages are paid for work that cannot be normed. Such work includes, for example, the work of blasters, hoist operators, electric power station control board operators, compressor operators, etc. The wages for work of this kind are determined by the wage rate for the category established for the specific job (for the worker in the given trade) and by the number of hours or shifts actually worked. The lack of any correlation between the pay and the labor productivity is a serious shortcoming of time wages.

In order to stimulate the activity of time workers, premiums are paid for the quality of their work, promoting fulfillment of the plan. All time workers serving vital units of the mine upon whom the fulfillment of the plan for production of ore depends directly, come under the time premium wage system. This kind of premium is usually paid to workers in such trades as blasters, top cagers, ore hoist operators, compressor operators, and operators and repair machinists who operate and repair underground equipment. Premiums are paid in amounts of up to 50% of the monthly wage rate for fulfillment of the monthly plan for the shop and for quality accomplishment of work, and up to 25% for overfulfillment of the plan.

These premiums are paid where there is fulfillment and overfulfillment of the plan for production, development work, and mine construction work; for operating units and equipment without accident or damage; for good repair work; and for savings on power, materials, etc.

A system of salaries is used in paying for the work of executives and engineering technical workers in the ore mining industry, as is the case in other branches of the national economy. The size of the salary depends upon the complexity of the job and the responsibility involved, the worker's background, the size of the enterprise, the degree of mechanization of production, etc. In addition to salaries, a system of premium payments has been established for executives and engineering technical workers. The size of the premiums depends upon the position held, the size of the unit or enterprise, and the extent to which the plan has been overfulfilled.

For example, the following premiums have been established for various categories of workers and groups of enterprises in the case of workers at ore mining enterprises of the nonferrous metallurgical industry (Table 23).

Other engineering technical workers and employees who have actively contributed to the fulfillment and overfulfillment of the plan, to an increase in labor productivity, and to a reduction on production costs are awarded premiums by the director of the enterprise. Up to 25% of the total amount of premiums to be paid to engineering technical and economic workers is used to pay premiums to these workers.

TABLE 23

SIZE OF PREMIUMS PAID IN ADDITION TO SALARIES, IN %

Position	Groups of Enterprises[1] I: For Fulfillment of the Monthly Plan	I: For Each % of Overfulfillment of the Monthly Plan	II: For Fulfillment of the Monthly Plan
Director and chief engineer	up to 56	up to 6	up to 45
Superintendents of shops, departments, and services	up to 45	up to 4, 5	up to 37
Deputy and assistant director, assistant superintendents of departments and shops	up to 37	up to 4	up to 30

Position	II: For Each % of Overfulfillment of the Monthly Plan	III: For Fulfillment of the Montly Plan	III: For Each % of Overfulfillment of the Monthly Plan
Director and chief engineer	up to 4, 5	up to 37	up to 4
Superintendents of shops, departments, and services	up to 4	up to 30	up to 3
Deputy and assistant director, assistant superintendents of departments and shops	up to 3	up to 22	up to 2

[1] Enterprises are assigned to groups on the basis of their yearly productivity. Mines with an annual production of less than 50,000 t of ore belong in Group III. Those with a production of 50,000-150,000 t belong in Group II. And those with an annual production of more than 150,000 t belong in Group I.

Section 2. Planning Labor and Wages

The wages and labor plan is a part of the branch plan for the ore mining industry. It shows what portion of the labor resources is allocated by the state for the development of the branch in question.

The labor plan contains an estimate of the manpower required to fulfill the plan established by the government for the mining of ore, for exploration work, for development work, for construction work, and other work. The labor productivity rate established by the plan serves as the basis for calculating the quantity of manpower required.

The labor plan specifies the average wages for individual categories of workers (blue-collar workers, ITR [Inzhenero-tekhnicheskiy rabotnik -- engineering and technical personnel], white-collar workers, and housekeeping personnel) and the payroll fund; and it makes provision for methods of recruiting, training, and improving the skills of workers and for measures to improve their living and working conditions (housing and communal construction, labor protection measures).

Individual labor plans are drawn up for the industrial enterprise, for the nonindustrial establishments under its administration, and for capital construction.

An industrial enterprise includes basic, auxiliary, and ancillary shops, a warehouse system, and other establishments connected with the basic production activity of the enterprise. The nonindustrial establishments include housing and public facilities, outside transportation facilities under the administration of the enterprise, and sociocultural institutions. The nonindustrial activity of the enterprise includes capital repairs to buildings and structures.

Planning Labor Productivity

The level of labor productivity is a very important plan index. The planned level of labor productivity determines all of the other sections of the labor plan, including the number of workers needed to fulfill the production program, the plan for selecting and training personnel, the average wages, and the payroll fund. Therefore, the measures required for a constant increase in labor productivity must be elaborated in the plans.

Only the level of expenditures of working time by workers at the given enterprise or in the given branch of industry (expenditures of live labor) are taken into account in planning the increase in labor productivity. The reduction in expenditures of embodied labor (materials, power, etc) is taken into account in other sections of the plan (the plan for cutting costs, etc).

Labor productivity is characterized by the quantity of products turned out by a worker per unit of time, or the expenditure of labor per unit of production.

The first index is computed with the formula:

$$\Pi_1 = \frac{P}{T},$$

where Π_1 -- output of products by the worker per unit of time;

P -- output of products for the entire period;

T -- quantity of labor expended during the entire period.

The formula for computing the second index is:

$$\Pi_2 = \frac{T}{P},$$

where Π_2 -- expenditure of labor per unit of production, expressed in units of time. The denotation of the symbols P and T is the same as in the preceding formula.

On the branch level, labor productivity is ordinarily planned in 2 units of measure, physical and monetary.

Labor productivity as expressed in physical units is determined by means of dividing the yearly or monthly plan for ore production by the average number of production workers on the payroll.

At enterprises of the ore mining industry it is the usual practice to determine the physical unit of measure for labor productivity on a separate basis for stoping, development, and timbering work. This is necessary because of the varying degrees of labor input for these jobs. The average labor productivity for mining enterprises as expressed in physical units is computed on an average per industrial worker in the mine, for a drill runner, for a group of miners working in the drift, and for one underground worker. Computation in monetary terms makes it possible to determine the dynamics of labor productivity not only for production of the basic product, ore, but for all of the work of the enterprise, including services on the outside, and capital construction.

The basic index of labor productivity in the ore mining industry is physical measurement in t of ore per worker at the mine (with only the industrial production group of workers being taken into account).

Preparation of the branch plan is begun several months prior to the commencement of the period being planned for. The quota for the increase in labor productivity is given in % of the actual yearly average level for the preceding year. Therefore, in order to establish the planned quota for increase in labor productivity, it is necessary first of all to analyze reported data on the previously attained level of labor productivity, on the fulfillment of current output norms, and on the level of mechanization of individual processes and the utilization of individual units of equipment, and data on the skills of workers, on the balance and losses of working time, etc.

It is essential to ascertain the achievements of the leading enterprises, shops, and production innovators, in order to establish on this basis progressive indexes of labor productivity and to study the possibilities for applying them at other enterprises.

In planning the increase in labor productivity, it is necessary to take into account the effect of all factors which determine it (the mechanization of processes; the improvement of existing systems of exploitation and the application of new, more effective methods of exploitation; the growth in the volume of production; changes in natural conditions, etc). It is also necessary to take into account changes in the nature of the work (the ratio between development workings and operational workings, etc).

On the basis of the analysis of the reported data, measures are planned for the further mechanization of processes, the improvement of systems of exploitation, the elimination of losses and idle time which occurred during the reported period, etc. The planned measures for increasing labor productivity must be assigned to specific periods of time and specific responsible personnel.

The effect of individual factors on the degree of increase in labor productivity should be substantiated by means of an appropriate calculation.

For example, in the course of the reported period, the process of loading ore has been mechanized 40%. The plan calls for an increase of up to 70% in the mechanization of this phase. This will mean that 20% of the workers engaged in loading ore will be made available for other work. If the number of workers engaged in loading during the reported period amounted to 25% of the total number of workers, the increase in the labor productivity of the workers (P) because of the mechanization of loading will amount to 5.26 according to the following calculation:

$$P = \frac{100}{100-\left(\frac{25 \cdot 20}{100}\right)} \cdot 100-100 = 5.26\%$$

Let us consider another example. Owing to improved utilization of the production capacity of a mine, there has been a 20% increase in the amount of ore mined. This means an increase of labor productivity at the mine, even if there has been no change in the labor productivity of the stoping workers (that is, if the number of these workers has increased accordingly), since a considerable part of the workers at the mine (those engaged in drainage work, ventilation, hoisting, maintenance of the workings, illumination work, plus the executives and a considerable part of the personnel concerned with maintenance of general mine structures, electromechanical, and repair shops, etc) remains almost unchanged regardless of the level of productivity of the mine.

In the case of an increase of 20% in the amount of ore mined where there is a permanent element of service and ancillary personnel amounting to 35% of the total number of workers at the mine, their productivity increases 6.2%, as determined by the following calculation:

$$P = \frac{1.2}{0.35+(0.65 \cdot 1.2)} \cdot 100-100 = 6.2\%$$

where P -- increase in labor productivity, in %;

1.2 -- coefficient of increase in ore production;

0.35 -- coefficient for permanent element of service personnel;

0.65 -- coefficient for variable element (1-0.35 = 0.65).

When the increase in labor productivity for individual groups of workers has been calculated, the overall increase in labor productivity for the mine as a whole is determined.

Planning the Number of Workers and Employees

The purpose of this section of the plan is to determine the number of workers and employees needed to fulfill the production program on the basis of the increase in labor productivity established by the plan.

For the ore mining industry as a whole, the number of workers and employees is planned separately for the following groups: (1) industrial production personnel in the ore mining industry; (2) industrial production personnel in other branches, in auxiliary and ancillary establishments (production of electric power, building materials, mining machine building, central mine repair and electromechanical shops, agricultural enterprises, railroad and centralized truck and animal drawn transport); (3) personnel engaged in the capital repairing of mine workings, buildings, and equipment.

The number of industrial production personnel is determined in the plan by the following categories: (a) workers; (b) engineering and technical workers (ITR); employees; (c) housekeeping personnel (MOP); (d) guards; (e) apprentices working under individuals or in crews.

In the case of nonindustrial personnel (transport, housing and public facilities, etc) the overall number of workers is determined without a breakdown into categories.

The final determination of the number of workers required for the branch is made on the basis of data from the plans of individual enterprises.

The determination of the number of basic workers at an enterprise must be based on the expenditures of normed time on the assigned quota and the distribution of workers by working areas. Taking into account the possibility of overfulfilling the established norms, it is necessary to decrease the planned number of workers in accordance with the anticipated overfulfillment of the norms. For example, if the output norms are to be overfulfilled 20% at the given enterprise, the number of workers must be reduced 16.5% in the plan:

$$100 - \frac{100}{120} \cdot 100 = 16.7.$$

The plan must also provide for an increase in labor productivity owing to an upward revision of output norms.

In addition to their overall requirements for workers, enterprises determine the number required for individual specialities. For example, in the case of ore mining enterprises it is necessary to determine the number of workers by individual groups (drill runners, stopers, all workers engaged in underground work, etc) and to keep the correct ratio between individual categories of workers. Failure to provide an enterprise with a sufficient number of workers in the leading trades leads to nonfulfillment of the plan as regards both production output and labor productivity increase.

In determining the planned number of workers, it is necessary to take into account changes in the budget of working time and the coefficient for the regular staff of workers.

The budget of time for the work actually done by a worker is less than calendar time. Days off and holidays, together with days not worked because of regular vacations, illness, and for other good and sufficient reasons, must be deducted from calendar time.

The balance of working time is shown in Table 24.

TABLE 24

BALANCE OF WORKING TIME

Elements of the time fund	Reported Period	Plan Period
Calendar number of days in the year	365	365
Nonworking time:		
Days off	52	52
Holidays	6	6
Number of working days in the year (theoretical working time)	307	307
Time Off		
Regular and supplementary leave	22.5	22.5
Illness	4	3 (arbitrary)
Pregnancy and maternity	0.8	0.9 (arbitrary)
Public and official duties	3.7	2.5 (arbitrary)
Other authorized absences	3	2
Total time off	34	30.9
Working time in days for the period (effective working time)	273	276.1

The number of workers on the permanent payroll of the enterprise is always greater than the official number of workers participating in the production process from day to day, since a part of the former are on regular leave, are on sick leave, or are absent for other reasons.

