

Master Plan of the Project

1. Objective of the Project

(1) Overall Goal

Underground coal mining technology is enhanced in the Republic of Indonesia.

(2) Project Purpose

Ombilin Mines Training College is able to train underground coal mining supervisors.

2. Outputs of the Project

(1) Administrative system of the Project is established.

(2) Operation and maintenance system of machinery and equipment of the Project is established by Counterpart.

(3) Preparation for implementation of the following courses by Counterpart is completed.

a) Underground Coal Mining Technology Training Course

b) Underground Coal Mining Safety Technology Training Course

c) Underground Coal Mining Machinery Technology Training Course

d) Underground Coal Mining Electricity Technology Training Course

e) Underground Coal Mining Environment Technology Training Course

(4) The following courses are being implemented at Ombilin Mines Training College.

a) Underground Coal Mining Technology Training Course

b) Underground Coal Mining Safety Technology Training Course

c) Underground Coal Mining Machinery Technology Training Course

d) Underground Coal Mining Electricity Technology Training Course

e) Underground Coal Mining Environment Technology Training Course

Both sides confirmed that the target group of the Project is supervisors to be appointed by MDCM.

3. Activities of the Project

1-1 Allocate necessary personnel as planned

1-2 Clarify the division of work

1-3 Make plans of activity

1-4 Prepare Facilities and equipment for the Project

1-5 Make Annual Plan of Operations

2-1 Make a Plan for Procurement, installment, and maintenance of machinery and equipment

2-2 Procure, install and maintain machinery and equipment

2-3 Make operational and maintenance manuals of machinery and equipment

2-4 Evaluate operation and Maintenance manuals of machinery and equipment

3-1 Make a plan of each training course

3-2 Prepare curriculums and materials for each training course

3-3 Make a recruiting plan of trainees

3-4 Recruit trainees

4-1 C/P acquires necessary knowledge for lecture of each training course and give lecture

4-2 C/P acquires necessary skills to operate machinery and equipment for exercises of each course and give exercises.

4-3 Evaluate each training course

4-4 Conduct follow-up survey for graduated trainee



Tentative Curriculum and Technology Transfer Items

1. Underground Coal Mining Technology Course

No.1

Curriculum	Lecture content and technology transfer items	Method of lecture	Necessary Machinery & Equipment for lecture
-1 Geology and exploration	Mapping Technology, Analysis of geology, U/G boring technology	Lecture, Surface exercise, Practice using Dummy Gallery	<ul style="list-style-type: none"> • Mapping system • Geological analysis system • U/G boring system (U/G surveying system)
-2 Mine design, Mine opening method	Coal mining and U/G road structure, U/G main road structure	Lecture Simulation	<ul style="list-style-type: none"> • Dummy Gallery
-3 U/G Road extension development (development, support, maintenance)	Development technology, support technology, Road maintenance technology	Lecture, Practice using Dummy Gallery	<ul style="list-style-type: none"> • Dummy Gallery • Development system (included Model) (Strata control system : rock bolting)
-4 Explosives and blasting	Kind of explosives, blasting theory, blasting standard, Blasting practice (Drilling, filling, connecting, current test)	Lecture, Practice using Dummy Gallery	<ul style="list-style-type: none"> • Blasting system (Included drilling practice at drilling training place)
-5 Coal mining (Inclined seam, thick seam, Mechanization, water power)	Coal mining study, various coal mining method	Lecture, Practice using Dummy Gallery	<ul style="list-style-type: none"> • Coal mining system (Included model)
-6 Ground pressure and rock dynamics	Ground pressure theory and rock mechanic	Lecture, Simulation	<ul style="list-style-type: none"> • Ground pressure control system (simulation)
-7 Transportation	Transportation technology (General : Mining relation)	Lecture, Practice using Dummy Gallery	<ul style="list-style-type: none"> (Transportation system) Mechanical electrical (Transportation) sharing
-8 Ventilation and Water drainage	Ventilation technology, water drainage technology (Genera : mining relation)	Lecture, Practice using Dummy Gallery	<ul style="list-style-type: none"> Shearing with Safety (ventilation) technology Shearing mechanical electrical course (transportation)
-9 Operation management	Work control technology (work plan, work control, materials control, work manuals, work diary etc.)	lecture	
-10 U/G surveying	U/G surveying technology	Lecture, Practice using Dummy Gallery	U/G surveying system

2. Underground Coal Mining Safety Technology Course

No.2

Curriculum	Lecture content and technology transfer items	Method of lecture	Necessary Machinery & Equipment for lecture
- 1 Ventilation control	Ventilation study, ventilation measurement technology, ventilation analysis technology Ventilation control technology	Lecture, Surface exercise, Practice using Dummy Gallery	Ventilation system
- 2 Gas · Coal dust explosion	Gas coal dust explosion theory, gas coal dust explosion prevention technology Gas coal dust explosion experiment, disaster sample	Lecture, Simulation Surface exercise, Practice using Dummy Gallery	· Gas measurement analysis system · Gas coal dust explosion system (coal dust measurement → mine dust measurement system)
- 3 Gas outburst and rock outburst	Theory of Gas outburst and rock outburst, Disaster sample	Lecture Simulation	(Boring for gas absorb → U/G boring System) (Ground pressure control system: model)
- 4 Spontaneous combustion	Theory of spontaneous combustion, Spontaneous combustion prevention technology, disaster sample	Lecture, Simulation Practice using Dummy Gallery	Spontaneous combustion prevention system
- 5 U/G fire	Fire control, fire fighting technology, fire expansion prevention technology, disaster sample	Lecture, Simulation Practice using Dummy Gallery	· Fire fighting system · Fire expansion prevention system
- 6 Work environment (included dust)	U/G environment, KATA degree, Air cooling plan, Dust-proof.	Lecture, Practice using Dummy Gallery	Mine dust measurement system Mine dust prevention system Sharing with Safety(ventilation)
- 7 Centralized monitoring (detection, analysis system)	Centralized monitoring system Expert System	Lecture, Surface exercise, Practice using Dummy Gallery	· Centralized monitoring system
- 8 Safety rule	Safety and Health regulation, Safety rule	Lecture	
- 9 Mine rescue	Emergency center, rescue team, Manual for correspondence to the urgent situation	Lecture, Practice using Dummy Gallery	· Rescue system

3. Underground Coal Mining Machinery Technology course

No.3

Curriculum	Lecture content and technology transfer items	Method of lecture	Necessary Machinery & Equipment for lecture
-1 Winding equipment (Vertical, inclined shaft)	Operation, maintenance, control technology for Winding equipment	Lecture, Practice using Dummy Gallery	· Transportation system
-2 Development equipment (Side dump etc.)	Operation, maintenance, control technology for Development equipment	Lecture, Surface exercise, Practice using Dummy Gallery	Share with Mining (Development) technology · Hydraulic/pressed air system
-3 Coal mining equipment (Long wall mechanized, iron prop/kape)	Operation, maintenance, control technology for Coal mining equipment	Lecture, Practice using Dummy Gallery	(Hydraulic equipment system) (Coal mining/development equipment system) Share with coal mining technology
-4 Transportation equipment (B C, hoist etc.)	Operation, maintenance, control technology for Transport equipment	Lecture, Practice using Dummy Gallery	(Transportation system)
-5 Ventilation equipment (Main fan, Supplementary fan etc.)	Operation, maintenance, control technology for Ventilation equipment	Lecture, Practice using Dummy Gallery	Share with safety(ventilation)
-6 Water drainage equipment (Pump, pipe etc.)	Operation, maintenance, control technology for Water drainage equipment	Lecture, Practice using Dummy Gallery	· Water drainage system · Piping system
-7 Explosion proof equipment (various kind)	Operation, maintenance, control technology for Explosion proof equipment	Lecture, Practice using Dummy Gallery	· Explosion proof system · Cable equipment
-8 Centralized monitoring equipment	Operation, maintenance, control technology for Centralized monitoring equipment	Lecture, U/G Practice using Dummy Gallery	Share with Safety (Centralized monitoring technology)
-9 Operational Manual /Maintenance manual	Manual preparation of the various kinds of machine/electricity devices Prevention safety	Lecture	

4. Underground Coal Mining Electricity Technology course

No.4

Curriculum	Lecture content and technology transfer items	Method of lecture	Necessary Machinery & Equipment for lecture
-1 Winding equipment (Vertical, inclined shaft)	Operation, maintenance, control technology for Winding equipment	Lecture, Practice using Dummy Gallery	• Transportation system
-2 Development equipment (Side dump etc.)	Operation, maintenance, control technology for Development equipment	Lecture, Surface exercise, Practice using Dummy Gallery	Share with Mining (Development) technology • Hydraulic/pressed air system
-3 Coal mining equipment (Long wall mechanized, iron prop/kappa)	Operation, maintenance, control technology for Coal mining equipment	Lecture, Practice using Dummy Gallery	(Hydraulic equipment system) (Coal mining/development equipment system) Share with coal mining technology
-4 Transportation equipment (B C, hoist etc.)	Operation, maintenance, control technology for Transport equipment	Lecture, Practice using Dummy Gallery	(Transportation system)
-5 Ventilation equipment (Main fan, Supplementary fan etc.)	Operation, maintenance, control technology for Ventilation equipment	Lecture, Practice using Dummy Gallery	Share with safety(ventilation)
-6 Water drainage equipment (Pump, pipe etc.)	Operation, maintenance, control technology for Water drainage equipment	Lecture, Practice using Dummy Gallery	• Water drainage system • Piping system
-7 Explosion proof equipment (various kind)	Operation, maintenance, control technology for Explosion proof equipment	Lecture, Practice using Dummy Gallery	• Explosion proof system • Cable equipment
-8 Electrical equipment (Transformer, switchboard, cable, Motor, various kinds safety device etc.)	Operation, maintenance, control technology for Electrical equipment	Lecture, Practice using Dummy Gallery	(Explosion proof system) (Cable equipment)
-9 Lighting · communication equipment	Operation, maintenance, control technology for Lighting · communication equipment	Lecture, Practice using Dummy Gallery	• Lighting equipment • Communication system
-10 Centralized monitoring equipment	Operation, maintenance, control technology for Centralized monitoring equipment	Lecture, Practice using Dummy Gallery	Share with Safety (Centralized monitoring technology)
-11 Operational Manual /Maintenance manual	Manual preparation of the various kinds of machine/electricity devices Prevention safety	Lecture	

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5. Coal Mining Environment Technology course

No.5

Curriculum	Lecture content and technology transfer items	Method of lecture	Necessary Machinery & Equipment for lecture
- 1 Subsidence	Theory of subsidence	Lecture Simulation	(Strata control system)
- 2 Water quality control	Water quality analysis technology, water processing technology	lecture, Indoor practice	• Water quality control system
- 3 Accumulation, Reclamation, Tree planting	Restoration technology	Lecture Field	
- 4 Coal preparation and Quality control	Coal preparation technology, Quality control technology, Coal preparation analysis technology	lecture, Indoor practice	• Coal preparation system • Coal analysis system
- 5 Possibility of coal processing	Sinking and floating experiment, passable selection curve preparation	lecture, Indoor practice	(Coal preparation system)
- 6 Construction of optimal system	Control technology of coal preparation factory	Lecture	(Coal preparation system)
- 7 Fine coal recovering and Waste water processing	Fine coal recovering technology, Waste water processing technology	lecture, Indoor practice	(Water quality control system)

