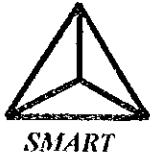


**添付資料9 Smart Technical Services Co., Ltd. 関連資料**



**SMART Technical Services**  
**Gross Income and Net Profit Statement**

| Year                 | 1995   |          | 1996    |           | 1997    |           | 1998   |           | 1999    |           | 2000   |                   |
|----------------------|--|----------|---------|-----------|---------|-----------|--------|-----------|---------|-----------|--------|-------------------|
|                      | Description  | Dollars  | Kyats   | Dollars   | Kyats   | Dollars   | Kyats  | Dollars   | Kyats   | Dollars   | Kyats  | 2000 (YTD) August |
| Exchange Rate        | I=   | 120      | I=      | 200       | I=      | 280       | I=     | 353       | I=      | 360       | I=     | 390               |
| Oil & Gas            | 408000   | 48960000 | 1149586 | 229917110 | 1908419 | 534357325 | 212678 | 75075430  | 966743  | 348027592 | 527534 | 205738334         |
| Electrical Power     | 36000  | 4320000  | 36000   | 7200000   | 53802   | 15064560  | 86125  | 30402125  | 338463  | 121846680 | 378866 | 147757698.9       |
| Total Gross Income   | 444000   | 53280120 | 1185586 | 237117110 | 1962221 | 549421885 | 298803 | 105477555 | 1305206 | 469874272 | 906400 | 553496423         |
| Net Profit after Tax | 150960   | 18115241 | 284541  | 56908106  | 647533  | 181309222 | 101593 | 35862369  | 326302  | 117468568 | 208472 | 81304177          |
| Remarks              | Majority income from Pipeline project for TOTAL/Spie-Capeg |          |         |           |         |           |        |           |         |           |        |                   |
|                      | Majority income from Seismic Project for PT ELNUSA         |          |         |           |         |           |        |           |         |           |        |                   |



SMART TECHNICAL SERVICES CO., LTD.  
37-B, 7 ½ Mile, Pyay Road  
Yangon, Myanmar  
Phone : 951-247799, 665707, 667417, 244310  
Fax : 951-665707, 533023

## Company Profile

SMART Technical Services was founded in 1994 by a group, consists of geologists, geophysicists and engineers. SMART founder has more than 100 years of combined experience in energy sector. Since 1994, SMART provides professional technical services to major oil and gas companies, oil well drilling companies and electrical power companies.

Through its tight focus on the petroleum and electrical power industries, the company has been able to develop high level of expertise and experience in the provision of services to these demanding industries. The company's staffs are not distracted by the need to provide services to many different industries, and as a result, the staffs have a high level of technical competency and a real depth of experience.

The company has extensive experience in Energy Sector, especially in dealing and launching projects together with Myanmar Oil and Gas Enterprise, Myanmar Electric Power Enterprise, Myanma Petrochemical Enterprise and Myanma Petroleum Products Enterprise. SMART Technical Services innovation strengths are not solely technical, and the company has anticipated the Myanma Economic trends towards the privatization of energy sector industries.

## SMART provides the following services to petroleum and electrical power industries

- \* Project feasibility studies
- \* Commercial Analysis of projects
- \* Project Proposal
- \* Negotiation of Agreements (Profit Sharing Contract, Improved Petroleum Contract, Performance Compensation Contract, Energy Conversion Agreements, Power Purchase Agreements, Fuel Supply Agreements, etc....)
- \* Human Resources Supply and Development
- \* Engineering Services
- \* Logistic Services
- \* Catering Services
- \* Country Representative for engineering products
- \* Sole Distributor for engineering product

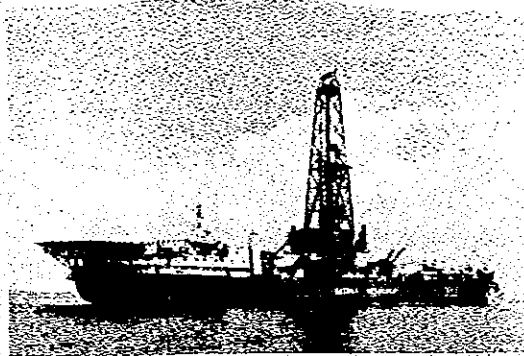


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## ACTIVITIES

### Oil & Gas Sector

#### 1. ARCO International Oil & Gas Company ( 1994 -1998 )



SMART provides technical services to ARCO since 1994. Starting from reviewing the geological and geophysical data, selecting the most promising offshore blocks, negotiation with Ministry of Energy to get best PSC terms and last but not the least is supporting logistic for seismic operations and drilling operations.

Atlantic Richfield Company, ARCO is one of the largest integrated hydrocarbon companies. ARCO is one of the 25 largest industrial corporations in the United States and owns total assets of US \$ 24 billion

#### 2. Goldwater Company Ltd. (APN Astra Petroleum) ( 1994 – 1998 )

APN Astra Petroleum signed the first IPR, Improve Petroleum Recovery in Myanmar. At present APN is an operator for Yenangyaung and Chauk oil fields. SMART give services to APN since 1994 in selecting potential oil fields, bidding process, negotiating terms with Ministry of Energy and providing logistic services to run efficient operations in Myanmar.

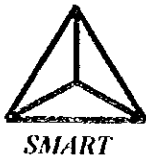
APN is the subsidiary of ASTRA International from Indonesia. ASTRA International is the second largest industrial group in Indonesia. A consolidated asset of the ASTRA at the end of 1996 is Rp 11.18 trillion.

#### 3. The Coastal Corporation. ( 1995 – 1998 )

USF.

SMART is the country representative for Coastal Corporation from 1995 to 1998. Coastal Corporation was looking opportunities to do business in oil and gas exploration, oil and gas downstream sector and independent power production sector in Myanmar. Coastal is the third largest gas transmission Company in the United States of America.

The Coastal Corporation has consolidated assets of more than US\$ 10 billion and subsidiary operations in natural gas marketing, transmission and storage, petroleum refining and marketing, oil and gas exploration and production, coals, chemicals, trucking, and independent power production.



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#### 4. Spie-Capeg ( 1996 – 1997 )



Spie-Capeg (France) is the main contractor to built pipeline control center and metering station, to lay onshore 36 in gas pipeline, to construct all weather 63 km service track along the pipeline route for gas Development Project operates by TOTAL Oil and Gas company.

Spie Capeg awarded US \$ 3 million worth of engineering subcontract to SMART and his subsidiary Petroman Engineering Company. The contract requires to built construction camps, security fences, foundations and drainage/ sewage systems for permaent pipeline control center and metering station.

#### 5. JET Drilling Company ( 1997 )

JET Drilling is the main drilling contractor for ARCO Myanmar drilling project in offshore Block M-9.

SMART handles all the drilling operations (recruiting drilling crew, crew change, visas, ticketing, custom & immigration clearance, material supply, emergency evacuation) of Drillship "Energy Searcher" in Myanmar during their drilling campaign for ARCO Myanmar. Energy Searcher drilled two exploration wells for ARCO Myanmar in 1997.

#### 6. FUGRO GEODETIC

SMART provides logistic services to FUGRO GEODETIC during their drill site survey in Mottama offshore area for ARCO Myanmar Inc.

#### 7. EXSPAN Myanmar/ ELNUSA GEOSAIN ( 1998 – 1999 )

ELNUSA-GEOSAIN was the main seismic contractor to run 2-D seismic for EXSPAN Myanmar Oil Company in ONDWE and THAYET area.

SMART was the sub-contractor of ELNUSA-GEOSAIN for Topography Survey and Recording Survey.





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The contract required to provide 700 skilled and unskilled workers including engineers, camps and camp equipment, transportation, medical facilities and catering services.

The project completed on time on budget without any lost time accidents.

#### 8. PT BUMA KUMAWA ( 1988-1999 )

P.T BUMA KUMAWA was the main contractor to drill seismic shot holes for 2D-SEISMIC Survey for EXSPAN Myanmar in ONDWE and THAYET Area.

SMART was the sub-contractor to provide

- 450 skilled and unskilled workers including engineers,
- camp & camp equipment
- catering services
- transportation
- medical facilities



The project completed on time on budget without any lost time accident

#### 9. SEMBAWANG ENGINEERING ( 1999 )

SEMBAWANG is the main contractor to built Yetagun Offshore Platform for Premier Oil, Myanmar. SMART provides skill and unskilled workers to Sembawang for their hook-up and commissioning works of Yetagun Offshore Platform.



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### *ENGINEERING SERVICES*

SMART provide total planning, design and construction as a complete turn-key package as well as individual services listed below.

#### *Planning and Design*

- Preliminary design and conceptual frame work
- Project planning
- Architectural and interior design
- Landscaping
- Structural design
- M&E design
- Interior design

With its qualified professional SMART offers creative design and advanced structural engineering services for a wide range of buildings in accordance with strict international code of practices.

#### *Project Management*

- Project estimating and budgeting
- Project documentation and bidding
- Contract administration
- Quantity surveying and Quality assurance
- Project control
- Logistics

#### *Contract and Construction*

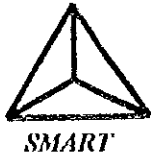
- General contracting
- Sub contracting
- Local partner to foreign contractors

Taking absolute responsibility for all stages of the development from land use studies and inception of concepts through to total design, construction and development management. SMART also supply and install all type of construction materials up to the requirements of our clients as a package.

#### *Pipe supply and Laying*

- Supplying of Stainless & Carbon steel Line Pipe
- Pipeline route survey
- Pipe laying
- Pipe coating





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## ENGINEERING SERVICES PORTFOLIO

### *Oil & Gas Sector*

- Supply and Installation of Security Fence for YADANA Development Project
- Accomodation Camp Supply and Construction Camp facilities for SPIE-CAPEG
- Civil works of Permanent Pipeline Center facilities & Metering Station, YADANA Development Project ( alliance with ARC )
- Office designing and building for ARCO Myanmar Inc. office
- Office designing and renovation of ASTRA Petroleum Field office in Yenangyaung

### *Diplomat Sector*

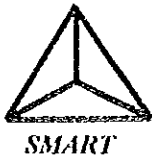
- Renovation of US Embassy / US Diplomats' residences
- Mechanical and Electrical work and interior finishes related to the HVAC/Windows replacement Project at US Embassy
- Installed Medium Voltage switch gear at Royal Thai Embassy, Yangon
- Installing Category 5 Cable and networking facilities at US Embassy

### *Business Institutions*

- Designing and installation of medium voltage switchgears at Dagon Center
- Designing and installation of medium voltage switchgears at Yangon Commercial Tower

### *Projects*

- Installed and commissioned 80 MVA Power Transformers at Kalaw and Mandalay, together with China Light and Power Company
- Building cable test sites at Pyapon for FRANCE TELECOM
- Dismantling Frame 5 Gas Turbine Station at Kuala Lumpur for Tenaga Nasional Berhad



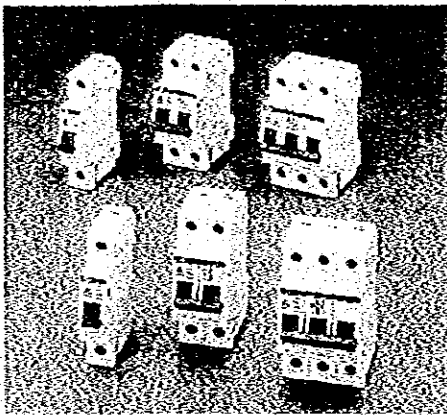
SMART TECHNICAL SERVICES CO., LTD.  
57-B, 7 1/2 Mile, Pyay Road  
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## ELECTRICAL POWER SECTOR

### 1. W.LUCY & CO LTD

W.LUCY is the Britain's leading independent Medium Voltage Switchgear and Low Voltage distribution equipment manufacturer. SMART is the sole distributor for LUCY switchgears in Myanmar for electrical power sector.

### 2. ABB Installation Materials



SMART is the sole distributor for ABB electrical building installation materials in Myanmar.

SMART distribute MCB (Miniature Circuit Breakers), RCDs (Residual Current-operated Devices), Consumer Units and Distribution Boards, MDRCs (Modular DIN- Rail Components) and Accessories for Connection and Installations.

### 3. LG MCCB & ACB

SMART is the sole distributor for LG Molded Case Circuit Breakers ( MCCB ) and Air Circuit Breakers ( ACB ).

LG Circuit Breakers are manufactured by LG Industrial Systems ( LGIS ) from Korea. LGIS produces electrical apparatuses equipment, switchgears, elevators, automated systems, controllers and service industry equipment.



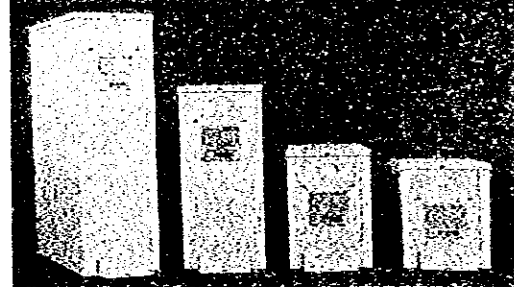


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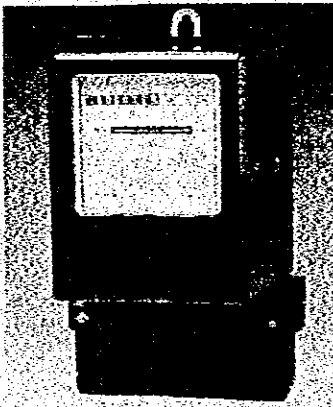
#### 4. ABB T& D LIMITED

SMART is the sole distributor for ABB Low Voltage Capacitor Unit Type "CLMD" from 220 to 1000 Volts.

SMART can provide designing, equipment supply, installation and commissioning of Power Factor controlling.