On the basis of the effective working time established in the plan, one determines the extent to which the number of workers on the regular payroll should exceed the number actually on the job. This is determined by the ratio between the number of days of work at the mine as per the plan, and the planned number of working days for the workers. In the above example of a balance (Table 37) [sic] the coefficient for converting from the number of personnel on the job to the total number of personnel on the payroll is 1.11:

$$\frac{307}{276.1} = 1.11.$$

If the mine worked uninterruptedly throughout the year, this coefficient would be:

$$\frac{365}{276.1} = 1.32.$$

The average yearly productivity per working day for one worker is determined as an average weighted value, taking into account the number of individual production groups of workers with working days of different lengths.

Owing to the fact that underground and surface workers have vacations of different lengths, calculations of the balance of working time are made on a separate basis for these 2 groups.

In planning the number of workers in auxiliary departments and the number of ancillary workers in basic shops it is essential to check the norms carefully and to reduce the incidence of this group to a maximum by means of mechanizing auxiliary operations, combining trades, etc. A reduction in the proportion represented by this group means an increase in labor productivity for the mine as a whole, even if there is no change in the labor productivity of the basic workers.

The following arbitrary example illustrates the effect of the structure of the labor force on labor productivity (Table 25).

TABLE 25

EFFECT OF THE STRUCTURE OF THE LABOR FORCE ON LABOR PRODUCTIVITY

Index	Reported	Planned
Total number of workers at the mine,		
including:	1,000	920
Production	800	800
Ancillary	200	120
Yearly production in wholesale prices,		
thousands of rubles	20,000	20,000
Average output per worker, rubles	20,000	21,734
Productivity increase owing to decrease		
in number of ancillary workers	100%	108.7%

A reduction in the incidence of ancillary workers from 20 to 12% meant an 8.7% increase in labor productivity for the mine as a whole, according to the calculation:

$$\frac{(20-12)\cdot 100}{100-(20-12)} = 8.7.$$

In planning other categories of workers (ITR, employees, and MOP), it is essential to be guided by the approved personnel complements, making the appropriate adjustments necessitated by a possible consolidation of shops, units, shafts, and other enterprises, an increase in the amount of technical equipment available and the amount of electrical equipment supplied to the enterprises, the rationalization of the administrative structure, the simplification of accounting methods and reports, etc. As a rule, it is essential to strive for a reduction in the incidence of these groups of workers in the overall number of industrial and production personnel.

In his speech before the Conference of Industrial Workers (January 1955), N. A. Bulganin pointed out that reducing administrative apparatuses in industry and cutting their cost is an especially important problem at the present time.

The rapid rate of expanded socialist reproduction, the construction of new mines and the expansion of existing ones, require the expanded reproduction of manpower. Therefore, the labor plan specifies the additional requirements for workers and employees, and the measures for meeting these requirements.

The additional manpower needs are determined by comparing the requirements for individual groups of workers for the plan period with the number of workers as of the end of the current period. To these requirements is added an additional number of workers to replace those who will be on leave for purposes of taking training, those who will be pensioned off, and those who will be absent for other acceptable reasons.

The plan for the recruiting and training of personnel is drawn up on the basis of these requirements. Provision is made for contingents of apprentices for basic groups and trades (drill runners, mine support workers, operators of machinery and equipment, etc). In addition to the plan for training new workers, a plan is prepared for advanced on-the-job training by means of taking courses at schools for advanced training and schools teaching advanced working methods.

Planning Wages

The planning of wages is an integral part of the labor plan. This part of the plan specifies the level of wages for various categories of workers, the ratio between the increase in labor productivity and the increase in wages, and the overall amount of wages to be paid (the payroll fund) in accordance with the production quotas and the number of workers.

The average wage is determined for the same groups as those listed in the plan for the number of personnel, namely, workers, ITR, employees, and MOP. In the case of ore mining enterprises the plan also specifies the average wages of workers engaged in stoping and development work (with a breakdown into trades).

The most important aim of planning wages is the establishment of a correct ratio between the increase in labor productivity and the increase in wages.

The increase in labor productivity should keep ahead of the increase in wages. This is an important factor in cutting costs and accumulating funds to ensure the wage increase, in expanding production, in satisfying the constantly growing cultural requirements, in rearing and educating the younger generation, and in the administration and defense of the nation.

In fixing the quota for average wages, it is essential to follow the general directives of the party and the government concerning the increase in wages for the plan period.

The following data should be used in fixing quotas for individual enterprises.

(1) The shift in labor productivity and average wages during preceding periods (year, quarter, month).

(2) The structural and qualifications shifts in the complement of workers, and the ratio between basic and ancillary groups.

(3) The composition of the payroll fund (incidence of individual payments, extra pay in accordance with the progressive system, extra pay for seniority, premium payments, etc).

(4) The number of working days per quarter or per year assumed in the plan.

(5) New enterprises, mines, and shops to be put into operation.

(6) Changes in wage scales, rates, salaries, settlement conditions, and output norms.

The payroll fund of a branch or enterprise is the total sum of money established by the state under planned procedure for paying wages during the given period of time (year, month, etc) for the given branch or enterprise.

The payroll fund of an enterprise is made up of (a) the payroll fund for the industrial personnel, and (b) the payroll fund for nonindustrial personnel.

The payroll fund for industrial personnel is planned on a separate basis for workers, engineering and technical personnel, employees, housekeeping personnel, and students.

In the case of nonindustrial personnel the payroll fund is planned as a whole without a breakdown by categories of workers.

To determine the payroll fund for workers, the number of workers on the payroll is multiplied by the average wage per worker.

The payroll fund and average earnings of engineering and technical personnel, employees, housekeeping personnel, and students is determined on the basis of plans for the number of workers in these categories, established wages, and currently effective premium systems.

The payroll fund and the average wages are determined on a yearly basis with a breakdown into quarters. The payroll fund includes all varieties of pay for work performed and various kinds of pay provided for by Soviet labor legislation.

The kinds of pay include (a) pay for time worked in accordance with wage rates, salaries, and piece rates, lump payments, extra pay on the basis of progressive rates, and various kinds of premiums, (b) extra pay for work during night hours, on holidays, and for overtime work, (c) extra pay for work in remote regions, (d) extra pay for seniority, (e) extra pay to working foremen for supervising crews, and (f) pay for idle time for which the workers were not responsible, pay for time off taken by minors and nursing mothers, pay for vacations and compensation for unused leave, pay for time absent while performing state and public duties, etc.

In cases where an enterprise has overfulfilled the production plan, Gosbank issues funds for payments to workers, engineering and technical personnel, and other workers of the industrial production personnel in accordance with the overfulfillment of the work plan, and to other workers of the enterprise not in excess of the monthly payroll fund established for them.

Industrial enterprises which have made excessive expenditures from the payroll fund as against the actual fulfillment of the production plan for the month must, no later than from 3 to 5 months, make good the overexpenditure by means of reducing excessive numbers of workers and employees, increasing labor productivity, and economizing on the payroll fund.

<u>The Structure of the Payroll Fund</u>

The structure of the payroll fund depends upon the wage system being used.

An example of the structure of a payroll fund for workers at ore mining enterprises is given in Table 26.

TABLE 26

STRUCTURE OF THE PAYROLL FUND FOR BLUE-COLLAR WORKERS FOR 1954, IN %

Item	Blyavinskoye mining administration	Mining administration imeni Third International	Degtyarskoye Mining administration	Tyrny-Auz combine
Pay at basic piece rates on progressive piecework	29.3	23.1	23.8	24.0
Extra pay to pieceworkers at progressive rates	11.2	6.7	9.7	7.7
Pay at basic piece rates under straight piecework system	19.2	27.9	25.1	35.4
Time wages at wage rates (salaries)	20.7	21.6	21.5	15.1
Premiums to time workers	3.5	0.8	0.7	1.4
Premiums to pieceworkers	-	1.0	1.5	0.05
Extra pay for overtime	-	0.1	-	0.05
Pay for entire days of idle time and hours of idle time within one shift	-	-	0.1	0.1
Pay for regular vacations	7.2	9.0	8.3	7.9
Seniority pay	4.5	5.7	5.8	5.6
Other types of pay	4.4	4.1	3.5	2.7
	100.0	100.0	100.0	100.0

Wages based on the progressive piece rate system account for 30-40% of the total payroll fund, and piecework systems of all types account for 60-68%. Time wages account for 15-20%.

The Overall Labor Plan

The labor plan for a mining enterprise includes the basic indexes shown in Table 27.

TABLE 27

THE INDEXES OF THE LABOR PLAN[1]

Index	As Per report 1955	As Per Plan, 1956: Total	Of Which, by Quarters: I	II	III	IV	Plan in % of reported figure
Gross production in wholesale prices, thousands of rubles	300,000	345,000	80,000	85,000	90,000	90,000	115
Development work, running m	8,000	10,000	2,200	2,400	2,600	2,800	125
Stripping, thousands of cu m	2,000	2,500	400	800	800	500	125
Average output per worker, rubles	15,000	15,680	3,810	3,780	4,000	4,090	104.5
Number of industrial production personnel	22,900	24,850	23,860	25,350	25,350	24,840	108
Of which:							
Workers	20,000	22,000	21,000	22,500	22,500	22,000	110
ITR	800	800	800	800	800	800	100
Employees	900	850	860	850	850	840	94.5
Housekeeping personnel (MOP)	1,200	1,200	1,200	1,200	1,200	1,200	100
Average wage, rubles	7,686	8,076	1,931.4	1,996.6	2,040.6	2,107.4	105.2
Of which:							
Workers	7,550	8,000	1,900	1,975	2,025	2,100	106
ITR	18,000	18,000	4,500	4,500	4,500	4,500	100
Employees	7,000	7,000	1,750	1,750	1,750	1,750	100
MOP	3,600	3,600	900	900	900	900	100
Payroll fund for industrial production personnel, thousands of rubles	176,020	200,770	46,085	50,605	51,730	52,350	114
Of which:							
Workers	151,000	176,100	39,900	44,437.5	45,562.5	46,200	116.6
ITR	14,400	14,400	3,600	3,600	3,600	3,600	100
Employees	6,300	5,950	1,505	1,487.5	1,487.5	1,470	94.4
MOP	4,320	4,320	1,080	1,080	1,080	1,080	100

[1] All figures are hypothetical.

The reported data for the year preceding the plan year are used in analyzing the indexes in the labor plan. This makes it possible to get a clearer idea of the dynamics of labor productivity and other indexes.

In the given example there was a 10% increase in the number of workers and a 15% increase in gross production. This meant an average increase of 4.6% in the labor productivity per worker.

The increase in the labor productivity of the workers was accompanied by an increase in their average wages. The planned number of employees was reduced in connection with the planned streamlining of the administrative apparatus, as a result of which the payroll fund for employees was reduced by 5.6%.

Controlling the Implementation of the Labor Plan

Heads of enterprises and shops, personnel workers, and planning organs are responsible for the labor indexes established by the plan and for the proper expenditure of payroll funds.

Ministries are required to ensure strict control over the expenditure of payroll funds and to heighten the responsibility of directors of enterprises for overexpenditures, for violations of the procedure for paying wages, and for the misappropriation of funds received for payroll purposes.

Control over the implementation of the wages and labor plan is exercised by the state committee on problems of labor and wages, the state bank and its branches, higher economic organs, and the trade union organizations of enterprises by means of encouraging the participation of the broad masses of workers in the work of commissions on wages. Local branches of Gosbank, which make systematic inspections directly at the enterprises, render a great deal of assistance in controlling the implementation of the plan for the expenditure of the payroll fund. In the case of construction these functions are exercised by local branches of Prombank (the bank which handles the financing of construction).

In analyzing the implementation of the wages and labor plan it is necessary to collate the reported data not only against the plan but also against reported data for the preceding period.

The analysis of the implementation of the wages and labor plan is carried out along the following lines.

(a) The correctness of application of the wage system, norms, and rates. The fixing of wage rates for workers, ITR, and employees.

(b) Changes in the number and composition of the labor force (workers in leading trades engaged in underground work).

(c) Comparison of the change in the size of the labor force and the volume of production, in physical units of measure and monetary units.

(d) Changes in the labor productivity of the stoping group, workers on underground jobs and other jobs.

(e) Comparison of the plan fulfillment for labor productivity and for average wages.

(f) Comparison of expenditure of the payroll fund relative to the plan and volume of production, and the work completed.

(g) Fulfillment of the plan as regards the recruiting, training, and advanced training of personnel.

(h) Fulfillment of the plan for measures concerning labor protection, accident prevention, housing, and public and socio-cultural construction.