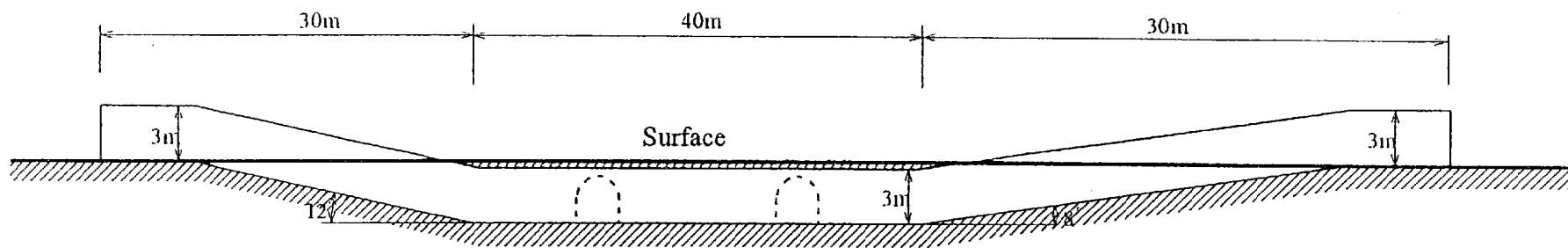
6. General knowledge course

- 1 Basic knowledge concerning to Coal (Distribution and reserves, Generation, Physics/chemical structure and nature, classification, coal quality)
- 2 Coal utilization technology (Various kinds combustion method, Air pollution, Coal cleaning, Gasification, liquefaction, CWM, CCS, briquette)
- 3 View of new technology (Underground gasification, coal seam gas utilization, up-grading technology for low rank coal)
- 4 Study of Natural Resources, and Coal Market(supply and demand)
- 5 Energy and Earth environment
- 6 Current Indonesian coal situation and future planning, prediction, mining policy
- 7 Mining Law and inspection (including mining safety)
- 8 Environment regulation

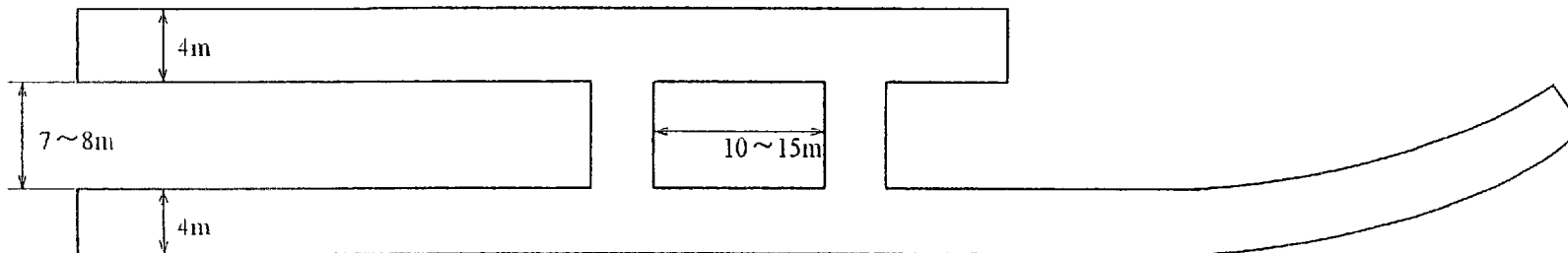
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Layout of Experimental Roadway (Tentative)

Total Length : about 200m



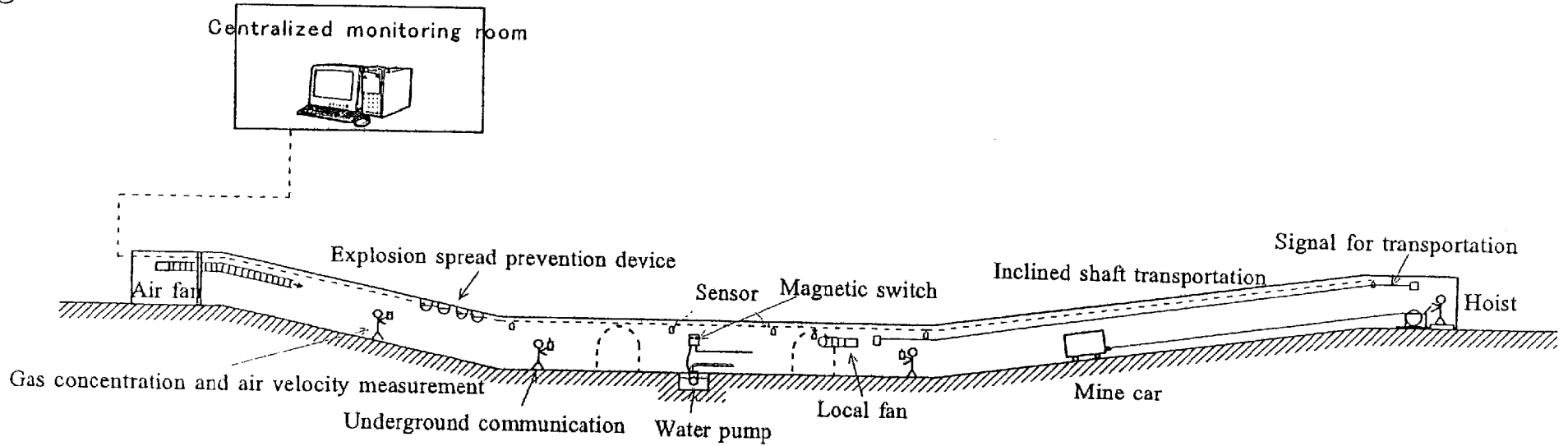
Sectional View



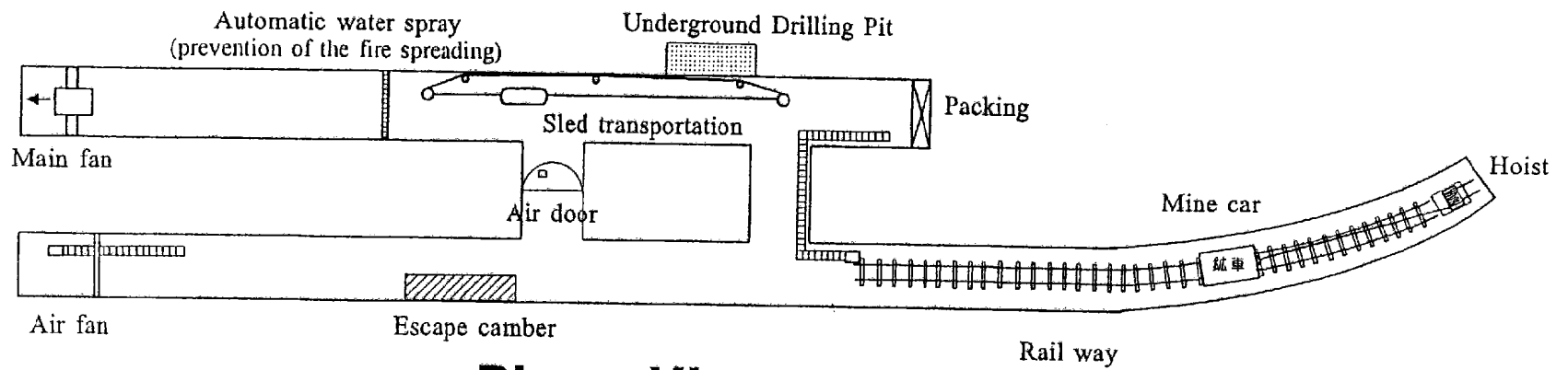
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Sectional View



Plane View

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SAFETY-ENSURING COUNTERMEASURES IN CONNECTION WITH THE
COAL MINING TECHNOLOGY ENHANCEMENT PROJECT
AT OMBILIN MINES TRAINING COLLEGE
IN THE REPUBLIC OF INDONESIA

I. Underlying Concepts

1. Basic principles for entering the underground mine.
 - (1) Regarding basic principles for ensuring the safety of persons related to the Project (experts and counterparts), transfer of technologies shall be implemented at Ombilin Mines Training College on experimental roadways, and actual entering of the underground mine shall be limited to cases necessary for the transfer of such technologies. The frequency of mine entry should also be reduced to a minimum.
 - (2) In order to provide for the transfer of technologies underground, a request to ensure safety of the areas to be visited shall be made in advance, and persons entering the mine must take necessary procedures and appropriate safety measures.

II. Safety-ensuring Countermeasures for entering the mine

1. Safety-ensuring countermeasures to be taken by the OCM at the earliest possible time.
 - (1) Prior to groups of persons concerned entering the mine in connection with the Project, OCM will be asked to implement the following measures.
 - ① Implementation of measures against loose roof rocks and repairs in roadways at (U-shaped) crossings near intake airways.
 - ② Repair of supports in the roadways which are to be used for training purposes during the Project (in Section J1-J2 or Section J6-J7).
 - ③ Improvement of the passageway from the mine portal to the roadways to be used for training purposes (in particular, the installation of stairways in inclined shaft areas).
 - ④ Maintenance and repair of ill-drained areas at the earliest possible time.
 - ⑤ Improvement and thorough management of ventilation.
 - ⑥ Performance of periodic checks on supports and reinforcement of dangerous parts/areas at the earliest possible time.
 - ⑦ Improvement of water-spraying capability in areas that are prone to coal dust occurrence (such as coal loading points, coal loaded on mine cars, coal dumping points from conveyor belts.), Strict enforcement of clean-up of areas where coal heaps are easily formed (areas surrounding conveyor belts

and coal loading points)

- ⑧ Improvement of observation of sealed-off areas, areas surrounding ventilation doors, triangular pillars and gobs, etc. where spontaneous combustion may occur.
And, according to necessity, improvement of efforts toward early detection of spontaneous combustion using thermometers.
- ⑨ Improvement of measurement of negative pressure at important points (ventilation doors in particular).
- ⑩ Strict enforcement of firedamp measurement.

2. Safety-ensuring countermeasures to be taken by the persons in charge of the Project.

(1) Mine-entry procedure

① Mine-entry application

Japanese experts who are entering the mine shall submit an application to the Team Leader, and Indonesian Counterparts who are entering the mine shall submit an application beforehand to the Project Manager (including the Assistant Project Manager, -- this will also apply to the item below) for approval.

② Approval

After receiving an application, the Team Leader and the Project Manager will issue approval after having studied its necessity and the applicant's plan for entering the mine. According to circumstances, they may make changes to the plan or add conditions.

(2) Safety Measures to be taken by those who are approved to enter the mine.

- ① Persons wishing to enter the mine shall receive explanations from the OCM's safety manager or other person responsible for safety on areas to be visited, items of danger and precaution, and accouterments to be worn along with their functions and directions for use before entering.
- ② At the time of mine entry, the party should form a line in single file consisting of around 10 persons maximum, with the person responsible for the safety from OCM or the on-site safety-supervisor in front.
- ③ Before entering the mine, the functions of the following accouterments should be understood, and the items worn correctly.
 - Dust mask
 - Dust glass
 - Gas detector
 - Oxygen self-rescuer
- ④ In the event of a shutdown of fans (main fan or local fan), an evacuation from the mine shall be conducted immediately.
- ⑤ No actual work shall be conducted underground.
- ⑥ While underground, gas (firedamp) concentration measurements shall be conducted by both the Japanese and Indonesian sides at predetermined

locations. If a gas concentration exceeding Indonesia's maximum permissible concentration level is detected, an evacuation from the mine shall be conducted immediately.

