

No.

マレーシア船舶機関士養成計画 アフターケア調査団報告書

昭和 61 年 12 月

国際協力事業団
社会開発協力部

海七
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マレーシア船舶機関士養成計画
アフターケア調査団報告書

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昭和61年12月

国際協力事業団
社会開発協力部

國際協力事業團

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序

「マレーシア船舶機関士養成計画」はマレーシア人の1等及び2等船舶機関士の資格を有する外航船舶機関士を養成することを目的として昭和48年3月から昭和59年6月まで11年余にわたり、イポー市のウングオマールポリテクニクに技術協力を行ったものである。

わが方は、プロジェクト協力終了後も、本プロジェクトの運営に係るマレーシア側の前向きな姿勢に接し、昭和60年7月アフターケア協力実施の妥当性を見極めるため「事後調査」を実施した。同調査による「アフターケア協力の必要性あり」との調査結果を踏まえ、今般、財海事国際協力センター海務部長岸本佳治氏を団長とする「アフターケア調査団」昭和61年6月25日から7月1日まで同地に派遣した。

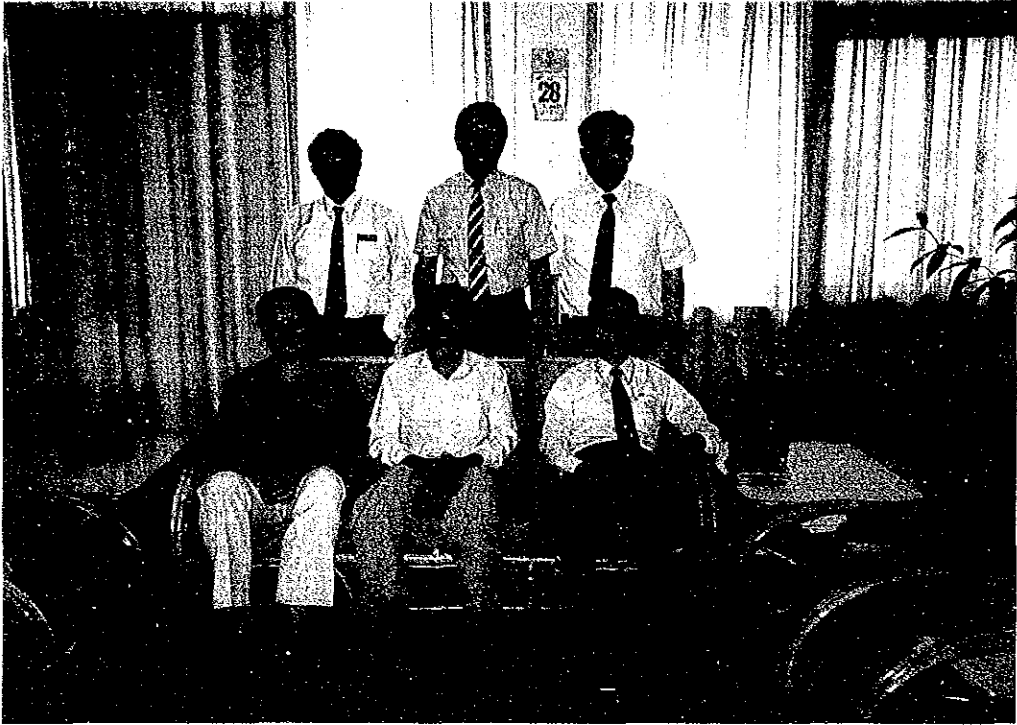
本報告書は同調査団の調査及び協議の結果を取りまとめたものである。

ここに本調査の任にあられた団員の方々、在マレーシア日本大使館並びに本調査団の派遣、調査の実施に御協力いただいた運輸省をはじめとする関係機関の方々に深甚なる謝意を表する次第である。

昭和61年12月

国際協力事業団

理事 玉 光 弘 明



Mr , Mustapar 姉崎団員 道下団員

Mr , Hee Mr , Rahman 岸本団長

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I アフターケア調査団の派遣

1. プロジェクト概要

国 名：マレーシア

- (1) プロジェクト名称 マレーシア船舶機関士養成計画
(The Marine Engineering Training Project at the Ungku Omar Polytechnic, Ipoh, Malaysia)
- (2) 協定署名年月日 昭和48年(1973年)12月3日
- (3) 協定発効日及び協力期間 当 初 昭和48年12月3日～
昭和52年(1977年)12月2日
延 長 昭和52年12月3日～
昭和55年(1980年)6月2日
フォローアップ 昭和55年 6月3日～
昭和59年(1984年)6月2日

(4) 協力の目的及び経緯

マレーシア政府は、政府が定める船舶機関士の資格を有する外航船舶機関士の養成を目的として、昭和46年(1971年)6月、船舶機関士養成計画に関する技術協力をわが国に要請してきた。

この要請に基づいて、日・マ両国政府は昭和48年(1973年)12月協定を締結し、マレーシア・イポーのウング・オマル・ポリテクニクに昭和47年7月新設されたマリソン・エンジニアリング・コースに対し、専門家派遣、研修員受入、機材供与によるプロジェクト方式技術協力を行うこととした。

両政府間の協定は昭和52年(1977年)12月2日までとなっていたが、昭和55年(1980年)6月2日まで2年6カ月延長され、その後はさらに4年間、単独派遣専門家による協力を続けた。

(5) 協 力 内 容

① 専 門 家 派 遣

年 度	48	49	50	51	52	53	54	55	合 計
専 門 家	5	5	7	9	5	6	4	4	45
			1	1	10				12
	5	5	8	10	15	6	4	4	57

② カウンターパート研修員受入

年 度		50	51	52	53	合 計
カ ウ ン タ ー パ ー ト	一 般	2	7	3	3	15
	高 級	2			1	3
	合 計	4	7	3	4	18

③ 機 材 供 与 総額 197,344千円

年度	供与額	主 要 機 材
48	126,395千円	2サイクルディーゼル機関・ボイラ・蒸気タービン・発電機
49	37,201	電動油圧舵取装置・油清浄機装置・ウォーシントンポンプ
50	10,595	9mカッター・ターボ送風機
51	23,153	模型・掛図・万能工作機・旋盤・溶接機・火災警報装置
合計	197,344	

④ 調 査 団

年度	種 別	派遣時期	人数	備 考
46	予 備 調 査 団	S47.3.22-4.13	4	
47	実 施 調 査 団	S48.3.5-3.18	5	討議議事録(R/D)署名
49	巡 回 指 導 班	S49.9.17-9.23	2	
50	巡 回 指 導 班	S50.5.11-5.17	2	
51	機 材 修 理 班	S52.2.1-2.10	2	
52	エヴァリュエーションチーム	S52.8.31-9.18	4	
55	エヴァリュエーションチーム	S55.5.13-5.25	3	
60	事 後 調 査 チーム	S60.7.14-7.20	3	

(6) プロジェクト主管官庁 教育省技術職業訓練部
(Technical & Vocational Education Division,
Ministry of Education)

(7) プロジェクト所在地 Politeknik Ungku Omar
Jalan Dairy, Ipoh, Perak
Malaysia
Telephone : 05-557622,557656

2. 調査の目的

昭和60年7月派遣した「事後調査団」の調査結果を踏まえアフターケア実施に係る具体的な協力内容等をつめるため下記事項の調査を行うことを目的とする。

- (1) 訓練機能強化のため、既供与機材に必要としている補修用スペアパーツ類の調査及びリストアップ。
- (2) その他補完用機器の必要性の調査。
- (3) 機材修理・据付及び保守短期専門家派遣に係る調査
イ) 指導内容 ロ) 派遣日数 ハ) 派遣人数、など。
- (4) プロジェクト「マ」側関係機関の協力態勢の調査。
イ) カウンターパート及びその他ローカルスタッフの配置について。
ロ) ローカルコスト負担について。
- (5) 短期専門家派遣要請並びに機材要請に係る「マ」側要請手続の促進。

3. 調査団の構成

団 長	岸 本 佳 治 (総括・教育訓練)	勸 海 事 国 際 協 力 セ ン タ ー 海 務 部 長
団 員	姉 崎 寛 (訓練機材)	運 輸 省 航 海 訓 練 所 海 務 課 機 関 担 当 官
団 員	道 下 高 一 (業務調整)	国 際 協 力 事 業 団 社 会 開 発 協 力 部 海 外 セ ン タ ー 課 職 員

4. 調査日程

日順	月日(曜日)	行 程	調 査 内 容
1	6/25(水)	東京→クアラ・ Lumpur	移動 (JL721)
2	26(木)	クアラ・ Lumpur→イボ	午前中 日本大使館、JICA 事務所 と打合せ 午後 Ministry of Education (MOE)にて協議
3	27(金)	イボ	PUOにて調査 (校長表敬、調査目的 スケジュールの説明、船舶機関学部の 現況調査とアドバイス及び供与機材の 調査)
4	28(土)	イボ	PUOにて調査 (A ₁ , A ₂ , A ₃ フォー ム及びミニッツ原案協議・作成 ; 2サイクルD/E稼動テスト及び指導、 供与機材の調査)
5	29(日)	イボ→クアラ・ Lumpur	移 動
6	30(月)	クアラ・ Lumpur	調査結果整理、教育省にてミニッツ署 名交換、日本大使館及びJICA 事務 所へ報告
7	7/1	クアラ・ Lumpur→東京	移動 (K.L. ^{CX720} 香港 ^{CX500} 東京)

5. 主な面談者

(マレーシア側)

イ、Technical & Vocational Education Division, Ministry of Education (MOE)

- (1) Dato' Haji Ahmad Saleh Director
- (2) Mohamed Rafik Khan Principal Assistant Director
- (3) Lee Chin Law "
- (4) Noor Azahan bin Othman Assistant Director

ロ、Polytechnic Ungku Omar (PUO)

- (1) Ahmad bin Abdul Rahman Principal
- (2) Hee Tieng Fok Vice - Principal

- (3) Mustapar bin Muhamad Head, Marine Engineering Department (MED)
- (4) S. Mariappen Chief Administrative Officer
- (5) Mohd. Hashim bin Buyong Lecturer, (MED)
- (6) Lee Giok Chui Lecturer, Mechanical Department (MED)

日 本 側

- (1) 後 藤 健 日本大使館二等書記官
- (2) 松 崎 孝 雄 JICAマレーシア事務所所長
- (3) 岩 佐 光 男 " 次長
- (4) 成 田 明 敏 " 所員

II 調査・協議の内容

1. 教育省技術職業訓練局に於ける協議

イ、調査団は6月26日午後クアラ・ルンブール、教育省技術職業訓練局を訪問、Assistant Mohamed Rafik Khan 氏等と面談した。

先づ、本調査団の目的、すなわち、昨年のPUO・マレイシア船舶機関士養成計画事後調査の結果に基づいて、JICA は本プロジェクトにアフターケアを実施することとし、実習訓練面でのテコ入れに重点を置き、供与機材の予備品および修理用部品、補完用機器の供与、短期専門家の派遣等につき調査し、またマレイシア側と協議することを説明した。

また昨年行われた事後調査のさい、マ側から要請のあった、18M.M.の長期専門家の派遣および18M.M.のカウンターパートのJICA受入れについては、要請に沿えない事を説明した。(この件については、今回のアフターケア調査団の派遣の前提となるとの観点から、クアラ・ルンブールJICA事務所を通じ事前にマ側に通知、了承を受けていた。)

つぎに、本調査に関しては、マ側教育省技術職業訓練局長と調査団長との間で、Minutes of Discussionを交す予定であるが、調査、協議はすべてPUOで実施されるので、その原案をイポにおいてPUCスタッフ調査団により作成したい旨申し入れたところ、これに対しM.R.Khan氏は作成原案にPUO校長のイニシャル或はサインをとることを条件に了承した。

ロ、調査団は、6月30日午後、教育省に技術職業訓練局長 Dato Hj-Ahmad Saleh氏を訪問、昨年の事後調査および今回のアフターケア調査につき説明した。

PUO校長および同校船舶機関部長は、イポより上京し会議に出席した。同日午前中、両者により局長に対し、Minutes of Discussionについて前もって説明、了承をうけていたので、会議においては、アフターケア協力の具体的内容等について若干の質疑応答ののち、局長、校長および団長の3者により、Minutesのサインが行われた。

最後に、局長より日本からの技術協力に対する謝意と今後の協力継続の希望の表明がなされた。

2. ウンク・オマール・ポリテクニク(PUO)における調査及び協議

(1) PUO船舶機関学部の現況

PUO校長、船舶機関学部長による同学部についての現状報告の概要は次のとおりである。

教員については、マラッカのMalaysia Maritime Academy (ALAM)のパキスタン人

に講義の応援をうけ、また、当学部卒業生で 2nd class certificate 保有者 1 人、certificate 非保有者 3 名が現在教員として活躍している。

教材については、昨 1985 年 6 月の JICA 調査団の来訪以後、2 サイクルディーゼル 機関のシリンダカバー解放検査等を実施したが、機関はスタートはするものの過給機や補助過給機に問題があり、連続運転は不可能であった。