The analysis of the fulfillment of the planned indexes for labor and the fulfillment of the output norms should facilitate the discovery of production reserves. In particular, it is essential to examine the following aspects in analyzing the fulfillment of output norms.

(a) Conformity to the established working procedures.

(b) Supplying equipment, tools, timber, and compressed air for the working areas.

(c) Conformity to the established cycle and graph of operations.

(d) Fulfillment of the plan for improving workers' skills.

In analyzing the average wage, it is essential to ascertain the causes of the increase or decrease in the average wage in terms of the basic factors determining it (percentage of skilled workers, norm fulfillment, overtime work, etc).

In analyzing the payroll fund, it is essential to establish the absolute and relative amount of savings or overexpenditures. It is determined by comparing the actual expenditure of payroll fund against the degree of fulfillment of the production program.

The method of determining the overexpenditure or saving of the payroll fund is shown in Table 28.

In the case of Enterprise A, with absolute savings amounting to 4,015,400 rubles there is a relative overexpenditure of 2,007,700 rubles, since the actual expenditure of the payroll fund is 93.3% of the planned expenditure, and the production program was fulfilled only 90%. In the case of Enterprise B there is an absolute overexpenditure of payroll fund amounting to 12,046,200 rubles, but when the overfulfillment of the production program is taken into account there is a saving amounting to 6,025,100 rubles. Enterprise C [illegible] achieved a relative saving because the production program was fulfilled 130% and the payroll fund was expended 120%. The branch as a whole achieved a relative saving on a payroll fund amounting to 8,026,800 rubles or ~4%.

$$\frac{8,026,800 \cdot 100}{200,770,000} = 4.$$

TABLE 28

CALCULATION OF SAVINGS OR OVEREXPENDITURE OF PAYROLL FUND

Enterprise	Fulfillment of production program, %	Planned Fund, 1,000 Rubles: plan	Planned Fund, 1,000 Rubles: taking into account the fulfillment of the production program	Actual expenditure 1,000 rubles	Savings, 1,000 rubles[1]	Overexpenditure, 1,000 rubles[1]
A	90	60,231	54,207.9	56,215.6	- 4,015.4 4,011.4	2007.7 -
B	100	80,308	80,308.0	76,296.6	4,011.4 6,025.1	- -
C	130	60,231	78,300.3	72,275.2	-	12,044.2
Total for the branch	106.0	200,770	212,816.2	204,787.4	8,028.8	- 12,044,2

[1] The numerator represents the savings or overexpenditure relative to the planned fund, adjusted by the percentage of fulfillment of the production program. The denominator represents the savings or overexpenditure relative to the original planned fund of wages.

It is now possible on the basis of the reported data to ascertain which factors caused the change in the absolute payroll fund and in its relative saving. For this purpose it is necessary to utilize data from the yearly report (Table 29).

TABLE 29

ACCOUNT OF THE CHANGE IN THE WAGES FUND

Index	Plan	Report	Change (plus + increase; minus - decrease) absolute	%
Production in wholesale prices, millions of rubles	345	365.7	+ 20.7	+ 6
Payroll fund for workers, 1,000 rubles	200,770	204,787.4	+ 4,017.4	+ 2
Average number of industrial production workers on regular payroll	24,850	23,856	- 994	- 4.0
Production per worker in wholesale prices, rubles	13,917	15,329	+ 1,412	+ 10.1
Average annual wage per worker, rubles	8,079	8,584	+ 505	+ 6.23

The effect of the change in the number of industrial production workers on the payroll fund is determined by multiplying the average wage as per the plan by the deviation from the planned number of personnel. In the given example this yields a saving for the year of 8,030,526 rubles:

$$994 \cdot 8,078 = 8,030,526.$$

Also, in the given example the increase in the average wage contributed to the change in the payroll fund. In order to calculate the effect of this factor we multiply the number of personnel as per the report by the deviation from the average wage. This reveals an overexpenditure of the payroll fund (in round numbers) amounting to 12,047,000 rubles:

$$23,856 \cdot 505 = 12,047,280.$$

Adding, we obtain the following data on the effect of the number of workers, the average wage, and the volume of production on the payroll fund (rounded off to thousands of rubles).

Referable to change in number of personnel:	+ 8,030
Referable to change in average wage:	- 12,047
Referable to change in volume of production:	+ 12,046
Total	+ 8,029

The relative savings of payroll fund amounting to 8 million rubles is a result of the fact that the rate of increase in labor productivity was faster than the rate of increase in wages. The average wage per worker increased by 6.23%, while the labor productivity increased by 10.1% (Table 29).

In the event of an overexpenditure of the payroll fund not only must the necessary steps be taken to prevent a recurrence in the future, but steps must also be taken to make good the overexpenditure within 6 months. To this end, depending upon the ascertained causes of the overexpenditure, it is essential to ensure an increase in the volume of production, the further mechanization of production processes, the improvement of technology, the reduction of excessive manpower, the revision of obsolete norms, and a reduction in the administrative apparatus.

CHAPTER IX. PRODUCTION COSTS IN THE USSR ORE MINING INDUSTRY

Section 1. Production Costs

Production costs represent the direct expenses of an individual khozraschet enterprise on the production and marketing of products, expressed in monetary terms.

Expenses included in production costs are: the wages of workers and employees and taxes on wages; the cost of raw materials, materials, fuel, and electric power; amortization; and expenses in connection with services (communications, rentals, transportation, etc).

Expenses in connection with establishing funds of socialist accumulation, reserve funds, sociocultural needs, maintaining the state apparatus, etc are not included in costs.

Cost accounting is of great importance in managing the economic activity of enterprises. The cost of production is the basic index characterizing the quality of the entire activity of the enterprise. In order that the work of the enterprise may be directed in the proper manner, it is necessary to know the actual expenses per unit of article for the basic cost items (wages; cost of raw materials, fuel, and electric power; amortization charges; administrative expenses) and to manage the economic aspect of the enterprise's activity in such a way that the cost and profits plan is unconditionally fulfilled.

Cutting production costs means that in the given period less labor, materials, power, etc are expended per unit of production than were expended in the preceding period. Therefore a reduction in production costs makes it possible, because of available material and labor resources, to increase the output of goods and to step up the tempo of expanded reproduction.

Cutting costs is of great national economic importance. A reduction of one% in industrial production costs in 1955 yielded savings for the year amounting to about 6 billion rubles.

The fulfillment of the plan for cutting costs is of great importance in implementing the policy of a continuing decrease in prices of goods with a view to the further improvement of the living conditions of the workers. In the period between 1947 and 1954 alone, prices of foodstuffs and industrial goods were reduced 7 times.

The savings achieved by way of cutting costs constitute an important source for financing capital construction.

Cost is an important factor in solving many problems in the process of planning. Thus, in selecting systems for the technological process, methods of opening up deposits and working them, transportation systems, electric power supply, etc, preference is accorded (other things being equal) to that system whereby production costs will be lower.

Costs are tied in with the implementation of khozraschet. The more rational, efficient, and economical the expenditure of funds, the lower the costs. The dissemination of planned cost quotas to an enterprise and to its lowest links and the systematic follow-up on the fulfillment of these quotas organizes the collective of the enterprise for the struggle to fulfill the production program in terms of quantitative and qualitative indexes. A study of the changes in production costs and an analysis of them with respect to the individual items (materials, wages, etc) make it possible to discover production reserves.

The resolutions of party congresses and conferences and the decrees of the TsK KPSS and the Soviet Government have emphasized the necessity for a systematic reduction in the cost of production.

Under socialism, a systematic reduction in production costs is ensured by continuing technical progress and the unlimited possibilities for utilizing the latest achievements of science and technology in socialist production, by the development of socialist forms of labor organization, and by the planned introduction of progressive norms for the utilization of equipment, materials, etc.

In a socialist economy, socialist competition among the millions of the laboring masses for raising labor productivity, for economizing on material resources, and for improving the quality of products, constitutes a very important means of cutting costs.

Despite the successes which have been achieved in cutting costs, there are considerable, far-from-exhausted reserves for reducing production costs in all branches of the national economy, including the mining industry.

Section 2. The Structure of Production Costs

Cost structure is the makeup of production costs by individual expense items, showing the incidence of each item in the total expenses.

A study of cost structure is necessary both for analysis of costs and for planning cost reductions. A knowledge of the incidence of all individual items in the total costs makes it possible to ascertain the best ways to cut costs. For example, if the incidence of all expenses on materials is 50%, then a 5% reduction on this item means a cost reduction of 2.5% ($\frac{50.5}{100} = 2.5\%$). But if the incidence of expenses on materials is 10%, a 5% reduction of these expenses yields a cost reduction of only 0.5%.

Different branches of industry have differing cost structure. This depends upon the technical, organizational, and economic conditions, the level of labor mechanization, and the type of volume production.

In order to make practical use of data on cost structure in planning, it is essential to study the cost structure not only for the branch as a whole but for individual enterprises, kinds of production, and processes.

The following is the structure of costs per % of ore with a breakdown into cost items (Table 30).

The major item of expense in mining ore is wages.

TABLE 30

STRUCTURE OF COST OF MINING ONE T OF ORE, BY EXPENSE ITEMS (Based on Planned and Reported Data)

Mines and Regions	Description of ore body	Type of Workings	Structure of Cost of Mining One T of Ore, %: wages including taxes	materials	power	amortization	services of repair and auxiliary shops	other expenses	total
Dzheskazgan, Kazakh SSR	**thick, sloping, blanket deposit of the cuprous sandstone variety**	open stope	48.8	14.32	7.15	12.53	3.4	13.8	100
Kounrad, Kazakh SSR	**thick, massive ore body**	open workings	35.0	21.7	10.0	11.1	1.95	20.25	100
Belousovka, Kazakh SSR	lenses and veins; **sharp dip**	horizontal slice and fill	59.9	11.4	1.7	13.3	1.6	10.1	100
Zolotozhil'nyy Mine	**thickness of ore body: 4.6-9.0 m**	shrinkage stoping	35.7	19.8	13.1	18.4	0.63	12.37	100
Zolotozhil'nyy Mine	**thick ore body**	6 deposits: open pit, 6 deposits shrinkage stoping	41.0	9.85	6.37	21.03	7.25	14.5	100
Zolotozhil'nyy Mine	**thick ore body**	sublevel drifts and horizontal slices	43.7	24.8	6.25	11.5	2.43	11.32	100

Table 30 Continued

Zolotozhil'nyy Mine	veins with thickness of 0.25-2.0 m	shrinkage stoping	44.0	20.0	9.50	6.04	2.26	18.2	100
Zolotozhil'nyy Mine	thick ore body, 23-25 cm	open workings	37.5	18.8	15.4	11.7	2.18	14.42	100
Zolotozhil'nyy Mine	veins with thickness of 0.3-2.0 m	horizontal slicing with partial or complete filling	37.8	23.0	14.0	21.2	1.22	2.78	100
Dzerzhinskiy Mining Administration (Krivoi Rog)	thick ore body	sublevel caving, 70.5%; sublevel drifts, 25.6%; other, 3.9%	48.3	23.4	-	5.7	6.7	15.9	100
Zheltaya Peka Mine (Krivoi Rog)	thick ore body	sublevel drifts	37.7	19.2	2.5	5.9	17.0	17.7	100
Nickel Mine	thick ore body	overhand stoping with brace supports	35.7	10.4	4.8	15.1	12.7	21.3	100

This bears witness to the great importance of increasing labor productivity in the matter of cutting costs.

It is of economic interest to present the cost structure not only in terms of expense items but in terms of individual processes.

Table 31 shows the structure of the cost of one t of ore in the case of underground workings, broken down into processes.

TABLE 31

STRUCTURE OF THE COST OF ONE T OF ORE MINED BY UNDERGROUND METHODS, BROKEN DOWN BY PROCESSES

(On the Basis of Planned Data)

Item	Percentage of total cost
Development work	8 - 25
Stoping (including gathering)	35 - 55
Tramming	5 - 12
Hoisting	3 - 8
Drainage	2 - 7
Ventilation and illumination	2 - 5
Repair and maintenance of workings	2 - 5
Mine and shaft general expenses, etc	13 - 25

Stoping accounts for the greater part of the expenses where underground methods are being used. Depending upon the system of extraction, this item accounts for 35% and more of the expenses in the case of sublevel and block caving, and up to 61-64% in the case of storing and slice caving. Development work accounts for 8% in the case of slice caving, and from 20-25% with other underground methods. The incidence of total expenses for tramming and hoisting depends upon the degree of mechanization of these processes, the length of the haul, and the height of the hoist. On the average, these expenses account for from 13-18% of the total expenses.