(3) Other Safety Measures

- ① No entry shall be made on days (such as Monday) following a holiday.
- ② Entry into underground routes that are being used for the transportation of heavy equipment shall be avoided.
- ③ Safety training shall be provided through counterparts for OCM personnel who are concerned with technological cooperation.
- ④ In the event that training is carried out in the areas of development and mining (PANEL, SL VI) in connection with Longwall, which is expected in the future, a request should be made to the Coal Mine Project's Safety Assessment Committee, and the training will be conducted according to the response to the request.

(4) Safety Committee

A Mine Safety Committee (provisional name) consisting of persons in charge shall be formed, and this committee shall meet regularly with the objective of establishing optimum safety levels for the implementation of the Project.

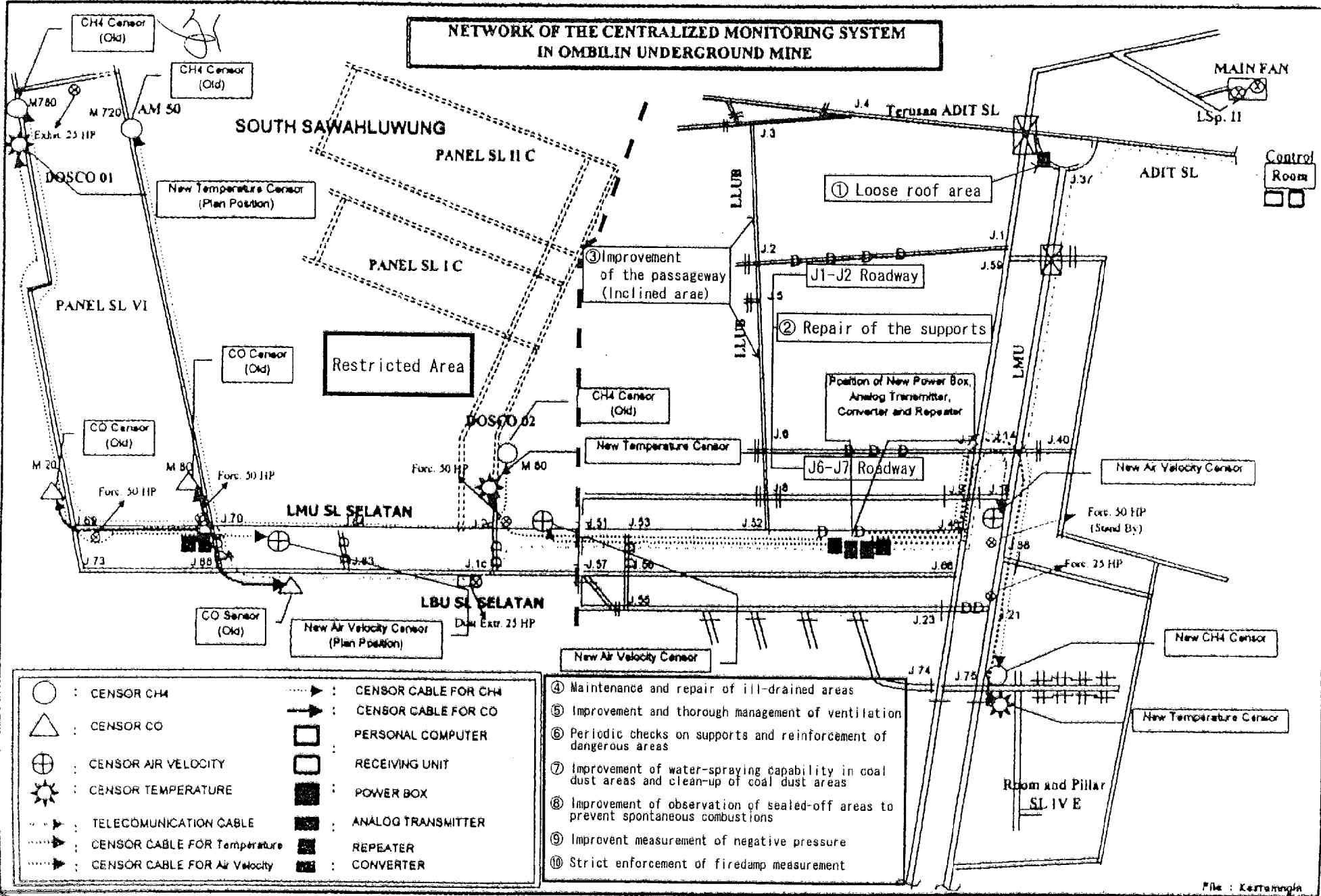
Project side:	Japanese side:	(team leader, coordinator, expert responsible for safety matters)
	Indonesian side:	(project manager, counterparts, safety management personnel)
OCM	:	mine manager, safety management personnel

3. Safety-ensuring countermeasures to be requested of the OCM at the time of mine entry.

(1) When persons concerns with the Project are entering the mine, the OCM shall be requested to take the following measures:

- ① The safety manager or other person in charge of safety should provide advance explanation to persons entering the mine of underground conditions and possible dangerous areas.
- ② The safety manager or on-site personnel responsible for safety will be positioned at the front and rear ends of the group, which will proceed in single file.
- ③ Enforcement of firedamp concentration measurements by the person(s) leading the group proceeding in single file.
- ④ Absolute cessation of blasting work in the places to be visited in the mine.
- ⑤ Complete cessation of transportation work in the places to be visited in the mine.

NETWORK OF THE CENTRALIZED MONITORING SYSTEM IN OMBILIN UNDERGROUND MINE



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- | | | | |
|-----|---------------------------------|-----|------------------------|
| ○ | : SENSOR CH4 | —●— | : SENSOR CABLE FOR CH4 |
| △ | : SENSOR CO | —▲— | : SENSOR CABLE FOR CO |
| ⊕ | : SENSOR AIR VELOCITY | □ | : PERSONAL COMPUTER |
| ☀ | : SENSOR TEMPERATURE | □ | : RECEIVING UNIT |
| —●— | : TELECOMMUNICATION CABLE | ■ | : POWER BOX |
| —▲— | : SENSOR CABLE FOR Temperature | ■ | : ANALOG TRANSMITTER |
| —▲— | : SENSOR CABLE FOR Air Velocity | ■ | : REPEATER |
| | | ■ | : CONVERTER |

- ④ Maintenance and repair of ill-drained areas
- ⑤ Improvement and thorough management of ventilation
- ⑥ Periodic checks on supports and reinforcement of dangerous areas
- ⑦ Improvement of water-spraying capability in coal dust areas and clean-up of coal dust areas
- ⑧ Improvement of observation of sealed-off areas to prevent spontaneous combustions
- ⑨ Improvement measurement of negative pressure
- ⑩ Strict enforcement of firedamp measurement

List of the Equipment to be procured

1. Underground Coal Mining Technology

No.1

Classification	Items	Responsible side	Procurement schedule *1)	Place of purchase
(1) Mapping System	1 Clinometer	Japanese	JFY2001	Japan
	2 Hand level	Japanese	JFY2001	Japan
	3 Compass	Japanese	JFY2001	Japan
	4 Sketching board, Paper, etc.	Japanese	JFY2001	Japan
	5 Hammer	Japanese	JFY2001	Japan
	6 GPS	Japanese	JFY2000	Japan
(2) Geological Analysis System	7 Geological analysis software	Japanese	JFY2001	Japan
	8 Coal area calculator device	Japanese	JFY2001	Japan
(3) U/G Boring System	9 U/G Boring machine	Japanese	JFY2000	Japan
(4) U/G Surveying System	10 Level	Japanese	JFY2000	Japan
	11 Measurement devices (Transit)	Japanese	JFY2000	Japan
	12 Light distance measure	Japanese	JFY2000	Japan
	13 Transceiver	Japanese	JFY2000	Japan
(5) Blasting System	14 Computer aided design system(CAD)	Japanese	JFY2000	Japan
	15 Hammer	Japanese	JFY2000	Japan
	16 Hammer tools	Japanese	JFY2000	Japan
	17 Auger	Japanese	JFY2000	Japan
	18 Auger tools	Japanese	JFY2000	Japan
	19 Explosives (Model)	Japanese	JFY2000	Japan
	20 Blasting tester (Ω meter)	Japanese	JFY2000	Japan
	21 Detonator (Model)	Japanese	JFY2000	Japan
	22 Tester (Ω meter)	Japanese	JFY2000	Japan
	23 Drilling training pit	Japanese	JFY2001	Indonesia
(6) Coal Mining System	24 Single prop	Japanese	JFY2000	Japan
	25 Iron Bar	Japanese	JFY2000	Japan
	26 Coal pick	Japanese	JFY2000	Japan
	27 Air block	Japanese	JFY2000	Japan
	28 Lever block	Japanese	JFY2000	Japan
	29 Chain block	Japanese	JFY2000	Japan
	30 Power roof support (Model)	Japanese	JFY2000	Japan
	31 Mechanized long wall (Model)	Japanese	JFY2000	Japan
(7) Development System	32 Side dump loader	Japanese	JFY2000	Japan
	33 U/G structure (Model)	Japanese	JFY2001	Japan
	34 Road header (Model)	Japanese	JFY2000	Japan
(8) Strata Control System	35 Strata pressure calculation software	Japanese	JFY2001	Japan
	36 Strata pressure (Model)	Japanese	JFY2001	Japan
	37 Rock bolt and tools	Japanese	JFY2000	Japan
	38 Displacement measure device and tools	Japanese	JFY2000	Japan
	39 Schmidt Hammer	Japanese	JFY2000	Japan

2. Underground Coal Mining Safety Technology

(1) Gas Detect / Analysis System	40 CH4 detector (Portable type)	Japanese	JFY2000	Japan
	41 CO2 detector (Portable type)	Japanese	JFY2000	Japan
	42 CO detector (Portable type)	Japanese	JFY2000	Japan
	43 Oxygen detector (Portable type)	Japanese	JFY2000	Japan
	44 Gas alarm detector	Japanese	JFY2000	Japan
	45 Multiple gas detector	Japanese	JFY2000	Japan
	46 Kitagawa type gas detector	Japanese	JFY2000	Japan
	47 Gas chromatograph	Japanese	JFY2000	Japan
48 CO mask	Japanese	JFY2000	Japan	
(2) Gas/Coal Dust Explosion System	49 Gas explosion experiment devices	Japanese	JFY2000	Japan
(3) Mine Dust Measurement System	50 Dust detector	Japanese	JFY2000	Japan
	51 Dust sampler	Japanese	JFY2000	Japan
	52 Auto balance	Japanese	JFY2000	Japan
	53 Dust mask	Japanese	JFY2000	Japan
(4) Ventilation System	54 Protective glasses	Japanese	JFY2000	Japan
	55 Axial fan	Japanese	JFY2000	Japan
	56 Biram velocity detector (Handy)	Japanese	JFY2000	Japan
	57 Smoke Tester	Japanese	JFY2000	Japan
	58 Thermo-hydrometer	Japanese	JFY2000	Japan
	59 Windgauge	Japanese	JFY2000	Japan
	60 Atmospheric pressure detector	Japanese	JFY2000	Japan
61 Ventilation analysis system	Japanese	JFY2000	Japan	
(5) Spontaneous Combustion System	62 Grouting device	Japanese	JFY2000	Japan
(6) Fire Fighting System	63 Fire fighting pump	Japanese	JFY2000	Japan
	64 Fire fighting pump tools	Japanese	JFY2000	Japan
	65 Fireplug equipment	Japanese	JFY2000	Japan
(7) Fire Extension-proof System	66 Auto-spray facility	Japanese	JFY2000	Japan
	67 Explosion spread prevention	Japanese	JFY2001	Japan
(8) Rescue Team System	68 Oxygen breathing apparatus	Japanese	JFY2000	Japan
	69 Emergency camber	Japanese	JFY2000	Japan
	70 Check devise (3 type tester)	Japanese	JFY2000	Japan
	71 Resasiater (Dummy for first aid)	Japanese	JFY2000	Japan
	72 Stretcher	Japanese	JFY2000	Japan
(9) Centralized Monitoring System	73 Monitoring System	Japanese	JFY2000	Japan

*1) JFY: Japanese Fiscal Year.