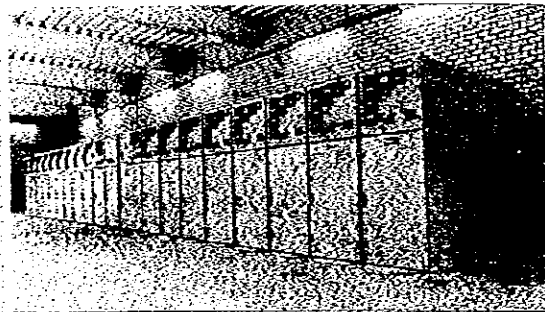
#### 5. P.T Mecoido Schlumberger

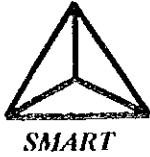


SMART is the sole distributor for Single Phase Kilowatt-hour Meter and Three Phase Meters for Three and Four -Wire Systems.

#### 6. HITACHI Metal-Clad Switchgear

SMART can provide HITACHI panel type Metal-Clad Switchgear using vacuum circuit breaker technology according to the customers' requirements.





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## Measurement and Control Sector

### 1. SAAB Tank Radar

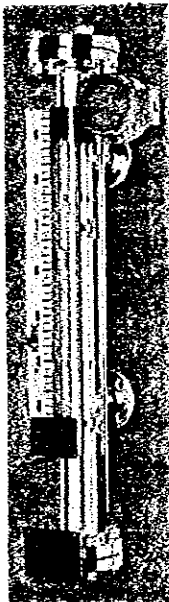
SMART is the country representative for SAAB-SCANIA Group. SMART introduces the SAAB Tank Radar Gauging System to Thanlyn Refinery Tank farm and Bitumen Plant. Thanlyn Refinery and Bitumen plants are owned by Myanmar Petrochemical Enterprise.



### 2. Honeywell Total Plant Solution System

SMART is the country representative for Honeywell Total Plant Solution System. Honeywell has more than 110 years of experience in the support of process control and factory automation systems.

### 3. K-TEK



SMART is the sole distributor for K-TEK products in Myanmar. K-TEK manufactured Magnetic Level Gauges, Magnetostrictive Level Transmitters and External Chamber Switches.

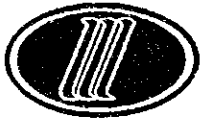
K-TEK is the US based firm and world leader in Magnetically Coupled Level Indication and Control Devices.



SMART\Wah wah\Company\picfile\98-99-00\SMART1.doc

**添付資料 10 Super Mega Engineers Group Co., Ltd. 関連資料**



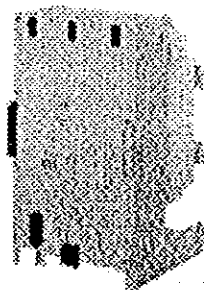


# SUPER MEGA ENGINEERS GROUP CO., LTD.

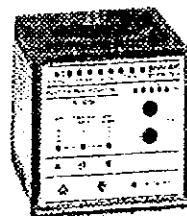
## SUPER MEGA TRADING CO., LTD.

49, Kyauk Myaung Street, Tarnway Tsp, Yangon. (11211), Union of Myanmar. Tel: 951-700114, 09-31632 Fax: 951-549593  
 (Show Room & Sales Centre) Quality Electric & Air-conditioning Centre  
 No. 364, Banyerdala Road, Tarnway Tsp., Yangon. Tel: 951-542343  
 (Workshop & Warehouse) Plot 197, Industrial Zone, North Okkalapa Tsp., Yangon. Tel: 951-690297

PLANT INSTALLATION  
 ELECTRICAL POWER SYSTEM  
 AUTOMATION SYSTEM  
 SERVICE CONTRACT WORK  
 REPAIRING & REWINDING



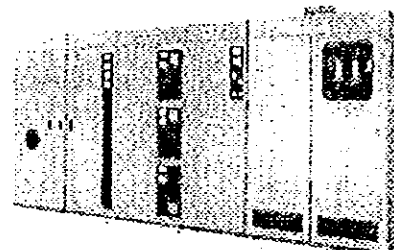
Vacuum Circuit Breaker



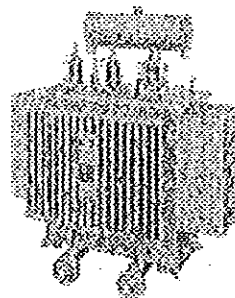
Power Factor Relays

### TRADING

- ❖ Medium Voltage Switchgears (6.6/11 kV)
- ❖ Medium Voltage Air Load Break Switches (6.6/11 kV)
- ❖ Power Transformers (50kVA to 2000 kVA)
- ❖ HT/LT Transmission & Distribution Materials
- ❖ Power, Control & Communication Cables
- ❖ LT Distribution Board c/w Protection Devices
- ❖ Circuit Breakers (MCCB, MCB, ELCB, RCCB)
- ❖ Voltage Stabilizers
- ❖ Power Factor improvement Materials
- ❖ 1ph/220V, 3ph/400V Induction Motors



H.V. Distribution Equipment

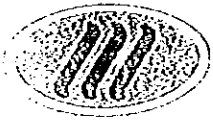


Power Transformer



Air Load Break Switch

Y. P.



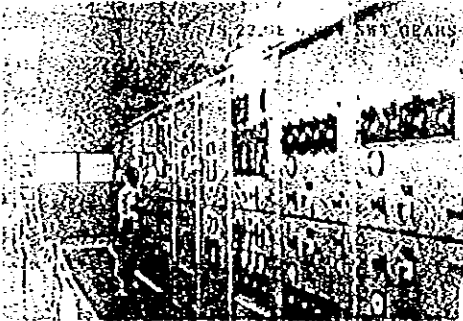
# SUPERMEGA ENGINEERS GROUP CO., LTD.

## SUPERMEGA TRADING CO., LTD.

NO.49, Kyauk Myaung St. Tamwe, Yangon (11211), UNION OF MYANMAR.  
 TEL: 951-542193/ 951-700114, FAX: 951-545207, WORKSHOP TEL: 951-700654

### ILLUMINATION SYSTEM

- Super Mega Engineers Group Company is to provide a comfortable lighting environment for safe and efficient work efficiency by Design & Installation
- Shopping centers
  - Factories & Warehouses
  - Hospitals & Schools
  - Streets & Urban Areas
  - Resorts & Sport Facilities



Power System in MOJSC Refinery, Singapore

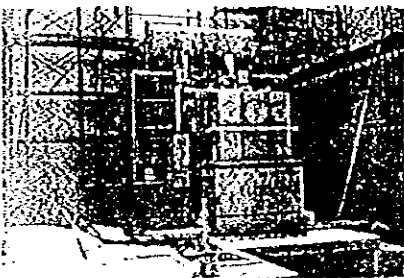
### AUTOMATION SYSTEM

- Designing automation system for energy saving
- Factory automation system
- Machine Automation system
- Automatic fire alarm system
- Smoke control & sprinkler system
- Emergency alarm / light and announcing system
- Telephone, PA & Intercom system
- LAN, Fiber Optic & cabling system

### REPAIRING AND REWINDING

Super Mega Engineers Group Co., is executing one Electrical Workshop with testing equipment.

- Transformers (up to 500 KVA/11000 Volts)
- Motors (up to 300 hp/ 6600 Volts)
- Generators (up to 200 KW / 400 Volts)

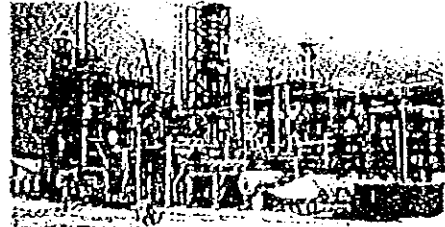


Transformer Installation in TPC (Sumitomo), Singapore

### TRADING

Super Mega Trading Company is trading for all related Electrical & Instrument Materials.

- Medium Voltage Switchgears (6.6 kV, 11kV/ Germany, England, Japan, Korea)
- Power Transformers (50kVA to 2,000kVA/ Germany, Japan, Thailand, Singapore, Indonesia)
- Power Transmission & Distribution Equipment ( Japan, Singapore, Malaysia, Thailand)
- Power, Control & Communication Cables (Japan, Singapore, Malaysia, England)
- Distribution Board c/w protection devices( Japan, Singapore)
- Circuit Breakers (MCCB, MCB, ELCB, RCCB from 6A to 3,200A/ Japan, France, Korea)
- Lighting Fixtures (Sodium, Mercury, Fluorescent, Tungsten including Flame-Proof fittings)
- Voltage stabilizer (USA, Japan)
- 3 phase 220 V, 3 phase 400 V induction Motors (Japan, Singapore)



Lighting System in ESSO Refinery, Singapore

### POWER SYSTEM

Super Mega Engineers Group Company has responded to a wide variety of modern society demands, providing electrical equipment and installation services.

- Power Station and Substation facilities
- Transmission & Distribution system(Overhead & Under ground)
- Standby generating system
- Power & Control Cabling works
- A.V.R & U.P.S system

### SERVICE CONTRACT WORK

Maintenance, Repair, Modification, Upgrading for Substation, Standby Generating system, Automation system, Operation system, including regular inspection, routine check and testing.



Automation System in Bar Rolling Steel Mill, Aunglan, Myanmar

### MANUFACTURING

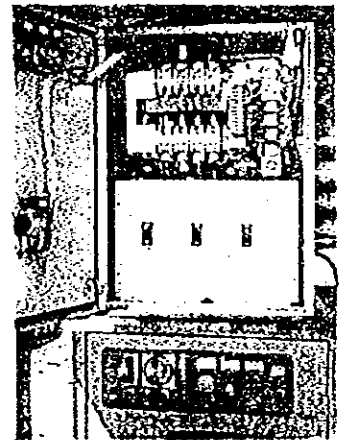
We are able to manufacture electrical related Equipment according to customers' requirement and comply with International standard.

- 6,650 Volts Vacuum Circuit Breaker Panels
- 400 Volts Air Circuit Breaker & Metal Clad Circuit Breaker/Receiving & Distribution Boards
- 400 Volts Motor Control Center / Motor Starter Panels
- Change Over Switch (100A to 1,600 A)/Auto-Transfer Switch (100A to 1,600A)
- 11,000 Volts Disconnecting Switch

### PLANT INSTALLATION

Super Mega Engineers Group Co., has garnered enough professional expertise in Plant Installation to earn the most of a wide range industries.

- Petrochemical & Chemical Plants
- Steel & Cement Factories
- Rice & Edible Oil Mill
- Garment & Paint Factories
- Food-processing factories

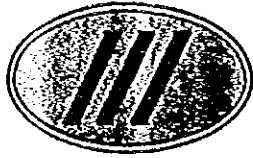


Auto Transfer System in Hae Wae Garment Co., Myanmar.





BUSINESS:



Saw Yul Brynner Win

here is a team of foreign trained engineers who call themselves SUPER MEGA ENGINEERS GROUP CO., LTD. (SME) in the field of Electrical Instrumentation, Building Electrical & Mechanical Engineering, Construction Work for Power Plant, Substation, Transmission Grid, Industrial Plant, Chemical Plant, Refineries, Marine Automation, Hotel and High-rise Building.

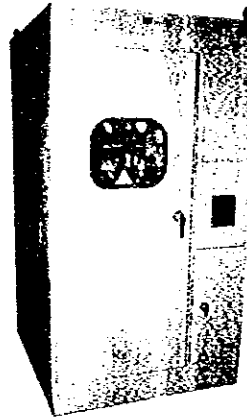
These engineers who started as classmates in school, colleagues and partners upon their return to motherland established SME on 25th June 1997. Managing Director U Khin Maung Win, B.E. Electrical, AGTI, worked together with his engineer buddies in Singapore for 6 years. They came back to set up SME as a fine example of

# Insist on SUPER MEGA Electrical Engineers to Wire Your Factory

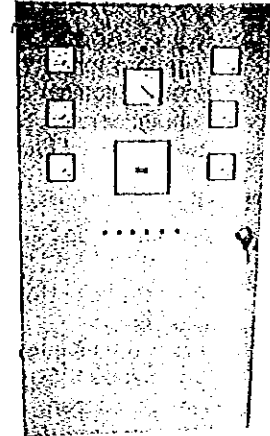
technology transfer for the nation.

**Functions & Services**

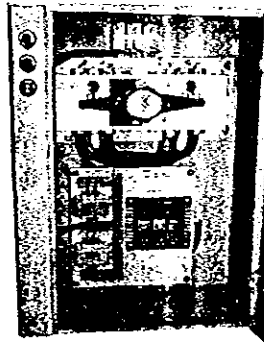
- ▣ Electrical, Control and Instrumentation, Basic Design and Engineering
- ▣ Procurement of Equipment, Materials and Instruments for new project
- ▣ Erection, Supply and Installation of complete electrical and instrumentation system
- ▣ Testing, Commissioning and Maintenance
- ▣ Fabrication of Low Tension Distribution Boards, Motor Control Centers and sub-DB
- ▣ Modification and Fabrication of Medium Voltage Switches Panel
- ▣ Trading for all related Electrical and Instrumentation materials and testing equipment: Transformers up to 2000 KVA, HT/ LT Switch gears OCB/VCB/SF6/ACB, Control & Power HT/ LT Cables,



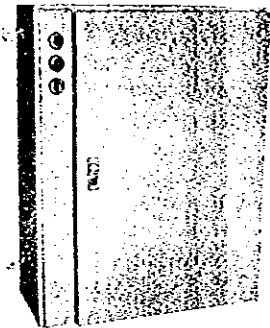
11,000 volt load breaker switch (LBS)



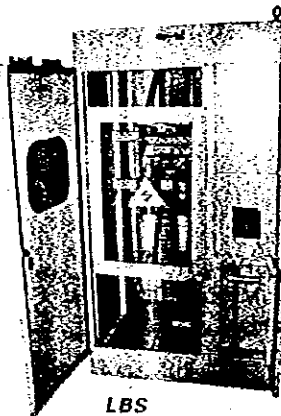
Power factor correction



Auto transfer switch (ATS) internal



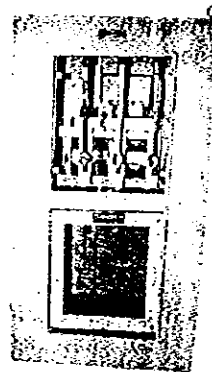
Auto transfer switch (ATS)



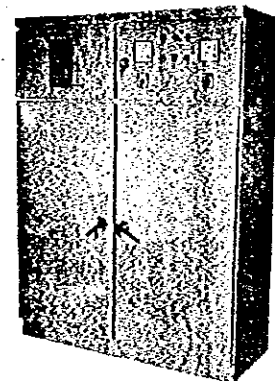
LBS



LBS



LBS (Rear)



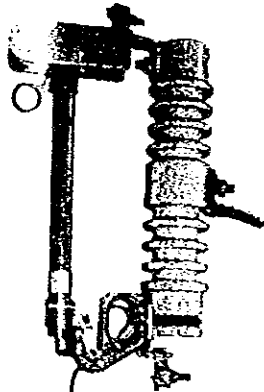
400V DB

LT DB, LT MCCS, MOTOR STARTERS, Motors, Instruments, Generators, HT/LT overhead line Materials, Insulation Tester, Clamp-on Meter, Energy Meters, etc.