The cost structure in the case of open workings is different from the cost structure where underground methods are used (Table 32).

TABLE 32

STRUCTURE OF THE COST OF ONE T OF ORE MINED BY OPEN PIT METHODS, BROKEN DOWN BY PROCESSES

(On the Basis of Planned Data)

Process and Kind of Expense	Percentage of total cost
Drilling and blasting work	28.0
Excavator loading	7.5
Transporting ore and rock	17.5
Dumps	2.1
Electric power plant	4.6
Bit sharpening	1.8
Repairs to equipment	3.1
Amortization of capital work	22.2
Other work	13.2

In the case of open workings the greatest expenses are those for drilling and blasting work, stripping, and transporting ore and barren rock. Altogether, these expenses account for as much as 70% of the total expenses.

The structure of the cost of concentration work depends upon the composition of the ore, the concentration methods used, and the productivity of the concentration mill.

At flotation concentration mills the operating expenses are usually distributed in approximately the following manner, in %.

Dry crushing, and transportating the ore to the crusher and the bunker	30 - 32
Damp fine grinding and classification	35 - 37
Flotation and transporting the pulps	24 - 26
Compressing, filtering, and dumping tails	6 - 8

At iron ore dressing plants, crushing accounts for 8-10% of all expenses, washing accounts for 40-45%, and agglomeration accounts for 45-46%.

In the structure of concentration costs as broken down by expense items, wages account for 15-20%, power expenses for 25-35%, amortization for 6-10%, maintenance and current repairs to fixed capital account for 15-25%, and other expenses account for 15-25%, depending on the process used.

Section 3. Basic Factors in Cutting Costs

Changes in costs are affected by national economic conditions of production and the conditions at the plant.

The former include, for example, the development of science, changes in the geographic distribution of industry, etc. Scientific and technical discoveries may radically change the production technology. Bringing industry closer to the sources of raw material means a considerable reduction in production costs by virtue of reducing transportation expenses, reducing losses, etc. The development of transportation has a great effect on cutting costs. For example, prior to the construction of the railroad to the Dzhezkazgan Mine and the Karsakpay Plant, it was necessary to deliver freight to this region in trucks and even on camels over distances of up to 400 km, which made for a considerable increase in the cost. The cost level is also affected by changes in railroad and water freight rates, wage rates, prices, etc.

Cooperation among enterprises for the purpose of ensuring the processing of all raw materials extracted, and cooperation as regards the electric power plants, repair shops, and transportation facilities, constitute an important factor in cutting costs.

The most important local factors affecting the cost of mining ore are (1) labor productivity, (2) expenditures of materials and power in accordance with the degree of mechanization and the system of working, (3) reduction of overhead expenses, (4) improving the utilization of fixed capital, and (5) natural conditions.

Labor Productivity

The increase in labor productivity in the ore mining industry is a very important factor in cutting costs.

An increase in labor productivity means improvement in the utilization of fixed capital and an increase in the output of production.

This means a cost reduction by way of reducing the expenses involved in the maintenance of fixed capital and the overhead expenses per unit of production.

An increase in labor productivity ensures a reduction in costs by way of reducing the amount spent for wages per unit of production.

A calculation of the savings achieved by an increase in labor productivity where there is an accompanying increase in wages is given in the following example.

In 1954 the per t cost of ore was 20 rubles, of which 12 rubles went for wages.

For 1955 it was planned to increase labor productivity 20% and wages 10%.

The problem is to determine the percentage of decrease in the cost of one t of ore by virtue of the difference between the increase in labor productivity and the increase in wages.

The calculation is as follows.

Owing to the increase in labor productivity, the expenditure of wages per t of ore is 11 rubles:

$$\frac{12 \cdot 1.10}{1.20} = 11,$$

where 1.10 is the wage index (ratio between wages for the plan period and wages for the reported period), and 1.20 is the labor productivity index.

(An index is a relative figure characterizing the change in the level (of wages, labor productivity, cost, prices, etc) for the given period relative to the other period taken as a base.)

The reduction in cost for the item of wages amounts in terms of percentage to 8.33%:

$$100-\left(\frac{11}{12} \cdot 100\right) = 8.33.$$

The incidence of wages in the total cost is 60%:

$$\frac{12}{20} \cdot 100 = 60.$$

The reduction in the cost of one t of ore referable to the increase in labor productivity is 5%.

$$\frac{8 \cdot 33 \cdot 60}{100} = 5.$$

On the basis of the above, we can construct the following formula for computing the cost reduction measurable to the increase in labor productivity where there is an accompanying increase in wages:

$$X = \left(100 - \frac{I_z \cdot 100}{I_{pr}}\right) \cdot u,$$

where X -- percentage of reduction in cost;

I_z -- wage index;

I_{pr} -- labor productivity index;

u -- incidence of wages in the cost structure for the reported period.

Using this formula, we find:

$$X = \left(100 - \frac{101.1}{1.2} \cdot 100\right) \cdot \frac{60}{100} \approx 25\%.$$

Saving on Materials, Fuel, and Power

On the average, expenses for indirect materials, fuel, and power account for about 15-20% of production costs in the ore mining industry.

The resolutions of the Nineteenth Party Congress proposed that: "Further considerable savings on material resources be ensured by means of eliminating excesses in the expenditure of materials and equipment, stepping up the struggle against spoilage, introducing economical types of materials, and the large scale use of adequate substitutes and progressive production technology." (Resolyutsii XIX s'yezda Kommunisticheskoy partii Sovetskogo Soyuza [Resolutions of the Nineteenth Congress of the KPSS], 1953, Gospolitizdat, page 32.)

In the ore mining industry savings on materials can be achieved by means of introducing progressive norms on the expenditure of materials, the use of renewable bits, the use of hard alloys in drilling hard rock, the efficient placing of blastholes, the use of more effective explosives, and switching to more efficient systems of stoping which do not require timbering, the use of metal supports, etc. The quality of the materials used is of great importance in cutting costs. For example, the amount of drilling steel used is reduced, if the steel is high grade.

In concentration mill work savings of materials and power can be achieved by automation of the dosing of flotation agents, etc.

Reduction of expenditures on auxiliary establishments (boiler plant, compressor plant, transportation, etc) is an important means of cutting costs. The importance of these departments in the economy of an enterprise is frequently underestimated. Actually expenses on auxiliary shops at ore mining enterprises account for 40-50% of the basic expenses of the mine. Cost reductions are achieved by way of a more complete utilization of the production capacities of the auxiliary shops, the mechanization of labor, etc.

The installation of meters and gauges helps to cut expenditures of electric power. The consumption of compressed air can be reduced by means of reducing losses of compressed air in the air lines.

In order to economize on material resources, power, fuel, and air, it is essential that accountability and control over their consumption be handled properly. The practice employed here and there of writing off these expenses at individual shops without actually determining the consumption does not stimulate the struggle for economy.

The reduction of consumption norms, the rationalization of the power and thermal plants, and the maximal reduction of losses of heat should lead to considerable savings on these items of expense.

The method for calculating cost reduction on the item headed "indirect materials" is illustrated in the following example.

A changeover from square set stoping to sublevel caving yielded the following change in the consumption of indirect materials per t of ore (Table 33).

TABLE 33

CHANGE IN CONSUMPTION OF INDIRECT MATERIALS

Materials	Price in rubles and kopecks	Square Set Stoping amount	Square Set Stoping cost in rubles	Sublevel Caving amount	Sublevel Caving cost in rubles
Explosives, kg	1-50	1.2	1.80	1.8	1.20
Drilling steel, kg	1-40	0.24	0.34	0.18	0.25
Hard alloys, g	0-28	7.69	2.15	4.5	1.26
Timber, cu m	30-00	0.06	1.80	0.03	0.90
Other materials, rubles			0.80		0.70
			6.89		4.31

The incidence of indirect materials in the per t cost of ore for the reported period amounted to 20%.

The change in cost referable to the indirect materials item may be calculated with the following formula:

$$X = (100 - I_m \cdot 100)\ u,$$

where I_m -- index of consumption of materials (ratios between cost of materials in plan period and cost in reported period);

u -- incidence of indirect materials in total cost in reported period.

Applying this formula to the given example, we obtain:

$$X = (100 - \frac{4.31}{6.89} \cdot 100) \cdot \frac{20}{100} = 7.5\%.$$

Where there has been a change in the price of materials the results of the calculation will be different. Let us suppose that in the above example, owing to a change in the price of materials, the cost of the materials consumed was not 4 rubles and 31 kopecks but only 3 rubles and 80 kopecks. In this case the overall reduction in cost would be:

$$X = \left(100 - \frac{3.80 \cdot 100}{6.89}\right) \cdot \frac{20}{100} = 9\%.$$

The cost reduction referable to the change in the norms for the consumption of materials amounts to 7.5%, and that referable to the change in prices amounts to 1.5%.

Improving the Utilization of Fixed Capital

A cost reduction by way of improved utilization of fixed capital leads not only to a decrease in amortization per unit of production but to a decrease in other expense items as well.

More intensive utilization of equipment leads to an increase in the volume of production and a decrease in fixed expenses per unit of production.

There may of course be cases where owing to the increase in the mechanization of production processes there will be an increase in the incidence of amortization. Nonetheless, the total production cost will be decreased in such cases, because of the decrease in other expense items.

Production costs are also affected by the location of the equipment. The shorter the route for the transportation of raw materials, indirect materials, and parts, the lower will be the expenses connected therewith.

In the ore mining industry, where amortization of the main mine workings accounts for the greater part of the amortization expenses (65-70%), considerable savings can be achieved by combatting losses of ore. The reduction of losses leads at the same time to a reduction in the cost of development work per t of ore.

Combatting idle time for equipment and changing over to improved equipment constitute an important means of cutting costs. For example, a saving of 50-60% in the cost of loading ore is achieved by switching from steam excavators to electric excavators.

The optimum utilization of the fixed capital and manpower of an enterprise is ensured by the planned organization of the production process. The introduction of advanced technology, rhythmic work, comprehensive mechanization, and the intensification of production processes encourage lower production costs.

In the latter part of 1947 the government proposed that coal mines be put on a 2-shift working schedule, so that repair work and preparatory work could be done during the third shift. The experience of ore mining enterprises using underground methods had shown that this kind of schedule makes for a greater labor productivity and increases production, which means a reduction in costs.

The cost of ore is largely affected by an even level of production throughout the month.

The All-Union Conference of Industrial Workers (July 1955) issued an appeal to all workers and engineering and technical personnel "... to achieve efficient organization of production and an even level of output, bearing in mind that this provides considerable reserves for increasing labor productivity and increasing production."

As a rule, an uneven level in the production of ores results in overexpenditures of wages and electric power and considerable losses from nonproductive expenditures.

Correct production organization and strict adherence to work cycles constitute a means of further reducing production costs.

Expenses for the maintenance and repair of fixed capital are of substantial importance in costs. These expenses account for 8-15% of the production expenses. Repair costs are frequently increased because spare parts have been manufactured in repair shops which are inadequately equipped for this purpose. The individual manufacture of parts inevitably leads to an increase in their cost relative to series production and, even more so to mass production. The absence of genuinely khozraschet relations between the basic shops and the repair shops also means an increase in the cost of repairs.

The organization of the production of spare parts, pieces, and units at specialized plants, the mechanization of repair work, and the establishment of khozraschet relations with repair shops tend to decrease the cost of repair work.

Overhead Expenses

The curtailment of shop, general, and other overhead expenses means a considerable reduction in costs. The incidence of this group of expenses varies within limits of 15-30% and higher. Savings on overhead expenses are achieved primarily by way of increasing the volume of production. The greater part of these expenses are fixed expenses. They increase with an increase in the volume of production, but to a lesser extent than the production increase, with the result that there is a drop in these expenses per unit of production.

The effect of a mine's productivity on the operational expenses per t of ore mined, other things being equal, is expressed in the following relative values characterizing the change in the per t cost of ore depending upon the yearly productivity of the mine.

Annual production 1,000 t	Cost per t of Ore (cost with annual production of 100,000 t: 100)	Annual production 1,000 t	Cost per t of Ore (cost with annual production of 100,000 t: 100)
100	100	300	71
150	86	400	68
200	78	500	64
250	73	600	63

Where there is an increase in the productivity of a mine the expenses for development work and stoping per t of ore remain almost unchanged. Expenses on tramming, hoisting, underground illumination, etc, decrease per t, but with a considerable lag behind the increase in the productivity of the mine. In the case of general mine expenses the drop in cost per t of ore is almost proportional to the increase in the productivity of the mine.