3. Underground Coal Mining Machinery Technology

No.2

Classification	Items	Responsible side	Procurement schedule *1)	Place of purchase
(1) Conveyor System	74 Belt conveyor (only Belt)	Japanese	JFY2001	Indonesia
	75 Emergency stop	Japanese	JFY2001	Japan
	76 Monitoring devices	Japanese	JFY2001	Japan
(2) Transportation System	77 Hoist (included wire-rope)	Japanese	JFY2000	Japan
	78 Roller (Vertical, horizontal)	Japanese	JFY2001	Japan
	79 Wire rope connector	Japanese	JFY2001	Japan
	80 Hoist fixation device	Japanese	JFY2001	Indonesia
	81 Signal equipment	Japanese	JFY2001	Japan
	82 Sled transport (Motor)	Japanese	JFY2001	Japan
	83 Rope, guide roller, sheave	Japanese	JFY2001	Japan
	84 Sled Motor fixation device	Japanese	JFY2001	Indonesia
	85 Electric locomotive (model)	Japanese	JFY2001	Japan
(3) Hydraulic System	86 Hydraulic system (for teaching)	Japanese	JFY2001	Japan
(4) Compressed Air System	87 Compressor (from OMTC)	Indonesian		
	88 Hose	Japanese	JFY2000	Japan
(5) Water Drainage System	89 Water pump	Japanese	JFY2000	Japan
	90 Air pump	Japanese	JFY2001	Japan
	91 Check valve and tools	Japanese	JFY2001	Japan
(6) Piping System	92 Pipe and tools	Japanese	JFY2000	Japan
(7) Face/Development Mechanized System	93 Plunger pump (from OMTC)	Indonesian		
	94 Setgun for prop	Japanese	JFY2000	Japan
	95 Valve	Japanese	JFY2000	Japan
	96 High pressure hose and tools	Japanese	JFY2000	Japan

4. Underground Coal Mining Electricity Technology

(1) Explosion Proof system	97 Distribution panel	Japanese	JFY2000	Japan
	98 Breaker	Japanese	JFY2000	Japan
	99 Electromagnetic switch	Japanese	JFY2000	Japan
	100 Transformer	Japanese	JFY2000	Japan
	101 Automatic alarm	Japanese	JFY2000	Japan
	102 Smoke detector	Japanese	JFY2000	Japan
(2) Cable devise system	103 Cables	Japanese	JFY2000	Japan
	104 Cable joint (for Inter-lock)	Japanese	JFY2000	Japan
(3) Communication system	105 Induction type communication	Japanese	JFY2001	Japan
	106 U/G Telephone	Japanese	JFY2001	Japan
(4) Lighting system	107 Explosive-proof electric lamp	Japanese	JFY2000	Japan
	108 Signal equipment	Japanese	JFY2000	Japan
	109 Caplamp	Japanese	JFY2000	Japan
	110 Charging unit	Japanese	JFY2000	Japan

5. Coal Mining Environment Technology

(1) Water Quality Control System	111 PH measurement device	Japanese	JFY2001	Japan
	112 Measurement of dirty water (SS)	Japanese	JFY2001	Japan
	113 Water treatment model	Japanese	JFY2001	Japan
(2) Coal Preparation System	114 Mini preparation plant	Japanese	JFY2000	Japan
(3) Coal Analysis System	115 Proximate analysis device	Japanese	JFY2001	Japan
	116 Calorie meter	Japanese	JFY2001	Japan

6. Educational Facility

(1) Audio-visual Education System	117 Copy machine	Japanese	JFY2000	Indonesia
	118 OHP	Japanese	JFY2000	Indonesia
	119 PC visual presenter	Japanese	JFY2000	Indonesia
	120 Screen	Japanese	JFY2000	Indonesia
	121 Copy white board	Japanese	JFY2000	Indonesia
	122 Video camera	Japanese	JFY2000	Indonesia
	123 Digital camera	Japanese	JFY2000	Indonesia
	124 Video deck	Japanese	JFY2000	Indonesia
	125 Scanner	Japanese	JFY2000	Indonesia
	126 Monitor	Japanese	JFY2000	Indonesia
(2) Data Analysis	127 Computer	Japanese	JFY2000	Indonesia
	128 Printer	Japanese	JFY2000	Indonesia
	129 Application software	Japanese	JFY2000	Indonesia
(3) Training Material	130 Video tapes	Japanese	JFY2001	Japan

7. Vehicle

(1) Vehicle	131 Land cruiser	Japanese	JFY2000	Indonesia
	132 Mini-Bus	Japanese	JFY2000	Indonesia

*1) JFY: Japanese Fiscal Year

LIST OF EXISTING MACHINERY AND EQUIPMENT
AT OMTC

No.	ITEM	NUMBER OF ITEM	
1	2	3	
I.	TECHNICAL EQUIPMENT		
1	Drilling Machine	6	unit
2	Acetelyn Gas	1	unit
3	Arc Machine	3	unit
4	Lathes Machine	2	unit
5	Hacksaw Machine	1	unit
6	Hidrolik Jack	1	unit
7	Compressor	1	unit
8	Transmition Stand	5	unit
9	Engine & Radial	1	unit
10	Air Cleaner	5	unit
11	Air Filter	1	unit
12	Housing	1	unit
13	Seal Kitt	2	unit
14	Sovece Kitt	1	unit
15	PT. Pump	1	unit
16	Gear Pump	3	unit
17	Piston Pump	1	unit
18	Traction Motor	2	unit
19	Equitment Control Valve	1	unit
20	Automatic Shift Vontrol	1	unit
21	Switch Control Valve HD.325	1	unit
22	Swing Motor PC.220	1	unit
23	Hydraulic Equipment C. Valve	1	unit
24	Steering Pump D.85	1	unit
25	Hydraulic Control Valve D.8L	1	unit
26	Air Master	2	unit
27	Hydraulic Pump	1	unit
28	Hydro Master	3	unit
29	Turbo Charger	2	unit
30	Injection Pump	2	unit
31	Frais Machine	1	unit

	2	3
32	Milling Machine Universal	1 unit
33	Drilling Machine	2 unit
34	Grinding Machine, Rema	1 unit
35	Mobilling Crane	1 unit
36	Archis Set	10 unit
37	H-Beam	8 unit
38	Rail Track	10 unit
39	Ruzrusznik	1 unit
40	Dinamo Loko Slinik	1 unit
II. LABORATORY EQUIPMENT		
1	Hidrolics Training Rig	1 unit
2	Pneumatic Kit Base	8 unit
3	Pneumatic Extention Kit	8 unit
4	Needle Valve 55 m - 175 - 010 B	3 unit
5	Standard Cylinders	23 unit
6	Midgef Cylinders	8 unit
7	Compressed Air Filters	7 unit
8	Compressed Air Regulator	7 unit
9	Spool Values	80 unit
10	Air Reservoir	5 unit
11	Trottle Values	60 unit
12	Shuttle Values	16 unit
13	Hose	57 unit
14	Pressure Switch	8 unit
III. ELECTRICAL EQUIPMENT		
1	Lockavolt Power Supply	1 unit
2	Regulator Power Supply	1 unit
3	Frequency Counter 500 MHZ	1 unit
4	Signal Generator & Amplifier	1 unit
5	Xenon Stroboscope	1 unit
6	Frequency Counter 2 GHZ	7 unit
7	Logic Probe LP-3500	10 unit
8	Tang Ampere	1 unit
9	Oscilloscope HM203G	3 unit
10	Microprocessor LSZ80	5 unit
11	Conector Oscilloscope & Frek. Counter	1 unit
12	Avometer YX-360 TRE	7 unit
13	Cos-Q-Meter V3060	2 unit

1	2	3	
14	Frequency Meter V300	3	unit
15	AM Meter E350C	5	unit
16	Volt Meter E350	7	unit
17	Digital Multitester DM7333	4	unit
18	Watt Hour Meter 3 Phase	6	unit
19	Stop Watch	5	unit
20	Meger 1010T	2	unit
21	Multi Meter	3	unit
22	Portable Ampemeter 10A	4	unit
23	Portable Voltmeter 750	4	unit
24	Portable Polyphase Watt meter 2042	1	unit
25	Portable Power Factor meter 2039	1	unit
26	Portable Fire Quency meter	1	unit
27	Portable Single Phase Watt meter 2041	1	unit
28	Ameter Muffing Coil 500 mA	52	unit
29	Micro Ampere 100 A	1	unit
30	Mili Volt 35 mV	8	unit
31	Resistor Geser 10 A	10	unit
32	Transformer Stand & Core	1	unit
33	Coll Law Vortage 300 Turns	2	unit
34	Tapped coll	1	unit
35	Resistance Unit 0,1 OHMS	216	unit
36	Electronic System Stater Kit LK 75 A	8	unit
37	Electronic System (add on) Kit LK 75 B	8	unit
38	Half Meter Bridge Scala 0-50 cmx1mm and 50-0 cm x 1 mm	8	unit
39	Machine Test Bad TR 1000, FH2 MK2+ 3 phase Transformer Box	1	1 unit
40	PLC/H 3000	1	unit
41	Power Unit	1	unit
42	Power Supply	1	unit
43	Linear Amplifier	1	unit
44	SWR & Power Meter	1	unit
45	Antena Toner	2	unit
46	Power Meter	1	unit
47	Adjustable Feed Horn	1	unit
48	Modular Micro Processor	13	unit
49	Bread Board	15	unit
50	Voltage Regulator 8 A	5	unit
51	Pesoldering Pump	9	unit
52	Serve Drever	3	unit

List of Counterpart and Administration Personnel

1. List of Full-Time Technical Counterparts OMTC

No	Name	Course	Present Position
1	Ir. Arifin Taib	Mining	Vice General Manager of PTBA UPO (Mining Engineering)
2	Drs. Murad MS., MT.	Mining	Lecturer in Mining Engineering (Padang University)
3	Asep Suryana, ST.	Mining	Mining Engineering (MDCM)
4.	Ir. Dadzui Ismail	Safety	Safety Manager Mining Engineering PTBA - UPO
5.	Ir. Zulfahmi	Safety	Mining Engineering PTBA - UPO
6.	Zul Ichwan, ME. (Hons)	Safety	Principal OMTC (Mining Engineering)
7.	Alexander Tomasoa	Mechanical	Lecturer in Mechanical Engineering (OMTC)
8.	Drs. Asmara Karma	Mechanical	Deputy Principal OMTC (Mechanical Engineering)
9.	Drs. Bambang Heriati, MT.	Mechanical	Lecturer in Mechanical Engineering (Padang University)
10.	Drs. Muryanto	Electrical	Lecturer in Electrical Engineering (OMTC)
11.	Gusti A. Wahyudi	Electrical	Lecturer in Electrical Engineering (OMTC)
12.	Marsudi, BE.	Electrical	Electrical Engineering PTBA - UPO
13.	Drs. Rijal Abdullah, MT.	Environment	Lecturer in Mechanical Engineering (Padang University)
14.	Yones Simanjuntak	Environment	Lecturer in Mechanical Engineering (OMTC)
15.	Hamdan Fridon	Environment	Lecturer in Mining Engineering (OMTC)