☐ Specially order from Singapore for very important Electrical & Instrument parts of Shutdown Machine/ Factory

**Tracing**

- ☐ Medium Voltage switch gears (6.6 kV, 11 kV) from Germany, UK, Japan & Korea
- ☐ Power Transformer (50 KVA to 2000 KVA) from Germany, Japan, Thailand, Singapore & Indonesia
- ☐ HT/LT Transmission & Distribution Equipment from Japan, Singapore, Malaysia & Thailand
- ☐ Power, Control & Communication Cables from Japan, Singapore, Malaysia & UK
- ☐ LT Distribution Board with protection devices from Japan and Singapore
- ☐ Circuits Breakers (ACB / MCCB, MCB, ELCB, RCCB from 6 A to 3,200 A) from Japan, France & South Korea



Drop out fuse 11,000 volt

☐ Lighting Fixtures (Sodium, Mercury, Fluorescent, Tungsten including Flame-proof fittings)

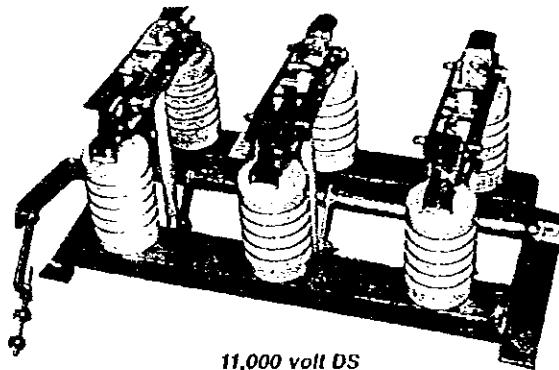
☐ Voltage Stabilizer (110V, 220V, 400V) from USA, Japan

Various Induction Motors (220V, 400V) of 1.0 hp to 50 hp

Auto Transfer Switch / change over switch (400V, 200A - 1,600A) from Korea, Thailand and Myanmar

materials at only K1.5m, a cost savings of 50%. U Khin Maung Win said that both local and foreign companies order switch gears from SME.

SME cannot paint panel boxes with epoxy paint that can provide electromagnetic protection. At a later date, SME could produce such epoxy panel boxes from their assembly line.



11,000 volt DS

U Khin Maung Win told *IT MYA MMAR BUSINESS MAGAZINE* that SME line of business includes power system, illumination system, fire protection system, communication system, automation system, air-conditioning system, plant installation, service contract work and repair and rewinding of transformers, motors and generators.

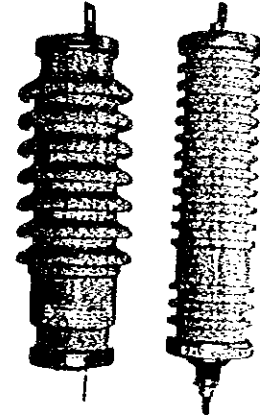
**Safety Switch Gears**

SUPER MEGA Engineers are specialists in medium voltage switch gears (6.6 kV, 11kV). If they are imported from Germany, UK, Japan and South Korea, each unit costs K3m. However SME could install such equipment with imported mate-

**Future Plan**

U Khin Maung Win told *IT MYANMAR BUSINESS MAGAZINE* that SME has been appointed by Ducati of Italy to use and distribute power factor correction capacitors and equipment. SME gives warranty to its clients and after-sales services.

SME distributes LL10, LL100 and LL100F model capacitors. All accessories related to these capacitors are on display at its show-



11,000 volt LA

room. SME and Khin Maung Nyunt Trading have associated themselves as the Golden Strength Engineering Services and Industries and will soon open HT Switch Gears and Equipment Showrooms at Bo Aung Kyaw Street, Yangon.

According to U Khin Maung Win, SME has completed the electrical installation on the ships of Jaya Co., Ltd. (Singapore) built at Sinmalike Shipyard, Yangon. SME has been appointed a sub-contractor for the installation of electrical systems for Department of Human Settlements and Housing Development (DHSHD) and Myanmar Electric Light Cooperatives (MELC). SME is also doing electrical installations in factories in Hlaing Tharyar, Shwe Pyi Thar and South Dagon.

**Contact:**

U Khin Maung Win  
 Managing Director  
 SUPER MEGA ENGINEERS GROUP Co., Ltd.  
 No. 49, Kyauk Myaung Street  
 Tarmwe  
 Yangon  
 Tel: 951 - 542 193, 09 - 31632  
 Fax: 951 - 540 593

# ELECTRICAL DRAWING

## FOR

# 6.6 KV V.C.B. SWITCHGEAR



**SUPER MEGA**  
**ENGINEERS GROUP CO., LTD.**

|                                      |            |                      |             |        |
|--------------------------------------|------------|----------------------|-------------|--------|
| Title: COVER SHEET                   | Drawn by   | Checked by           | Approved by | Date:  |
| Project: 6.6 KV VCB SWITCHGEAR PANEL | Y.Y.S.     | U WIN TIN            |             | Scale: |
| Owner:                               | File name: | Dwg.No. SM/6.6VCB_01 |             | Sheet: |



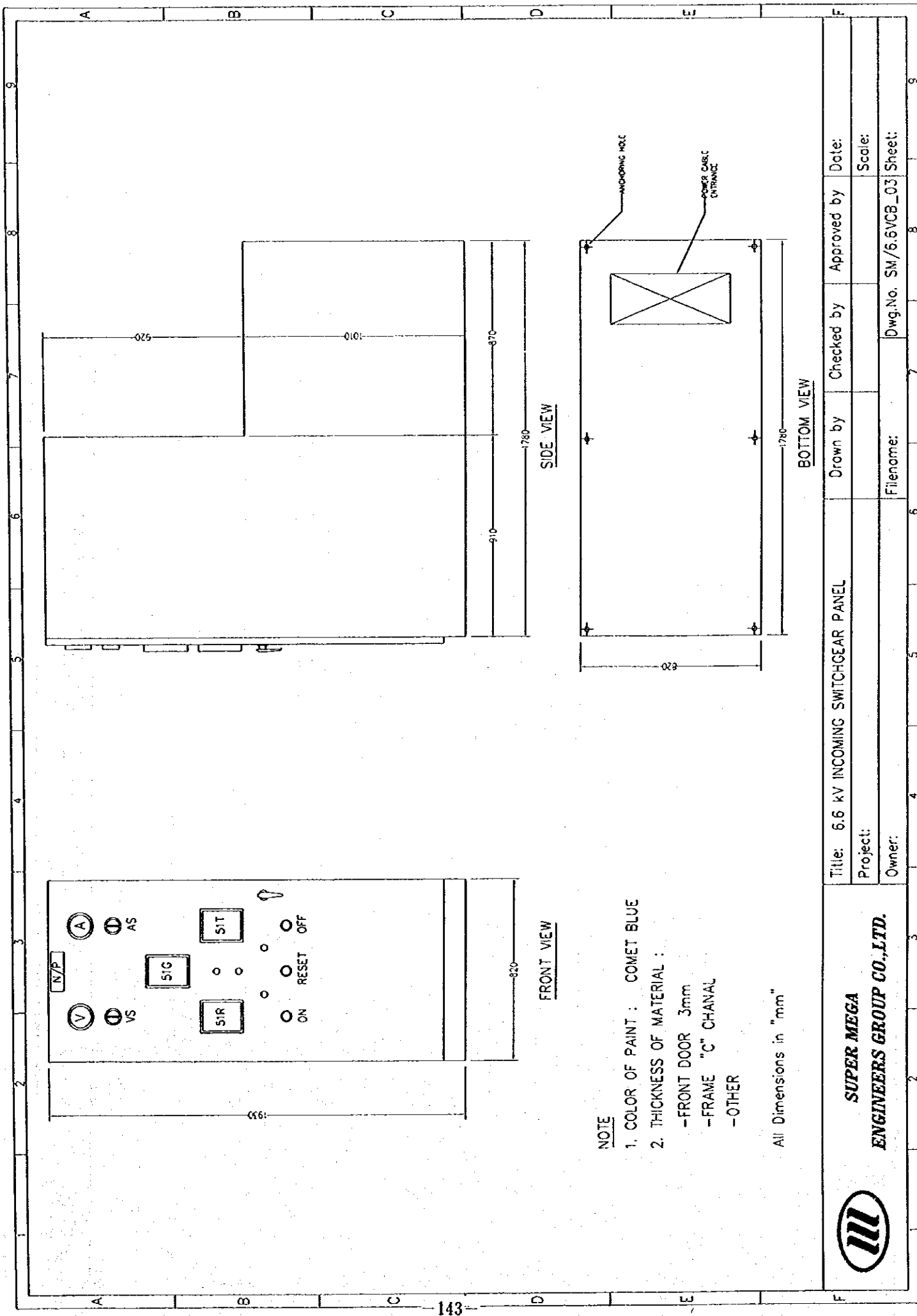
**SUPER MEGA  
ENGINEERS GROUP CO., LTD.**

NOTE SHEET

SHEET SME/2

**VCB**

**GOLD STAR HIGH VOLTAGE CONTACTOR.  
TYPE \_ SVC \_ 6 \_ 42LC.  
RATED OPERATION VOLTAGE 6.6KV 50 HZ.  
RATED OPERATION CURRENT 200A.  
RATED INSULATION VOLTAGE 20KV.  
CONTROL SYSTEM INSTANTANEOUS .  
RATED CONTROL VOLTAGE DC 110.  
MFG. DATE 95 \_ 2.  
INSULATION METHOD \_ G .  
STANDARD IEC RVO 470 .  
CATEGORY AC 3 .  
SHORT CIRCUIT INTERRUPTING CURRENT 4KA.  
WEIGHT 33KG.  
SERIAL NO \_ 5G\_62040 ,  
GOLDSTAR INDUSTRIAL SYSTEMS CO.,LTD.  
GOLDSTAR ELECTRIC MACHINERY CO.,LTD.  
INSTALLATION OF EQUIPMENT.**



FRONT VIEW

SIDE VIEW

BOTTOM VIEW

NOTE

1. COLOR OF PAINT : COMET BLUE
2. THICKNESS OF MATERIAL :
  - FRONT DOOR 3mm
  - FRAME "C" CHANAL
  - OTHER

All Dimensions in "mm"



**SUPER MEGA  
ENGINEERS GROUP CO., LTD.**

Title: 6.6 kV INCOMING SWITCHGEAR PANEL

Project:

Owner:

Drawn by

Checked by

Approved by

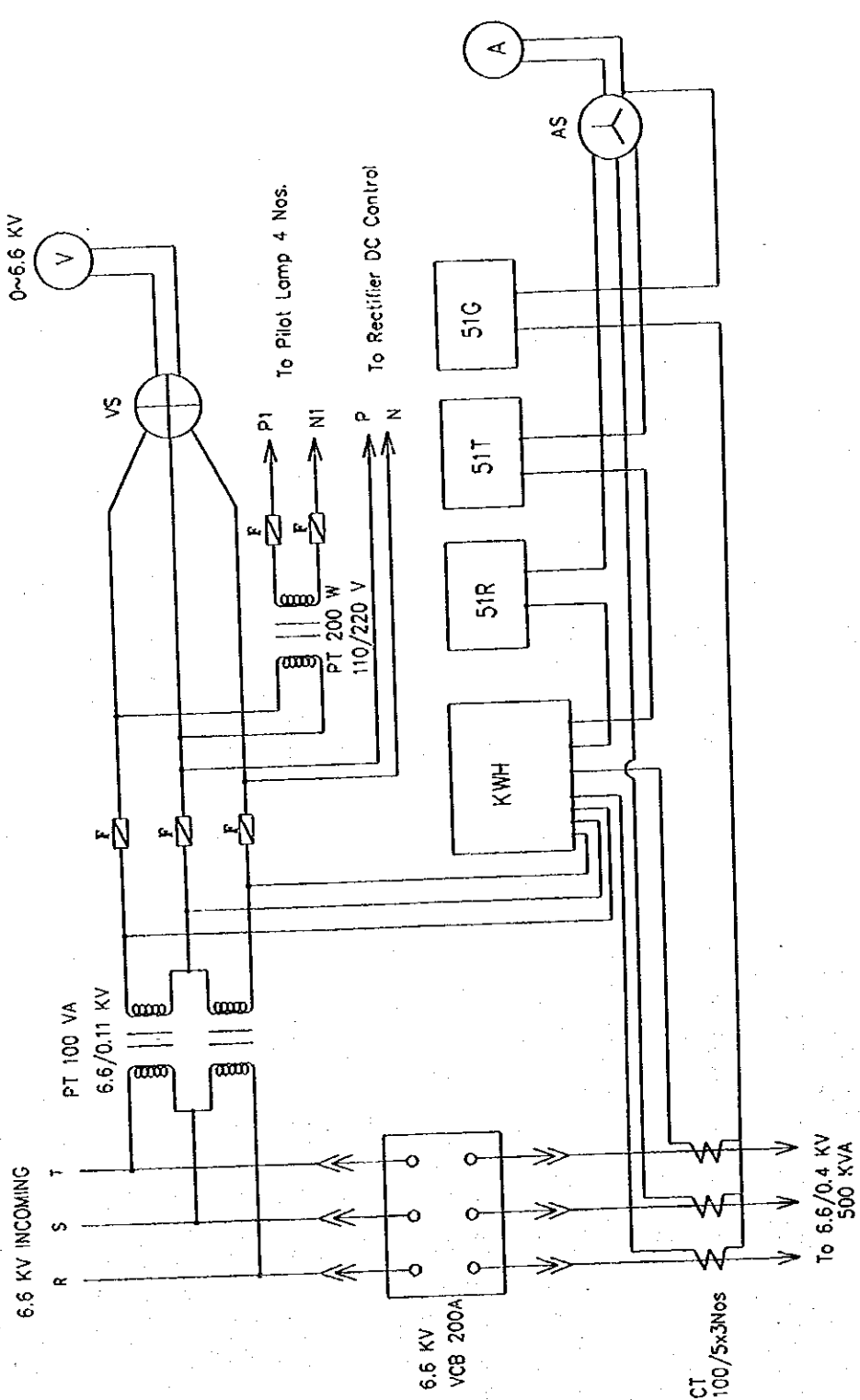
Date:

Filename:

Dwg.No. SM/6.6VCB\_03

Scale:

Sheet:

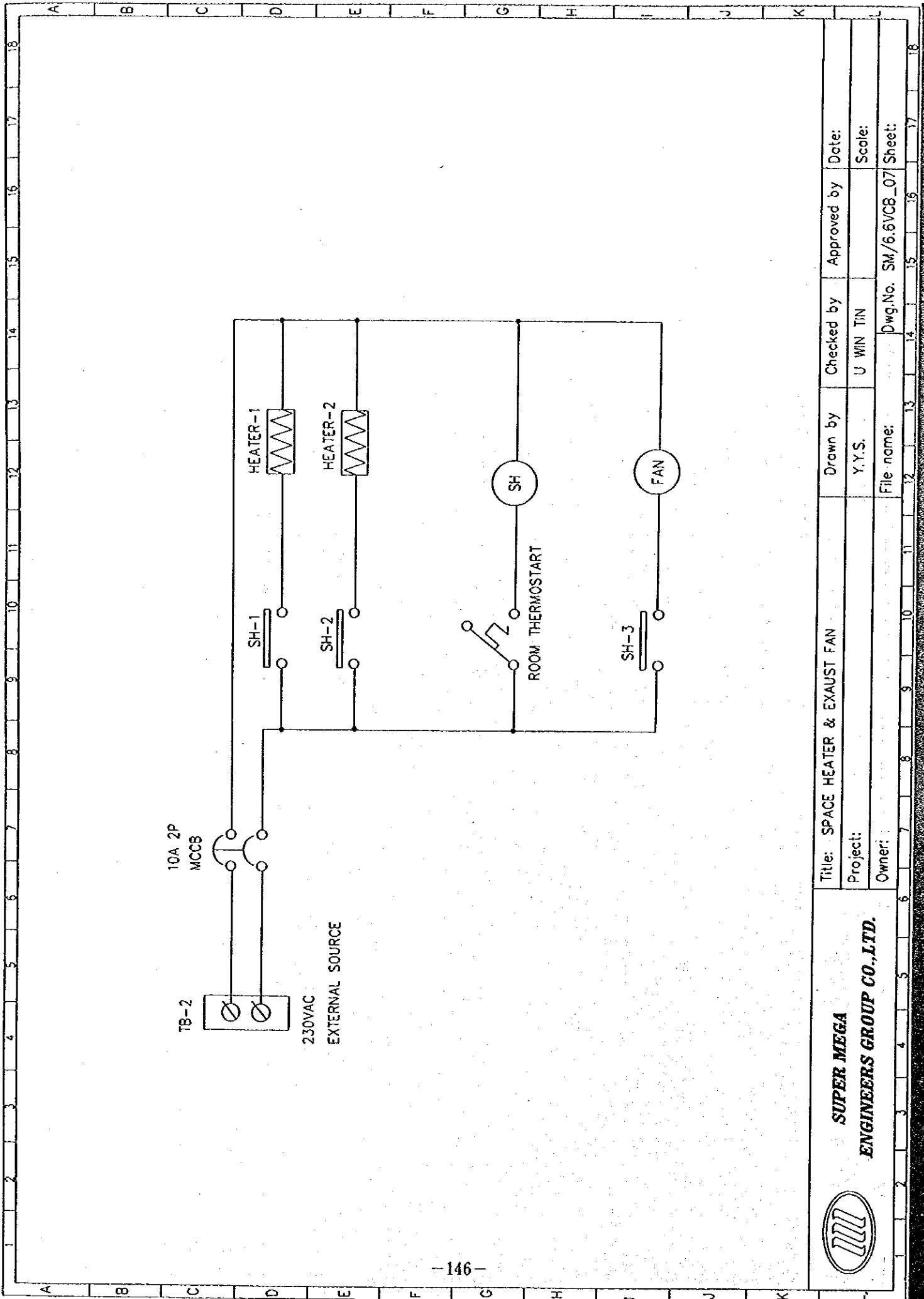


|  |  |            |             |                               |
|--|--|------------|-------------|-------------------------------|
| Title: CIRCUIT DIAGRAM OF 6.6KV SWITCHGEAR PANEL |  | Checked by | Approved by | Date:                         |
| Project:   |  | Y.Y.S.     | U WIN TIN   | Scale:                        |
| Owner:   |  | File name: |             | Dwg.No. SM/6.6VCB_05 Sheet: 9 |


**SUPER MEGA**  
ENGINEERS GROUP CO.,LTD.







|                                   |            |            |                      |        |
|-----------------------------------|------------|------------|----------------------|--------|
| Title: SPACE HEATER & EXHAUST FAN | Drawn by   | Checked by | Approved by          | Date:  |
| Project:                          | Y.Y.S.     | U WIN TIN  |                      |        |
| Owner:                            | File name: |            | Dwg.No. SM/6.6VCB_07 | Sheet: |

  
**SUPER MEGA**  
**ENGINEERS GROUP CO., LTD.**



Super Mega 社がシンガポール企業から取得した見積りの資料

2000-9-16

Dear Sir,

**RE : SEMBAI MICRO-POWER STATION, MYANMAR**

First we have to apologize for the late response to your request. At the moment we are literally "downed" in requests as a result of the obvious revival of the utilization of renewable energy sources.

We are very happy to learn that you are involved in the realization of a hydropower project and are more than interested to make your plans a success.

Find below the quotation for a WKV-Crossflow turbine unit with electronic load-controller. We strongly recommended to plan for one unit as a two unit version would far too expensive for the power level in question. Further we offer a load controller for speed regulation, a very reliable and economic solution. As requested we offer a hydraulic mechanical speed regulator as an alternative.

Considering the head and the size of the plant we recommend not to plan for an inlet valve, but to use the turbine's guide vane for emergency closing in case of a controller failure. However we quote for a manual operated inlet valve as an option.

**I. GENERAL DESCRIPTION**

The plant is equipped with a WKV-single cell Crossflow turbine, coupled to a 1000 rpm synchronous generator via gear drive. The speed/frequency will be controlled to a value  $\pm 0.5$  Hz at full load rejection/acceptance using a WKV load controller.

**1. Turbine**

The turbine has one adjustable guide vane with manual actuator. Alternatively the guide vane will be opened by oil pressure and closed by counterweight. In case of any failure the guide vane will close automatically and stop the turbine. The closing time is adjustable if you want to utilize flow rates below 300 l/sec (dry season and not more water available) we recommend a twin cell solution.

### 2. Electronic Load Governing System

As the output of the station is rather small we recommend an Electronic Load Controller (ELC) to maintain the frequency of 50 Hz.

A water turbine requires a governing system to prevent a change to load resulting in a change of speed. A WKV Electronic Load Controller (ELC) governs the turbine speed by adjusting the electrical LOAD applied to the alternator instead of altering the water flow. Constant speed is maintained by exactly matching the applied load to the input power - under all conditions.

The balance of power is achieved by splitting the load into two parts, the MAIN LOAD and the BALLAST LOAD. The Main Load is the consumer load consisting of lights machines etc. and can be treated as a normal mains supply. The Ballast Load is a separate load and usually consists of space heating or water heaters. It is a fixed load capable of continuously absorbing the full power of the plant. This will be a stainless steel heater installed in the tailrace channel. The voltage supplied to this load will vary depending on the Main Load power and the water conditions. The Main Load voltage is held constant by the Alternator's own voltage regulator.

Alternator Power = Main Load Power + Ballast Power.

As the WKV ELC does not require a change in water flow for governing it can be easily fitted to virtually any Hydro Electric Plant.

The main features are :

- 55 deg. C maximum ambient temperature, no altitude restriction
- 100% load acceptance possible
- Recovery time better than 0.5 seconds
- Transient frequency deviation better 0.2 Hz
- Frequency setting  $\pm 3$  Hz
- Automatic phase balance

### 3. Generator speed

We didn't quote for a 1500 rpm generator. This speed is not reliable because of the runaway speed in case of failures (3000 rpm) and the bearing lifetime. Hence we quoted with 1000 rpm.

## II QUOTATION IN DETAIL :

|                            |                   |   |         |                     |
|----------------------------|-------------------|---|---------|---------------------|
| WKV-crossflow turbine unit | H <sub>net</sub>  | = | 12.5    | m                   |
|                            | Q                 | = | 600     | l/sec               |
|                            | P <sub>turb</sub> | = | 60      | kW                  |
|                            | n <sub>turb</sub> | = | 336     | rpm                 |
|                            | P <sub>gen</sub>  | = | 55      | kW                  |
|                            |                   |   | 68      | kVA at cos phi 0.8  |
|                            | n <sub>gen</sub>  | = | 1000    | rpm                 |
|                            | n                 | = | 1800    | rpm (runaway speed) |
|                            | U                 | = | 400/231 | V                   |
|                            | F                 | = | 50      | Hz                  |

At a net head of 12.5m we guarantee the following values :

| Flow<br>(l/sec.) | Turb. effc.<br>(%) | Turb. outp.<br>(kW) | Gear effc<br>appr. (%) | Gen. effc.<br>appr. (%) | Gen outp<br>(kW) |
|------------------|--------------------|---------------------|------------------------|-------------------------|------------------|
| 600              | 81                 | 60                  | 98.0                   | 95.6                    | 56               |
| 450              | 83                 | 46                  | 97.5                   | 95.7                    | 43               |
| 300              | 80                 | 29                  | 97.0                   | 95.6                    | 27               |

Scope of supply : **Generating unit**

### **WKV-crossflow turbine TD 40-590-1**

- \* single cell version
- \* stainless steel guide vane shaft in self lubricating, regreasable bearings
- \* guide vane from nodular cast iron
- \* stainless steel shaft sleeve (exchangeable), to prevent shaft run in at the stuffing box
- \* runner blades with hydraulically optimised profile
- \* roller bearings grease lubricated for a calculated lifetime of more than 100,000 operating hours and designed to withstand the runaway speed
- \* sturdy turbine housing fabricated from heavy steel plate of 25 and 16 mm thickness, complete with detachable inspection hole to permit checking of all parts of the runner without needing to disassemble the turbine
- \* inlet pipe with flange and inspection hole to allow checking of the guide vane

- Painting system
  - All parts sand-blasted acc. SA 2.5
  - Surfaces internal, water touched
    - \* 1 time coated with 80  $\mu$  epoxy zinc "Fiazinc R", SIKA Chemie
    - \* 3 times coated with 80  $\mu$  each epoxy tar "Poxitar Inertol", SIKA Chemie
  - Surfaces outside
    - \* 1 time coated with 60  $\mu$  "Fiazinc R", SIKA Chemie
    - \* 1 times coated with 80  $\mu$  intermediate epoxy
      - "Icosit EG1 DB2", SIKA Chemie
    - \* 1 times coated with 80  $\mu$  final epoxy
      - "Icosit EG5 RAL 1004 yellow", SIKA Chemie
- One set of screws c/w nuts and washers
- 1 set of rubber sealings for flange connections
- Inlet pipe to suit to a penstock dia 500, c/w adapter coupling "Straubflex"
  - \* no welding needed on site
- Pressure gauge 0 - 2.5 bar  $\varnothing$  100, glycerin-filled, c/w valve
- Base frame for turbine
- Handle to adjust the flow rate (discharge)
- Flexible coupling between turbine and gearbox
- Helical gear to step up to 1000 rpm
  - \* air cooled
  - \* calculated bearing lifetime more than 100,000 operating hours
  - \* for permanent operation under tropical conditions
- Flexible coupling between gearbox and generator
- 2 Protection covers for couplings

**Three-phase synchronous generator**

- \* 415/240 V, 50 Hz
- \* 70 kVA
- \* Insulation class F rated to B
- \* Enclosure IP 23
- \* Frame B 3
- \* Brushless excitation system
- \* AVR for accuracy  $\pm 1\%$
- \* Voltage setting  $\pm 10\%$
- \* Ambient temperature 40 deg. C
- \* For tropical conditions
- \* calculated bearing lifetime more than 100,000 operating hours

Common base plate for generator and gear for easy erection on site

**WGV-load controller with complete control equipment**

- \* Frequency control better  $\pm 0.1$  Hz
- \* Recovery time better 0.5 sec
- \* Constant frequency from zero to maximum load
- \* Metering
  - 1 line Voltmeter with selector switch
  - 3 ballast Voltmeter
  - 3 alternator Amperemeters
  - 1 Frequency meter
- \* Main circuit breaker
- \* Frequency trip adjustable

Ballast load 60 kW, to be installed into tailrace water, heaters from stainless steel, star-connected, c/w all material needed for erection