ボイラは、昨年より労働省機械局に登録し、毎年同局の検査をうける事になった。

供与機材の一つである二隻のカッターを 13,000 M\$ の費用をかけ修理した。

学生については、本年度定員 35 名が入学し 1972 年以來 160 名の卒業生を送り出し、そのうち 19 名が first class certificate を、69 名が second class certificate を保有している。卒業生の大部分は MISC に就職している。

(2) PUO 主脳部との協議及び供与機関に係る調査

調査団は、27、28 日両日にわたり、PUO の校長 Ahmad bin Ab. Rahman 氏、船舶機関学部長 Mustapar bin Muhamad 氏等と面談、本調査の目的および PUO 船舶機関学部の現状を各々交互に説明し、つづいてアフタケアについて協議および現場供与機材の調査を行った。

イ. 協議は、第一に両者が必要と認める船舶機関学部の実習訓練面の強化 — 供与機材の有効活用 — についての方策、次いでアフタケア要請の手続・条件等について行われ、それにもとづき Minutes of Discussion の原案を作成した。

その内容は次のとおりである。

(i) PUO の船舶機関学部の教育のうち講義面は満足すべき状態にあるが、弱点となっている実習面は JICA からの供与機活のより一層の活用によって強化する必要がある。

(ii) 問題が生じた場合、実際的にその解決のため、PUO、JICA や関係機関 — 例えば MISC、MSE — などのメンバーにより構成される恒常的な委員会を設立するようマ側は効果的対策を立てる。

(iii) PUO は、船舶機関学部の実習面の強化充実を図るよう十分な考慮を払い、機器を常に良好な状態に保つための責任体制を再組織する。

(iv) 調査団は PUO に対し次のように強く勧告した。

PUO は可及的速やかに、規則的な最低任期 1 年とした一級船舶機関士の PUO 派遣について、MISC 等と協議・合意を得るべきである。

これは、機器の適正な運転・整備について学生や学部スタッフを教育指導するのに有効である。

(v) 船舶機関学部の教授標準を高めるため、JICA が沖縄で実施している 1 年間の船員教育コースに、同学部の適正な教官を派遣する。

(vi) 予備員、補完的機器等の供給および短期専門家の派遣は、調査団の調査の結果をもと

とし、マ政府より日本政府に対し正式に要請がなされた時点より開始される。

- (v) 日本側は、JICAの予算の範囲内においてアフタケアを実施し、マ側は部品交換、機器の据付、機材の国内輸送等の費用を負担する。

アフタケアの正式の要請 — A1 Form, A4 Form については道下団員が詳細に説明指導し、マ側からの正式要請がすみやかに日本側に提出され、アフタケアの早期実施が果されるのを期した。

- ロ、現場供与機材の調査は姉崎団員が行った。同団員は1979年3月より、1982年6月まで3年3月にわたり、本プロジェクト長期専門家としてPUOの船舶機関学部に勤務した経験があり、同学部に旧知も多く、また供与機材について細部まで知りつくしていた。

従って現場における必要予備品、修理部品および補完的機器の調査も、わずか2日間で、正確かつ詳細に行われた。

供与機材の現状は、全般的には一応の整備がなされ、実習に活用されているが、2-cycle Diesel Engine, Boiler, Steam Turbine, Fresh water Generator, Air Compressor 等々については予備品、修理用部品が必要とみなされ、また補完的機器としてAtlas Type Fresh water Generator, Oily water Separator 等々があげられる。

また、PUO側で、以前から過給機等不調のため運転不能としていた2サイクルディーゼル機関も、姉崎団員の手によりたちどころに運転することができた。

これは、昨年のも事後調査においても、同機運転不能の原因は、重大な故障ではなく単に実機運転経験と自信の欠如によると指摘したのであるが、船舶機関士の職務遂行 — 実機の運用には、経験と自信が不可欠であり、それがPUOに不足している事を、マ側に如実に示したこととなった。

- ハ、現場調査により、アフタケアを必要とする部品、補完的機器、短期専門家は凡そ次のとおりである。

- (i) 供与部品および補完的機材

調査の結果要供与機材は下記の品目である。

DESCRIPTION OF REQUESTED SPARE PARTS AND
ADDITIONAL EQUIPMENT

I. Spare parts items required by the Marine Engineering Department.

1.1 2 cycle Diesel Engine

(a) Bosch Type F.O. Injection pump	3 units
(b) F.O. Injection Valve	3 units
(c) Cylinder Lubricator	1 set
(d) Air Reducing Valve for starting air	2 sets
(e) Air Filter for starting air	1 set
(f) Exhaust Valve Automatic Lubricator	1 set
(g) Starting Air Automatic Stop Valve	1 set
(h) Starting Air Pilot Valve	1 set

1.2 Exhaust Gas Turbocharger

(a) Bearing (for blower side)	1 unit
(b) Bearing (for turbine side)	1 unit
(c) Labyrinth (for blower side)	1 unit
(d) Labyrinth (for turbine side)	1 unit
(e) Inside Gas Labyrinth	1 unit
(f) Tachometer pick-up	1 unit

1.3 Hydraulic Dynamometer

(a) Load cell	1 unit
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1.4 Equipment for measuring & calibration of 2 cycle Diesel Engine

(a) Cylinder Bore Gauge	1 set
(b) Deflection Gauge	2 sets
(c) Torque Range	
(i) for crank-pin bearing	1 set
(ii) Cylinder cover	1 set
(d) Micrometer for piston pin and crank pin	2 sets

1.5 Boiler

(a) Rotary Burner	1 complete set
(b) Pilot Burner	2 complete set
(c) Ignition Plug	2 sets
(d) Seal Rings for rotary burner	2 sets
(e) Manhole Packing	
(i) Water side	10 pieces
(ii) Steam side	10 pieces

1.6	Steam Turbine	
	(a) Labyrinth packing	12 pieces
	(b) Tachometer Dynamo	1 sets
1.7	4-Cycle Diesel Engine	
	(a) Pressure and temperature Limit Switch	3 sets
	(b) Torque wrench	
	(i) Crank-pin bearing	1 set
	(ii) Cylinder Cover	1 set
1.8	Fresh Water Generator	
	(a) Cooling tube nest	1 complete assembly
1.9	Air Compressor	
	(a) Suction Valve (H.P. side)	4 sets
	(b) Delivery Valve (H.P. side)	4 sets
	(c) Cooling Water Pump	1 complete set
	(d) Impleller for cooling water pump	10 sets
1.10	Refrigerator Machine	
	(a) Automatic Expansion Valve 09H1M	2 sets
	(b) Automatic Expansion Valve 19HZL	2 sets
	(c) High & Low Pressure Switch	2 sets
	(d) Suction Valve	8 pieces
	(e) Set pin for suction valve	8 pieces
	(f) Delivery Valve	8 pieces
	(g) Stopper for Delivery Valve	4 pieces
	(h) Spring for Delivery Valve	8 pieces
	(i) Screw for Delivery Valve	8 pieces
1.11	Miscellaneous items	
	(a) CO ² Gas Analyser	1 set
	(b) Flow meter for condensate	1 set
	(c) Pressure Gauge 0 - 6 Kg/cm ² x2.5"	5 sets
	(d) " " 0 - 2 kg/cm ² x2.5"	2 sets
	(e) Pressure Gauge 0 - 10 kg/cm ² x2.5"	2 sets
	(f) Thermometer 0 - 500°C	3 sets
	(g) Thermometer 0 - 100°C	5 sets
	(h) Boiler Water Test Kit	1 set
	(i) Oil test kit	1 set
	(j) Boiler Compound	1 batch
	(k) Water Softener Resins	1 batch
	(l) Anti-Rust Compound	1 batch

II Additional Equipment Requested to Supplement the existing Equipment.

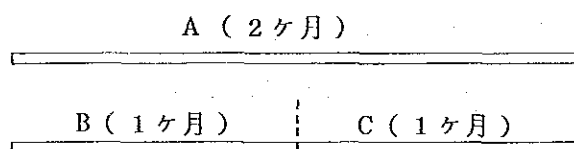
- (A) One complete set of Fresh Water Generator - Atlas Type
Capacity 1 - 2 tonne/day
- (B) One complete set of Dehydrator for starting air of
2-cycle D/E
Type- Absorbent type
- (C) One complete set of oily-water separator including
Analyser set.
Type - Twin Cylindrical type
- (D) 1 set of plate-type Heat Exchanger
- (E) Portable oil analyser kit.

(ii) 短期専門家

短期専門家の任務は a) の供与部品および補完的機材の部品交換および機材据付について、マ側カウンターパートに対し指導、監督することとする。

人員は3名とし、そのうち1名(A)は任期2ヶ月、部品交換、機材据付および、指導監督全般を担当する。

他の2名(B、C)は下図のとおり任期を各々1ヶ月ずつとし、前述任務を分担する。



派遣開始は供与部品および補完的機材がPUOに到着し、PUOでの工事に必要な諸資材、ハンズ等の手当が整い、工事の準備がすべて完了した時期とする。

Ⅲ 調査の結果

今回の調査は、P U O 側が今回の調査の意義を十分に理解し、友好的協力的であったため、また姉崎団員がもと本プロジェクトの長期専門家であったため、調査日程が非常に短期であったにもかかわらず、十分に目的を達する事ができた。

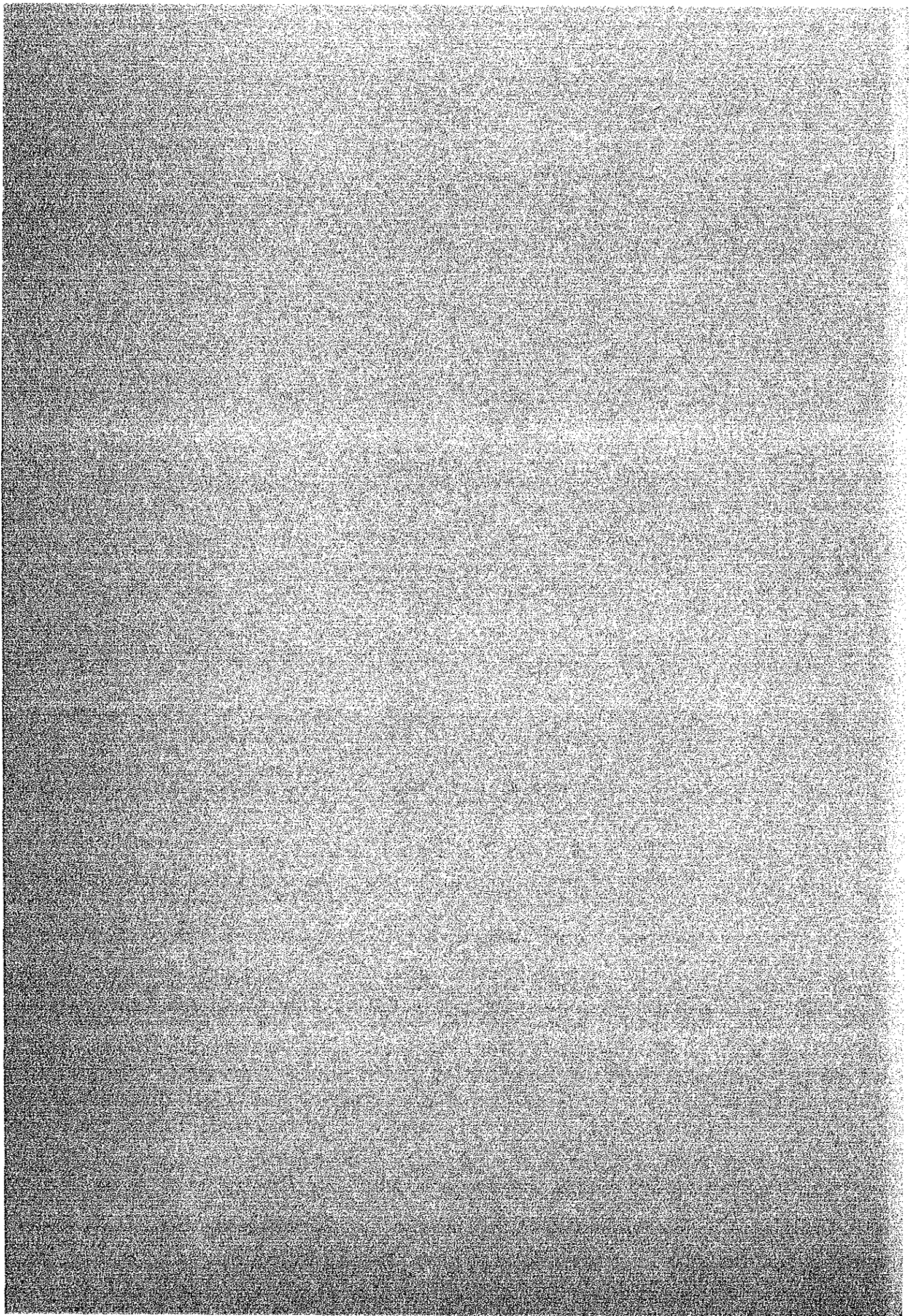
マ側と調査団が共に認識したP U O 船舶機関学部の弱点である実習面を強化するため、Minutes of Discussion に示すように、同学部の責任態勢の再編成および関係上部機関のバックアップ態勢の確立、ならびに教授標準向上のため教官の日本研修等の必要がある。

また、機材に対しては、前述の必要部品および補完的機器を供与し、短期専門家を派遣する。

これらの協力は、本プロジェクトの弱点であった船舶機関学部の実習面を強化し、プロジェクトの目的達成に大いに効果的であると思料する。

IV 付 属 资 料

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(資料 1)

(1) MINUTES OF DISCUSSION BETWEEN THE JAPANESE AFTER CARE SURVEY TEAM AND THE AUTHORITIES CONCERNED OF TECHNICAL AND VOCATIONAL EDUCATION DIVISION, MINISTRY OF EDUCATION MALAYSIA ON THE MARINE ENGINEERING TRAINING PROJECT AT POLITEKNIK UNGKU OMAR, IPOH

The Japanese After Care Survey Team (hereinafter referred to as "THE TEAM) organized by the Japan International Cooperation Agency and headed by Mr. Keiji KISHIMOTO, visited the Federation of Malaysia from the 25th of June, 1986, to the 1st of July, 1986, for the purpose of conducting a survey for the implementation of the Japanese After Care Cooperation to the said project.