2. List of Administrative Personnel OMTC

No	Name	Present Position
1.	Anton Adi Rozianto	Adm. and Finance Manager
2.	Sri Handayani	Secretary
3.	Syamsul Bahri	Maintenance Services Teaching Facilities
4.	Miswardi	Maintenance Services Teaching Facilities
5.	Sumarno	Maintenance Services Non Teaching Facilities
6.	Darna	Maintenance Services Non Teaching Facilities
7.	Abu Bakar	Security
8.	Rizal	Store Services and Properties Maintenance
9.	Suripno	Mechanical Electrician
10.	Sumasdi	Security

TENTATIVE BUDGET PLAN TO BE ALLOCATED FOR THE PROJECT BY INDONESIAN SIDE

(Thousand Rupiahs)

No.	ITEM	YEAR					TOTAL	REMARKS
		2001	2002	2003	2004	2005		
1	Building * JICA Expert and Counterpart Office * Laboratory of Analysis Test, and Centralized Monitoring	1.552.000	-	-	-	-	1.552.000	
2	Office Equipment	575.000	575.000	-	-	-	1.150.000	
3	Dormitory Equipment	116.000	116.000	-	-	-	232.000	
4	Personnel Protective Equipment	100.000	-	-	-	-	100.000	
5	Computer Laboratory	-	530.000	-	-	-	530.000	
6	Vehicle (2 units)	180.000	180.000	-	-	-	360.000	
7	Personnel Fee/Allowance : * Counterpart (CP) * Staff	207.750	207.750	207.750	207.750	207.750	1.038.750	Salary of the counterparts and administration staff
8	Consumable Training for CP	191.250	210.375	231.413	254.554	280.009	1.167.600	
9	Travel for CP	60.000	60.000	60.000	60.000	60.000	300.000	Daily allowance and accommodation
10	Operational Cost Stationery Photo Copy	112.800	112.800	112.800	112.800	112.800	564.000	
11	Training Programme * Accomodation and travel for trainees * Accomodation and travel for trainers * Training Consumable * Field Trip * Marketing	-	1.000.000	1.000.000	1.000.000	1.000.000	4.000.000	
12	Maintenance * Training Equipment * Building * Vehicle * Cleaning Service	414.958	414.958	414.958	414.958	414.958	2.074.790	Repair, spare parts, etc.
13	Electricity and Local Telephone	50.000	50.000	50.000	50.000	50.000	250.000	
14	Handling	224.860	-	-	-	-	224.860	
	Total	3.784.618	3.456.883	2.076.921	2.100.062	2.125.517	13.544.000	

Project Design Matrix (PDM ver.1) for Coal Mining Technology Enhancement Project at Ombilin Mines Training College (OMTC) in the Republic of Indonesia

Project Name: Coal Mining Technology Enhancement Project at Ombilin Mines Training College in the Republic of Indonesia
 Project Site: Sawahlunto, West Sumatra, Republic of Indonesia

Duration: 5 Years
 Target Group: Coal Mining Supervisor

Date: June 23, 2000

	Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal	Underground coal mining technology is enhanced in the Republic of Indonesia.	<ul style="list-style-type: none"> Coal production from underground mine Accident rates of underground mine Status of employment and job category of coal mining supervisor (OMTC graduate) 	<ul style="list-style-type: none"> Coal production statistics of Directorate General of Mines (DGM) Accident statistics of Directorate General of Mines(DGM) Follow-up survey for OMTC graduate 	<ul style="list-style-type: none"> Smooth progress of Energy Supply & Demand Scheme Coal policy will not be shifted. Master Plan on Human Resources development will not be Shifted.
Project Purpose	Ombilin Mines Training College (OMTC) is able to train underground mining supervisors.	<ul style="list-style-type: none"> Number of C/P and qualification of C/P as trainers in OMTC Number of coal mining supervisors as trainees completed and registered in OMTC 	<ul style="list-style-type: none"> Statistic of MDCM Statistic of OMTC 	<ul style="list-style-type: none"> Trained coal mining supervisor continues to engage in activities related to underground mining technology in respective organization. Central and local Governments will support and cooperate with OMTC.
Outputs	<ol style="list-style-type: none"> Administrative system of the project is established. Operation and maintenance system of machinery and equipment of the project is established by Counterparts. Preparation for implementation of the following courses by Counterpart is completed. <ul style="list-style-type: none"> Underground Coal Mining Technology Training Course Underground Coal Mining Safety Technology Training Course Underground Coal Mining Machinery Technology Training Course Underground Coal Mining Electricity Technology Training Course Underground Coal Mining Environment Technology Training Course The following course are being implemented at Ombilin Mines Training College <ul style="list-style-type: none"> Underground Coal Mining Technology Training Course Underground Coal Mining Safety Technology Training Course Underground Coal Mining Machinery Technology Training Course Underground Coal Mining Electricity Technology Training Course Underground Coal Mining Environment Technology Training Course 	<ol style="list-style-type: none"> Assignment of C/P and allocation of OMTC budget <ul style="list-style-type: none"> Number of courses, classes and trainees planned Inventory, maintenance and utilization status of training machinery and equipment <ul style="list-style-type: none"> C/P operational and maintenance skill for training machinery and equipment Curriculum and educational materials of each course <ul style="list-style-type: none"> Certificate for Trainer required to teach courses Qualification of C/P Number of courses, classes and trainees completed <ul style="list-style-type: none"> Certificate for Trainees required to complete courses Number of Certificate awarded to trainees and graduates 	<ol style="list-style-type: none"> Administrative and account report <ul style="list-style-type: none"> Records of training activity Asset list and check list of training machinery and equipment <ul style="list-style-type: none"> Evaluation report of operational and maintenance skill of C/P Guideline for curriculum and training materials <ul style="list-style-type: none"> Guideline of Certificate for Trainer Certificate status of each C/P Records of training activity <ul style="list-style-type: none"> Guideline of Certificate for Trainee Academic performance record of trainees and graduates 	<ul style="list-style-type: none"> Needs for educational opportunities of underground coal mining technology do not change from the Project start date.

FIVE (5) BASIC EVALUATION COMPONENTS

1. The Five Basic Components

The five basic components defined by JICA as mentioned below are in line with those used for evaluation work by DAC (Development Assistance Committee, OECD) and other international assistance organizations. Introduction of these components has enabled a consistent, well-balanced evaluation, which minimizes evaluator biases. Further, it allows us to share results, knowledge and lessons with other aid organizations, since we are using common components and discussing issues with them from the same viewpoints.

(1) Efficiency

Evaluate the method, producers, term, and cost of the project with a view to productivity.

(2) Effectiveness

Evaluate the result in comparison with the goals (or revised goals) defined at the initial or intermediate stage, and evaluate the attributes (factors and conditions) of the result.

(3) Impact

Evaluate the positive and negative effects of the project, extent of the effect and beneficiaries.

(4) Relevance

Perform a preliminary evaluation as to whether the needs in the country have been correctly identified, and whether the design is consistent with the national and/or master plan.

(5) Sustainability

Evaluate the autonomy and sustainability of the project after the termination of cooperation, from the perspectives of preparation, management, economy, finance and technology.

2. Relation between the Five Basic Components and the PDM

The five components are used for the evaluation and the selection of a project. These components are directly connected to the elements of the PDM.

(1) Efficiency

The component efficiency is a measure to qualitatively and quantitatively compares all resources (input) to the results (output) of the project in order to evaluate the economic efficiency of conversion from input to output.

(2) Effectiveness

The component effectiveness is a measure to evaluate whether the project purpose has been achieved or not, to evaluate how much the output contributed to the achievement of the project purpose, or to evaluate whether or not the characteristics of the output were as expected.

(3) Impact

The component impact refers to evaluation of foreseeable or unforeseeable as well as favorable or adverse effects that a project has on society. To evaluate impact, both the overall goal and the project purpose should be referred to in the beginning of the evaluation. Evaluation with this component can lead to confirmation as to whether or not the overall goal has been obtained. Evaluation with this component requires comprehensive survey in many cases.

(4) Relevance

The components relevance is comprehensive evaluation of whether or not the project meets the overall goal, the politics of both the donor and recipient, local needs and given priority levels. This is used to decide whether the project should be continued, reformulated or terminated.

(5) Sustainability

The component sustainability is comprehensive evaluation of how long the favorable effects of the project can continue after the project has been terminated. Evaluation with this component is required for decisions on how long local resources should continue to be used for the project, and to evaluate the importance the country receiving the assistance attaches to the project. According to the OECD (1989), sustainability is a component to be used as the final test of the success of a development project.

All five components are essential for all projects or programs. The five components give necessary information to the decision-maker so that he/she can decide how to approach the next step. Since each of the five components build on the intervention strategy, they also lay the foundation for standardization in monitoring and information handling within and among organizations and agencies.

In practice, each of the five components should also contain project-specific information.

Tentative Schedule of Implementation (TSI)

Calendar Year	2000				2001				2002				2003				2004				2005				2006		Remarks
Quarter	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	
1. Duration of the project																											
2. Dispatch of Mission Team to Indonesia																											
1) Preliminary study	-																										
2) Supplementary study		-																									
3) Implementation study (R/D: Record of Document)			-																								
4) Management consultation team					-					-					-												
3. Japanese side																											
3.1 Long term experts																											
(1) Team Leader																											
(2) Coordinator																											
(3) Mining Technology																											
(4) Mine Safety Technology																											
(5) Mining Machinery Technology																											
(6) Mining Electricity Technology																											
(7) Mine Environment Technology																											
3.2 Short term experts																											
(1) Mining Technology																											
(2) Mine Safety Technology																											
(3) Machinery-Electricity Technology																											
(4) Environment Technology																											
(5) Machine installation/operation /maintenance																											
(6) Others																											
3.3 Provision of machinery and equipment								▼				▼															
3.4 Counterpart training in Japan								-				-															
4. Indonesia side																											
4.1 Budget allocation																											
4.2 Buildings and facilities for project																											
4.3 Machinery, equipment and materials																											
4.4 Assignment of Full-time counterpart																											
4.5 Privileges, exemptions and benefits to the Japanese experts																											
4.6 Qualification system																											
4.7 Measures for sustainability for the project																											

According to the
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Annual Plan of Operations (APO)

PM : Project Manager DPM : Deputy Project Manager CP : Counterpart TL: Team Leader CA : Coordinator LE : Long term Experts SE : Short term Experts
 Δ : Dispatch of Mission Team ▼ : Provision of Machinery

Calendar Year	2005												2006			Project relation responsibility	Input	Remark	
	Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2				3
Dispatch of Study Team to Indonesia																			
Provision of machinery and Equipment																			
1	Administrative system of the project is established.																		
1-1	Allocate necessary personnel as planned.																PM/DPM,TL,C	CP, L E	
1-2	Clarify the division of work.																PM/DPM,TL,C	CP, L E	
1-3	Make plans of activity.																PM/DPM,TL,C	CP, L E	
1-4	Prepare facilities and equipment for the project.																PM/DPM,TL,C	CP, L E	
1-5	Make annual plan of operations.																PM/DPM,TL,C	CP, L E	
2	Operation and maintenance system of machinery and equipment of the project is established by Counterpart.																		
Make a plan for procurement, installment and maintenance of machinery and equipment.																			
2-1	maintenance of machinery and equipment.																PM/DPM,TL	CP, L E, SE	
Procure, install, and maintain machinery and equipment.																			
2-2	Make operational and maintenance manuals of machinery and equipment.																PM/DPM,TL	CP, L E, SE	
2-3	Preparation for implementation of the each training courses by counterpart is completed.																PM/DPM,TL	CP, L E	
3	Make a plan of each training course.																PM/DPM,TL	CP, L E	
Prepare curriculums and materials for each training course.																			
3-2	Make a recruiting plan of trainees.																PM/DPM,TL	CP, L E	
3-3	Recruit trainees.																PM/DPM,TL,C	CP, L E	
3-4	The each training courses are being implemented at Ombilin Mines Training College.																PM/DPM,TL,C	CP, L E	
4	C/P acquires necessary knowledge for lecture of each training course and give lectures.																PM/DPM,TL	CP, L E, SE	
4-1	C/P acquires necessary skills to operate machinery and equipment of each course and give.																PM/DPM,TL	CP, L E, SE	
4-2	Evaluate each training course.																PM/DPM,TL,C	CP, L E	
4-3																			