One set of all cabling needed inside the powerhouse

All material needed for erection

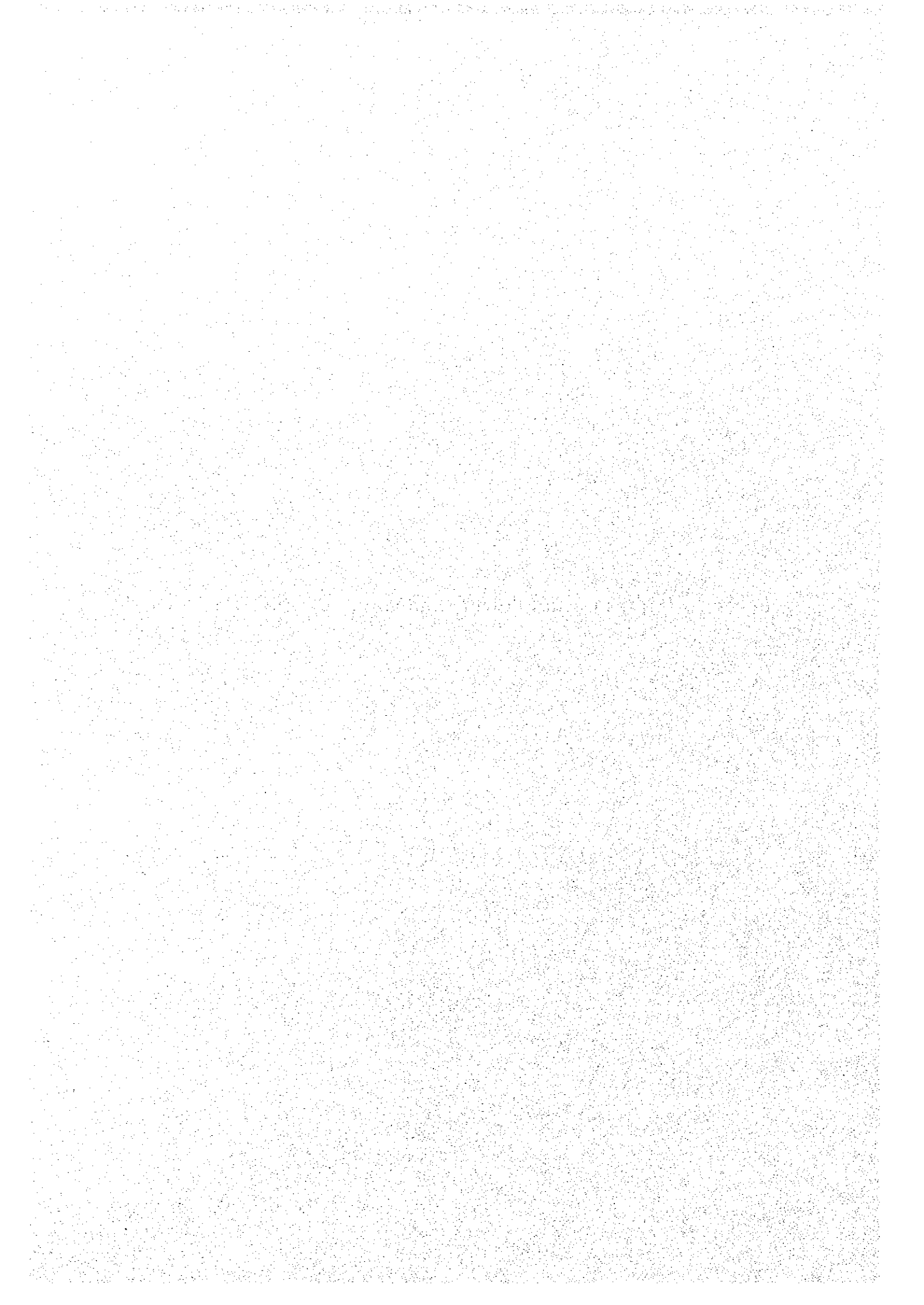
Arrangement and foundation drawings in duplicate (English language)

Maintenance and erection manual in duplicate (English language)

All lubricants for 1 year of operation



**添付資料 11 Sun Power Company Ltd. 関連資料**







# ဆန်းပါဝါကုမ္ပဏီလီမိတက်

## SUN POWER COMPANY LTD.

No. 63, 9th Street, Lanmadaw Township, Yangon, Myanmar.

Phone : 01-222360, 222506, 221451

Fax : 95-1-220295

ရောင်းကုန်ပစ္စည်းအညွှန်းနှင့်တန်ဖိုးဇယား

### SOLAR PRICE LIST

US \$  
01-06-2000

| စဉ် | ကုန်ပစ္စည်းအမျိုးအစား                         | အညွှန်း                  | တန်ဖိုး |
|-----|---|--------------------------|---------|
| ၁။  | နေအားလျှပ်စစ်ပြား (Solar Panel)               | 8 W                      | 77.00   |
| ၂။  | နေအားလျှပ်စစ်ပြား (Solar Panel)               | GL 833 5.4W 15.5V 0.35A  | 92.00   |
| ၃။  | နေအားလျှပ်စစ်ပြား (Solar Panel)               | SP 10 10W 17V 0.58A      | 110.00  |
| ၄။  | နေအားလျှပ်စစ်ပြား (Solar Panel)               | GL 230 22W 14.4V 1.50A   | 238.00  |
| ၅။  | နေအားလျှပ်စစ်ပြား (Solar Panel)               | SP 36 36W 17.0V 2.20A    | 285.00  |
| ၆။  | နေအားလျှပ်စစ်ပြား (Solar Panel)               | M 55 55W 17.4V 3.05A     | 380.00  |
| ၇။  | နေအားလျှပ်စစ်ပြား (Solar Panel)               | SP 75 75 W 17.0V 4.40A   | 475.00  |
| ၈။  | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | SR 16 16A (၂%V)          | 98.00   |
| ၉။  | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | SR 20 20A (၂%V)          | 120.00  |
| ၁၀။ | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | SR 25 25A (၂%V)          | 142.00  |
| ၁၁။ | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | SR 30 30A (၂%V)          | 145.00  |
| ၁၂။ | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | Sun Saver 6-6L (USA)     | 70.00   |
| ၁၃။ | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | Solsum 6.6X (中国(၂%V/12)) | 65.00   |
| ၁၄။ | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | Pro-star-12 12A (USA)    | 100.00  |
| ၁၅။ | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | Pro-star-20 20A (USA)    | 132.00  |
| ၁၆။ | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | Pro-star-30 30A (USA)    | 152.00  |
| ၁၇။ | ဓါတ်အားထိန်းကိရိယာ (Charge Controller)        | SC 02 (၂%V, 2A)          | 12.00   |
| ၁၈။ | ဓါတ်အားထိန်းကိရိယာ (Deluxe Controller)        | PC 10 / 24 (၂%V)         | 142.00  |
| ၁၉။ | Solar Jack Pump                               |                          | 180.00  |
| ၂၀။ | Surface Pump (Homemate)                       |                          | 80.00   |
| ၂၁။ | လှိုင်းခွဲဘူး (Junction Box)                  | JB 02 (၂%V)              | 8.00    |
| ၂၂။ | ဝါယာကြိုးအစုံ (Wiring Set)                    | PVW - 01 (F)             | 5.25    |
| ၂၃။ | ဒီစီမီးချောင်းအစုံ (DC Fluorescent Light Set) | 9 W PL Light             | 7.00    |
| ၂၄။ | ဒီစီမီးချောင်းအစုံ (DC Fluorescent Light Set) | 10 W With Cover          | 11.00   |
| ၂၅။ | ဒီစီမီးချောင်းအစုံ (DC Fluorescent Light Set) | 20 W With Cover          | 19.00   |
| ၂၆။ | ဒီစီမီးချောင်းအစုံ (DC Fluorescent Light Set) | 20 W Without Cover       | 15.00   |
| ၂၇။ | ဆိုလာ ဘက်ထရီ (Solar Battery)                  | 45 AH (6 BC 120 P / 2)   | 86.00   |
| ၂၈။ | ဆိုလာ ဘက်ထရီ (Solar Battery)                  | 30 AH (6 JC 105 P / 2)   | 70.00   |

**PROVEN TECHNOLOGY INDUSTRY CO., LTD.**

No.36/38, Ahlan Pya Pagoda Road, Mingalar Taung Nyunt T/S, Yangon, Myanmar

TEL: 951-289191, 289179 ; FAX: 951-252495, 289179

E.mail : proven @ mptmail.net.mm

PTIC- 150/2000.

ATIN : Managing Director  
 TO : Sun Power Co., Ltd.  
 FROM : U Ohn Lwin  
 FAX : 220295  
 DATE : 16.09.2000  
 PAGE : (1)

Sub : Quotation for TOYO Battery.

Dear Sir,

1. We are pleased to quote you our best selling price as follows:

| Type of Battery | Voltage | Plate / Cell | Nominal Capacity |          | Selling Price |  |
|-----------------|---------|--------------|------------------|----------|---------------|--|
|                 |         |              | 5 HR (20 HR)     | (Dry)    | With Acid     |  |
| N 20            | 6,8,12  | 9            | 14 (18)          | K 3,150  | K 3,220       |  |
| NS 40 (L)       | 12      | 9            | 26 (32)          | K 4,150  | K 4,250       |  |
| NS 40 Z(L)      | 12      | 11           | 28 (35)          | K 4,350  | K 4,450       |  |
| N 50 Z(L)       | 12      | 11           | 48 (60)          | K 5,900  | K 6,050       |  |
| N 70 (L)        | 12      | 13           | 56 (70)          | K 6,850  | K 7,100       |  |
| N 70 Z(L)       | 12      | 15           | 60 (75)          | K 7,700  | K 7,950       |  |
| N 100           | 12      | 17           | 80 (100)         | K 9,800  | K 10,100      |  |
| N 120           | 12      | 21           | 96 (120)         | K 12,000 | K 12,350      |  |
| N 150           | 12      | 25           | 120 (150)        | K 14,300 | K 14,700      |  |
| N 200           | 12      | 33           | 160 (200)        | K 20,200 | K 20,700      |  |

[ Validity of selling price will be for (30)days ]

2. We hope that the above selling prices are favourable to you and looking forward to your order soon.

3. Please do not hesitate to contact me if you need further information for the above quotation of our batteries.

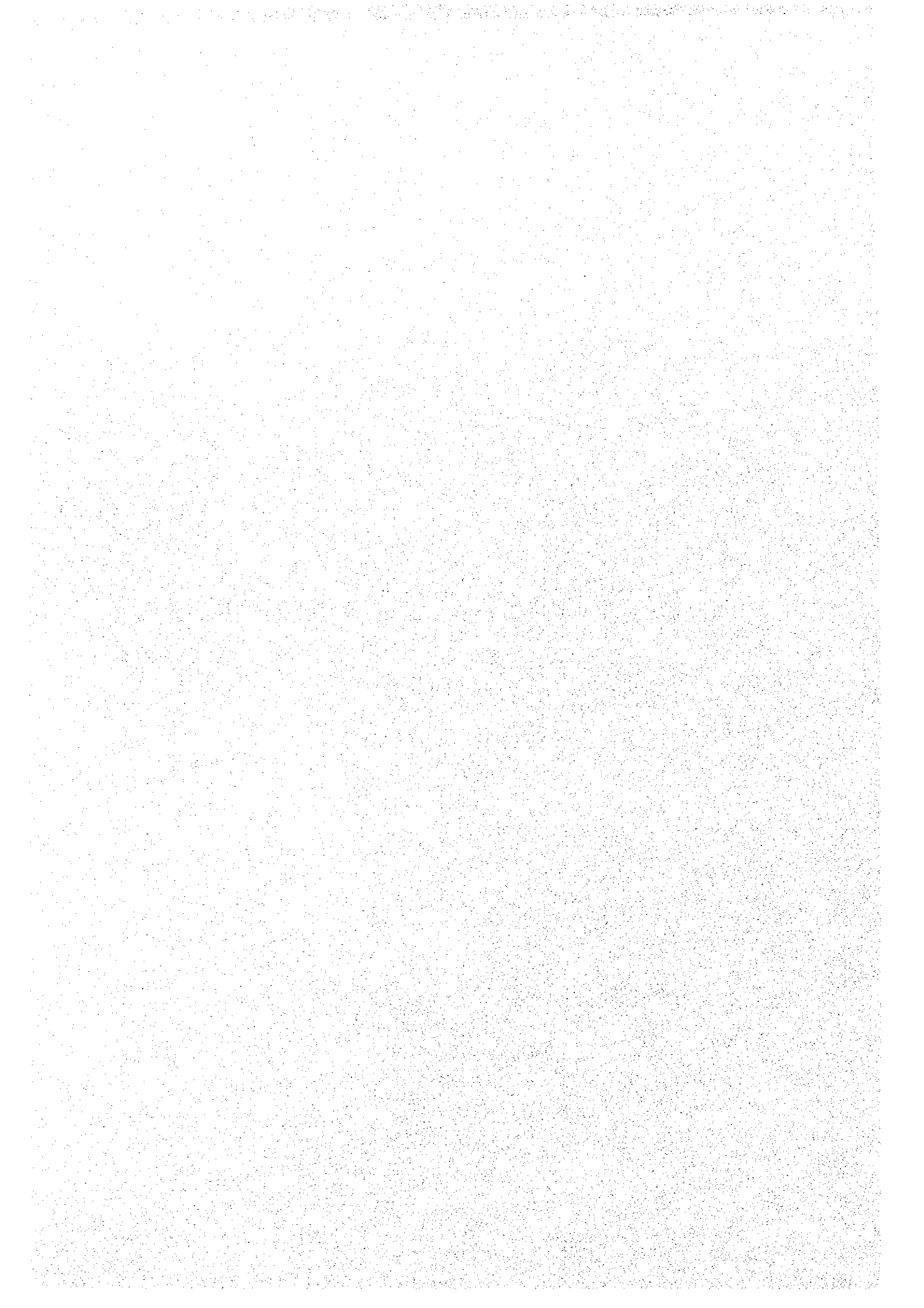
Thank you and best regards.

Yours faithfully,



U Ohn Lwin  
Managing Director

**添付資料 12 Renewable Energy Association Myanmar 関連資料**





REGISTERED 17 SEP 2000

## REAM'S EXPRESSION ON MEETING WITH JICA

We feel very pleased to meet the official person<sup>el</sup>ly of JICA.