M. I. Agoshkov's calculations have shown that in the case of small mines a doubling of the productive capacity means a 25-30% decrease in the operating expenses per t, and in the case of large mines a decrease of 10-15%.

In planning expenses for production services and management, it is essential to ensure a continuing reduction in these expenses by means of the following.

(a) A maximum curtailment of administrative expenses by means of simplifying the administrative apparatus at enterprises and shops and more strictly controlling adherence to established estimates for administrative expenses.

(b) Improving utilisation of power, tools, and indirect and other materials used for general purposes by establishing norms and quotas on their consumption, expanding their repeated use and reprocessing, using standard materials and tools, and eliminating losses thereof.

(c) Providing a full load for the working time of ancillary workers and raising their labor productivity on the basis of improved organization and the mechanization of individual jobs and operations.

(d) Effecting substantial reductions in the cost of the work and services performed by auxiliary shops by means of improving their production organization.

Considerable economies can be achieved by eliminating superfluous administrative units and reducing the housekeeping personnel. The curtailment of an enterprise's administrative apparatus can be achieved by consolidating units and shops.

The most important factors to be considered in consolidating units are (1) physical proximity or the possibility of merging one unit with another and (2) the technological homogeneity or integration of units.

In consolidating shops, the following must be taken into consideration: (1) homogeneity of the technological process or sequence in which it is performed; (2) physical proximity of the shops, facilitating the management of the shop.

At mining enterprises it is possible to consolidate the management of shafts and units located near to one another, as well as individual repair and machine shops, etc.

The significance for the state of consolidating units and shops consists in the fact that this makes a part of the executive staff and skilled workers available for other work.

In order to cut down overhead expenses, it is essential to combat nonproductive expenditures and losses. These include losses from rejects, from idle time, from spoilage, shortages of products, and from the payment of fines, penalties, and forfeits because of the violation of contracts. The elimination of these expenses is an important means of cutting industrial production costs.

A calculation of the decrease in production costs referable to the overhead expenses item may be made with the following formula:

$$X = (100 - I_n\ 100)\ u,$$

where I_n -- index of overhead expenses (ratio between overhead expenses per unit of production for the plan period and for the reported period);

u -- incidence of overhead expenses.

The Role of Natural Conditions

In terms of the form of occurrence of the ores, deposits may be divided into 3 groups: (1) blankets or blanket deposits; (2) massive deposits (lenses); (3) veins.

Costs are greatly affected by the thickness of the deposit and the depth at which it occurs, which determines the system used in working it and frequently the productivity of the enterprise as well. Several of the least expensive systems, such as level and sub-level caving, combined systems where the deposit is divided into chambers and blocks transversely to the strike, etc, can be used only in working thick deposits.

The relative cost of mining one t of ore mass depending upon the system used in working the deposit is expressed in the following relative values, in %:

The timbering and filling method	100
The filling method	80-85
Shrinkage stoping ["storing"] method with ore broken out by blastholes	60-70
Shrinkage stoping with massive breaking of the ore	20-30
Open stope method:	
Ore bodies of limited thickness	70-80
Thick ore bodies	30-50
Slice caving method	65-75
Sublevel caving with mat	50-60
Sublevel caving without mat and with massive breaking of the ore	30-40
Level caving, ore caving of own weight	15-20
Level caving, forced caving of ore	25-30
Method of working very thin ore bodies with separate removal of vein mass and wall rock	150-250
Open workings	10-20

The most expensive method is that for working very thin ore bodies with separate removal of the vein mass and wall rock. This necessitates a great deal of development work per t of ore mass.

Of the other systems the most expensive is method which involves the timbering and filling of the worked-out stope. These systems require great expenditures of manpower and considerable consumption of timber.

In the case of methods involving open worked-out stopes in thick ore bodies the expenditure of manpower is 1/3 what it is for timbering and filling methods, and the consumption of timbers is 10 times less. Therefore costs are 2-3 times lower with this method.

The most effective underground methods of mining are those involving caving. They ensure high labor productivity on the part of the drill runners and miners, and a small consumption of timber, power, and explosives. With these methods the cost of the ore mass is 2-3 times lower than with systems involving timbering. Therefore the selection of the best system of stoping is an important factor in cutting the cost of the ore mass. The lowest costs in mining ore are achieved in open workings.

As a rule, the cost of working large, massive deposits, which include mineralized massifs and large lenses, is low because of the large scale of production and the possibilities for complete mechanization. But where deposits are small (pockets) and irregular, the cost of mining ore can be very high.

The cost of working vein-type deposits, especially thin veins, is very high. This is owing to the small quantity of ore which can be recovered per sq m of a thin vein, the high cost of drilling and blasting work in a narrow drift, and the relatively low productivity of the enterprise.

Mining costs are also affected by the regularity of the contour of deposits and by faulting. The working of a deposit of regular occurrence, the absence of faulting, and constant thickness along the dip and strike, ensure cheaper exploration and mining of ore.

One of the factors determining the cost of ore is the physicochemical analysis of the ore and the wall rock. Hard ores and rock do not require the timbering of the stope. Soft or water encroached ores and rock necessitate considerable expenditures of manpower and timber in support work. The presence of large quantities of water in a deposit necessitates large expenses for drainage, and it sometimes complicates very badly the removal of ore from individual areas.

The recovery of industrial ore per cu m of the ore mass is of great importance in the economics of ore mining enterprises and in the cost of mining. The higher the yield of ore from the ore body, and the more complete the utilization of its volume, the lower the expenses involved in separating the barren rock by means of selective mining or sorting ore. A high volumetric weight of ore means a high recovery of ore per cu m, and a reduction in the per t cost of mining.

The effect of natural conditions on costs is decreasing in proportion to the development of technology and the mechanization of production.

Section 4. Planning Production Costs

The cost plan is one of the basic sections of the national economic plan, of the plans of ministries and main administrations, and of the plans of enterprises.

The production costs plan is governed by the national economic plan, which provides for a systematic reduction in costs. The level of expenditures is determined by the production program and by progressive norms for expenditures of live and embodied labor on the output of products.

The basic sections of the costs plan are as follows.

(1) The plan for expenditures on the production of all gross and commodity production.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

(2) The cost estimates for individual, important, homogeneous kinds of production. (The method for drawing up the plan for expenditures on production and estimating costs is explained in the textbook, Organizatsiya i planirovaniye predpriyatiy [The Organization and Planning of Enterprises]. Therefore we have confined ourselves to explaining the economic significance of these sections of the plan.)

(3) The plan for cutting the cost of comparative commodity production.

The Plan for Expenditures on Production (Estimate of Production Expenses)

The document which reflects all of the expenditures of the enterprise (mine, combine) or of the branch, and which is drawn up in terms of basic expense items, is called the plan of production expenses or the estimate of production expenses.

In the case of combines of the ferrous metallurgical industry, which include mines, a separate estimate of production expenses is prepared for the latter.

The basic expense items are those expenses which, at the given enterprise, cannot be broken down into other items, for example, wages, cost of indirect materials, amortization, etc.

Compound expense items are those which, at the given enterprise, can be broken down into individual items, for example, current repairs, semifinished articles of the enterprise's own manufacture, etc, which can be broken down into expenses for materials, wages, amortization, power, etc.

The plan for production expenses covers expenses on the gross production of the enterprise. Therefore the internal turnover on expenses for power, services, the manufacture of tools, and semifinished articles sent out for processing or utilized at the enterprise, is not given in the estimate of production expenses. In those cases where an enterprise renders services of a non-industrial nature, sells by-products, and has other production results not included in the gross production, these expenses are included in the plan for production expenses.

In order to determine the total expenses on gross production, the expenses on this kind of work are shown as an overall figure without a breakdown into individual expense items.

In the plan for production expenses, all compound items are broken down into basic expense items. If the enterprise gets electric power from its own power station, the cost of the power will be included in the corresponding expense items (wages, materials, amortization, etc) in the plan for production expenses. The same principle is followed with regard to all expenses for materials, fuel, etc. Therefore semifinished articles, fuel, power, etc, will figure in the plan for production expenses in the form of individual items only in the event that they have been purchased on the outside.

In the plan for production expenses, all expenses are grouped according to the principle of homogeneity of expenses. Thus expenses for wages cover the basic and supplementary wages of all categories of workers (workers, employees, engineering and technical personnel, housekeeping personnel) Regardless of the kind of work for which these expenses went. The same thing applies to amortization and other expenses.

In drawing up the plan for production expenses for an enterprise

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

(mining administration), the expenses of auxiliary and ancillary shops are also broken down into items, and are included in the corresponding expense items for the enterprise.

The form for the estimate of production expenses, established on the basis of standard forms of the Ministry of Ferrous Metallurgy, is shown below (Table 34).

TABLE 34

PLAN FOR PRODUCTION EXPENSES (ESTIMATE OF PRODUCTION EXPENSES)

Expense Items	As per plan 1,000 rubles*	Incidence, %
Expenses		
Raw materials and direct materials	64	1.6
Indirect, repair, and other materials, and spare parts	807	20.2
Depreciation on inexpensive and rapidly wearing tools and equipment purchased	97	2.4
Fuel (purchased on the outside)	102	2.6
Electric power (purchased on the outside)	225	5.6
Total for items	1,295	32.4
Wages (basic and supplementary)	2,188	54.5
Taxes on wages	159	3.98
Amortization	243	6.02
Other monetary expenses	125	3.1
Total production expenses	4,010	100.0
Of which the following expenses, not entering into commodity production, are to be excluded:		
(a) transportation expenses on finished production included in the gross cost	10	-
(b) outside services of a nonindustrial nature	130	-
(c) by-products sold on the outside	70	-
Total (a+b+c)	210	-

Table 34 Continued

Difference between balance on hand at beginning and end of the year (increase +, decrease -):		
Of work in progress	+ 30	-
Of semifinished articles	-	-
Expenses for future years	60	-
Including for development and stripping work	50	-
Factory cost of commodity production	3,710	-
Including for basic production	3,500	-
Nonproduction expenses	300	-
Including:		
Administrative expenses of trusts	25	-
Marketing expenses	120	-
Transportation expenses	10	-
Charges for scientific research work	145	-
Total overall (commercial) cost of commodity production	3,800	-
Including:		
Overall cost of comparative commodity production	3,700	-

*The figures are hypothetical

Expenses for outside services of a nonindustrial nature, the value of by-products sold on the outside, and transportation expenses on finished production included in the overall (commercial) cost, are shown in the estimate of production expenses under the total.

The estimate of production expenses is of great importance in planning the economic and financial activity of an enterprise. It is used as a basis for drawing up the enterprise's financial plan, for determining requirements for working capital, the results of marketing, etc.

The estimate of production expenses serves as a means of checking on the correct preparation of other sections of the plan.

The following correspondence between the estimate of production expenses and the other sections of the plan must be ensured.

(a) The total expenses for materials, fuel, and power as per the estimate of production expenses (less transportation and procurement expenses) must correspond to the quantities of materials, fuel, and power allocated for production and evaluated on the basis of wholesale prices.

(b) The total wages in the estimate of production expenses must correspond to the payroll fund for industrial production personnel, workers of the nonindustrial transport system, and workers not on the regular payroll, as given in the labor plan.

(c) The amount for the amortization of fixed capital given in the estimate of production expenses must correspond to the data on the movement of fixed production capital as per the balance sheet for fixed capital of enterprises.

(d) The amount of increase in work in progress must correspond to the value of the increase in work in progress (on the basis of cost) given in estimates of the volume of production.

(e) The difference between the balance of expenses for putting new products into production and expenses for future periods must correspond to the estimates for putting new products into production and for expenses of future periods, given in the estimate of production expenses.

The estimate of production expenses characterizes the expenses on gross and commodity production. In order to determine the expenses on commodity production from the total expenses on production it is necessary to deduct from the latter, or add to it, the expenses on the difference between the balance of work in progress and of semifinished articles. Also, the expenses on commodity production do not include those expenses which figure in costs beyond the limits of the plan period. These include expenses for development work in developing reserves for the following period, a part of the expenses on putting new products into production, etc. That part of these expenses which yield no return during the plan period is deducted from the expenses on gross production.

In order to calculate the cost of commodity production, the nonproduction expenses must be added to the factory cost.