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Annual Plan of Operations (APO)

PM : Project Manager DPM : Deputy Project Manager CP : Counterpart TL: Team Leader C : Coordinator LE : Long term Experts SE : Short term Experts
 △ : Dispatch of Mission Team ▼ : Provision of Machinery

Calendar Year	2004												2005			Project relation responsibility	input	Remark
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3			
Month																		
Dispatch of Study Team to Indonesia									△									
Provision of machinery and Equipment										▼								
1 Administrative system of the project is established.																		
1-1 Allocate necessary personnel as planned.										=====						PM/DPM,TL,C	CP, L E
1-2 Clarify the division of work.											=====						PM/DPM,TL,C	CP, L E
1-3 Make plans of activity.	=====																PM/DPM,TL,C	CP, L E
1-4 Prepare facilities and equipment for the project.										=====						PM/DPM,TL,C	CP, L E
1-5 Make annual plan of operations.	=====																PM/DPM,TL,C	CP, L E
2 Operation and maintenance system of machinery and equipment of the project is established by Counterpart.																		
2-1 Make a plan for procurement, installment and maintenance of machinery and equipment.											=====						PM/DPM,TL	CP, L E, SE
2-2 Procure, install, and maintain machinery and equipment.																	PM/DPM,TL	CP, L E, SE
2-3 Make operational and maintenance manuals of machinery and equipment.																	PM/DPM,TL	CP, L E, SE
3 Preparation for implementation of the each training courses by counterpart is completed.																		
3-1 Make a plan of each training course.																	PM/DPM,TL	CP, L E
3-2 Prepare curriculums and materials for each training course.																	PM/DPM,TL	CP, L E
3-3 Make a recruiting plan of trainees.																	PM/DPM,TL,C	CP, L E
3-4 Recruit trainees.																	PM/DPM,TL,C	CP, L E
4 The each training courses are being implemented at Ombilin Mines Training College.																		
4-1 C/P acquires necessary knowledge for lecture of each training course and give lectures.																	PM/DPM,TL	CP, L E, SE
4-2 C/P acquires necessary skills to operate machinery and equipment of each course and give.																	PM/DPM,TL	CP, L E, SE
4-3 Evaluate each training course.																	PM/DPM,TL,C	CP, L E

List of Attendance in the Discussion

1. The Japanese Side

(1) Implementation Study Team

Mr. Norinobu HAYASHI	Leader
Mr. Hiroaki TATSUNO	Coal Mining Technology
Mr. Koji NISHIMIYA	Project Cooperation Planning

(2) JICA Expert to Directorate of Coal (DOC)

Mr. Masafumi UEHARA

2. The Indonesian Side

(1) Directorate General of Mines (DGM)

Mr. Surna T. Djajadiningrat	Director General of Mines
Mr. Nasri Yunus Anis, SH	Secretary of Directorate General of Mines

(2) Directorate of Coal (DOC)

Mr. Farid Rachim S.A.	Section Manager
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(3) Manpower Development Center for Mines (MDCM)

Mr. Ahmad Thabri Akma, M.E.	Head
Dr. Ir. Irwan Bahar	Coordinator
Mr. Mulyono Hadiprayitmo, M. Sc.	Head, Mining Engineering Manpower Division
Mr. Zul Ichwan, M.E.	Head, Mineral Processing Sub Division
Mr. Drs. Wawan Supriatna	Chief, Programming and Reporting Sub Division
Mr. Marsudi Sudarisman	Functional/Instructor
Drs. Dedih Budiman	Head, Data Information and Library Management Manpower Section
Ms. Hirawati	English Lecturer

(4) Ombilin Mines Training College (OMTC)

Drs. Asmara Karma	Deputy Principal
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平成12年9月20日

インドネシア石炭鉱業技術向上プロジェクトに係る 安全確保対策

鉱工業開発協力部

I. 基本的考え方

1. 入坑に当たっての基本原則

- (1) 本プロジェクトにおける関係者（専門家及びC/P）の安全を確保する原則として、技術移転をできるだけ坑外及び模擬坑道内において実施することとし、入坑は技術移転の必要性上、やむを得ず坑内で技術移転（見学）を行わざるを得ない場合に限るものとする。また、その回数もできるだけ少なくするよう努めるものとする。
- (2) やむを得ず坑内にて技術移転を行なう場合に備えて、予め対象炭鉱箇所の安全確保対策を依頼するとともに、入坑者は入坑に当たっての手続き及び入坑に当たっての安全確保対策を十分行なうこととする。

II. 入坑に当たっての安全確保対策

1. オンビリン炭鉱に早期実施を依頼する安全確保対策

- (1) プロジェクト関係者が入坑するに先立ち、オンビリン鉱山に対し、以下の対策の実施を依頼する。
 - ① 沿層坑道に設置されているトランス等電機設備周辺に対する火災防止のため鉄板などによる覆いの施工
 - ② 入気付近の交差部（U字型）の坑道での浮石対策と補修
 - ③ プロジェクトの研修に使用する坑道（J1-J2間、またはJ6-J7間）の支保の補修
 - ④ 坑口から研修坑道に至る通路の改善（特に斜坑部での階段の敷設）
 - ⑤ 排水不良箇所の早期整備
 - ⑥ 通気管理の改善と徹底
 - ⑦ 支保の定期点検・危険箇所の早期補強。
 - ⑧ 炭じんの発生し易い箇所（石炭積み込み場、炭車積み石炭、ベルトコンベア落口等）の散水強化、炭じんの堆積し易い箇所（ベルトコンベア周辺や積み込み場周辺等）の清掃励行。
 - ⑨ 自然発火の起こりやすい密閉箇所、風門周辺、三角炭箇所、払跡等の監視強化。また、必要に応じては温度計を埋設して早期発見に努める。
 - ⑩ 要所（特に風門）での負圧測定強化。
 - ⑪ 坑内ガス測定の励行強化の徹底

2. プロジェクト関係者が行う安全確保対策

(1) 入坑手続き

①入坑申請

入坑者は事前にチーフアドバイザー及びプロジェクトマネージャー（アシスタントプロジェクトマネージャーを含む。以下、同じ）宛の申請書を提出し、認可を得る。

②認可

申請を受けたチーフアドバイザー及びプロジェクトマネージャーは、当該入坑見学の必要性及び内容を検討のうえ、認可を行う。場合により、計画の変更、条件の付与なども指示する。

(2) 入坑者の取るべき安全対策

① 入坑者は、入坑に先立ちオンビリン炭鉱の保安管理者または保安責任者より入坑場所、危険・注意事項、装着品の機能確認・使用方法等の説明を受けるものとする。

② 入坑に当たっては、必ずオンビリン炭鉱の保安または現場責任者の先導で、最小限度（10人前後）の人数の隊列で行なうものとする。

③ 入坑に当たっては、以下の装着品の機能を事前に確認の上、装着するものとする。

- － 防じんマスク
- － 防じんメガネ
- － ガス検定器
- － 酸素発生自己救命器

④ 扇風機（主扇または局扇）の停止時には、直ちに坑外へ退避するものとする。

⑤ 坑内における実作業は、基本的には行わないものとする。

⑥ 入坑時には、日・イ側双方で所定箇所でのガス濃度測定を行い、インドネシアの基準濃度以上のガス濃度を検知した場合には直ちに坑外へ退避する。

(3) その他の安全対策

①炭鉱休業日の翌日（月曜日等）は、入坑を行わない。

②重機運搬時の経路への入坑は避ける。

③技術協力に関連するオンビリン炭鉱関係者に対しては、C/P 経由で保安教育を行う。

④今後開発が予想されるロングウォールに係る掘進・採炭箇所（PANEL, SL VI）等での研修を行う場合には、再度炭鉱プロジェクト安全評価委員会の評価を仰ぎ、その結果に基づいて研修を実施することとする。

Annual Plan of Operations (APO)

PM : Project Manager DPM : Deputy Project Manager CP : Counterpart TL: Team Leader C : Coordinator LE : Long term Experts SE : Short term Experts
 Δ : Dispatch of Mission Team ▼ : Provision of Machinery

Calendar Year	2001												2002			Project relation responsibility	Input	Remark		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3					
Dispatch of Study Team to Indonesia				Δ	Dispatch of Long term Experts					Δ										
Provision of machinery and Equipment											▼									
1 Administrative system of the project is established.																				
1-1 Allocate necessary personnel as planned.				—————	—————					—————	—————						PM/DPM,TL,C	CP, L E	
1-2 Clarify the division of work.				—————	—————					—————	—————						PM/DPM,TL,C	CP, L E	
1-3 Make plans of activity.					—————	—————	—————							—————				PM/DPM,TL,C	CP, L E	
1-4 Prepare facilities and equipment for the project.				—————	—————												PM/DPM,TL,C	CP, L E	
1-5 Make annual plan of operations.				—————	—————								—————				PM/DPM,TL,C	CP, L E	
2 Operation and maintenance system of machinery and equipment of the project is established by Counterpart.																				
2-1 Make a plan for procurement, installment and maintenance of machinery and equipment.											—————	—————						PM/DPM,TL	CP, L E,SE	
2-2 Procure, install, and maintain machinery and equipment .											—————	—————	—————	—————				PM/DPM,TL	CP, L E,SE	
2-3 Make operational and maintenance manuals of machinery and equipment.											—————	—————	—————	—————				PM/DPM,TL	CP, L E,SE	
3 Preparation for implementation of the each training courses by counterpart is completed.																				
3-1 Make a plan of each training course.					—————	—————	—————	—————	—————	—————	—————	—————	—————	—————	—————			PM/DPM,TL	CP, L E	
3-2 Prepare curriculums and materials for each training course.					—————	—————	—————	—————	—————	—————	—————	—————	—————	—————	—————			PM/DPM,TL	CP, L E	
3-3 Make a recruiting plan of trainees.																		PM/DPM,TL,C	CP, L E	
3-4 Recruit trainees.																		PM/DPM,TL,C	CP, L E	
4 The each training courses are being implemented at Ombilin Mines Training College.																				
4-1 C/P acquires necessary knowledge for lecture of each training course and give lectures.				—————	—————	—————	—————	—————	—————	—————	—————	—————	—————	—————			PM/DPM,TL	CP, L E,SE	
4-2 C/P acquires necessary skills to operate machinery and equipment of each course and give.										—————	—————	—————	—————	—————			PM/DPM,TL	CP, L E,SE	
4-3 Evaluate each training course.																		PM/DPM,TL,C	CP, L E	

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Annual Plan of Operations (APO)

PM : Project Manager DPM : Deputy Project Manager CP : Counterpart TL: Team Leader C : Coordinator LE : Long term Experts SE : Short term Experts
 △ : Dispatch of Mission Team ▼ : Provision of Machinery