During its stay in the Federation of Malaysia, the Team exchanged views and had a series of discussions with the Malaysian authorities concerned for the successful implementation of the above-mentioned after-care cooperation.

For confirming the discussions made here, both sides agreed to leave them in the form of "Minutes of Discussion", the contents of which are itemized hereunder:

MAJOR POINTS OF AGREEMENT

1. The Japanese side feels and the Malaysian side agrees that, while the lecturing aspect of the Marine Engineering course in PUO is satisfactory, the workshop training aspect of the course needs to be strengthened by making fuller/maximum use of the donated equipment.
2. It is recommended that the Malaysian side should take effective measures to build up some sort of standing committee comprising members from PUO, JICA and other relevant bodies (for example, MISC, MSE) through which a working channel can be set up on a permanent basis so that practical solutions can be found to problems that may arise.
3. It is recommended that PUO reorganises the 'responsibility system' in the Marine Engineering Department and ensure its strict enforcement/implementation so that the workshop training aspect is given sufficient consideration and the equipment always kept in good order.
4. The Japanese side strongly recommends that an arrangement be made, as early as possible, with MISC or other relevant departments for secondment of 1st class certificated marine engineers to PUO on a regular basis for a minimum period of one year for each expert. This is to provide effective workshop practical training to the students and staff in the proper operation and maintenance of equipment.

5. In order to improve the standard of teaching it is also recommended that suitable local candidates from PUO be sent every year to the one-year group training courses on seamanship, sponsored by JICA, in Okinawa, Japan until sufficient local expertise is built up.
6. It is agreed that the supply of spare parts/additional equipment and short term expert(s) be made according to the findings of the After Care Survey team and will begin only when an official request has been made by the Malaysian Government, through EPU, to the Japanese Government by way of JICA (Malaysian) office.
7. The Japanese side will undertake to implement the After Care Program (supply of spare parts/additional equipment and despatch of short term experts) within the scope of the budget approved by JICA. In addition, the Malaysian side will undertake to provide any operational expenses pertaining to the replacement of parts and installation of new equipment and other incidental expenses like forwarding and transport charges.

Kuala Lumpur, the 30th of June, 1986.

Keiji Kishimoto

 Mr. Keiji KISHIMOTO,
 Head of the Japanese
 After Care Survey Team.

Ahmad b. Hj. Saleh

 Dato' Hj. Ahmad b. Hj. Saleh
 Director,
 Technical and Vocational Education
 Division.
 Ministry of Education.

Ahmad b. Abdul Rahman

 Ahmad b. Abdul Rahman
 Principal,
 Ungku Omar Polytechnic.

THE COLOMBO PLAN
COUNCIL FOR TECHNICAL CO-OPERATION IN SOUTH AND SOUTH-EAST ASIA

APPLICATION FOR EXPERT

By the Government of Malaysia to the Government of Japan
for an expert in MARINE ENGINEERING for Ungku Omar Polytechnic, Ipoh


Notes— (a) This form has been devised for the general guidance of co-operating countries in order to facilitate the supply of relevant information and data necessary to afford an adequate appreciation of the nature of the technical assistance required. Full and accurate completion of this application form will avoid much reference back and lead to speedier action.

(b) The requisite number of copies of the Form A 1, including a copy for the Colombo Plan Bureau, duly endorsed by the appropriate Foreign Aid Department of the requesting government should be forwarded to the donor government concerned through the appropriate channels.

<p>1. Back ground Information This section should show as precisely as possible the general nature of the project for which the expert is required, stating whether it comes within the Government's development programme. It is important to indicate whether the project is a new enterprise or whether it was started previously. In the latter case, any assistance received under other technical co-operation programmes (e.g. under United Nations auspices) should be stated. With regard to industrial enterprises, some impression of the size is important and the output and number of workers to be employed are useful indications. The type of process, make and age of industrial or scientific equipment with which the expert will be concerned should be specified. In the case of academic establishments, it is an advantage to know the number of annual intake of students, their level of attainment, numbers and status of existing staff and details of any research facilities and the level of research being undertaken (Copies of brochures, annual reports, financial statements, calendars, syllabus of instruction etc. should be attached where applicable).</p>	<p>The Japanese technical cooperation for the Marine Engineering Training Project at the Ungku Omar Polytechnic, Ipoh was implemented from December, 1973 to June, 1980. The experts will take charge of primarily inspection and repairing of the existing equipment. They will also be required to train local instructors on method of maintenance, repairs and servicing.</p> <p>This point has been discussed with the Japanese After Care Survey Team during a series of meetings held in Malaysia from 25 June to 1st July, 1986.</p>
<p>2. Specification for the post.* (a) post title (b) duties for which the expert will be responsible. These should preferably be listed, and it is important to give as much detail as possible. (c) authority to whom expert will be responsible (d) Qualification and experience required and approximate age limits. (e) number of personnel required.</p>	<p>Marine Engineering</p> <p>To inspect and repair (where necessary) the existing machines and train local instructors.</p> <p>Principal, Ungku Omar Polytechnic</p> <p>Expert(s) in inspection, repair and servicing from the manufacturing companies.</p> <p>Two (2) or Three (3)</p>
<p>3. In the case of continuous projects, give name and particulars of understudy or counterpart who is to work with the expert</p>	<p>Not applicable</p>
<p>4. Terms and condition of appointment: (a) duration (b) actual place of employment, nearest town and post office (c) if living accommodation to be provided, state whether furnished or unfurnished, and whether suitable for married man with family: (i) daily allowance for food if accommodation only provided (ii) daily rate for accommodation and food if neither are provided in kind</p>	<p>• One expert for two (2) months • Two (2) experts for each one (1) month</p> <p>Ungku Omar Polytechnic, Ipoh</p> <p>Not to be provided</p> <p>Ditto</p> <p>Ditto</p>

* It is essential that full particulars should be given. If the space provided is inadequate, they should be given on a separate sheet.

4. Terms and conditions of appointment (Cont'd.)	Not to be provided.
(d) daily and nightly rates of subsistence payable when away from base on duty	
(e) are costs of internal travel paid or car provided?	Car to be made available.
(f) what leave arrangements are suggested?	
(g) extent to which free hospital and medical treatment is to be provided for the expert and his accompanying dependents, if any	Medical services and facilities to the Japanese experts not less favourable than those granted to the experts of any third country cooperating with Malaysian Ministry of Education under similar circumstances.
(h) is expert free from income tax?	Yes, to be exempted.
(i) will personal effects imported on first arrival be cleared free of custom duty?	Ditto
(j) does host government undertake to indemnify expert in respect of damages awarded against him for actions performed in the course of his official duties?	Yes
(k) approximate date on which the expert is required to arrive in receiving country	Around the time of arrival of the spare parts/additional equipment to Ungku Omar Polytechnic.
(l) any other information	None
5. Proposals for apportionment of costs of salary and allowance and passages	Nil
6. Previous steps, if any, to fill the post: If any previous attempt has been made to fill the post under the Colombo Plan (including ICA) or from any external source (UN, Specialised Agency or other) please indicate:	Not applicable.
(a) to whom application was addressed, with date	
(b) result or present stage of negotiations	
(c) are other experts working in this area in associated projects or have there been reports by these experts working in this field previously? If so, are any available?	
7. Correspondence: Name, postal and telegraphic address of official to whom correspondence regarding this application should be forwarded	MR. AHMAD BIN ABDUL RAHMAN KMN., AMP. Principal, Ungku Omar Polytechnic, Dairy Road, 31400 Ipoh, Perak.



AHMAD BIN ABDUL RAHMAN
Principal
Ungku Omar Polytechnic.
Date: 28.6.86

For use only by Donor Government

Application accepted/rejected/withdrawn

on behalf of the Department of

Date:

Signed

on behalf of the Government of

THE COLOMBO PLAN
COUNCIL FOR TECHNICAL CO-OPERATION IN SOUTH AND SOUTH-EAST ASIA
Equipment for Training or Research Institutes and for Equipment accompanying Experts

APPLICATION

By the Government of Malaysia
from JAPAN

(Country)

Notes.—(a) This Form has been devised for the general guidance of co-operating countries in order to facilitate the supply of relevant information and data necessary to afford an adequate appreciation of the nature of the technical cooperation required. The careful completion of this application form will avoid much reference back and lead to speedier action. Separate forms A.4 should be used for requests for equipment for each individual institute or project.
(b) The requisite number of copies of the Form A.4, including a copy for the Colombo Plan Bureau, duly endorsed by the appropriate Foreign Aid Department of the requesting government should be forwarded to the donor government concerned through the appropriate channels.

1. Background Information

Please describe as concisely as possible the general outlines of the project for which the equipment is required, indicating whether the latter is (a) for use by an expert in the performance of his duties (b) for a training scheme of institution or (c) for a research institution. If either (b) or (c) please say whether the equipment is for the establishment of a new institution or the expansion or re-organisation of an existing one (e.g., by the provision of a new department, &c.). The name and exact location of the institution, its approximate cost and the authority responsible for it should be stated. Where appropriate details should be given of the availability of any services required for the operation of the equipment. This would include operation by electricity (i.e. type of current, periodicity, voltage and any variations, phases, frequency etc. and if D.C. is the only current available please give full details), water reticulation or steam gas etc. Details of similar equipment already in use should be given.

The Japanese technical cooperation for the Marine Engineering Training Project at Ungku Omar Polytechnic, Ipoh, was implemented from Dec., 1973 to Jun 1980. The spare parts and/or supplementary instruments are required for proper functioning and improvement of the existing facilities at the Polytechnic and thus to increase the capacity and level of education there.

This point has been discussed with the Japanese After-Care Survey Team during a series of discussion held in Malaysia from 25 Jun to 1st July, 1986.

2. Description of equipment required.

Please give a full description of each item and general specifications where possible. The manufacturer and estimated cost of each item if known together with details of the proposed end use of item should be given. Where applicable, give details of any special packing or tropic proofing required and indicate whether handbooks or instruction data supplied in English will suffice. If appropriate, please indicate any required priorities or phasing of deliveries and advise whether adequate facilities exist for maintenance and servicing of the type of equipment requested. (If lengthy, detailed lists should be annexed: it would be convenient to have separate annexures for (a) films, (b) books and (c) other equipment.)

Description - please see annexures.

3. Has this equipment request already been directed to any other Agency of Colombo Plan country and if so to whom was it addressed and with what result?

Not applicable


4. Has the list of equipment already been discussed with representatives of the supplying country/ies? If so, please indicate what stage the discussions have reached

Yes, discussion was held with the Japanese After-Care Survey Team and it was agreed that additional spare parts and/or supplementary instruments would be requested.

5. Furnish full particulars in respect of—
(a) Consignee;
(b) Official to receive documents and enquiries; and
(c) Clearing agent at port of entry.

Director, Technical and Vocational Educational Division,
Ministry of Education, Malaysia.