The Cost of Individual Kinds of Products

In addition to determining the total expenses on gross and commodity production, the plan specifies the cost of the most important kinds of products. The planned cost, established on the basis of progressive norms for the utilization of equipment and raw materials and a high level of labor and production organization, represents for socialist enterprises a criterion of the permissible level of expenditures and of the correct expenditure of allocated funds.

The establishment of a planned cost for individual kinds of products is necessary in order to establish wholesale prices, to plan cost reduction, to analyze changes in costs, and to follow-up on plan fulfillment.

It is essential to distinguish between shop (shaft) production costs, factory (general mine) production costs, and overall production costs. The shop costs include the direct production expenses and the indirect expenses of the shop. The factory costs include the shop costs and the general plant (general mine) expenses.

In order to calculate the overall cost, it is necessary to add to the factory cost all nonproduction expenses (expenses for the maintenance of trusts, marketing expenses, transportation expenses, and charges for scientific research work).

The calculation made in order to determine the per unit cost of one kind of product (ore, concentrate, metal, etc) is called costing, and the sheet on which these calculations are made are called cost sheets.

Two kinds of cost accounts are prepared: planned (estimated) and reported.

In addition to the products of the enterprise, cost analysis may be applied to expenses on individual phases of the production process, for example, stoping, transportation, and dressing.

The planned cost analysis represents a planned quota for the cost of an individual kind of product (articles, work, semifinished articles) determined by means of calculating the expenses on individual items, taking into account advanced norms for the utilization of equipment, expenditures of labor and consumption of materials, fuel, and power, and also ensuring the implementation of a strict economy program in expenses for servicing and managing the plant.

Planned cost sheets are drawn up by enterprises on the basis of the norms and quotas approved for them for the plan period.

The correct selection of the thing to be costed is of great economic importance. In the case of a mine the things to be costed are the mine mass and the ore mass. In the case of concentration mills the cost analysis is applied to the processing of one t of ore and to ideal concentrate. In addition, many enterprises apply cost analysis to the jobs done by auxiliary shops (compressed air, electric power, timber supports, etc).

Since the function of an ore mining enterprise is not to mine the ore mass but the metal therein, it would be more appropriate to calculate the expenses per t of metal in the ore mass rather than per t of ore mass. This would make for an increase in the enterprise's economic interest in meeting requirements as to the quality of the ore.

In grouping expense items, it is desirable that the cost sheet should reflect those individual expenses which are of substantial significance in an economic description of the technological peculiarities of the production. For example, cost sheets for ore list the expenses for development work separately.

In drawing up a cost sheet, it is essential to see that the maximum of expenses are included in the cost directly and not indirectly, in order that the cost of individual kinds of products and processes be accurately reflected. In the mining industry expenditures of materials, manpower, power, and compressed air can be estimated on the basis of norms, and in most cases they can be assigned directly to a certain kind of work. Insofar as possible, these expenses should also be distributed among individual kinds of production, separating them from the overhead expenses.

The planned cost of one t of ore at mines of the ferrous metallurgical industry is determined approximately on the standard form shown in Table 35.

TABLE 35

PLANNED COST ANALYSIS FOR MINING ORE (Plan for Producing One Million t)

Item	Unit of Measure	As per Report for the Base Period			As per Plan for the Plan Period				
		quantity	per unit price, rubles	amount, rubles	quantity	per unit price, rubles	amount, rubles	total quantity	total amount, 1,000 rubles
Basic wages for production workers	man-hours	0.9	6	5.4	0.85	6	5.10	850,000	5,100
Including:									
Drilling and blasting work or cutting	man-hours	0.4	8	3.2	0.4	8	3.2	400,000	3,200
Loading in the stope	man-hours	0.1	4	0.4	0.08	4	0.32	80,000	320
Timbering	man-hours	0.05	5	0.25	0.04	5	0.20	40,000	200
Gathering	man-hours	0.1	4	0.4	0.08	4	0.32	80,000	320
Underground tramming	man-hours	0.05	4	0.2	0.05	4	0.2	50,000	200
Surface tramming	man-hours	0.02	3.5	0.07	0.02	3.5	0.07	20,000	70
Supplementary wages and taxes on wages	-	-	-	1.08			1.02		1,020
Materials	-	-	-	4.00			3.8		3,800
Including:									
Timbers	cu m	0.0266	30	0.8	0.0233	30	0.07	10,000	70
Ammonal	kg	0.6	2.0	1.2	0.6	2	1.2	600,000	120
Pobedit	g	7	0.2	1.4	6	0.2	1.40	6,000,000	140
Power expenditures:									
Electric power	kwh	3	0.12	0.36	3	0.12	0.36	3,000,000	360
Compressed air	cu m	25	0.02	0.5	22	0.02	0.44	22,000,000	440
Total power expenditures	-	-	-	0.86	-	-	0.80	-	800

CONTINUATION OF TABLE 35

(Reverse Side)

Item	As per Report per unit of production, in rubles	As per Plan per unit of production, in rubles	As per Plan total, 1,000 rubles
Services of auxiliary shops	1.50	1.40	1,400
Including:			
Surface railroad haulage	0.40	0.38	380
Surface truck haulage	-	-	-
Amortization	1.25	1.15	1,150
Writing off development work	1.40	1.40	1,400
Current repairs and maintenance of fixed capital	0.80	0.90	900
Labor protection	0.08	0.08	80
Other expenses	1.10	1.0	1,000
Total expenses	17.47	16.65	16,650
Production from development workings	0.4	0.4	400
Total, including production from development workings	17.87	17.05	17,050
Including total shop wages	7.08	6.80	6,800
General mine expenses	1.2	1.1	1,100
Administrative expenses	0.8	0.7	700
Losses from spoilage (for report)	0.1	-	-
Mine cost, delivered at the job	19.97	18.85	18,850
Transportation of products	0.8	0.7	700
Total mine cost delivered at the warehouse	20.77	19.55	19,550
Intramine (commercial) expenses (less transportation)	0.6	0.55	550
Transportation expenses	0.6	0.55	550
Including:			
Anticongelation measures	0.1	0.1	100
Analysis of quality of products	0.15	0.15	150
Overall (commercial) cost	21.97	20.65	20,650

The estimate of expenditures for manpower, materials, and power is made on the basis of the progressive norms used in the plan. The services of auxiliary shops (transportation, laboratory, etc) are distributed among the shops on the basis of their actual cost without counting general mine expenses.

At mines of the ferrous metallurgical industry, expenses for development work are written off in accordance with an established coefficient of extinction for such work. The coefficient of extinction is determined on the basis of the plan for working the mine, with separate calculations of coefficients for linear and volumetric workings and for construction and installation work classified with development workings (pits, platforms, haulageways, etc).

The value of the development work written off per t of ore is determined by multiplying the average cost per cu m of these workings as given in the plan for development work, by the coefficient of extinction.

For example, according to the plan, an explored deposit is to be worked for a period of 20 years. The total volume of the reserves to be extracted in the course of this period is 20 million t of ore. In order to extract these reserves it is necessary to do productive development work amounting to 120,000 cu m and construction installation work classified with development workings amounting to 1.4 million rubles.

The per t coefficient of extinction for development work is 0.006 cu m, that is, 120,000:20,000,000 = 0.006; and for construction and installation work it is 7 kopecks per t of ore:

$$1,400,000:20,000,000 = 0.07.$$

The value per cu m of development work is determined by means of adding the planned value for the plan period to the value of the unextinguished work as of the beginning of the plan period, and dividing the sum thus obtained by the overall volume.

For example, the balance of unextinguished development as of 1 January 1953 is 5,000 cu m, the value of which is 500,000 rubles. According to the plan, 7,000 cu m of development workings amounting to 640,000 rubles, are to be driven during the plan period. The average cost per cu m of development workings is 95 rubles:

$$\frac{640{,}000+500{,}000}{5{,}000+\ 7{,}000} = 95,$$

while the amount to be written off per t of ore is 0.57 rubles:

$$95 \cdot 0.006 = 0.57,$$

where 0.006 represents the norm for writing off development work per t of ore.

If the development workings are driven into an ore body, there is "incidental production" of ore. The ore mined from productive development workings is included in the production plan and is calculated together with the ore mined from the stopes. Ore mined from development workings is valuated according to the planned shop cost, less the value of development work written off. At the same time this sum is excluded from actual expenses for driving the development workings.

Planning Cost Reduction

The plan for production expenses, like the plan for the cost of individual kinds of products, does not specify the amounts to be saved by cutting production costs. But for the national economy it is important to ascertain how production costs change and what anticipated savings will be achieved by cutting costs. This is determined in the plan for cutting the cost of commodity production.

The quota for cutting the cost of comparative commodity production is planned on the basis of the following figures: percentage of reduction in the cost of comparative commodity production relative to the average level for the preceding year; savings from cutting the cost of comparative commodity production; incidence of comparative commodity production.

The work in connection with preparing the branch plan for cutting costs may be arbitrarily divided into the following basic stages.

(1) Evaluation of fulfillment of the current plan and the cost level attained.

(2) Elaboration and promulgation of directives on cost reduction.

(3) Elaboration of concrete plans for cutting costs in individual branches and at individual enterprises.

The breakdown of the plan into stages must not be understood in the sense that they are carried out in a sequence. Actually the work on individual stages is interrelated. At the same time that the plan is being evaluated and directives for the future period are being drawn up, organizational and technical measures are being elaborated for cutting costs in the future period and for the struggle to fulfill the cost reduction plan in the current period.

For purposes of eliminating existing shortcomings in work and discovering reserves for the further reduction of costs, great importance attaches to the analysis of plan fulfillment. Cost analysis must be carried out systematically, as the report data come in. The systematic study and analysis of costs in terms of individual items is a means of mobilizing the resources of enterprises. It is essential to determine the cost level attained by the end of the current period, since it is only on a basis of this level that the quota for cutting costs for the following period can be accurately determined.

Directives for cutting costs are promulgated by the state.

Gosplan USSR and Gosekonomkomissiya USSR work up draft directives on the basis of general national economic goals, discovered reserves, the cost level attained, the planned increase in labor productivity and wages, the development of technical progress, the reduction of overhead expenses, etc. Directives on cost reduction are approved by the Council of Ministers USSR simultaneously with general directives on the preparation of the national economic plan. They should be considered as a minimal quota.

The cost reduction quota fixed for individual ministries is subsequently distributed among individual main administrations, and by the latter, among enterprises. This quota is drawn up on the basis of an analysis of the actual expenses during the preceding period, making allowance for progressive norms for the utilization of equipment, consumption of materials, electric power, and fuel, expenditures of labor, and the elimination of nonproductive expenses.

The cost reduction quota is a very important quantitative index of the plan. Enterprises are required to fulfill this quota just as completely as the quotas on the volume, assortment, and quality of production.

The amount of savings which can be secured as a result of cutting costs is of great importance in planning the national economy. These savings are determined not only by the overall percentage of reduction in the cost of industrial production but by the volume of production. Therefore the total yearly savings figure along with the percentage of reduction in the cost reduction quota.

The plan for cost reduction is elaborated at the same time as other sections in the plan for an enterprise, with large scale participation of engineering and technical personnel, workers, and employees. The plan should provide for a reduction of costs in all determining factors and, insofar as possible, on individual processes.

In the case of those branches of industry which, like the ore mining industry, have a massive, homogeneous production, the cost reduction quota for the main administration is established by means of evaluating the comparative part of the commodity production of the enterprises under the main administration (without a separate calculation for internal turnover), on the basis of the reported and planned costs.

The cost reduction quota in percentages is determined by the ratio between the cost for the plan period and the cost for the reported period, using the following formula:

$$X = 100 - \frac{\Sigma q_1 P_1}{\Sigma q_1 P_0} \cdot 100$$

where X -- percentage of cost reduction;

P_1 -- production cost for the plan period;

P_o -- production cost for the reported period;

q_1 -- comparative commodity production as per plan.

To determine the amount of savings for the branch, the commodity production as per the plan (without internal turnover) is multiplied by the difference between the reported cost and the planned cost.

For example:

Cost as per plan	21.71 rubles
Cost as per reports	23.14 rubles
Output as per plan	3,600,000 t

The total yearly savings amount to:

3,600,000 (23.14-21.71) = 5,148,000 rubles.

Comparative and Non-comparative Production

The commodity production planned for the plan period may include products which were not being made during the reported period, and on which a cost reduction quota cannot be assigned. Therefore the comparative portion of the production is separated from the overall commodity production in order to establish the quota for cost reduction. Comparative production is that production which is already being turned out by the enterprise during the current year.