Calendar Year Month	2002												2003			Project relation responsibility	Input	Remark		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3					
Dispatch of Study Team to Indonesia										△										
Provision of machinery and Equipment										▼										
1 Administrative system of the project is established.																				
1-1 Allocate necessary personnel as planned.										=====							PM/DPM,TL,C	CP, L E	
1-2 Clarify the division of work.											=====							PM/DPM,TL,C	CP, L E	
1-3 Make plans of activity.	=====																	PM/DPM,TL,C	CP, L E	
1-4 Prepare facilities and equipment for the project.										=====							PM/DPM,TL,C	CP, L E	
1-5 Make annual plan of operations.	=====																	PM/DPM,TL,C	CP, L E	
2 Operation and maintenance system of machinery and equipment of the project is established by Counterpart.																				
2-1 Make a plan for procurement, installment and maintenance of machinery and equipment.											=====							PM/DPM,TL	CP, L E, SE	
2-2 Procure, install, and maintain machinery and equipment.																		PM/DPM,TL	CP, L E, SE	
2-3 Make operational and maintenance manuals of machinery and equipment.																		PM/DPM,TL	CP, L E, SE	
3 Preparation for implementation of the each training courses by counterpart is completed.																				
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4-2 C/P acquires necessary skills to operate machinery and equipment of each course and give.																		PM/DPM,TL	CP, L E, SE	
4-3 Evaluate each training course.																		PM/DPM,TL,C	CP, L E	

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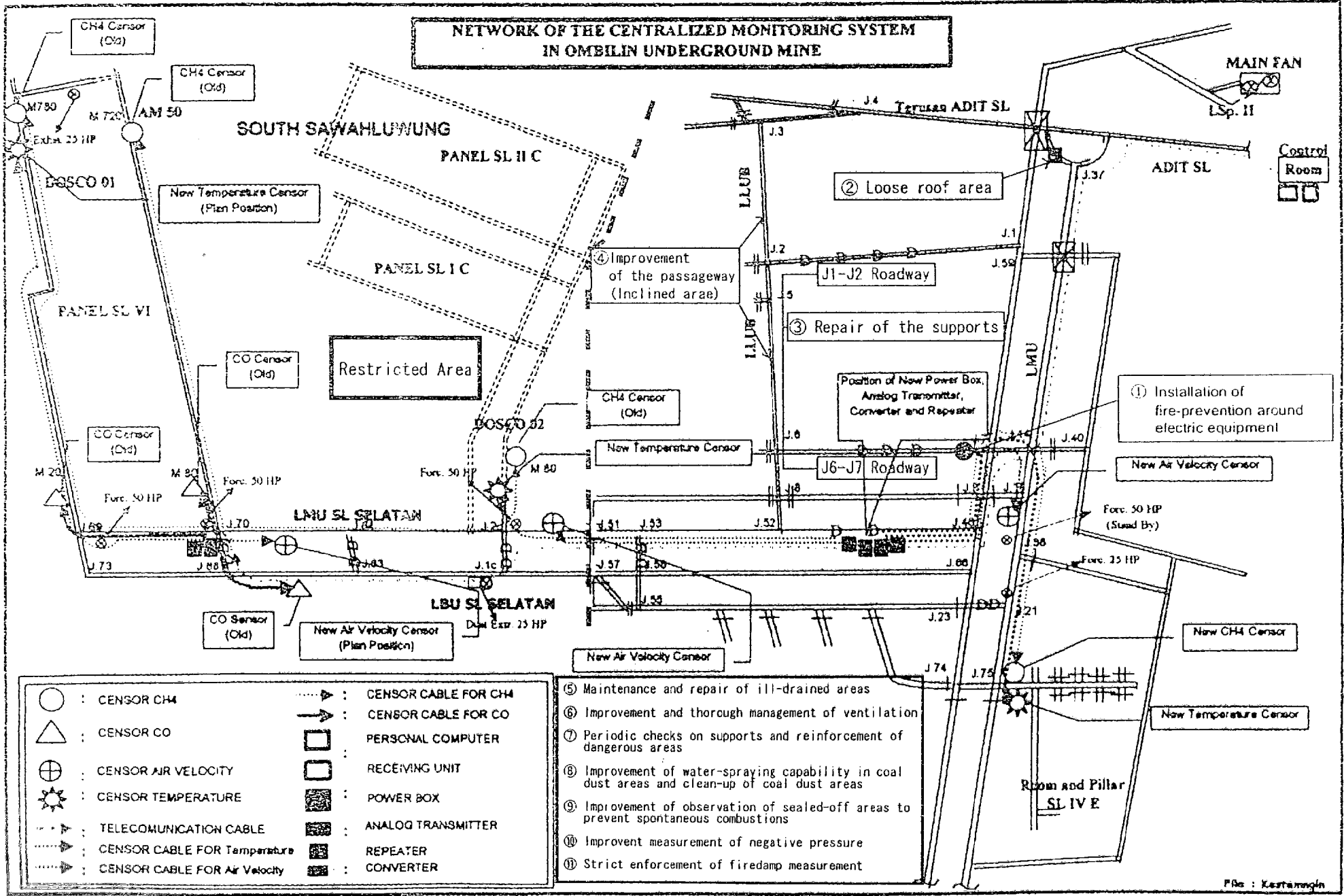
Annual Plan of Operations (APO)

PM : Project Manager DPM : Deputy Project Manager CP : Counterpart TL: Team Leader C : Coordinator LE : Long term Experts SE : Short term Experts
 Δ : Dispatch of Mission Team ▼ : Provision of Machinery

Calendar Year	2003												2004			Project relation responsibility	Input	Remark		
	Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2				3	
Dispatch of Study Team to Indonesia										Δ										
Provision of machinery and Equipment											▼									
1 Administrative system of the project is established.																				
1-1 Allocate necessary personnel as planned.																	PM/DPM,TL,C	CP, L E	
1-2 Clarify the division of work.																		PM/DPM,TL,C	CP, L E	
1-3 Make plans of activity.																		PM/DPM,TL,C	CP, L E	
1-4 Prepare facilities and equipment for the project.																	PM/DPM,TL,C	CP, L E	
1-5 Make annual plan of operations.																		PM/DPM,TL,C	CP, L E	
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2-2 Procure, install, and maintain machinery and equipment.																		PM/DPM,TL	CP, L E, SE	
2-3 Make operational and maintenance manuals of machinery and equipment.																		PM/DPM,TL	CP, L E, SE	
3 Preparation for implementation of the each training courses by counterpart is completed.																				
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- 601 -

NETWORK OF THE CENTRALIZED MONITORING SYSTEM IN OMBILIN UNDERGROUND MINE



110

	: SENSOR CH4		: SENSOR CABLE FOR CH4
	: SENSOR CO		: SENSOR CABLE FOR CO
	: SENSOR AIR VELOCITY		: PERSONAL COMPUTER
	: SENSOR TEMPERATURE		: RECEIVING UNIT
	: TELECOMMUNICATION CABLE		: POWER BOX
	: SENSOR CABLE FOR Temperature		: ANALOG TRANSMITTER
	: SENSOR CABLE FOR Air Velocity		: REPEATER
			: CONVERTER

- ⑤ Maintenance and repair of ill-drained areas
- ⑥ Improvement and thorough management of ventilation
- ⑦ Periodic checks on supports and reinforcement of dangerous areas
- ⑧ Improvement of water-spraying capability in coal dust areas and clean-up of coal dust areas
- ⑨ Improvement of observation of sealed-off areas to prevent spontaneous combustions
- ⑩ Improvement measurement of negative pressure
- ⑪ Strict enforcement of firedamp measurement

Nomor : 0601/02.07/3.3010/X-2000
Lampiran :
Perihal : Perbaikan Safety Di Tambang Dalam

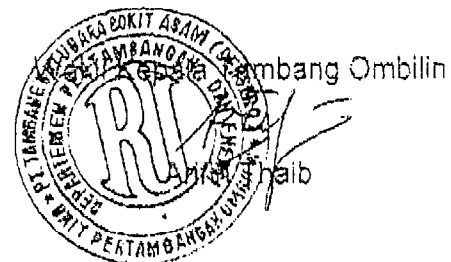
18 Oktober 2000.

Yang terhormat,
Bapak DR, Ir, Irwan Bahar
Koordinator Proyek OMTC
Pusat Pengembangan Tenaga Pertambangan
Jln. Jend. Sudirman No. 623
Di -
Bandung (Fax. 022 - 635506)

Sehubungan dengan facsimile Bapak Nomor : 513/Fax/PPTP/2000 tanggal 17 Oktober 2000 tentang pelaksanaan perbaikan safety di Tambang Dalam, bersama ini kami sampaikan pendapat kami atas usul Tim Safety Committee JICA sesuai dengan point - point yang tercantum didalam facsimile, pada dasarnya bisa kami laksanakan dan beberapa hal akan kami tingkatkan, adapun point - point tersebut adalah ;

1. Dilaksanakan segera ;
2. Bisa dilaksanakan ;
3. Selalu ditingkatkan ;
4. Bisa ;
5. Sudah dilaksanakan dan akan ditingkatkan ;
6. Sudah dilaksanakan dan akan ditingkatkan ;
7. Sudah dilaksanakan dan akan ditingkatkan ;
8. Sudah dilaksanakan secara kontinue ;
9. Sudah dilaksanakan secara kontinue ;
10. Sudah dilaksanakan secara kontinue

Demikian kami sampaikan, atas perhatian Bapak kami ucapkan terima kasih.



Tembusan :

1. Kepala Tambang Ombilin ;
2. Kepala Tambang Dalam.

MW/ND:WKTONG
PT. TAMBANG BATUBARA BUKIT ASAM (PERSERO)

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Tanjungkarang
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Bender Lampung, Indonesia
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Facsimile : (0712) 31577

Kertapati
Jl. Stadion Kertajiati, Palembang
Sumatera Selatan, Indonesia
Telephone : (0711) 512617
Facsimile : (0711) 513368

DEPARTEMEN ENERGI DAN SUMBER DAYA MINERAL REPUBLIK INDONESIA
DIREKTORAT JENDERAL PERTAMBANGAN UMUM
PUSAT PENGEMBANGAN TENAGA PERTAMBANGAN
JALAN JENDERAL SUDIRMAN NOMOR 623 BANDUNG 40211

TELEKS : 28279 PPTMBD 1A TROMOL POS : 816 TELEPON : (022) 6076756, 6038295 FAKSIMILE : (022) 6035506

LEMBAR PENGANTAR PENGIRIMAN FAX
No. 513/Fax/PPTP/2000

Yang terhormat : Kepala Tambang Ombilin
PT Tambang Batubara Bukit Asam (Persero)
No. Fax. : 0754-61402
Dari : Dr. Ir. Irwan Bahar - PPTP
Tanggal kirim : 17 Oktober 2000
Jumlah halaman : 6(enam) lembar termasuk lembar pengantar ini

Sehubungan dengan hasil Evaluasi Survey Safety Assesment Committe by JICA pada tanggal 26 - 30 Agustus 2000 di Tambang Dalam Ombilin guna persiapan pelatihan OMTC yang akan menggunakan fasilitas Tambang Dalam Unit Pertambangan Ombilin, maka Team Safety Committe by JICA mengusulkan untuk melaksanakan perbaikan safety di Tambang Dalam agar pelaksanaan pelatihan nantinya dalam keadaan aman bagi peserta pelatihan, instruktur dan JICA Expert.

Adapun masukan perbaikan oleh Team JICA untuk pelatihan di Tambang Dalam UPO tersebut dimaksud (terlampir).