<p>6. Where equipment is required for use by an expert Please indicate -</p> <p>(a) The country or agency from which the expert has been requested or obtained.</p> <p>(b) His duties and length of secondment (a reference to the relative Form A. 1 will suffice when the expert is being provided by the country to whom the equipment request is addressed).</p> <p>(c) What use is proposed for the equipment when the expert's period of secondment terminates?</p> <p>(d) By what date is the equipment required?</p>	<p>(a) JICA, Japan.</p> <p>(b) indicated in Form A-1</p> <p>(c) This will be mostly spare parts of the existing training equipment for Marine Engineering of the Polytechnic.</p> <p>(d) As early as possible.</p>
<p>7. Where equipment is required for Training or Research Institutions Please indicate -</p> <p>(a) Nature and standard of training or research to be undertaken</p> <p>(b) Total number of students to be accommodated from within the country or from elsewhere in the Region, the qualifications for admission, the duration of courses, and the annual output of trainees</p> <p>(c) Whether there is already a similar institute(s) in existence in the country. If so, please give details</p> <p>(d) Whether buildings are already available. If not has construction started and when is it expected to be completed?</p> <p>(e) Whether qualified staff to handle the equipment has been recruited or is proposed to be recruited locally. If not is it proposed: - (i) to recruit foreigners under aid-programmes? (ii) to train locally recruited personnel abroad in handling equipment? (the reference numbers of any Forms A. 1 or A. 2 relating to such requests should be quoted)</p> <p>(f) Taking into account the answers to (d) and (e) above, what is the date by which the equipment is required and the date on which training or research work is to commence.</p> <p>(g) Whether any assistance in drawing up the Scheme has been obtained from outside experts? (Any specialist reports or Government surveys (e.g., Educational Committee Reports, etc.), bearing on the request should be provided if possible)</p>	<p>(a) Pre-Sea Training for Marine Engineering Officers.</p> <p>(b) 35 students (local), Malaysia Certificate of Education; duration 4 years; annual output 35 graduates.</p> <p>(c) Nil</p> <p>(d) Yes, building available.</p> <p>(e) Partially qualified staff has been recruited. Proposed to be trained locally by short term expert.</p> <p>(f) As early as possible.</p> <p>(g) Yes, under JICA assistance.</p>
<p>8. Correspondence Name, Postal and Telegraphic Address of official to whom correspondence regarding this proposal is to be forwarded</p>	<p>Mr. Ahmad bin Abdul Rahman, Principal, Ungku Omar Polytechnic, Dairy Road, 31400, Ipoh, MALAYSIA.</p>


 AHMAD BIN ABDUL RAHMAN,
 Principal, Ungku Omar Polytechnic,
 Ipoh. 28.6.86
 Date:

Signed
 on behalf of the Government of

For use only by Donor Government

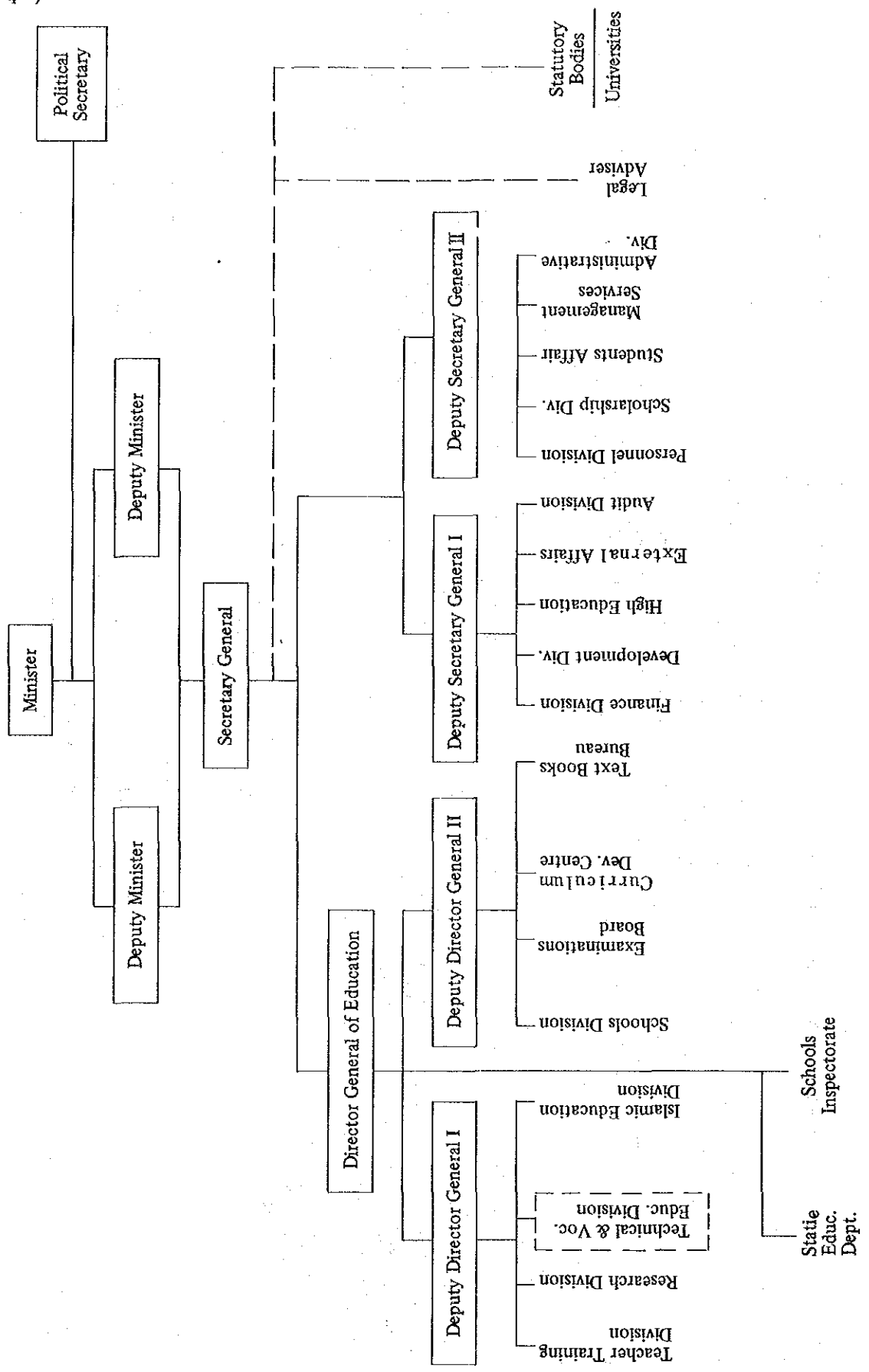
Proposal accepted/rejected/withdrawn

on behalf of the Department of

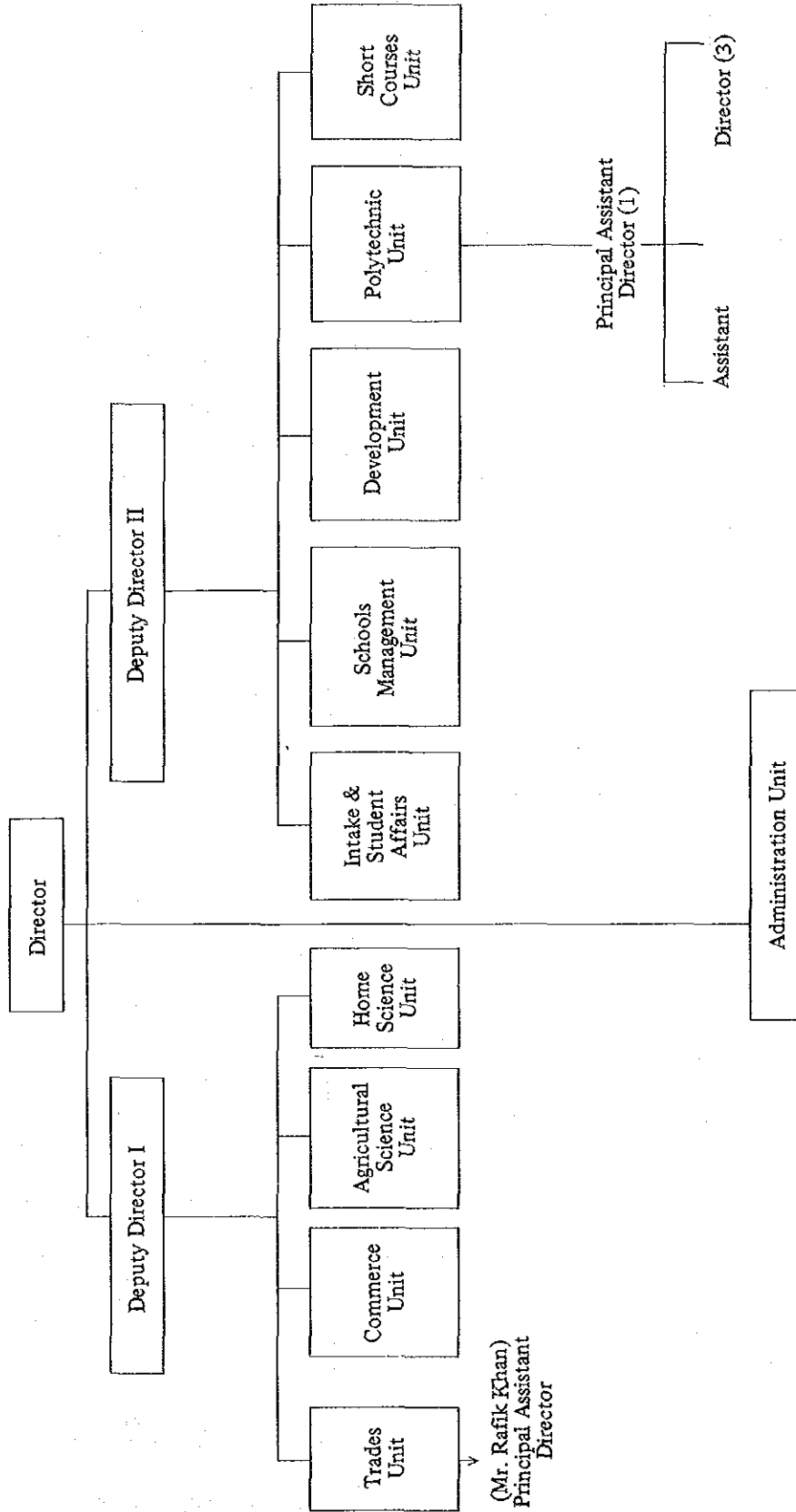
Date:

ORGANIZATIONAL CHART, MINISTRY OF EDUCATION

(資料 4)

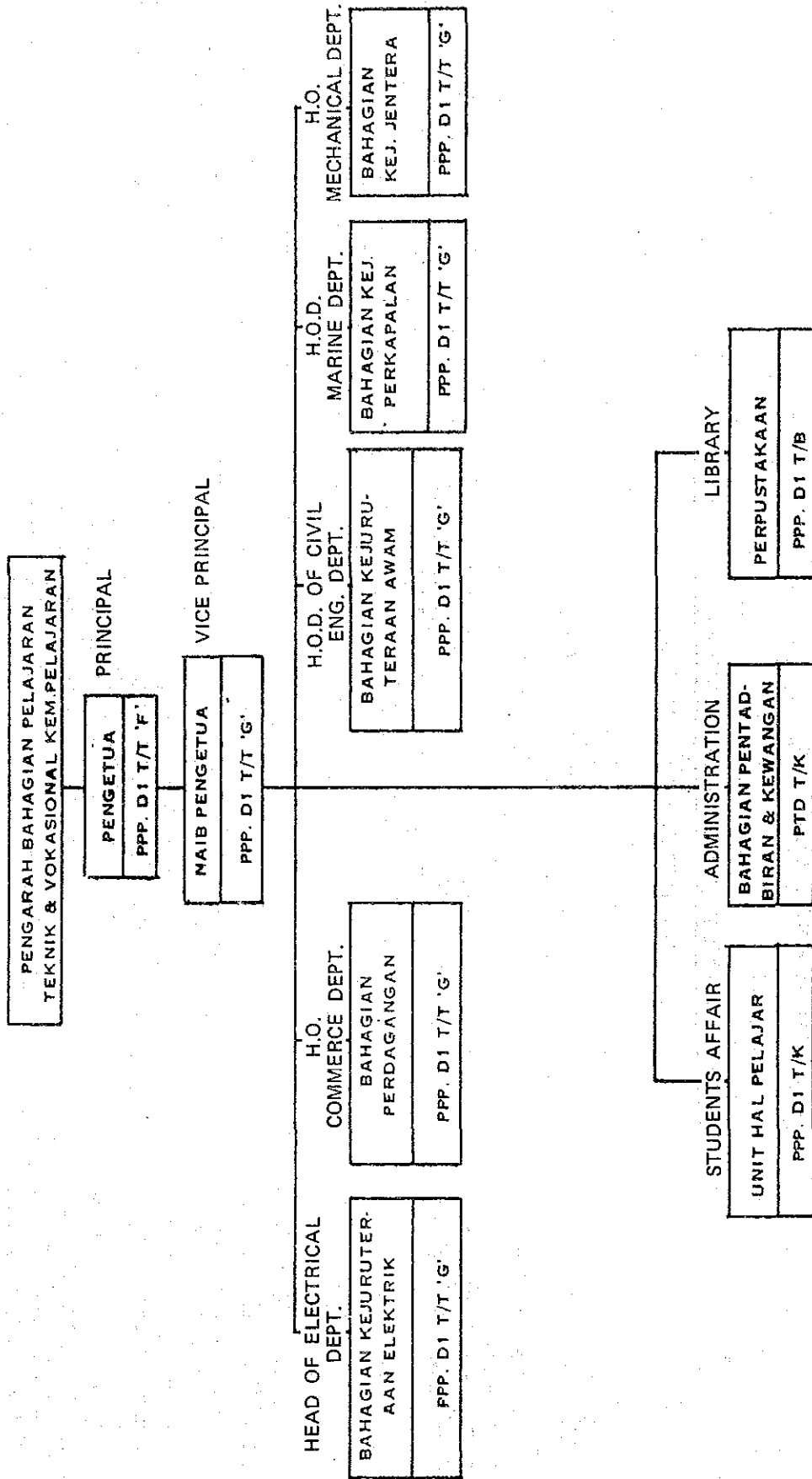


ORGANIZATIONAL CHART OF TECHNICAL AND VOCATIONAL EDUCATION DIVISION



ORGANIZATIONAL CHART OF UNGKU OMAR POLYTECHNIC, IPOH

CARTA ORGANISASI POLITEKNIK UNGKU OMAR, IPOH
1986



ORGANIZATIONAL CHART FOR MARINE ENGINEERING DEPARTMENT,
 UNGKU OMAR POLYTECHNIC, IPOH

CARTA ORGANISASI BAHAGIAN KEJURUTERAAN PERKAPALAN
 POLITEKNIK UNGKU OMAR, IPOH

Petunjuk:-

Post for 1986

Post Upgrading
 Kenaikan Taraf Jawatan

HEAD OF DEPARTMENT

KETUA BAHAGIAN
 P.P.P. Kat. DI T/T 'G'