If during the preceding period production was begun on a new kind of product and it was produced on a small scale with a very high cost level, the decision as to whether this production is to be considered as comparative or noncomparative is made in each individual case by the ministry with the approval of Gosekonomkomissiya USSR.

A change in the quality of a product or a changeover to a new technological process does not render the product noncomparative. A changeover from mining oxidized ores to mining sulfide ores or from open workings to underground workings does not provide a basis for considering the production noncomparative. If there has been an actual deviation in the assortment or grades of the product from the planned assortment or grades, it is not permissible to make an adjustment in the established quota for cost reduction.

In the case of noncomparative production, or of enterprises newly put into operation during the plan period, no cost reduction quota is promulgated, and only the planned cost is established.

The cost reduction plan is drawn up by individual expense items for the total comparative commodity production of the enterprise or trust.

The cost reduction plan is submitted and approved at the same time as the production plan.

Section 5, Cost Analysis

The analysis of costs in the process of drawing up the plan has the purpose of establishing the deviation of the planned cost of comparative production from the actual cost for the reported period, both in terms of absolute magnitudes and in percentages for the following basic factors: (a) changes in the price of materials consumed; (b) changes in consumption norms; and (c) changes in the volume of production.

In analyzing costs on the main administration level it is also necessary to ascertain the effect on costs of changes in the geographic location of mines.

The analysis of reported costs is of great importance in administering the work of enterprises.

An enterprise may be considered as having fulfilled the costs plan when it has fulfilled the following plan indexes: (a) cost of total commodity production; (b) reduction of cost of comparative commodity production; and (c) cost of most important kinds of products.

The analysis of the reported cost production makes it possible to evaluate the quality of the work of the enterprise and the branch, to compare the work of similar enterprises, and to apply the practices and achievements of the leading enterprises to the lagging ones.

Reports on costs, both accounting and statistical reports, together with the balance sheet should serve as the basic documents in analyzing the quality of an enterprise's work.

Reports on costs must be prepared in time so that they can be used for operative management and improving the quality of the work. A monthly cost sheet which is not prepared on time can be used only to a very slight extent, since working conditions at a mining enterprise are constantly changing (new drifts are put into operation, the stoping methods are changed, etc). Instances where promptly prepared cost sheets are not studied or analyzed by anyone are even less to be tolerated. The results of cost analysis should be studied by the top management of the enterprise and should be considered at production meetings and meetings of the aktiv for purposes of taking effective measures for a systematic reduction of costs.

The following are the objects of cost analysis.

(1) The report on production expenses in terms of expense items.

(2) The cost of total comparative production for the given period relative to the preceding period and the plan, and the cost of noncomparative production relative to the plan.

(3) The cost of individual kinds of products in the given period relative to the preceding period and to the plan.

The report on production expenses in terms of expense items is drawn up on the form used for the estimate of production expenses (Table 34). The report shows both planned expenses and actual expenses.

This report is of great importance in analyzing the expenditure of the payroll fund, the fulfillment of the enterprise's financial plan, and other sections of the plan. However these data do not suffice as a basis for judging the fulfillment of the cost reduction plan as a whole, since the amount of expenses is also affected by the volume of production and changes in the price level.

The analysis of cost reduction is based primarily on data on the cost of commodity production, which in the items in the cost sheet reflects data on the cost of total commodity production and on its comparative portion.

The report on the cost of commodity production makes it possible to ascertain the savings or overexpenditures not only on the basis of the total expenses but with regard to individual items thereof. This kind of analysis makes it possible to ascertain the factors causing an increase in costs and the best way to eliminate the causes thereof.

Cost reports and current cost sheets show the cost of the ore mined. But from the national economic point of view the important thing is not the cost of the ore mined but the cost of the metal contained therein. Therefore, in analyzing the fulfillment of the plan for the cost of ore, it is essential to analyze at the same time the cost per unit of metal contained in the ore.

For example, the per t cost of ore with a 2% content of copper should be 40 rubles according to the plan. According to the cost report the per t cost of the ore was 36 rubles, but the metal content in the ore was only 1.6 %. According to the plan the cost of the t-percentage of metal should be 40:2 = 20 rubles. According to the report the cost of the t-percentage of metal is 36:1.6 = 22.5 rubles.

Although the per t cost of the ore according to the report was 4 rubles, that is, 10% lower than the planned cost, the cost of the t-percentage of metal was 2.5 rubles, or 12.5% more than the planned cost.

Where polymetallic ore is being mined it is necessary for purposes of analysis to evaluate on the basis of the plan and the reports all of the metals contained in the ore, in wholesale prices, and to compare the resulting amounts with the planned and actual cost of the ore.

This is shown in the following example:

	Plan	Report	Result, % - saving + overexpenditure
Per t cost of ore	80	76	- 5
Cost of metals contained in the ore, in wholesale prices	160	144	-10

The per t cost of ore has dropped 5%, but the value of the metals therein has dropped 10%. As a result the cost of the metal in the ore has increased 5.4%. $[100-(\frac{144}{76}) - (\frac{160}{80}) \cdot 100 = 5.4]$.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

Because of the high incidence of wages in the production costs of the ore mining industry, special attention must be devoted to the analysis of this item.

It is essential to ascertain the incidence of piecework and time wages, since a change therein has a substantial effect on the production costs. With straight piece rate wages an increase in labor productivity is not reflected in the wages item of costs, and with the progressive wage system it means an increase thereof, but one accompanied by a reduction in costs on other items. With time wages, an increase in labor productivity means a drop in this item of the per unit cost of an article.

Expenses for supplementary wages are analyzed in their relation to basic wages in percentages.

The purpose of analyzing expenses for materials is to ascertain the reasons for changes in these expenses.

In analyzing consumption of materials it should be ascertained whether progressive norms for the consumption of direct and indirect materials have been established at the enterprise. Progressive norms for consumption should be based on technical computations and the utilization of the advanced practices of production innovators. This kind of analysis should bring out the reasons for deviations from established norms and, in the event they have been exceeded, it should help in working out measures to eliminate overexpenditures, to evaluate critically the norms themselves, and to ascertain the effect that price changes on materials have had on costs.

For example, in analyzing consumption norms for explosives, steel, and hard alloys, it is important to ascertain the effect of changes in the stoping method, the quality of the explosives and steel, changes in the hardness of the rock, the coefficient of utilization of blastholes, the type of drilling machines, the skill of the workers, etc.

In analyzing consumption norms for timber, it is important to ascertain the correspondence between the kind of timbers used and the established specifications, to check the fulfillment of norms for reuse, etc.

The following form of calculation may be used in analyzing cost deviations because of prices and norms (Table 36).

TABLE 36

EFFECT OF COST DEVIATIONS REFERABLE TO PRICES AND CONSUMPTION NORMS ON MATERIALS IN ANALYZING COST

Designation and grade of Material	Planned expenditures			Actual Expenditures			value of actual quantity at planned prices, rubles	Difference referable to norms		Difference referable to prices	
	quantity, kg	price, rubles	amount, 1,000 rubles	quantity, kg	price, rubles	amount, 1,000 rubles		saving	overexpenditure	saving	overexpenditure
Explosives	1,000	3	3,000	900	2.50	2,250	2,700	300	-	450	-

The difference between the value of the actually expended quantity in planned prices and the planned amount of expenditures characterizes the deviation referable to norms. The difference between the value of the actually expended quantity of materials in planned prices and the actual amount of expenditures characterizes the deviation referable to prices.

In the given example there was a saving of 750 rubles on materials, relative to the plan. An analysis of this table shows that the saving referable to norms amounted to only 300 rubles, and that referable to price changes amounted to 450 rubles. The effect which changes in railroad and waterway freight rates have on costs is calculated by the same method.

This kind of analysis is especially important where shops are being put on a khozraschet basis. In order to ascertain the results of the activity of the shop, all expenses dependent upon the shop are analyzed in terms of the actual consumption norms and the planned prices. This makes it possible to ascertain deviations in cost arising both out of the work of the shop itself and out of causes not dependent upon the shop.

A change in the volume of production has its greatest effect on the level of arbitrarily fixed expenses. Arbitrarily fixed expenses are those expenses which remain almost unchanged despite changes in the volume of production.

Variable expenses are those which change almost in proportion to the change in the volume of production. Arbitrarily variable expenses include expenses for current repairs and maintenance of fixed capital, amortization, other shop expenses, and general mine expenses. A change in the volume of production has a relatively small effect on their absolute magnitude, but the amount of expenditures per unit of production depends directly upon the volume of production. Therefore, the purpose of the analysis is to determine the effect of a change in the volume of production on the amount of overhead expenses per unit of production. This effect can be calculated in percentages by means of the following formula: $X = 100 - \left(n + \frac{1-n}{K}\right) \cdot 100$, where n -- incidence of variable expenses in the total amount of expenses;

k -- coefficient characterizing the change in the volume of production.

In the practical application of this formula the most important thing is to determine the magnitude of n. To this end it is necessary to determine by means of a detailed analysis the incidence of variable expenses for each item.

The following is an example of calculating the effect of the volume of production on the cost per unit of production.

The quantity of ore mined increased from one million to 1.2 million t, that is, by 20%, and the cost per t of ore decreased from 33 rubles 05 kopecks to 30 rubles 07 kopecks, that is, by 9%. Variable expenses accounted for 29 rubles or 88% of the reported cost, while fixed expenses accounted for 4 rubles 05 kopecks, or 12%. Under these conditions the decrease in costs referable to the increase in the volume of production amounted to 2%:

$$X = 100-(0.88+\frac{1-0.88}{1.2}) \cdot 100 = 2.$$

The other 7% of reduction was due to other factors.

Section 6. Costs and the Quality of Products

The party and the government attribute great importance to improving the quality of products. The quality of a product is the extent to which all of its properties correspond to the requirements established, specification models, or technical specifications. The quality of a production, along with the cost index, is one of the basic plan indexes. The quality of production is characterized by the degree of mastery of the most improved technological processes, proper adherence thereto (technological discipline), adaptation of equipment, the skill of the workers, and the level of technical management.

A reduction in costs at the expense of a decrease in quality is completely inadmissible. Cost reductions must be accompanied by an improvement in the quality of the products.

A deterioration in the quality of an ore or a reduction in the content of metal therein is undesirable even where there is a reduction in the per-unit cost of metal in the ore or concentrates, since subsequent expenses in connection with processing them may wipe out the saving achieved by mining poorer grade ore or in obtaining poorer grades of concentrates.

The fulfillment of the cost reduction plan by means of reducing the content of metal in the ore does great damage to the national economy, since it leads to excessive expenditures in processing the ore and to a lower degree of recovery of metals.

Persons responsible for turning out products of poor quality, incomplete assortments of products, or products which do not meet specifications, are liable to harsh penalties and even to criminal punishment.

Section 7. Costs and Prices

In the socialist economy, the prices of the products of state industry are regulated under planned procedure.

As a rule, the price exceeds the cost to an extent equal to the socialist accumulations. In the ore mining industry, as in other branches of industry where different enterprises have different cost levels, prices are established on the basis of the rough average of costs at enterprises which are doing good work. The planned regulation of prices and establishment of the difference between the prices of goods and their cost ensure the establishment of proportions in the national economic plan and of proper ratios between balances, makes for economies on certain materials or, conversely, creates the preconditions for increasing the consumption of other materials, regulates the creation of accumulations in individual branches, etc.

At the present time 3 kinds of prices are in effect in the industry of the USSR, namely (1) the wholesale prices of enterprises, (2) the wholesale prices of industry, and (3) retail prices.

1. The wholesale prices of an enterprise are built on the basis of the branch cost plus the profit planned for the given branch. These prices serve as a basis for planning and accounting for gross and commodity production and labor productivity in monetary terms. They are used in intrabranch and interbranch settlements.

2. The wholesale prices of industry in those branches whose production is sold for consumer consumption through the state and cooperative trade networks include the wholesale price of the enterprise plus the turnover tax. The latter is one of the basic sources of revenue for the state budget. In 1949 all branches of heavy industry (except for the petroleum industry), including the ore mining industry, were exempted from the turnover tax. In these branches the turnover tax is retained only in the case of the consumer goods produced by the enterprises of the branch. Therefore, in the ore mining industry the wholesale prices of enterprises and those of the industry are the same.

3. Retail prices express the value of the product in retail turnover. They are applied to consumer goods sold in the retail trade network. Industry gives trading organizations discounts on

retail prices to cover their expenses and to ensure the accumulations established for the trading organizations.