We consider this meeting as an important function of our association to expose our activities to Japanese atmosphere where many actions on Renewable Energy Development field is encouraging at global scale.

We already have some involvement in some activities of Japanese INGOs and Japan's Grassroots Grant assistance projects in Myanmar.

At the moment, we emphasize on Solar Photovoltaic Power application at remote areas in Myanmar and our current activities has linkage with Myanmar private business sector, social organizations, INGOS, UNDP and also with government departments in promoting of this field.

We are interested in some particular Japanese projects like New Sunshine Project and etc.. We do believe that if we have chance to participate in some portion of such kind of project which has to launch in Myanmar area, it will be very beneficial for both parties.

As we <sup>have</sup> are registered environmental NGO, privately we established with young and energetic people who <sup>has</sup> expertise and qualification in respective fields even though they are not government staffs and still <sup>has</sup> no chance to show their ability.  
<sup>have</sup>

Not like some organizations of red tapped, our work procedure and functions are always active and prompt by cooperating with established flexible networking scheme.

Accordingly, we would like to offer our services on any functions of information, education and communication matters relating to do particular activities on survey work, feasibility study, project evaluation, joint research, demonstrative function, test site establishment and project implementation tasks of RET development.

Brief profile of REAM is attached here for your perusal and further relation.

RENEWABLE ENERGY ASSOCIATION MYANMAR (REAM)  
PH: 01-292012; 01-298530; 01-212486; 01-701650  
FAX: 01-202826  
E-Mail: siel.ygn@mpt mail. net. mm.

## BRIEF DESCRIPTION OF RENEWABLE ENERGY ASSOCIATION MYANMAR (REAM)

PH: 01-292012; 01-298530; 01-212486; 01-701650, FAX: 01-202826, E-Mail: siel.ygn@mpt mail.net.mm.

REAM is one of the active national NGO ( affiliated to Forest Resource Environment Development and Conversation Association - FREDA ) working on renewable energy related services for rural development and environmental conservation.

Idea to establish this association was evolved since 1993 together with the activities of solar power application function at remote villages. In 1995, founders group was actively participating in State Fuel Wood Substitution Committee as private members and did many public education activities on practical application of Renewable Solar Energy to alleviate the energy shortage problem and to save the environment. This activities became more efficient in 1998 due to State encouragement on private sector participation to solve the current problems of fuel and environmental conservation. Organization set up activities were done in that year and association register application was submitted in 1999 as a national NGO under association law. At the moment, the association is functioning thoroughly in implementing the aimed plans together with other private associations, business farms, international NGOs and also with government departments.

REAM has firm concept, objective and targeted plan for long term establishment in Myanmar to support renewable energy concerned endeavor of human development services at global scale.

REAM believes that efficient coordinating action with others including local inhabitants, professionals, technicians, micro or small enterprises and same objective oriented organizations is a real necessity in combating environmental problems. Our networking strategy has full flexibility with decentralized management ( limitation in each institutional set-up has to be practiced under own management ). But particular collective function has to be executed together systematically as mutually agreed plan or project.

To get sustainable and perfect achievement, it is also clear that all the participating personals must gain certain benefits of their own interests. At this stage, applicable networking scheme and procedure become important and now REAM and following groups are start implementing to exploit workable networking scheme by practicing some joint actions. Following organizations are some prominent partners of our activities in Myanmar.

Forest Resource Environment Development & Conservation Association ( FREDA )

Friends of Rainforests in Myanmar ( FORM )

ECODEV Group

Solar Energy Cooperative Ltd. — UNEP project.

Emerald Green Cooperative Ltd.

Dry Land Cooperative Ltd.

Kirishow EleconCo., Ltd.

Myanmar myay Ceramic industries Co., Ltd.

Orient Nation Battery Enterprise

Medical Doctors Association of Asia (AMDA) Japanese international NGO

My Hour's International Society (MIS) Japanese international NGO

UNDP/FAO/MYA/99/006 PROJECT(Kuaukpadaung area)

CGP/MYA/002/HCR-FAO PROJECT (Rakhine area)

District Peace and Development Council (Min-bu and Meiktilar Districts)

Water Resources and Utilization Dept., Ministry of Agriculture and Irrigation

Ultimate aim of REAM is to upgrade the standard of people who live in remote areas of Myanmar by promoting and applying Renewable Energy Technology (RET). At the moment, we focus particularly upon dry and arid zone where the situation of inhabitants' daily energy requirement is threatening their environment to become desert soon. Ecological backlash of this happening will lead to enormous bad consequences to the whole area. This clear ecosystem deteriorating pattern is caused by the action of people who can't effort to think about other matters apart from their immediate requirements. Daily energy requirement is their critical need. Effective fuel substitution and making them convinced themselves by providing proper services, technologies, materials, and funding is only sustainable way for improvement.

Many different projects have been done in such remote areas for development. We find and believe that the project without community participation cannot get positive result and sustainable achievement. In real practice, practical essence of community participation is not easy to be achieved. Our (REAM) hypothesis is mutually beneficial networking strategy among practicing atmosphere is essential and practical way to get success.

#### **THREE MAIN OBJECTIVES OF REAM ARE:**

- (1) to alleviate the energy problem by using RET
- (2) to protect the environment and save the natural resources
- (3) to improve living standard of grass-root level people by utilizing RET

#### **THREE MAIN SERVICES OF REAM ARE:**

- (1) **INFORMATION**  
collection and dissemination of information on RET and its related affairs
- (2) **EDUCATION**  
educating services on RET development and its related affairs
- (3) **COMMUNICATION**  
communication services between who want to materialize a RET related project and who can implement or be good person(s) [ or organization(s) ]

**REAM IS NOW TRYING TO PRACTICE IN  
WORKABLE NETWORKING SCHEME IMPLEMENTING SMALL DEVELOPMENT PROJECTS**

**EVEN OUR PERFORMANCES ARE VERY SMALL, SYNERGETIC RESULT OF THOSE ACHIEVEMENTS  
WILL  
ACCUMULATE TO BE AN EFFECTIVE IMPROVEMENT  
FOR THE VILLAGE PEOPLE**

**SUSTAINABLE AND DIRECTLY BENEFICIAL ACTIONS FOR THE PEOPLE AT GRASS-ROOT LEVEL IS  
URGENTLY REQUIRED BEFORE THE SITUATION WORST AND TOO LATE TO SAVE.**

**SMALL FUNCTIONS ARE QUICK TO START, EASY TO MONITOR AND GET SIMPLIFIED  
ACHIEVEMENT TO MAKE CONVINCED THE BENEFICIARIES**

**REAM WILL USE THAT STRENGTH OF INHABITANTS AND NETWORK TO DEVELOP THE RET AND  
CONSERVE  
THE ENVIRONMENT**

**RET IS CRITICAL REQUIREMENT FOR GREEN ENVIRONMENT**

## SOME PROMINENT ACTIVITIES OF REAM

-Paper presentation about " Practical Application and Commercialization of Renewable Solar Energy in Myanmar" at State Seminar of Fuel Wood Substitution Committee, Ministry of Forestry (1998).

### -Educational functions:

Joint exhibition with Ministry of Science and Technology  
Joint exhibition with Ministry of Forestry  
Education booth at Trade Fares, Yangon; Mandalay  
Education booth at Pagoda festival, Min-bu/ Shwe-setaw  
Broadcasting on Myanmar Radio

### -Training on Solar Photovoltaic power application:

Na-thar-myaing re-habitation site, Ministry of Health  
Meiktilar General Hospital, Ministry of Health  
FISCA Security System Company  
Field staff of UNDP/FAO/MYA/99/006, Kyayk-padaung Tsp.  
Participation at field training center of ECODEV

### -Feasibility survey work:

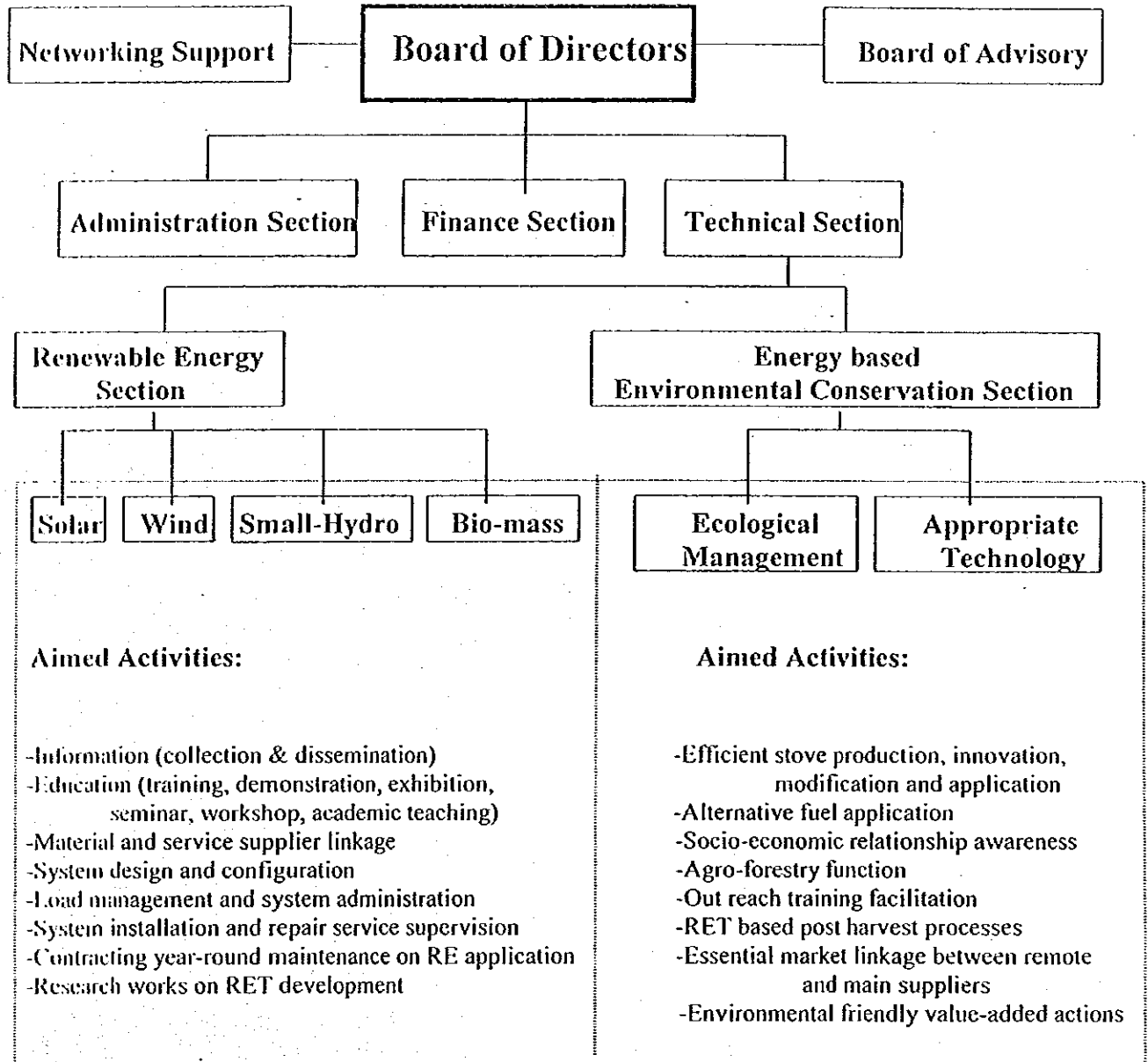
Small hydro-power plant establishment at Pin Pu village, Kyauk-padaung Tsp. ( UNDP/FAO/MYA/99/006 )  
Hydro-electric power generating potential from Man Chaung dam, Nga Phe Tsp. (Minbu DPDC arrangement)  
Small Solar and Wind Hybrid power application potential at Kone-thar village track, Min-bu Tsp (Minbu DPDC arrangement).  
Solar Photovoltaic power system specification and cost evaluation for water purifier plant at Meiktilar central market (INGO,AMDA).  
System re-installation potential and expenditure estimation of damaged solar pump station , Kone-thar village , Min bu Tsp. (Minbu DPDC arrangement).  
Solar PV application potential study at Mangrove Reforestation Project area, Ayawaddy Delta, (ACTMAN/FREDA/FD project).