ASSISTANT

HEAD OF DEPARTMENT

PENOLONG KETUA BAHAGIAN
 P.P.P. Kat. DI T/K

WORKSHOP TRAINING UNIT

UNIT KHIDMAT LATIHAN
 & KELENGKAPAN

P.P.P. Kat. T2 T/T 1 jawatan
 P.P.P. Kat. DI T/B 1 jawatan
 P.P.P. Kat. T1 T/Kh. 1 jawatan
 P.P.P. Kat. T2 T/Kh. 1 jawatan
 Attendan Makmal
 Juruteknik

UNIT STEAM ENGINE

P.P.P. Kat. DI T/B 1 jawatan
 P.P.P. Kat. T1 T/B 2 jawatan

UNIT DIESEL ENGINE

P.P.P. Kat. DI T/B 1 jaw.
 P.P.P. Kat. T1 T/Kh. 1 jaw.
 P.P.P. Kat. T2 T/Kh. 1 jaw.

UNIT NAVAL ARCHI-
 TECTURE & DESIGN

P.P.P. Kat. DI T/B 1 jaw.
 P.P.P. Kat. T2 T/B 1 jaw.

STATISTICS RELATING TO MARINE ENGINEERING COURSE GRADUATES & UNDERGRADUATES (PUO)

Commencement date of course	MM72	MM73	MM74	MM75	MM76	MM77	MM78	MM79	MM80	TOTAL	MM81	MM82	MM83	MM84	MM85	TOTAL
	7/1/72	7/1/73	7/1/74	7/1/75	7/1/76	7/1/77	7/1/78	11/1/79	7/1/80		7/1/81	7/1/82	7/1/83	7/1/84	7/1/85	
Completion date of course	20/7/67	14/9/79	13/9/80	28/7/81	28/8/82	3/12/82	1/8/83	12/12/83	12/84		12/85					
Intake number of students	32	35	29	33	34	25	24	28	24	264	32	37	38 ^{*2}	34	35	
Number of graduates with diplomas	20	21	23	20	22	23	23	24	24	200	number of present students					
Number of graduates working on board ship	9 (7)	10 (8)	16 (14)	16 (12)	8 (7)	16	21 (15)	22	15	135 (118)	30	35	34	33		(160)
Number of holders of certificates of competency	1st Class	4 (7)	2 (6)	3 (6)					9 (19)							
	2nd Class	9	8	14	7 (9)	2 (7)	1 (7)	(5)	43 (69)							
Number of graduates working on shore	11	11	7	4	14	6	2	2	4 unknown	60	4	1	7	9	5	81.5%
SCHOLARSHIP	JPA	16	19	18	14	16	16	14	18		4	1	7	9	6	
	MISC	-	-	-	-	-	1	1	6		21	18	19	16	20	
	LANG	-	-	-	-	-	-	-	-		4	4	-	4	-	
	Penns	-	-	-	-	-	-	-	-		-	5	6	2	-	
	+12	-	-	-	-	-	-	-	-		-	-	-	-	-	
	FIA	-	-	-	-	-	-	-	-		-	-	-	-	-	
	+3	-	-	-	-	-	1	-	-		-	-	-	-	-	
	NES	-	-	-	-	-	-	1	-		-	-	-	-	-	
	Perlis	-	-	-	-	-	-	-	-		-	-	-	-	-	
	Hokkaido	-	-	-	-	-	-	-	-		1	-	-	-	-	
Private	4	1	6	6	6	5	5	-	8	1	5	5	3	9		
Yamanashi	-	-	-	-	-	-	-	-	-	-	1	-	-	-		
Schneefer	-	-	-	-	-	-	-	-	-	-	-	-	1	-		

*1 E.T.C. Estimate of complete

*2 MM83

() Statistics as 26.8.1986

(資料 8 - 2)

POLITEKNIK UNGKU OMAR

OPERATING EXPENDITURE 1979 - 1986

<u>Year</u>	<u>Allocation</u>	<u>Actual Expenditure</u>
1979	3,119,350.00	2,409,964.21
1980	3,293,077.00	2,829,814.41
1981	4,385,750.00	3,393,532.35
1982	4,475,500.00	4,235,758.11
1983	4,772,970.00	4,188,844.64
1984	4,654,100.00	4,405,752.00
1985	5,928,100.00	4,676,377.30
1986	6,286,300.00	

LIST OF COUNTERPARTS

No.	Name	Category	Acc. Qualification	Training Undergo During Service
1.	Mustapar bin Muhamad	DI	B.E. (Mech.) (Australia)	<ol style="list-style-type: none"> 1. Six month training in Japan in Marine Engineering 2. One month in education Management and Curriculum Development (UK) 3. Twelve months sea training (MISC) 4. Attend QCC course organized by INTRAN. 5. Attend Seminar for Heads of Maritime Institution in Developing Countries in Sweden. 6. Attend Colombo Plan Staff College Singar in Country Course in Kuantan Pahang.
2.	Mohd. Hashim bin Buyong	DI	B. Sc. Mech. (UK) Dip. in Mech. Eng. (ITEK) Cert. in Mech. General (PUO)	<ol style="list-style-type: none"> 1. In Country course - Evaluation of Curriculum Implmentation two weeks (PUO). 2. Workshop and Seminar Maritime Training Institute in ASEAN Management and Meteorology three weeks at AIAA, Melaka. 3. Attending short - nine months (UK) (Presently attending course)
3.	Mohd. Sopian bin Bahauddin	DI	B.Sc. (Mech.) (UK) (Marine Option) Certificate Mech. Eng. (Airconditioning & Ref.) PUO. Teaching Cert.-Central Training Institute for Instruction India in Air Conditioning & Ref.	

No.	Name	Category	Acq. Qualification	Training Undergo During Service
4.	Misri bin Darwo	D1	B. Sc. Mech. (UTM) Dip. Mec. Eng. (ITK) Cert. Mech. Production (PUC)	1. Three weeks on board MISO ship.
5.	Loo Leong Peng	D1	Diploma in Marine Engineering (PUC) 2nd. Class Certificate of Competency in Marine Engineering (MOT)	
6.	Fisal bin Haroon	D1	B. Sc. (Marine Engineering) California Maritime Academy	
7.	Arshad bin Yusof	T1	Dip. in Elect. Engineering (Power) (UTM)	1. Japanese Language Course at ITM five months. 2. In Plant Training in Japan.
8.	Mohammed Zulkifli Mohammed	T1	Dip. in Marine Engineering (PUC)	
9.	Mohana Krishnan a/l Gobalakrishnan	T1	Dip. in Mech. Eng. (UTM)	
10.	Mohd. Nasruddin bin Abd. Muaid	T4	Dip. in Marine Engineering (PUC)	
11.	Ridzuan bin Md. Daud	T1	Dip. in Marine Engineering (PUC)	

No.	Name	Category	Aca. Qualification	Training Undergo During Service
12.	Liew Siew Men	T2	Tech. Teachers Cert. (Inds. Arts) TTTC C & G Mec. Eng. Crafts Prac. Part I & II (UK) C & G Mech. Eng. Tech. Part I & II	1. Six months in tool making
13.	Kamaruddin bin Ajib	T2	Tech. Tec. Cert. (TTTC) Dip. in Tech. & Voc. Edu. (Canada)	1. Auto Diesel course in Toronto.
14.	Kussein bin Yono	T2	Tech. Teachs. Weld. Eng. Cert. in Teachers Training Tech. College (TTCKI)	1. Welding & Air Conditioning course in TTCKI. 2. Seminar for Career and Guidance for Youth USM.
15.	Ismail bin Hashim	Tech.	Ordinary National Dip. (Mech. Eng.) Cambridgeshire College of Arts Tech. Cambridge UK.	1. Three weeks sea training on board MSC ships. 2. One week in plant trainings (Boiler) at IEAE Malaysia.

(資料 10)

IMO-UNDP-MALAYSIA SEMINAR ON
TRAINING, CERTIFICATION AND EXAMINATION
OF MARINE PERSONNEL

MALAYSIAN MARINE ENGINEERING OFFICER'S EXAMINATION
AND CERTIFICATION SYSTEMS

PRESENTED

BY

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PENINSULAR MALAYSIA

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MALAYSIAN MARINE ENGINEERING OFFICER'S EXAMINATION
AND CERTIFICATION SYSTEMS

The paper describes the Malaysian examination and certification systems practised in the past and subsequent changes up to the present time, and goes on to consider the proposed system in compliance with the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW).

INTRODUCTION

The Marine Department Malaysia, a Government agency under the Ministry of Transport, is the authority responsible for the administration of the examination and certification of Merchant Navy Engineering Officers under the provisions enacted in the Merchant Shipping Ordinance 1952. The management of the examination and certification of seafarers has been established as the function of the Examination and Training Division in the Department's Organisation. This Division is responsible technically to the Examination Board which consists of a Chairman and one or more member duly appointed by the Minister of Transport. This Examination Board, which remains to be the highest policy making body to all matters concerning the conduct of Examinations and the Certifications of Engineering Officers, is directly answerable to the Minister of Transport.

HISTORY

The examination for the certification of merchant navy engineering personnel was first conducted locally as early as in the year 1953. Although under the Merchant Shipping Ordinance 1952, there have been provisions for the conduct of various grades of examinations, it was quite normal to discover that for many years after the date of commencement, only the examinations for the Certification as Engine

Drivers were conducted. This was due to the fact that the shipping industry of Malaysia at that time was made up mainly of small ships, plying within the local waters and requiring only the holders of Engine Drivers Certificates to fulfil their manning requirement.

As the local shipping industry developed and diversified the need for qualified marine engineers became obvious and prompt actions were taken by the Government in order to meet the requirements. One of the effective steps acknowledged was by offering scholarships to young citizens who were interested and eligible to pursue the career at sea as cadet engineers aboard ships. These students undergoing the Engineer Cadet Scheme of Training were initially required to attend marine engineering courses in recognised technical colleges prior to shipboard practical experience and tuition by comprehensive correspondence course set and marked by the college. The majority of these engineers completed their initial training and, after undergoing the required sea service, sat for their examinations for the Certificates of Competency in United Kingdom.

The year 1969 was of great significance to Malaysian shipping industry when a National Shipping Line was officially established. Commencing with only one ship, the shipping line later made a rapid development in terms of numbers, types and sizes of ships, and it was not surprising to find that throughout the year 1970 the Malaysian ships had sail all over the world. With this development the need for qualified marine engineers to man the ships had become more acute and in the effort to overcome the shortage of trained marine personnel, the Government successfully established a centre at Politechnic Ungku Omar Ipoh for the Engineer Cadet Scheme of training. Later it was decided that the time was ripe for Malaysia to conduct her own Examination for the Certification of Marine Engineer Officers.

With this objective, IMO assistance was sought and in the year 1980 two IMO appointed advisors were sent an attachment with the Marine Department. The main activity for both advisors had been directed towards the development of a new certificate and examination structure to meet national requirements and eventually enable Malaysia to accede to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention 1978). As the result, the first examination for engineer officers was conducted locally in late 1981 and this has been a regular exercise ever since.

Included in the IMO's technical assistance project was the training of local examiners. With the fellowships provided by the IMO/UNDP, two Marine Engineer Officers from the Marine Department were sent to Australia for a two month training with the Australian Department of Transport Examination Centres in Canberra and Sydney. Upon completing their training abroad, the two engineers eventually took over the role of examiners when the UNDP/IMO assistance ended.

THE PRESENT EXAMINATION AND CERTIFICATION SYSTEM

The present examination and certification system practised in Malaysia in many respect are similar to the systems used in most Commonwealth countries. Similarities are found in the initial training requirements, qualifying sea-service, examination structure, examination syllabi, examination subjects and supplementary courses requirements.