In the ore mining industry, uniform wholesale prices are established for ores, semifinished products, and finished production, metals and alloys thereof. The wholesale prices are established FOB the regular freight yards where the shipment orginates or FOB the shipping terminal when transportation is via water.

Prices of ore are established in accordance with the quality of the ore (grade, content of metals and foreign matter, size of pieces, etc).

Prices on iron ores are differentiated for individual deposits, depending upon the metal content in the ore.

The price of copper ore is established in accordance with the percentage of copper contained in the ore. If there is an increase or decrease in the average content of copper in the ore as against the planned content, the price is raised or lowered accordingly. In the case of copper sulfate plants, higher prices are paid for ore delivered in large lumps, since large lump ore is more easily smelted.

The price of lead ores varies in accordance with the lead content in the ore.

Whole prices on concentrates are fixed in accordance with the same principle. The higher the content of the basic metal in the concentrate, and the better the ratio for the content of other metals therein, the higher the price per unit of basic metal contained in the concentrate. For example, a t of copper in grade KN-1 concentrate (copper no less than 20%, lead no less than 19%, zinc no more than 6%) brings a higher price than a t of copper in grade KM-4 concentrate (copper no less than 11%, lead no more than 15%, and zinc no more than 19%).

The wholesale prices of products of the ore mining industry are obligatory for all suppliers and consumers. The schedule of wholesale prices provides for a system of higher rates or discounts, depending upon the quality, size of lumps, moisture content, etc.

Products of inferior quality which do not meet all of the requirements of specifications models or technical specifications, but which can be used, are valuated with discounts or on the basis of especially low prices. These apply, for example, to copper concentrates with a lower metal content than is specified for grades of inferior type, etc.

This system of fixing prices provides an economic stimulus for improving the quality of products.

Wholesale prices of ore and concentrates are used in those cases where the mines and concentration mills are independent enterprises.

When the mine or concentration mill forms a part of a combine, settlements for ore concentrates processed at the combine in question are effected on the basis of the actual cost.

[Pages 7-115]

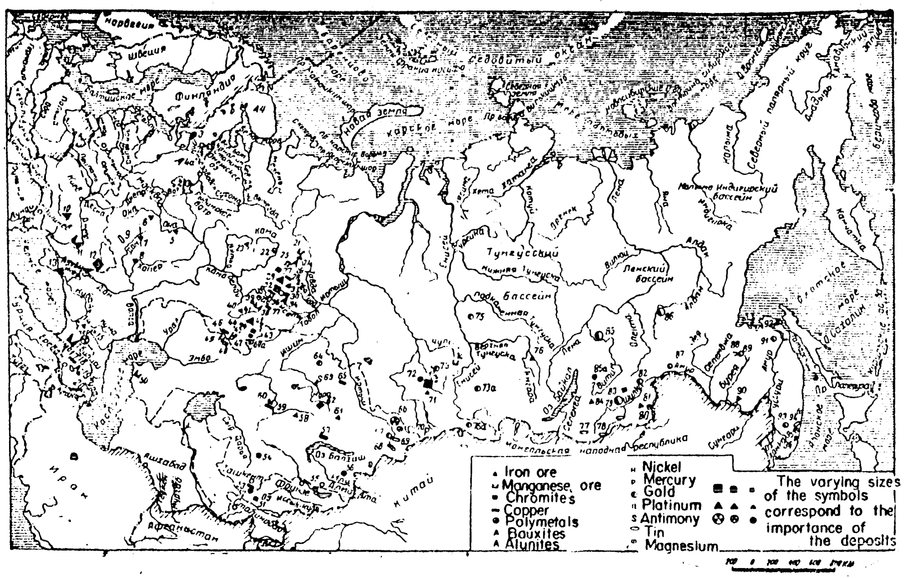


Figure 1. Deposits of ferrous and nonferrous metals in the USSR. (Prepared on the basis of the map in the book by P. N. Stepanov, Geografiya promyshlennosti SSSR [Geography of the Industry of the USSR], 1955, Uchpedgiz.)

Iron ore

5, Vyksa; 6, Tula region; 7, Lipetsk; 8, Khoper; 9, Kursk magnetic anomaly; 10, Krivoi Rog region; 13, Kerchen; 14, Malka; 19, Dashkesan; 23, Omutinskoye; 24, Ivdel'skoye; 29, Tagilo-Kushvinskaya group (Vysokogorskoye, Goroblagodatakoye, Lebyazhinskoye); 30, Alapayevsk region; 39, Baikal group; 40, Komarovo-Zigazinskaya group; 42, Matnitogorsk; 45, Khalilovo group; 58, Atasuy; 61, Ken-Tyube-Togay group; 71, Tel'bes group (Tel'bes, Temir-Tau, Tashtagol); 76, Angaro-Ilimsk region; 81, Zheleznyy Kryazh; 84, Sosnov; 90, Malo-Khingan; 92, Nikolayevsk; 96, Ol'ga.

Figure 1 (Continued)

Manganese ore

11, Nikopol'; 16, Chiatura; 21, Polunochnoye; 38, Satka; 50, Mangyshlak; 60, Dzhezdin; 74, Mazul'.

Chromites

27, Saranov; 32, Khrompik; 41, Kraki range; 43, Verblyuzhegorskoye; 48, southern Kimpersey group.

Copper

17, Alaverdsk; 20, Zangezur; 28, Krasnoural'sk group; 28a, Krasnoturinsk; 31, Kirovgrad; 35, Degtyarka; 37, Karabash group; 44, Baymak group (Baymak, Sibay); 46, Blyava; 53, Almalyk; 57, Kounrad; 59, Dzhezkazgan; 65, Boshchekul'.

Polymetals

3, Pitkyarnta; 15, Sadon; 52, Karamazar; 54, Achisay; 55, Ak-Tyuz; 56, Tekeli; 66, Leninogorsk; 67, Zyryanovsk; 72, Salair; 80, Nerchinsk; 95, Tetyukhe.

Aluminum raw material

4, Kirov, Tikhvin; 26, Krasnaya Shapochka; 26a, Alapayevsk; 34, Kamensk group, Akmolinsk group.

Alunites

18, Zaglik;

Magnesium

22, Solikamsk region; 22a, Satka.

Tin

2, Pitkyaranta; 69, Cherdoyak; 77, Shumilovsk; 78, Khapcheranga; 79, Cnonsk; 94. B. Sinanchinsk.

Nickel

1, Nikel'; 36, Ufaley group; 47, Khalilovo; 49, Kimpersay.

Mercury

12, Nikitovsk; 51, Khaydarkan; 70, Chagan-Uzun.

Figure 1 (Continued)

Gold

33, Berezovskiy; 64, Stepnyak; 64a, Dzhetygara; 68, Altay deposit; 73, Berikul'ski; 73a, Artem'yevski; 85, Severo-Yenisey; 75a, in the Kyzyl region; 82, Klyuchi; 83, Darasun; 85, Bodaybo; 85a, Vitimsk; 86, Aldan; 87, Skovorodino; 89, Kerba; 91, Afanasevski; 93, Upper course of the Imen River.

Platinum

25, Kytlym.

Antimony

63, Turgay; 88, upper course of the Selemdzha River (Leninsk).

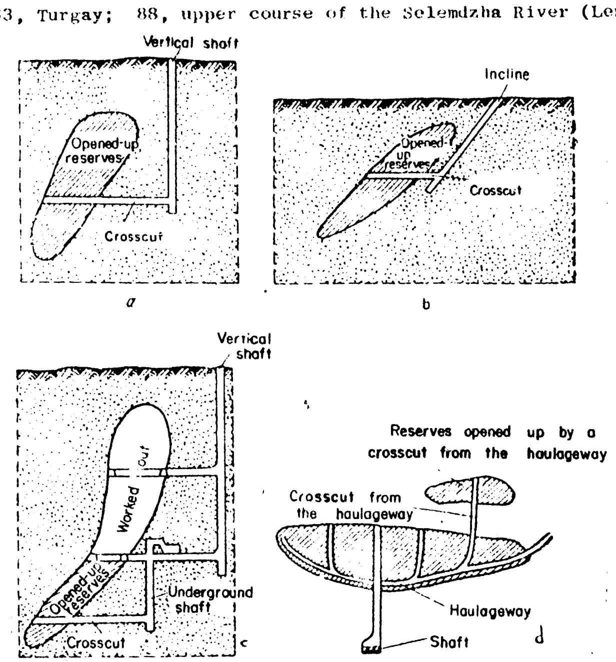


Figure 2. Opened-up reserves with various methods of opening up deposits. a, opened up by a vertical shaft and a crosscut; b, opened up by an incline and a crosscut; c, opened up by an an underground shaft; d, opened up by a crosscut from the haulageway.

Sanitized Copy Approved for Release 2010/07/15 : CIA-RDP81-01043R000500190009-3

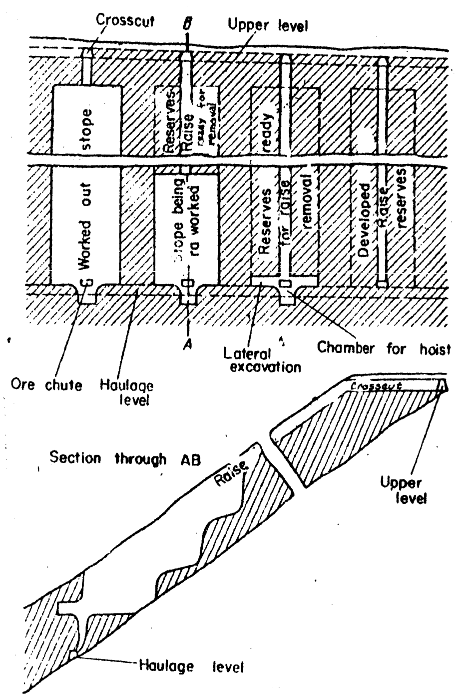


Figure 3. Classification of reserves into developed reserves and reserves ready for removal using continuous stoping with regularly spaced pillars.

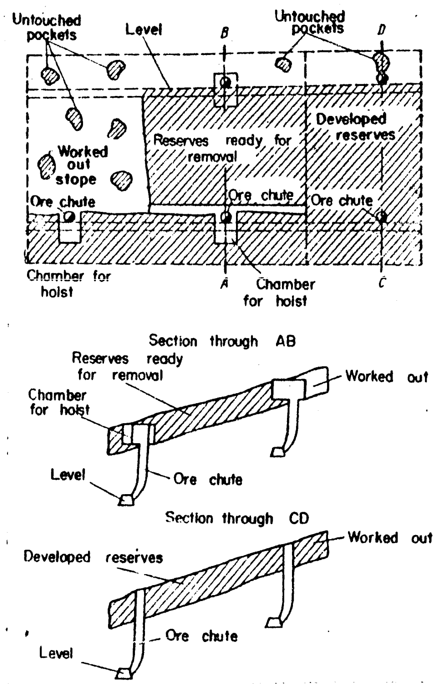
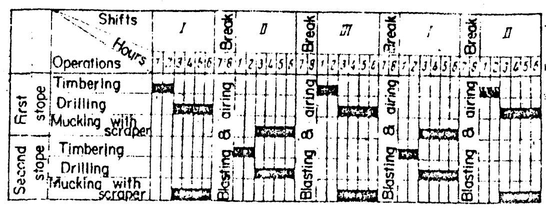


Figure 4. Classification of reserves into developed reserves and reserves ready for removal using continuous stoping with irregularly spaced pillars.

[Pages 187-260]



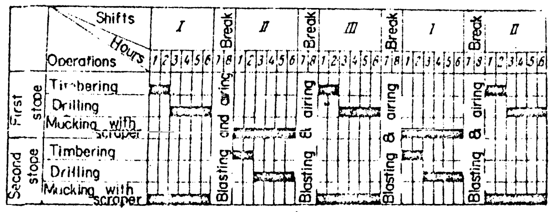


Figure 6. Graph of cycles for crews of 2 and 3 men.

a. 2-man crew, technical conditions

Hardness of rock as per Glavmed' scale	7-8
Number of blastholes in stope	8-10
Depth of blastholes, in m	1.20
Coefficient of utilization of blastholes	0.9
Recovery of ore mass per cycle in one stope, m^3	6.6
Number of workers working in stopes	2

b. 3-man crew, technical conditions

Hardness of rock as per Glavmed' scale	7-8
Number of blastholes in stope	16-17
Depth of blastholes, in m	1.50
Coefficient of utilization of blastholes	0.85
Recovery of ore mass per cycle in one stope, m^3	8.0
Number of men working in stopes	3