### - Out reach functions:

Field survey on solar photovoltaic pump stations to record and report about actual situation, performance, required materials for maintenance and system efficiency for the Ministry of Agriculture and Irrigation  
Year round maintenance contract on solar electric pump stations at Nathar-myaing re-habitation center (Ministry of Health)  
Solar/wind hybrid power system test Pale village, Thone-gwa Tsp. ( Solar Energy Co. Ltd.)  
Technical supervision on Installation of Solar electric pump for monastery water supply system ( Ma-hling )  
Technical supervision on Installation of Solar electrification of remote cotton Farm, Pyaw-bwe Tsp., ( Ministry of Agriculture and Irrigation)  
Technical supervision on Installation of Solar electric pump system for water purifier plant, General Hospital, Meiktilar, (INGO,MIS)

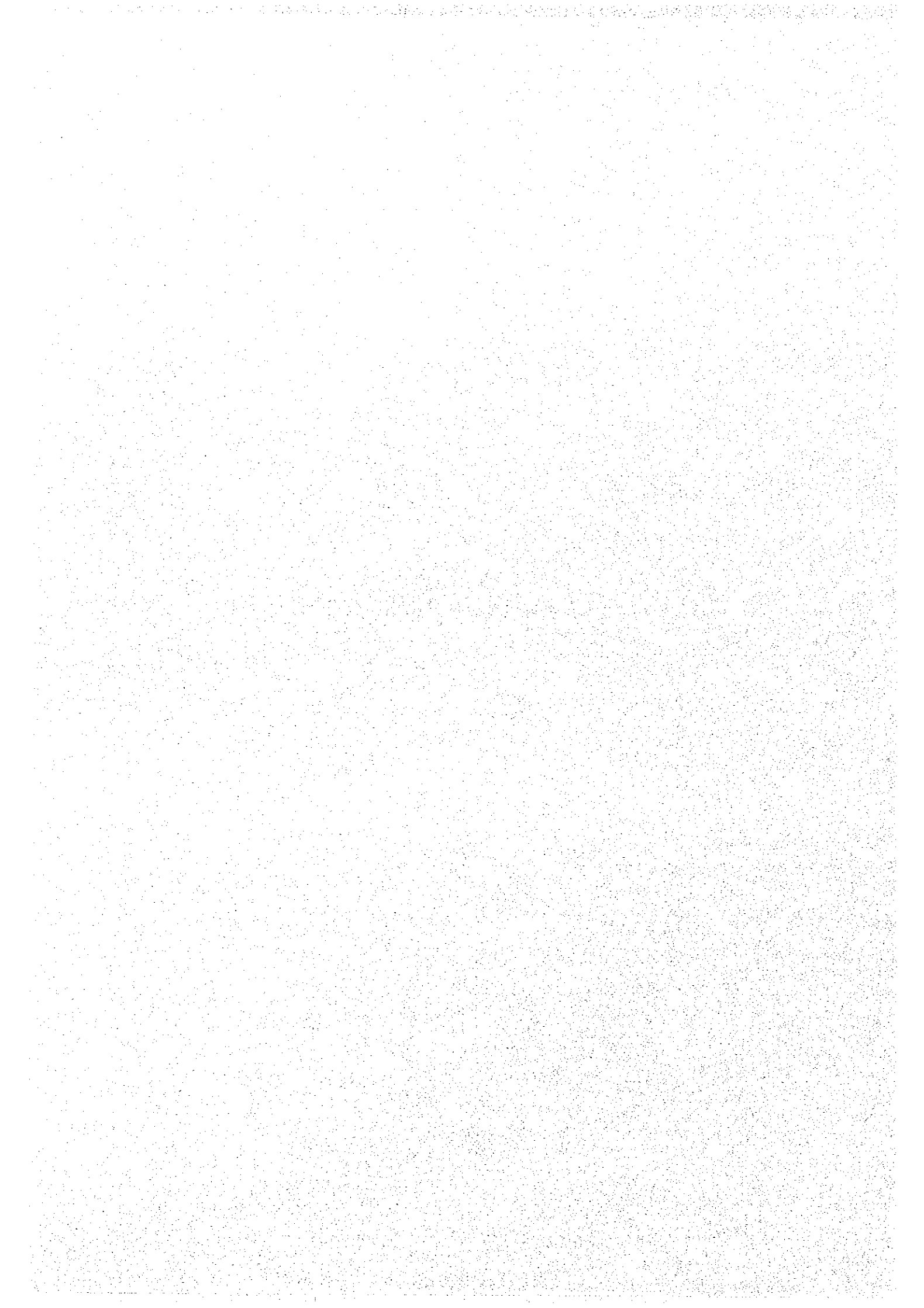


# Organization Chart of REAM





**添付資料 13 雲南省機械設備進出口公司 関連資料**





## BRIEF INTRODUCTION

### OUTSTANDING ACHIEVEMENTS OF THE COMPANY

- Ranked as the No. 285 in the top 500 Import and Export Enterprise of China
- One of top 200 Export Enterprise in China
- One of top 100 Export Enterprise for the Machinery and Electrical products of China

### THE COMPANY STRUCTURE

YMEC is the kernel member of YMEC (Group) Corporation with the eighteen-year glorious career. YMEC (Group) Corporation is the transactional, transprovincial and transprofession large group company with the system of ownership which possesses the 106 member units. And it is the powerful backing for YMEC foreign economic trade business. YMEC has set up the branch offices in Ruili, the border of China and Myanmar, He Kou, the border of China and Vietnam, and in U.S.A., Thailand, Myanmar, Laos, Vietnam. YMEC has established the business and cooperation relations with the more than 80 countries and regions all over the world. They have become the big foreign trade, service and information network of YMEC.

### SCOPE OF FOREIGN TRADE BUSINESS

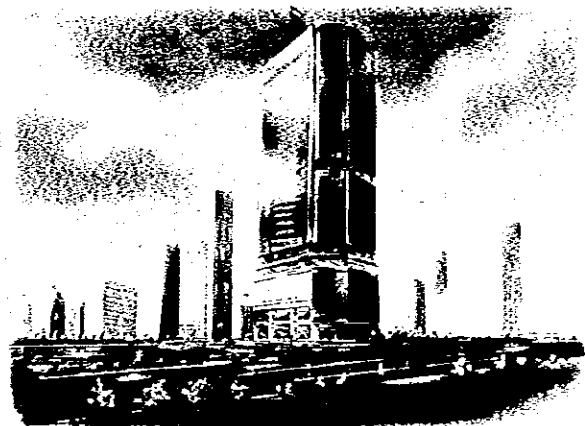
YMEC is an international trading corporation specializing in the import and export of machine tools, wires and cables, motors, diesel engine, medical equipments, optical products, agricultural machineries, light industry equipment, transport equipment, food industry equipment, building engineering equipment, electric products, automobile, motorcycle and complete -set equipment etc. YMEC greatly engaged in business of various forms including agency, joint venture, processing

to customers' designs, sample or with supplied materials or OEM as well as barter trade and compensation trade etc. YMEC has also developed the international bidding and inviting tenders business.

### SCOPE OF FOREIGN ECONOMIC BUSINESS

- contract for overseas engineering and domestic international tender project on its line.
- export of equipment and material for the above projects.
- dispatch of various labours for the projects on its line.
- establishment of all kinds of enterprises abroad according to the country's regulations

YMEC is famed the world over by its high prestige, good quality products and perfect after-sale services. YMEC sincerely hope to develop the cooperation with all friends domestic and abroad in the wide economic field.

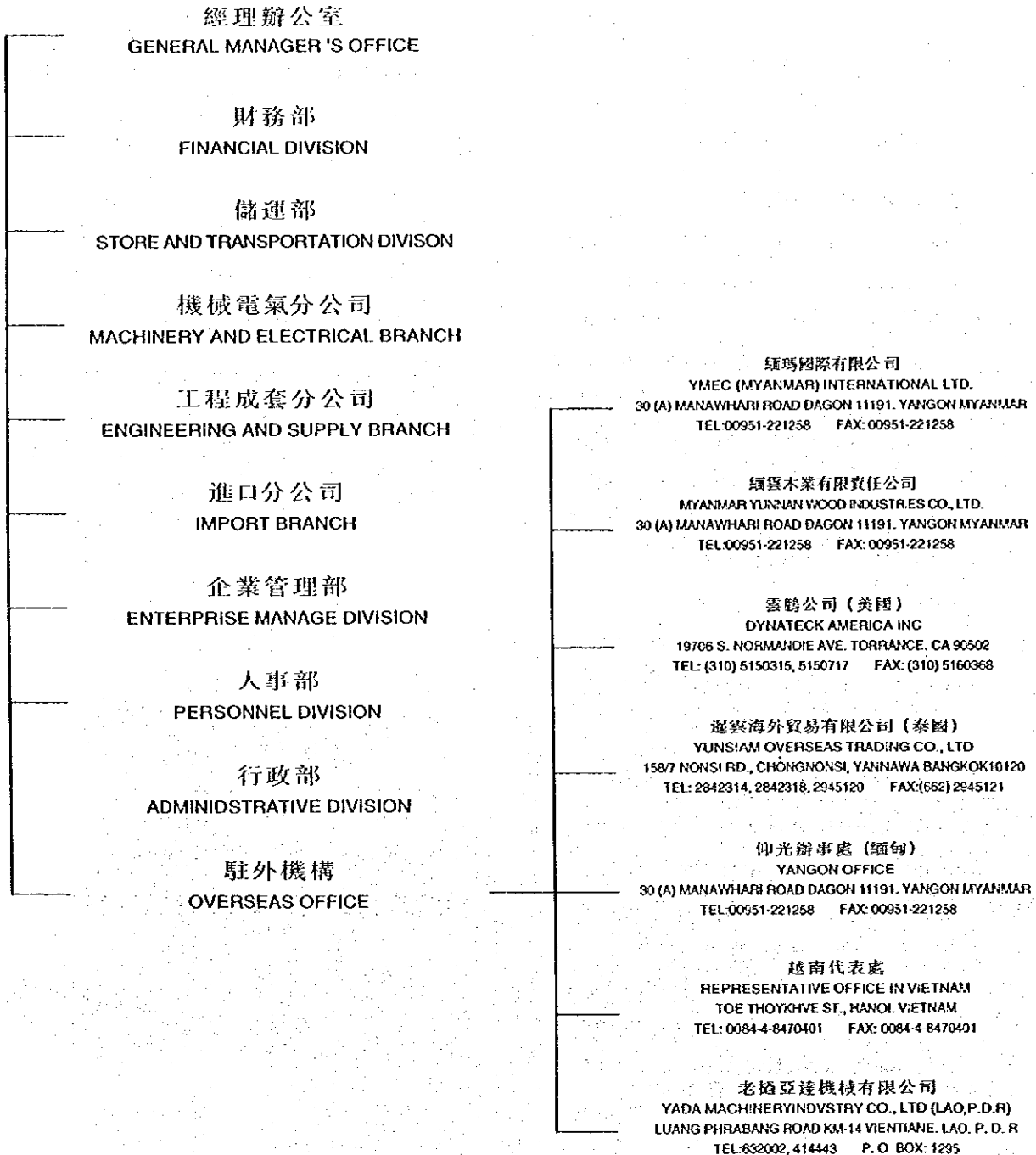


公司办公大楼 — 云南世博大厦  
THE OFFICE BUILDING OF YMEC — YUNNAN  
WORLD FAIR BUILDING



# 雲南省機械設備進出口公司

## 雲南省機械設備進出口公司管理機構 ADMINISTRATIVE FRAMEWORK OF YUNNAN MACHINERY & EQUIPMENT IMPORT & EXPORT CORPORATION





# 雲南省機械設備進出口公司

## 雲南省機械設備進出口公司歷年機電成套設備出口及境外工程情況

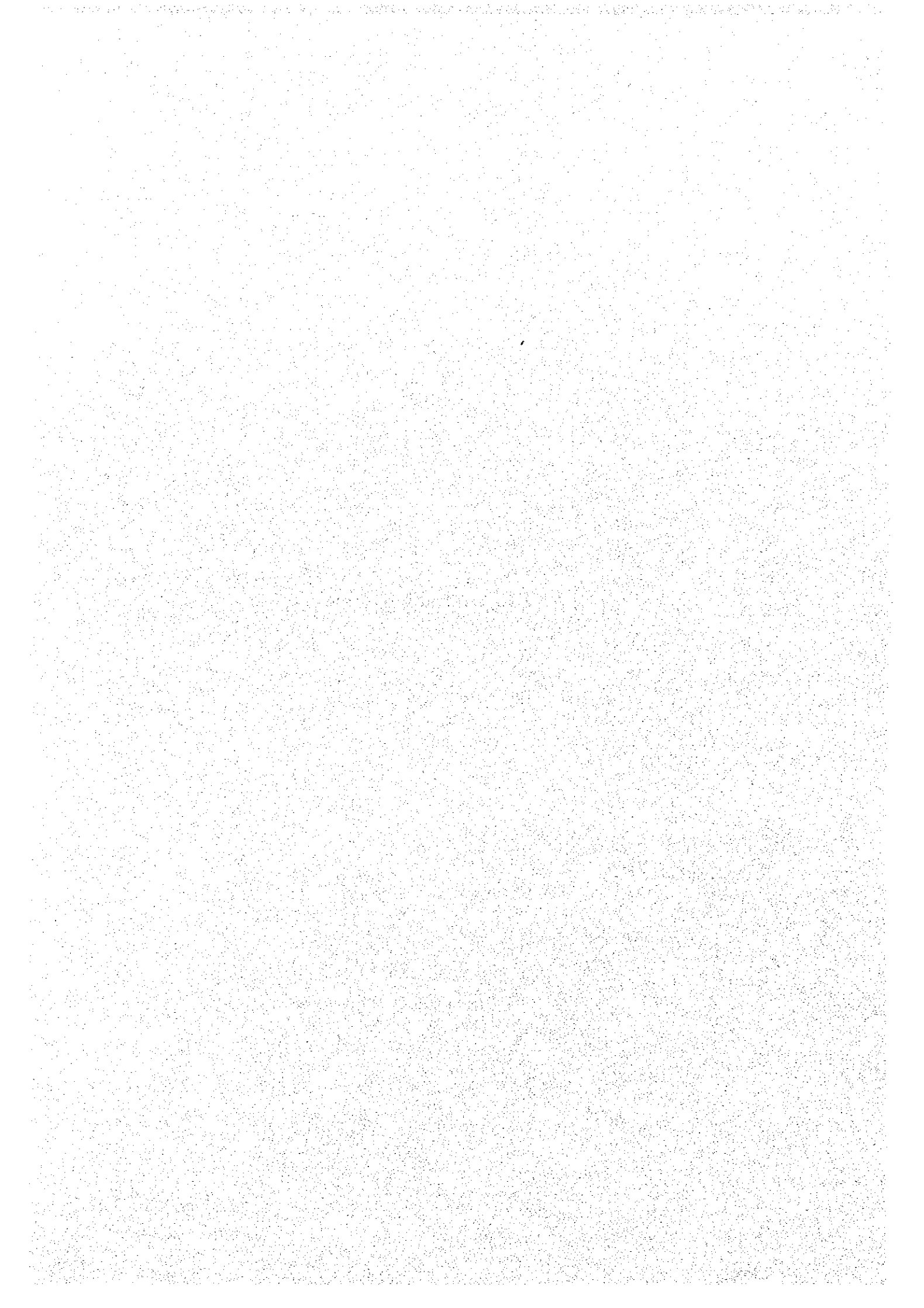
|      |               |   |   |                                      |
|------|---------------|---|---|--------------------------------------|
| 1988 | 美國<br>U.S.A.  | 拜塔索水電站<br>Bataso Hydropower Station         | 總容量 3100KW<br>Total Capacity 3100kw   | 1 套<br>1 set                         |
| 1988 | 美國<br>U.S.A.  | 福德江水電站<br>Hood River Hydropower Station     | 總容量 1800KW<br>Total Capacity 1800kw   | 1 套<br>1set                          |
| 1992 | 緬甸<br>Myanmar | 和平常 3 個水電站<br>3 Hydropower Stations (Hopin) | 總容量 1890KW<br>Total Capacity 1890kw   | 7 套<br>7 sets                        |
| 1992 | 美國<br>U.S.A.  | 臘瓦水電站<br>Lava Spring Hydropower station     | 總容量 800kw<br>Total Capacity 800kw   | 1 套<br>1 Set                         |
| 1993 | 緬甸<br>Myanmar | 萊瓦等 3 個水電站<br>3 Hydropower Stations(Laiva)  | 總容量 4760KW<br>Total Capacity 4760KW   | 7 套<br>7 Sets                        |
| 1993 | 緬甸<br>Myanmar | 南苗南姆 2 個水電站<br>Nammyaw Hydropower station   | 總容量 7000KW<br>Total Capacity 7000KW   | 5 套<br>5 Sets                        |
| 1993 | 美國<br>U.S.A   | 英格冉水電站<br>Ingran Ranch Hydropower Station   | 容量 350kw<br>Capacity 350KW  | 1 套<br>1 Set                         |
| 1993 | 緬甸<br>Myanmar | 工程機械<br>Construction Equipment              | 推土機、挖掘機、<br>裝載機、自卸卡車等<br>Bulldozer, excavator, Loader,<br>Dump, truck. etc. | 122 臺<br>122 Sets                    |
| 1993 | 緬甸<br>Myanmar | 鐵路成套設備<br>Railway Transportation Equipment  | 2000HP 機車 6 臺<br>6 Sets of Locomotive 2000HP                                | 23 輛客車<br>23 Sets of Passenger coach |