The types of examination held in Malaysia at present may be classified into two grades namely Engine Driver's Examination and Engineer Officer's Examination. Engine Driver's Certificates of Competency are issued to officers mainly for the manning of Home Trade and Local Trade Malaysian registered ships and the latter for the manning of Foreign Going Malaysian registered ships.

EXAMINATION AND CERTIFICATION OF ENGINE DRIVERS

Under this certification scheme, the class of Certificate of Competency issued are :-

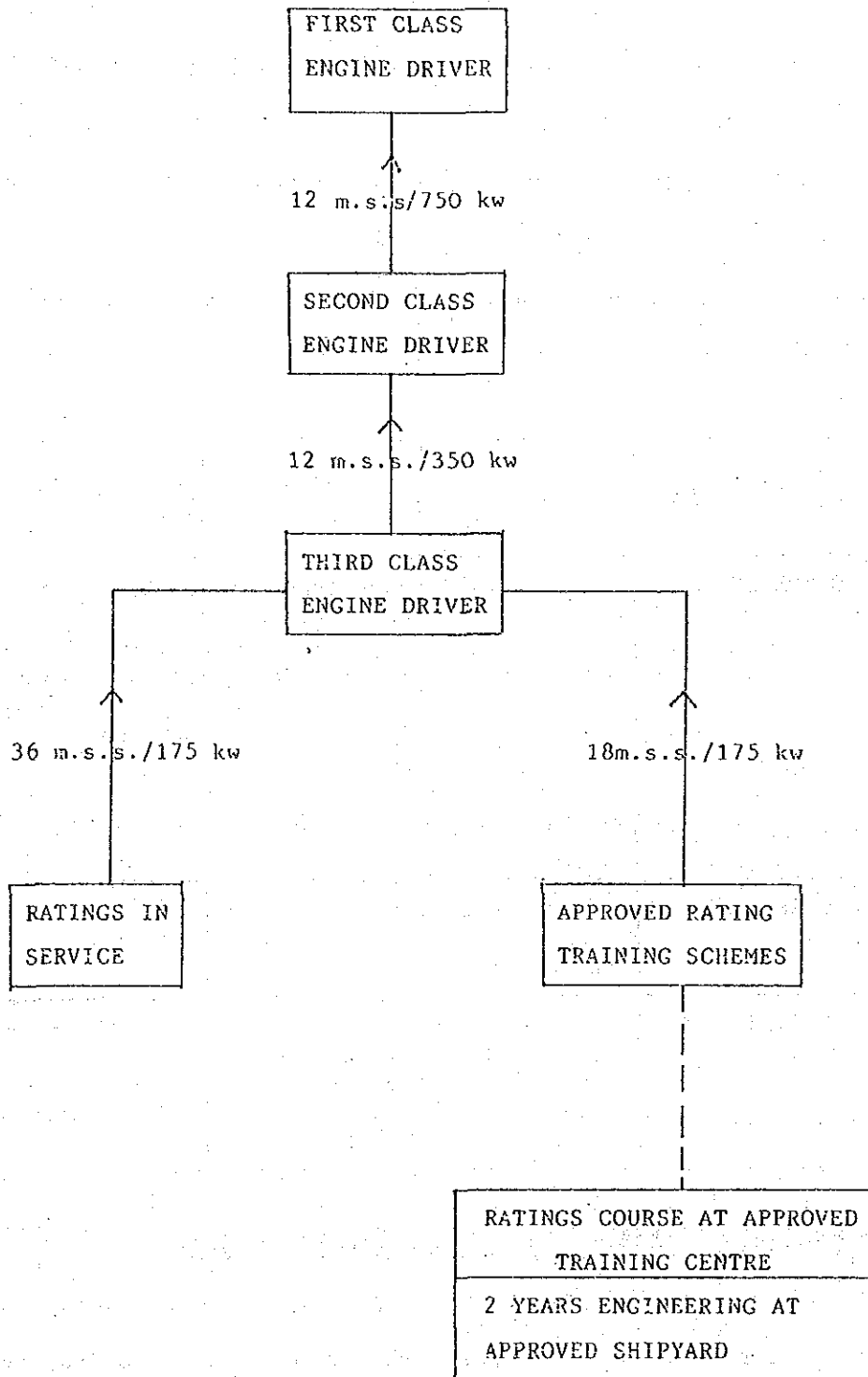
- First Class Engine Driver's Certificate of Competency
- Second Class Engine Driver's Certificate of Competency
- Third Class Engine Driver's Certificate of Competency

The initial training requirement for this scheme are :-

- (a) by completing one of the approved courses of training as an engine room rating, or
- (b) by completing two years of Engineering craft training in a shipyard or an industrial training centre approved by the Department.

Ratings in service who have completed a minimum of 18 months sea service as an engine room operative are considered to have met the initial training requirement.

The qualifying sea service required for each class of certificate is as tabulated.



The examination for the certification as Engine Driver is in the form of written examination on Engineering Knowledge of 2 hours duration, and viva voce.

All candidates are required to have undergone supplementary courses in fire-fighting and First Aid at Sea conducted by an approved training centre prior to the issuance of a certificate of competency as Engine Driver.

The limitations of each class of certificate as Engine Driver are as shown below :

CLASS OF CERTIFICATE	RANK	TRADING AREA	REGISTERED PRO-PULSION POWER (KW)
FIRST CLASS ENGINE DRIVER	Chief Engineer	Home Trade or Local Trade	3000 and below
	2nd Engineer	Foreign Going	750 and below
		Home Trade or Local Trade	No Limit
	Watchkeeping officer	All Trades	No Limit
SECOND CLASS ENGINE DRIVER	2nd Engineer or Watchkeeper	Home Trade or Local Trade	No Limit
THIRD CLASS ENGINE DRIVER	Chief Engineer	Home Trade or Local Trade	350 and below
	Watchkeeper	Home Trade or Local Trade	3000 kw and below

ENGINEER OFFICER'S EXAMINATION AND CERTIFICATION SYSTEM

The classes of Certificate of Competency presently being issued by the Malaysian Administration under this certification system are:

First Class Engineer's Certificate of Competency

Second Class Engineer's Certificate of Competency

Third Class Engineer's Certificate of Competency

Fourth Class Engineer's Certificate of Competency

The Third and Fourth Class Certificate of Competency were only recently introduced in July, 1984 so as to meet the requirements of the revised manning regulations implemented by the Ministry of Transport in March, 1985.

The initial training requirements for the Engineer Officer's Certification Scheme are :

- (a) by completing an approved course of training as an engineer cadet, or
- (b) by completing a four year Engineering craft training or apprenticeship at a shipyard approved by the Department, or
- (c) by completing an approved full time course of study in Mechanical or Marine Engineering of not less than 3 years at a Polytechnic or University together with 18 months Engineering workshop training relevant to the duties of a sea going engineer officer.

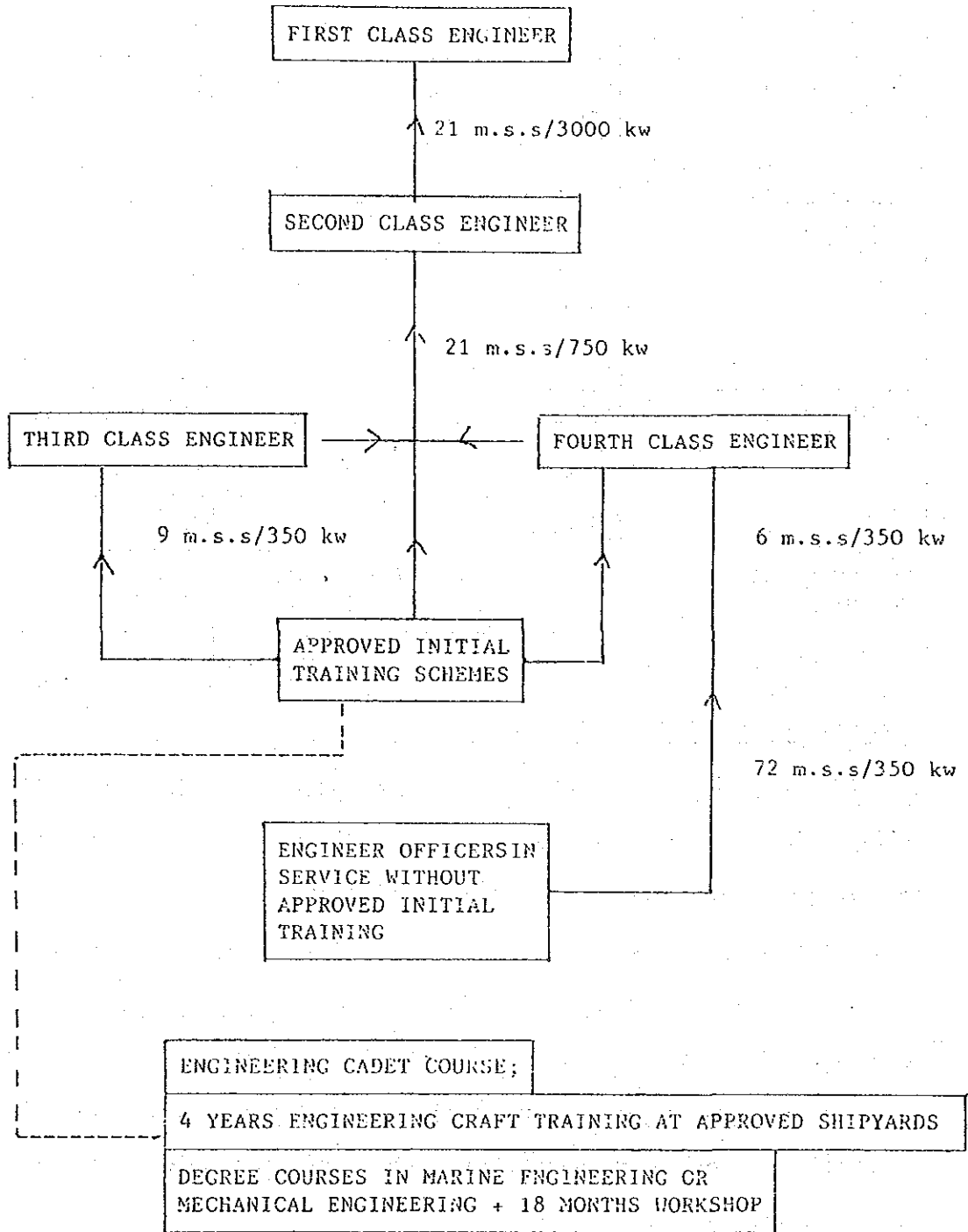
The examination of Engineer Officers is in the form of written examination and viva-voce, except for the Fourth Class Certificate of Competency where the mode of examinations is in the form of viva-voce only. The summary of examination subjects for each class of certificate is as given. (refer to page 8)

SUBJECTS		GRADE OF CERTIFICATE			
		1st Class Engineer	2nd Class Engineer	3rd Class Engineer	4th Class Engineer
PART 'A'	MATHEMATICS-(3 HRS)		✓		
	APPLIED MECHANICS-(3 HRS)	✓	✓		
	APPLIED HEATS-(3 HRS)	✓	✓		
	ENGINEERING DRAWING-(4HRS)		✓		
	GEN. ENGINEERING SCIENCE			✓	
PART 'B'	ENGINEERING KNOWLEDGE STEAM OR MOTOR)-(3 HRS)	✓	✓		
	ENGINEERING KNOWLEDGE (GENERAL) - (3 HRS)	✓	✓	✓	
	ELECTROTECHNOLOGY-(3 HRS)	✓	✓		
	NAVAL ARCHITECTURE-(3 HRS)	✓	✓		
	VIVA-VOCE	✓	✓	✓	✓

SUMMARY OF EXAMINATION SUBJECTS

As in the Engine Driver's Certification Scheme, all candidates are required to undergo supplementary courses in Fire Fighting and First Aid at sea prior to the issuance of a Certificate of Competency.

The qualifying sea service requirements for each class of certificate are as shown by the flow chart.



The limitations of each class of Certificate of Competency are as shown in the table:

CLASS OF CERTIFICATE	RANK	TRADING AREA	REGISTERED PRO-PULSION POWER(KW)
FIRST CLASS ENGINEER	Chief Engineer	All Trades	No Limit
	2nd Engineer Watchkeeper		
SECOND CLASS ENGINEER	Chief Engineer	Foreign Going	750-3000
		Home Trade or Local Trade	No Limit
	2nd Engineer Watchkeeper	All Trades	No Limit
THIRD CLASS ENGINEER	2nd Engineer	Foreign Going	750-3000
	Chief Engineer	Foreign Going	750-below
	Watchkeeper	All Trade	No Limit
FOURTH CLASS ENGINEER	2nd Engineer	Home Trade or Local Trade	No Limit
	Watchkeeper	All Trades	No Limit

EXAMINATION AND CERTIFICATION SYSTEM UNDER STCW CONVENTION

Malaysia is still to be a signatory to the STCW Convention 1978. However, various steps and policies are being considered to ensure smooth and effective changeover upon the signing the convention by the Government in a very near future. In fact, the administration had enforced various regulations in line with the requirements of the STCW convention. Examples of such regulations enforced are the revised manning policy in March 1985 and by making it mandatory for every certificate of competency holder to undergo supplementary modular courses.