Sehubungan dengan hal tersebut di atas, mohon tanggapan dan saran dari Saudara.

Atas perhatian Saudara, kami ucapkan terima kasih.


Koordinator ~~Tim~~ OMTC


Dr. Ir. Irwan Bahar

①
ANNEX 1

SAFETY-ENSURING COUNTERMEASURES IN CONNECTION WITH THE
COAL MINING TECHNOLOGY ENHANCEMENT PROJECT
AT OMBILIN MINES TRAINING COLLEGE
IN THE REPUBLIC OF INDONESIA

I . Underlying Concepts

1. Basic principles for entering the underground mine.
 - (1) Regarding basic principles for ensuring the safety of persons related to the Project (experts and counterparts), transfer of technologies shall be implemented at Ombilin Mines Training College on experimental roadways, and actual entering of the underground mine shall be limited to cases necessary for the transfer of such technologies. The frequency of mine entry should also be reduced to a minimum.
 - (2) In order to provide for the transfer of technologies underground, a request to ensure safety of the areas to be visited shall be made in advance, and persons entering the mine must take necessary procedures and appropriate safety measures.

II . Safety-ensuring Countermeasures for entering the mine

- ⇒ 1. Safety-ensuring countermeasures to be taken by the Ombilin Coal Mine at the earliest possible time.
- (1) Prior to groups of persons concerned entering the mine in connection with the Project, Ombilin Coal Mine will be asked to implement the following measures.
 - ① Installation of fire-prevention coverings of sheet iron around electric equipment/facilities (such as transformers) that have been installed along in-seam roadways.
 - ✓ 1 ② Implementation of measures against loose roof rocks and repairs in roadways at (U-shaped) crossings near intake airways.
 - ✓ 2 ③ Repair of supports in the roadways which are to be used for training purposes during the Project (in Section J1-J2 or Section J6-J7).
 - ✓ 3 ④ Improvement of the passageway from the mine portal to the roadways to be used for training purposes (in particular, the installation of stairways in inclined shaft areas).
 - ✓ 4 ⑤ Maintenance and repair of ill-drained areas at the earliest possible time.
 - ✓ 5 ⑥ Improvement and thorough management of ventilation.
 - ✓ 6 ⑦ Performance of periodic checks on supports and reinforcement of dangerous

Tidak perlu karena sudah ada

parts/areas at the earliest possible time.

✓ 7 ⑧ Improvement of water-spraying capability in areas that are prone to coal dust occurrence (such as coal loading points, coal loaded on mine cars, coal dumping points from conveyer belts.), Strict enforcement of clean-up of areas where coal heaps are easily formed (areas surrounding conveyer belts and coal loading points)

✓ 8 ⑨ Improvement of observation of sealed-off areas, areas surrounding ventilation doors, triangular pillars and gobs, etc. where spontaneous combustion may occur.

And, according to necessity, improvement of efforts toward early detection of spontaneous combustion using thermometers.

✓ 9 ⑩ Improvement of measurement of negative pressure at important points (ventilation doors in particular).

✓ 10 ⑪ Strict enforcement of firedamp measurement.

2. Safety-ensuring countermeasures to be taken by the persons in charge of the Project.

(1) Mine-entry procedure

① Mine-entry application

Japanese experts who are entering the mine shall submit an application to the Team Leader, and Indonesian Counterparts who are entering the mine shall submit an application beforehand to the Project Manager (including the Assistant Project Manager, -- this will also apply to the item below) for approval.

② Approval

After receiving an application, the Team Leader and the Project Manager will issue approval after having studied its necessity and the applicant's plan for entering the mine. According to circumstances, they may make changes to the plan or add conditions.

(2) Safety Measures to be taken by those who are approved to enter the mine.

① Persons wishing to enter the mine shall receive explanations from the Ombilin Coal Mine's safety manager or other person responsible for safety on areas to be visited, items of danger and precaution, and accouterments to be worn along with their functions and directions for use before entering.

② At the time of mine entry, the party should form a line in single file consisting of around 10 persons maximum, with the person responsible for the safety from Ombilin Coal Mine or the on-site safety-supervisor in front.

③ Before entering the mine, the functions of the following accouterments should be understood, and the items worn correctly.

- Dust mask

- Dust glass
- Gas detector
- Oxygen self-rescuer

- ④ In the event of a shutdown of fans (main fan or local fan), an evacuation from the mine shall be conducted immediately.
- ⑤ No actual work shall be conducted underground.
- ⑥ While underground, gas (firedamp) concentration measurements shall be conducted by both the Japanese and Indonesian sides at predetermined locations. If a gas concentration exceeding Indonesia's maximum permissible concentration level is detected, an evacuation from the mine shall be conducted immediately.

(3) Other Safety Measures

- ① No entry shall be made on days (such as Monday) following a holiday.
- ② Entry into underground routes that are being used for the transportation of heavy equipment shall be avoided.
- ③ Safety training shall be provided through counterparts for Ombilin Coal Mine personnel who are concerned with technological cooperation.
- ④ In the event that training is carried out in the areas of development and mining (PANEL, SL VI) in connection with Longwall, which is expected in the future, a request should be made to the Coal Mine Project's Safety Assessment Committee, and the training will be conducted according to the response to the request.

(4) Safety Committee

A Mine Safety Committee (provisional name) consisting of persons in charge shall be formed, and this committee shall meet regularly with the objective of establishing maximum safety levels for the implementation of the Project.

- Project side: Japanese side: (team leader, coordinator, expert responsible for safety matters)
- Indonesian side: (project manager, counterparts, safety management personnel)
- Ombilin Coal Mine: mine manager, safety management personnel

→ 3. Safety-ensuring countermeasures to be requested of the Ombilin Coal Mine at the time of mine entry.

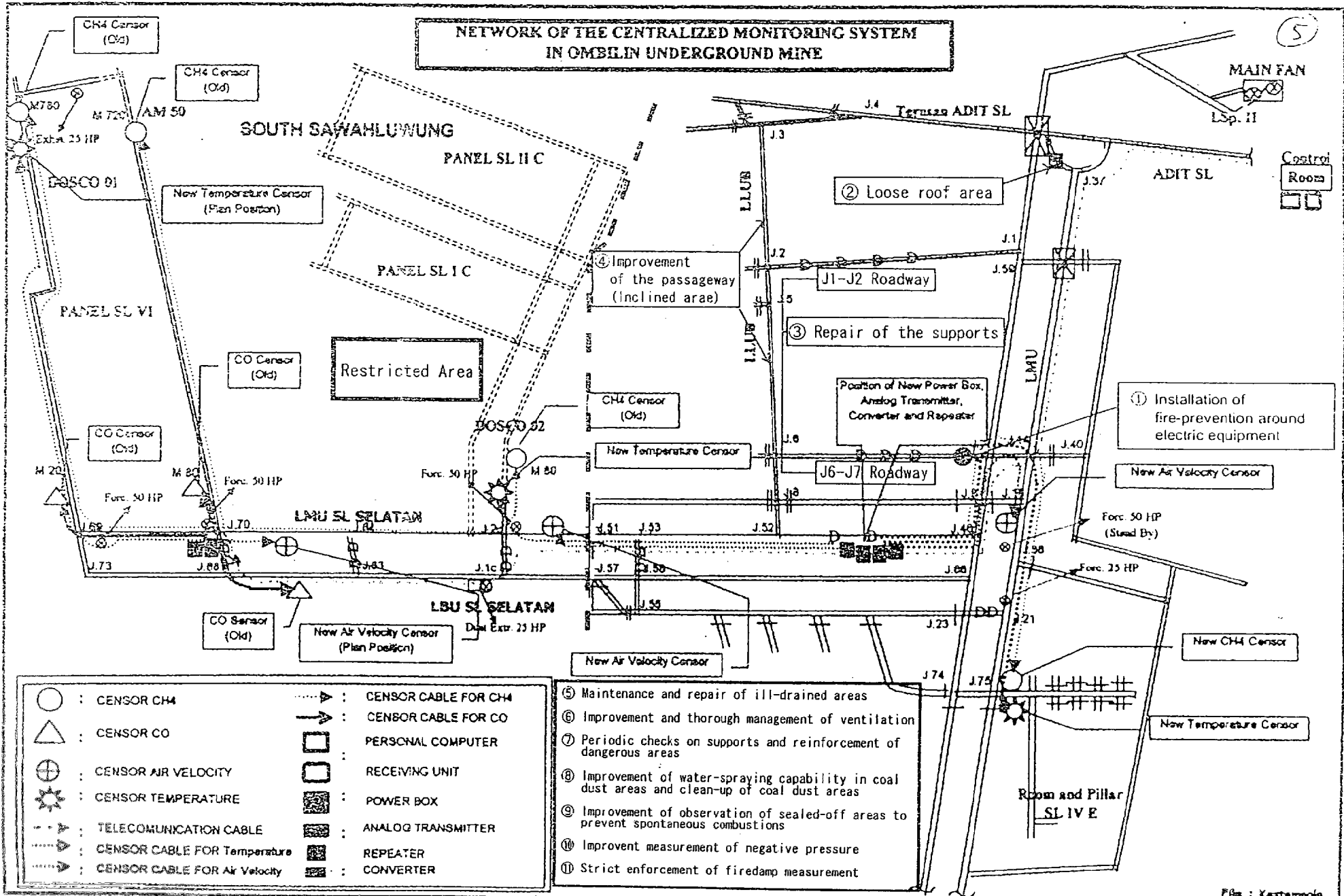
✓ (1) When persons concerned with the Project are entering the mine, the Ombilin Coal Mine shall be requested to take the following measures:

- ① The safety manager or other person in charge of safety should provide advance explanation to persons entering the mine of underground conditions

④

- and possible dangerous areas.
- ✓ ② The safety manager or on-site personnel responsible for safety will be positioned at the front and rear ends of the group, which will proceed in single file.
 - ✓ ③ Enforcement of firedamp concentration measurements by the person(s) leading the group proceeding in single file.
 - ✓ ④ Absolute cessation of blasting work in the places to be visited in the mine.
 - ✓ ⑤ Complete cessation of transportation work in the places to be visited in the mine.

NETWORK OF THE CENTRALIZED MONITORING SYSTEM IN OMBLIN UNDERGROUND MINE



5

Control Room

① Installation of fire-prevention around electric equipment

② Loose roof area

③ Repair of the supports

④ Improvement of the passageway (inclined area)

⑤ Maintenance and repair of ill-drained areas

⑥ Improvement and thorough management of ventilation

⑦ Periodic checks on supports and reinforcement of dangerous areas

⑧ Improvement of water-spraying capability in coal dust areas and clean-up of coal dust areas

⑨ Improvement of observation of sealed-off areas to prevent spontaneous combustions

⑩ Improvement measurement of negative pressure

⑪ Strict enforcement of firedamp measurement

- | | | | |
|----|---------------------------------|----|------------------------|
| ○ | : SENSOR CH4 | ⋯→ | : SENSOR CABLE FOR CH4 |
| △ | : SENSOR CO | → | : SENSOR CABLE FOR CO |
| ⊕ | : SENSOR AIR VELOCITY | □ | : PERSONAL COMPUTER |
| ☀ | : SENSOR TEMPERATURE | □ | : RECEIVING UNIT |
| ⋯→ | : TELECOMMUNICATION CABLE | ■ | : POWER BOX |
| ⋯→ | : SENSOR CABLE FOR Temperature | ■ | : ANALOG TRANSMITTER |
| ⋯→ | : SENSOR CABLE FOR Air Velocity | ■ | : REPEATER |
| | | ■ | : CONVERTER |