## EXPORT RECORD OF PACDAGE EQUIPMENT BY YMEC

|      |                |   |  |   |
|------|----------------|---|--|---|
| 1991 | 塞浦路斯<br>Cyprus | 地下電纜<br>Underground Cables                        | 0.6/1KV & 6.35/11KV<br>紙力電纜, 標號:<br>213/1990   | 0.6/1KV & 6.35/11KV<br>PILCDSTA CABLE<br>TENDER NO. 213/1990<br>81公裏 81KM |
| 1994 | 緬甸<br>Myanmar  | 輸變綫路材料<br>Transmission Line Material              | 變壓器、開關櫃、斷路器、鋼<br>芯鉛紋綫等<br>Tran sformer, Switchgear, circuit<br>Breaker. ACSR. etcl           |   |
| 1994 | 緬甸<br>Myanmar  | 清水河等 2 個水電站<br>2 Hydropower stations(Chinshwehaw) | 總容量 550KW<br>Total Capacity 550kw  | 3 套<br>3 Sets   |
| 1994 | 緬甸<br>Myanmar  | 照濟 I 級水電站<br>Zawgyi I Hydropower station          | 容量 3x6000KW<br>Total Capacity 3x6000KW   | 3 套<br>3Set   |
| 1995 | 緬甸<br>Myanmar  | 鐵路成套設備<br>Railway transportation Equipment        | 2000HP 機車 6 臺<br>1200HP 機車 4 臺<br>6 Sets of Locomotive 2000HP<br>4 Sets of Locomotive 1200HP | 客車 30 輛<br>30 Sets of Passenger coach                                     |
| 1996 | 緬甸<br>Myanmar  | 志衝等 3 個水電站<br>3 Hydropower station (Zi chuang)    | 總容量 11260KW<br>Total Capacity 11260KW  | 8 套<br>8 Sets   |
| 1996 | 緬甸<br>Myanmar  | 藏都水電站<br>Zaungtu Hydropower Station               | 總容量 2x10000KW<br>Total Capacity 2x10000KW  | 2 套<br>2 Sets   |
| 1996 | 緬甸<br>Myanmar  | 照濟 II 級水電站<br>Zawgyi II Hydropower station        | 閘門壓力綫管等<br>Gate Valve and penstock pipe  |   |
| 1997 | 緬甸<br>Myanmar  | 仰光碼頭項目<br>Yangon Bo Aung Gyaw<br>Containter Wharf | 1. 183M long with two 18M wide<br>approach bridges<br>2. Cargo Handling Equipment            | 16000 噸<br>16000 Tons   |



## 添付資料 14 MEPE 地方組織関連資料



### **(3) Organizational Structure of the MEPE in Rural Operation**

#### **Management of each regional headquarters and branch office.**

The Head Office of MEPE is located in Yangon, and the remaining 14 Regional Offices are located in the capital cities of the 7 States and 7 Divisions of the Union of Myanmar. Each Regional Office is headed by the State and Divisional Engineers. There are also Township Electrical Engineers who under take the responsibilities of the State and Divisional Engineers. Under the supervision of the Township Electrical Engineers, ( 5 ) sectors are divided, namely:-

1. Village Electrical Incharge
2. Accounts Incharge
3. Distribution Incharge
4. Mini hydro power ( or ) Diesel power station incharge

#### **Role of each local office**

- The Township Electrical Engineer is responsible for the distribution of electricity to the relevant towns.
- To organize for collection of electricity charges.
- To supervise and co-ordinate with the Regional Administrative in order to electrify the border area towns by diesel or mini hydro power.

#### **Composition of staff**

- |   |          |
|---|----------|
| ( a ) Divisional ( or ) State Electrical Engineer | - 1 No.  |
| ( b ) Township Electrical Engineer                | - 1 No.  |
| ( c ) Village Electrical Incharge                 | - 1 No.  |
| ( d ) Accounts Incharge                           | - 1 No.  |
| ( e ) Distribution Incharge                       | - 1 No.  |
| ( f ) Sub – assistant electrical engineer         | - 1 No.  |
| ( for mini ( or ) diesel power station )          |          |
| - Shift duty in charge                            | - 4 Nos. |
| - Helper  | - 3 Nos. |
| Sub – assistant electrical engineer               | - 1 No.  |
| ( for transmission Line )                         |          |
| - Foreman   | - 1 No.  |

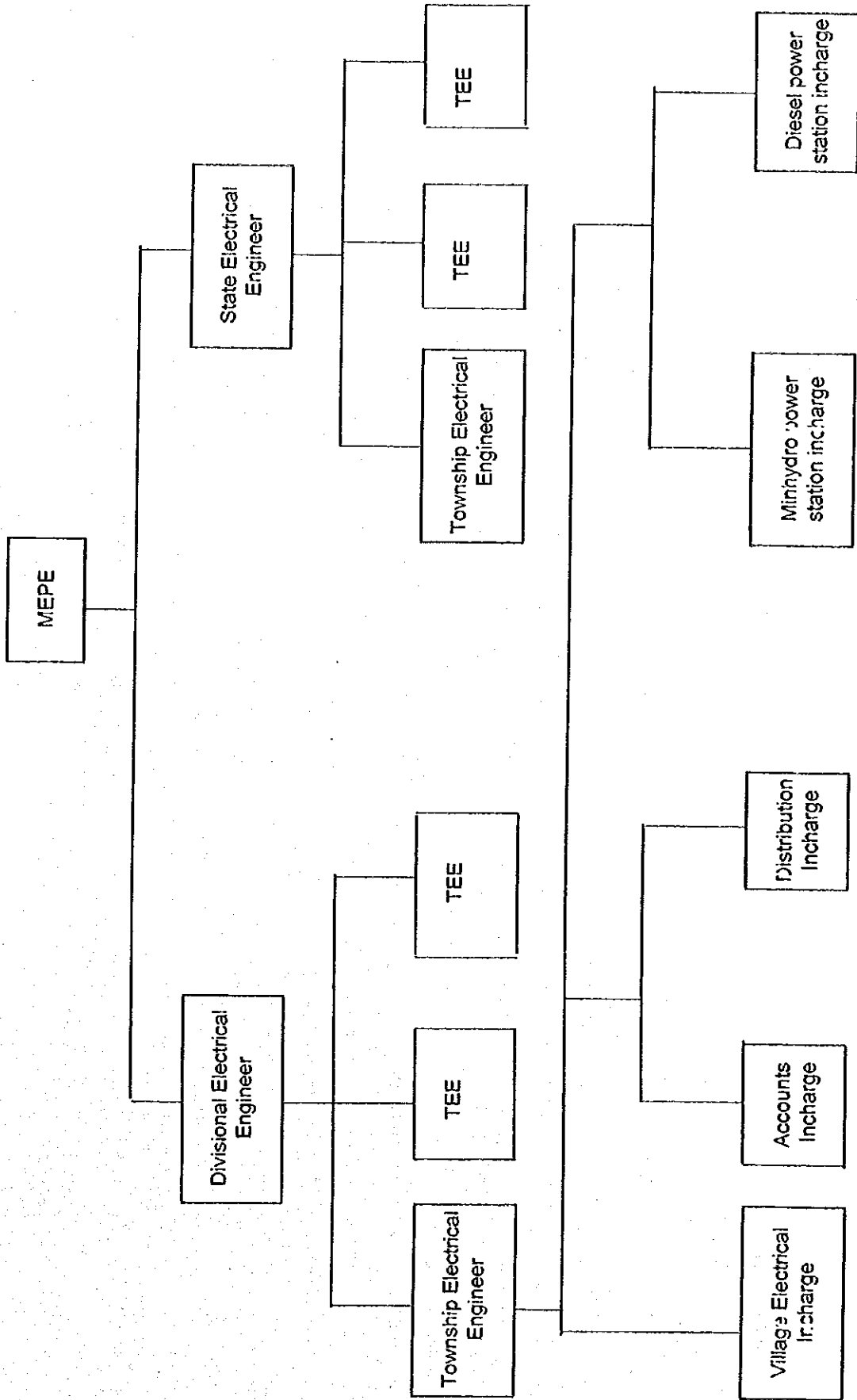
### **Training system of the MEPE**

( 1 ) Newly appointed sub-assistant engineers to MEPE are trained for ( 3 ) months in Administration, Accounts and Engineering Subjects before they under take the duties of MEPE.

( 2 ) Present responsible engineers are in turns called to the Headquarters of MEPE to attend refresher courses.

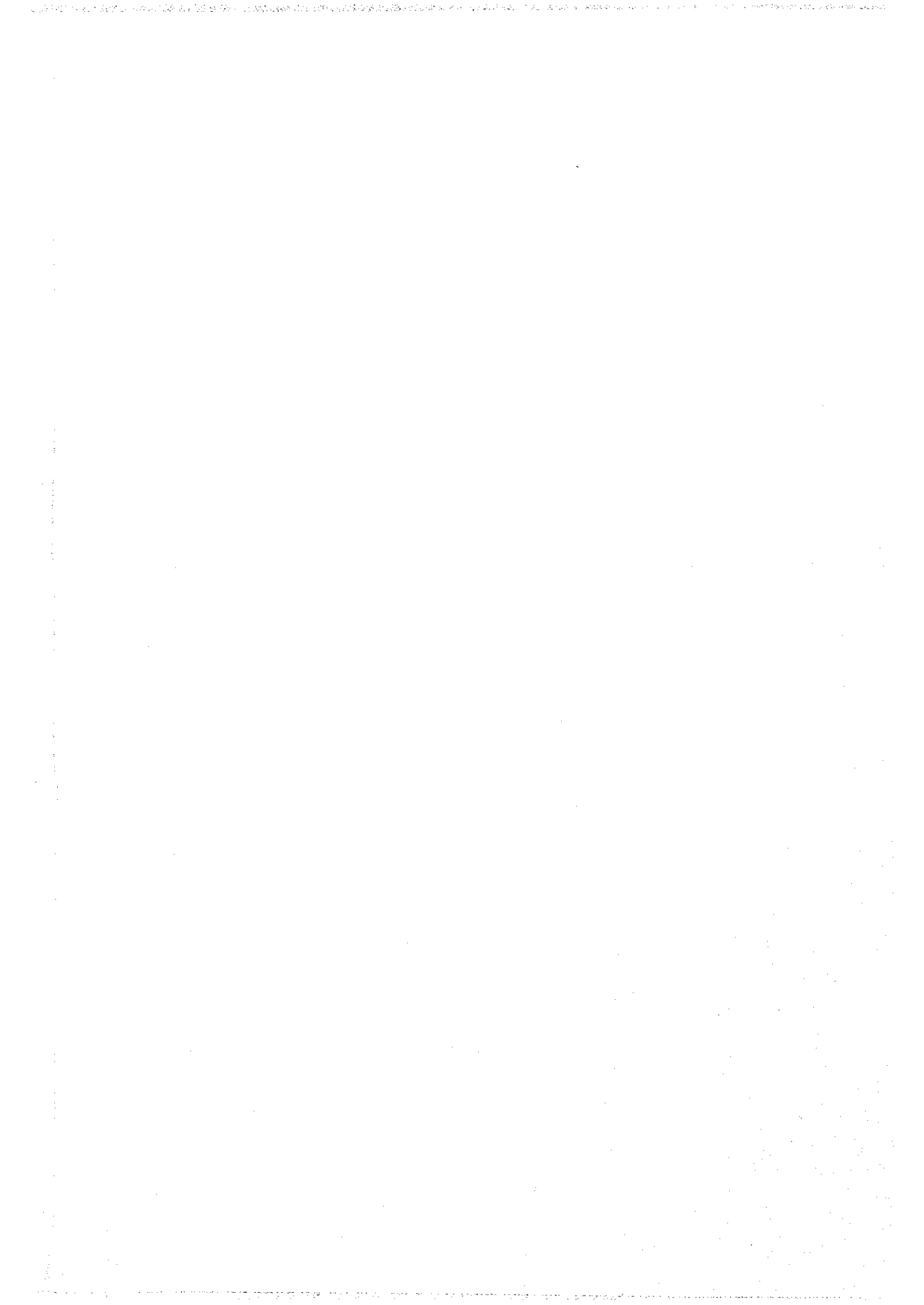
( 3 ) Various levels of engineers are sent abroad occasionally to attend degree ( or ) training courses.

Organizational Structure of the MEPE in Rural Operation













JICA