PROPOSED STCW MARINE ENGINEER OFFICER'S CERTIFICATION STRUCTURE

Under the proposed system, there will only be a single certification system instead of two as currently practised. The new certificate structures proposed will be:

Marine Engineer Officer Class One Certificate of Competency

Marine Engineer Officer Class Two Certificate of Competency

Marine Engineer Officer Class Three Certificate of Competency

Marine Engineer Officer Watchkeeper Certificate of Competency

Marine Engineer Officer Class Four Certificate of Competency

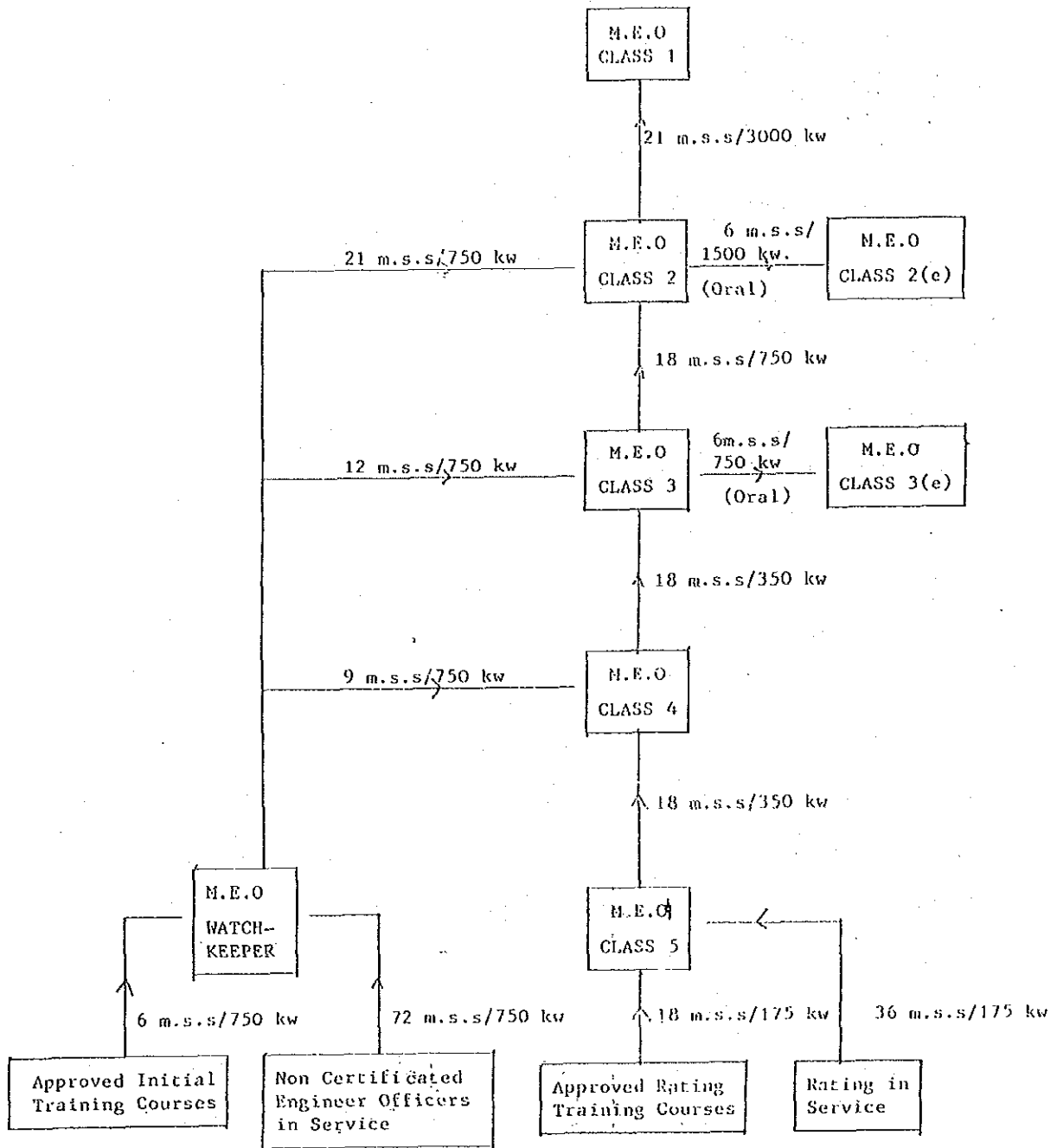
Marine Engineer Officer Class Five Certificate of Competency

Endorsements for Marine Engineer Officer Class Two and Class Three Certificate of Competency will be introduced.

For the proposed system there will be two entry points, namely Marine Engineer Officer Watchkeeper and Marine Engineer Officer Class Five Certificate.

The initial training requirements for gaining entry through Marine Engineer Officer Watchkeeper Certificate will be the initial training required for the present Engineer Officer's Certification Scheme and the initial training requirements for gaining entry through Marine Engineer Officer Class Five Certificate will be by having to undergo a mandatory rating training at an approved training institution. Consideration may be given to ratings already in service with a minimum of 18 months sea service to be accepted as meeting the initial training requirements but will be required to undergo supplementary modular courses.

The proposed certification structure and the required sea service is as shown by the following chart.



The comparison between the proposed certificates structure their equivalent and standard with the present structure is as tabulated below:

COMPARISON BETWEEN PROPOSED M.E.O. CERTIFICATES
STRUCTURE STANDARDS AND PRESENT CERTIFICATES

PROPOSED NEW CERTIFICATE	STANDARD
M.E.O. CLASS 1	Existing First Class Engineer Certificate of Competency + Supplementary Courses
M.E.O. CLASS 2	Existing Second Class Engineer Certificate of Competency + Supplementary Courses
M.E.O. CLASS 3	Existing First Class Engine Driver Certificate of Competency + Supplementary Courses
M.E.O. W/KEEPING	Existing Fourth Class Engineer Certificate of Competency + Supplementary Course
M.E.O. CLASS 4	Existing Second Class Engine Driver Certificate of Competency + Supplementary Course
M.E.O. CLASS 5	Existing Third Class Engine Driver Certificate of Competency + Supplementary Course

EQUIVALENT CERTIFICATES

M.E.O. CLASS 1	FIRST CLASS ENGINEER CERT. OF COMPETENCY
M.E.O. CLASS 2	SECOND CLASS ENGINEER CERT. OF COMPETENCY
M.E.O. CLASS 3	FIRST CLASS ENGINE DRIVER CERT. OF COMPETENCY
M.E.O. W/KEEPING	FOURTH CLASS ENGINEER CERT. OF COMPETENCY
M.E.O. CLASS 4	SECOND CLASS ENGINE DRIVER CERT. OF COMPETENCY
M.E.O. CLASS 5	THIRD CLASS ENGINE DRIVER CERT. OF COMPETENCY

The nature of examination of the proposed system will be similar to the present practice. Except for Marine Engineer Officer watch-keeper and endorsement certificate where the examination will be in the form of viva voce only the examinations for other classes will involve written papers and viva-voce.

The present examination subjects for each class of certificate will be maintained under the new scheme. Given below is the summary of examination subjects for the various classes of certificates.

SUBJECTS		CLASS OF CERTIFICATES					
		MEO CLASS ONE	MEO CLASS TWO	MEO CLASS W/KEEPER	MEO CLASS THREE	MEO CLASS FOUR	MEO CLASS FIVE
PART "A"	MATHEMATICS		✓				
	APPLIED MECHANICS	✓	✓				
	APPLIED HEATS	✓	✓				
	ENGINEERING DRAWING		✓				
PART "B"	GENERAL ENGINEERING KNOWLEDGE				✓	✓	✓
	ENGINEERING KNOWLEDGE (MOTOR OF STEAM)	✓	✓				
	ENGINEERING KNOWLEDGE (GENERAL)	✓	✓				
	NAVAL ARCHITECTURE	✓	✓				
	ELECTRO TECHNOLOGY	✓	✓				
	VIVA-VOCE	✓	✓	✓	✓	✓	✓

SUMMARY OF EXAMINATION SUBJECTS

As to the supplementary modular courses requirements, under the proposed scheme there will be an additional short course from the present requirement. The additional new course will be the Proficiency in Survival Craft which is tailored to include various aspects of personal survival at sea too. Therefore, three supplementary modular courses namely Fire Fighting, First Aid at Sea and Proficiency in Survival Craft will be required under the new scheme.

The limitations of the proposed certificate structure are as

shown below:

CLASS OF CERT.	RANK	TRADING AREA	REGISTERED PROPULSION POWER (KW)
M.E.O. CLASS 1	Chief Engineer 2nd Engineer Watchkeeper	ALL TRADES	NO LIMIT
M.E.O. CLASS 2(e)	Chief Engineer	ALL TRADES	UNDER 3000
		NEAR COASTAL TRADE	3000 AND OVER
M.E.O. CLASS 2	2nd Engineer or Watchkeeper	ALL TRADES	NO LIMIT
M.E.O. CLASS 3(e)	Chief Engineer	NEAR COASTAL TRADE	UNDER 3000
M.E.O. CLASS 3	2nd Engineer	ALL TRADES	UNDER 30000
	2nd Engineer	NEAR COASTAL TRADE	NO LIMIT
	Watchkeeper	ALL TRADES	NO LIMIT
M.E.O. CLASS 4	2nd Engineer	NEAR COASTAL TRADE	UNDER 30000
	Watchkeeper	NEAR COASTAL TRADE	NO LIMIT
M.E.O. CLASS 5	Watchkeeper	NEAR COASTAL TRADE	NO LIMIT
M.E.O. W/KEEPER	Watchkeeper	ALL TRADES	NO LIMIT

Minimum Mandatory Training and Qualification of Officers and Ratings on Tankers

Officers and Ratings who are to have specific duties and responsibilities related to those duties, in connection with cargo or cargo equipment on oil tankers, chemical tankers or gas tankers and who have not served on board such tankers as part of the regular complement will be required to have appropriate tanker endorsements before carrying out such duties.

These endorsements may be obtained by completing:

- (a) An approved shore based fire fighting course, and
- (b) A minimum period of 3 months supervised shipboard service on such a tanker; or
- (c) An approved appropriate tanker familiarisation course.

In addition to the above requirements, every Chief Engineer Officer, Second Engineer Officer and any other Engineer Officer with immediate responsibility for loading, discharging and care in transit or handling of cargo, will be required to have:

- (a) A minimum of 3 months experience appropriate to their duties on such a tanker; and
- (b) Completed a specialised training course.

Revalidation of Certificate

For the purpose of maintaining continued proficiency and updating of knowledge, every Engineer Officer holding a certificate of competency who is serving at sea or intends to return to sea after a period ashore shall, in order to continue to qualify for seagoing service in the rank appropriate to his certificate, be required at regular intervals not exceeding 5 years revalidate his certificate.

The requirements for this revalidation process will be based on:

- (i) having to pass a medical fitness test including eyesight and hearing,
- (ii) satisfactory conduct by having to produce a service testimonials from his superior, and
- (iii) professional competence by having a minimum of 12 months sea service during the preceding 5 years; or by having a minimum of 3 months sea service and successfully completing a refresher course or courses conducted by an approved training institute.

It is also proposed that the sea service requirement may be waived for certificate holders who are employed in specific professions such as college lecturers, examiners, surveyors and engineer superintendents. For this group of professionals, the revalidation of certificate requirements will only by having to undergo a refresher course or courses conducted by an approved training institute.

Medical Standard

Every seafarer to be employed on a Malaysian sea-going ship of 200 gross register tons and above shall be required to hold a valid medical fitness certificate. Medical fitness examinations are to be carried out by an approved medical practitioner. Medical fitness certificate issued in accordance with ILO medical examination (Seafarer) Convention 1946 No.73 or the ILO Minimum Standards on Merchant Ship Convention No.147 (Regulation 6a) or by other foreign government according to these standards may be accepted as meeting this requirement.

The frequency of the medical examination is as follows:

- (a) Seafarers below the age of 18 - yearly examination.
- (b) Seafarers between the ages of 18 and 40 - every 5 years.
- (c) Seafarers of over 40 years of age - every 2 years.

Seafarers serving on bulk chemical carriers will be subjected to yearly examination and blood test at yearly or more frequent intervals.

CONCLUSION

From the details given, it can be seen that the examination system for seafarers in Malaysia has developed remarkably from what it was before and more is still being done to develop the system further in line with the aspirations of the STCW Convention.

While the number of Certificate of Competency issued by this administration has increased year by year, the demand for more is still there. It is hoped that the demand can be met while still maintaining the highest possible standards comparable to certificates issued by other nations.

(資料 11)

HANDBOOK

Politeknik Ungku Omar

Jalan Dairy, Ipoh

Perak

Telephone: 05-557622

557656

1. THE ROLE OF THE POLYTECHNIC

- 1.1 The Ungku Omar Polytechnic was established in 1969 as an Educational Institution under the Ministry of Education. Its main function is to train school-leavers from Secondary Schools and above to be efficient technicians and middle-level business personnel.
- 1.2 Ungku Omar Polytechnic offers full-time courses for two years and three months in the main fields of engineering technology and business studies, three years and three months in Accountancy and four years in Marine engineering. This period includes six months of industrial attachment which is compulsory.

2. COURSES OF STUDY

- 2.1 Information concerning the courses offered, their structure, and the academic calendar are as shown in the appendices.

3. ENTRY QUALIFICATIONS

- 3.1 To qualify for consideration for admission a candidate must first have obtained the Sijil Pelajaran Malaysia/Sijil Pelajaran Vokasional Malaysia or its equivalent with a pass in Bahasa Malaysia together with the following qualifications obtained at one examination sitting only:-

- 1) *i) All certificate courses*
ii) Diploma in Accountancy Course (SPM Grade 1 and 2 only)

- | | |
|--------------------------------|------------------------------|
| a) a credit in Mathematics and | a) a pass in Mathematics and |
| b) a pass in any one subject | OR b) a credit in any one |
| from the following | subject from the |
| grouping:- | following grouping: |

*Physics, Physical Science, Additional General Science, General Science, Engineering Science, any related technical subject, Commerce and Principles of Accounts**

**(for Commerce courses only)*

2) Diploma in Marine Engineering Course (SPK only)

- a) Credit - Mathematics and Physics
- b) Pass - any related subject

3.2 Candidates must also be:-

- i. Malaysian citizens
- ii. more than 16 years in age
- iii. physically healthy.

4. APPLICATION PROCEDURE

4.1 Application for admission can be made on the application form provided and submitted to the Secretary-General, Ministry of Education (Technical and Vocational Education Division) only after the advertisement inviting applications has appeared in the local newspapers.

4.2 The advertisement inviting applications will normally be published in the local Bahasa Malaysia newspapers after the announcement of the Sijil Pelajaran Malaysia Examination results.

4.3 All completed application forms must be accompanied by the required photographs (recently taken) and certified copies of certificates held by the applicant.

4.4 Application from candidates who do not possess the necessary academic qualifications and who do not follow the stated procedures will not be entertained.

5. SELECTION OF STUDENTS

5.1 Shortlisted candidates will be required to attend an interview. All expenses incurred for attending this interview will be borne by the candidates themselves.

6. FEES

6.1 Tuition fees

All students will pay tuition fees amounting to \$300/- a year and of this sum a portion amounting to \$150/- will be paid on acceptance of offer. Tuition fees paid are not refundable.

6.2 Security Deposit

All students are required to pay a security deposit of \$50/- as soon as they receive a formal acceptance from the Polytechnic. This amount is refundable provided there is no damage to any Polytechnic property by the student.

6.3 Hostel Fees

Students who are given hostel places will be required to pay a hostel deposit of \$50/-. Students may take their food at the cafeteria where one pays as one eats.

6.4 All students are expected to buy their own text-books, drawing equipment and stationery.

7. SCHOLARSHIPS

7.1 The Ungku Omar Polytechnic does not offer any scholarships or financial assistance to students. However, students can apply for scholarships offered by the federal government, the various state governments, statutory bodies and other private organisations.

7.2 Scholarship forms from the various sponsoring bodies are available for registered students of the polytechnic. Selection interviews are normally held by the sponsors. The value of the scholarships and the attached conditions are the prerogative of the sponsors.

8. ACCOMMODATION, SPORTS AND GAMES

8.1 Limited hostel accommodation is available to first year students. Students not given hostel accommodation are expected to find their own accommodation. The Ungku Omar Polytechnic provides assistance in finding accommodation for the students in the various nearby housing estates.

8.2 Various facilities for sports and games are available. However, students are expected to arrange their own sports, social and cultural activities under the guidance of appointed lecturers.

9. GENERAL

9.1 Successful candidates are required to pass a medical examination (including X-Ray) before being allowed to commence their studies. Medical fees incurred are to be borne by the students.

9.2 Students are also required to fill in an Indemnity Form, absolving the Ungku Omar Polytechnic of any responsibility in case of any accidents that may befall them while studying here.

9.3 Students are also required to take a personal insurance cover for the period of their studies in the polytechnic and for the period of their industrial attachment.

9.4 Students are required to observe all the rules and regulations of the Polytechnic which are currently in force and those which may be introduced from time to time.

10. JOB EMPLOYMENT

10.1 Students, after completion of their studies, are expected to find their own employment. However, the Polytechnic offers help by channelling notices of employment opportunities from firms to the suitable students/graduates. The Polytechnic also provides facilities for firms wishing to interview graduating students.

10.2 Among the posts held by Engineering Certificate holders in the various government departments are technicians, radio officers, assistant project supervisors, instructors, plan drafters, works supervisors and assistant quantity surveying officers. For graduates in the Accountancy and Business Studies courses, among the posts are Accounts clerks, Accounts examiners, clerks and others.

11. EXAMINATIONS

11.1 All students are required to satisfy the attendance and course work requirements before they are allowed to appear for the examinations.

11.2 The following examinations are held:-

Term examination : This examination is held at the end of each Polytechnic term.

Final examination : This is held at the end of the final term of each academic year.

Supplementary examination: This examination is held after the Final examination for those who have failed in one or more subjects (up to a certain maximum) in the Final examination; these subjects have to be passed before a student is allowed to go on to the next year of studies or to receive the Polytechnic Certificate or Diploma.

11.3 The performance of the student in all these examinations are taken into account in deciding on his academic achievement/standard for that particular year of study. Students who have successfully completed their course of studies will be awarded a Certificate/Diploma in the discipline concerned.

CIVIL ENGINEERING DEPARTMENT

The Civil Engineering Department offers the following engineering courses at Certificate (Technician) level:

1. Civil Engineering (Construction)
2. Civil Engineering (Public Works & Hydraulics)
3. Architecture
4. Land Surveying.

These courses are planned to equip the students with sufficient skills so that they can become competent technicians in the government departments, statutory bodies and private organisations.

Heavy emphasis is placed on practical work in the laboratory and workshop.

These courses are of two years and three months duration and include a six months training period in industries between the two academic years.

CIVIL ENGINEERING (CONSTRUCTION)

This course equips the students with the necessary theory and practical skill to enable them to become technicians competent enough to supervise construction and development projects like building construction, housing, roads, highways, bridges and others.

In addition to studying basic subjects like Science and Mathematics, the students are also given sufficient theoretical and practical knowledge on topics connected with construction like Surveying, Materials Testing, Basic Hydraulics, Structures, Water Supply, Highway and also the different construction materials commonly used.

Basic workshop training includes carpentry, concrete work and surveying. Students are also taught about contracts and the tendering process beginning from drawing up of specifications to supervision until completion of project.

Visits are made to various factories and industries where building materials and components are manufactured or fabricated and to construction site works of varied nature, to broaden their knowledge generally.

CIVIL ENGINEERING (PUBLIC WORKS & HYDRAULICS)

One of the aims of this course is to produce technicians who can help engineers and technical assistants to supervise drainage and sewerage works, surveying and other works connected with Civil Engineering.

To achieve this aim the students will study subjects connected with water works like methods of water flow measurement, collection of data on rainfall and water works. Students will also learn various aspects of construction including properties of building materials used and also ways of engineering measurement that are covered in the Construction course.

Practical work in the workshop and laboratory are the same as for the Construction course like carpentry, brickworks, concreting, surveying and others.

ARCHITECTURE

Students in this discipline will be equipped with knowledge in the areas of construction technology, drafting, structures and drafting office management.

In the first year students are taught Mathematics and Science subjects. Basic subjects like Physics, Electricity, Mechanics and Building Materials are also taught. Theory classes are balanced with practical work where the students develop practical skills in woodwork, brickwork, concreting and surveying. In the Architectural Studio, the students are shown the correct ways of using drawing/drafting instruments.

After the period of industrial training, the students are taught architectural structures, Architectural Drawing techniques (with emphasis on wooden and concrete construction), perspective drawing and other presentation drawings. Architectural structures are taught using the method of building calculation as employed for building structures. Students are also given instructions on office management procedures

connected with estimating and costing in the preparation of contracts and tenders and also the legal aspects involved in the construction field.

LAND SURVEYING

In the first year the course structure is similar to that followed by the other Civil engineering courses. However the emphasis is the aspects of measurement like ways of drawing plans, method of division and subdivision of land.

In the second year the students study the ways of investigating border markers, three cornered measurement system, analysis of aerial photograph for determining mountain facing direction and others. Amongst the instruments used are theodolite, electronic distance measurement instrument, plane table, prismatic compass and other surveying instruments.

It is expected that the graduates of this course will be able to help the surveyors in Topographic survey, Photogrammetry and Engineering Survey.

CURRICULA

CIVIL ENGINEERING (CONSTRUCTION)

First Year	Second Year
English Language	Islamic Civilization
Islamic Education	Structures & Strength of
Mathematics	Materials
Engineering Science	Soil Mechanics
Engineering Drawing	Estimating & Contract
Engineering Survey	Procedures
Construction & Materials	Engineering Survey II
	Civil Engineering
	Construction II
	Hydraulics
	Water Supply & Sewerage
	Highway Engineering

CIVIL ENGINEERING (PUBLIC WORKS & HYDRAULICS)

First Year

English Language
Islamic Education
Mathematics
Engineering Science
Engineering Drawing
Engineering Survey
Construction & Materials

Second Year

Islamic Civilization
Structures & Strength of
Materials
Soil Mechanics
Estimating & Contract
Procedures
Engineering Survey II
Civil Engineering
Construction II
Hydraulics
Water Supply & Sewerage
Irrigation & Drainage

ARCHITECTURE

First Year

English Language
Islamic Education
Mathematics
Engineering Science
Architectural Drawing
Engineering Survey
Construction & Materials
Principles of Graphic
Communication

Second Year

Islamic Civilization
Architectural Structures
Building Services
Architectural Project
Architectural Practice
Building Construction
Architectural Design
Architectural Presentation
Drawing

LAND SURVEYING

First Year

English Language
Islamic Education
Mathematics
Engineering Science
Engineering Drawing
Engineering Survey
Computation I
Plan Drafting

Second Year

Islamic Civilization
Engineering Survey II
Cadastral Survey
Astronomy
Land Laws & Regulations
Photogrammetry
Cartography
Computation II
Survey Camp

ELECTRICAL ENGINEERING DEPARTMENT

The Electrical Engineering Department runs the following engineering courses at Certificate (Technician) level:

1. Electrical Engineering (Power)
2. Electronic Engineering (Communication)
3. Industrial Instrumentation and Controls
4. Computer Technology

These courses are of two years and three months in duration and include a compulsory six-month training period in industries between the two academic years. Throughout the course great emphasis is placed on practical and laboratory work.

ELECTRICAL ENGINEERING (POWER)

This course provides the student with the necessary theory and practice that is necessary for a technician to do his job competently. Electrical Technicians working with Electricity Supply Boards play an important role in ensuring supply to firms and residences. Those involved with electrical installation and construction can ensure that these are done properly and safely. For those in the sales field, the knowledge and expertise in electrical repairs and maintenance will provide him with that necessary 'extra' that will help to clinch a sale.

This course offers basic Electrical Theory, Technical Mathematics, Engineering Science and Engineering Drawing, along with extensive training in installation, operation and maintenance of electrical machines, industrial electronics and controls, measurement and electrical power distribution as utilised in industry. Laboratory and workshop exercises provide insight into the applications of the principles.

ELECTRONIC ENGINEERING (COMMUNICATIONS)

The last two decades have seen startling developments in the field of space exploration, industrial automation, communications and computer science. This technological explosion has resulted in a tremendous

diversification of possibilities in which a graduate from an electronics course may seek employment.

This course covers the fundamental concepts and circuits commonly encountered in the fields of communications, controls, measuring, recording and display devices. Because electronics is a rapidly evolving field, the course is designed to train the student to be readily adaptable to the changes which will inevitably occur in the future. The theory courses are supplemented with laboratory work on electrical and electronic principles.

In addition to the basic subjects, this course also provides theory and practice in Repair and Maintenance of Radio and Television, Communications and Microprocessors.

INDUSTRIAL INSTRUMENTATION & CONTROL

Industrial Instrumentation and Control is the science of applying devices and techniques to measure, display, monitor and control plant equipment and process operations. The objective of this course is to train Instrument Technicians specially suited for the continually expanding processing and automated industries.

The laboratory contains an S2 plant which provides extensive training in temperature-pressure-level-flow control, process control simulator, process trainer, pneumatic PID controller, basic servo mechanism trainer, pneumatic and electronic instrument calibrating panel, system simulator, Maxam fluid power panel and analog simulator.

The training given in start-up, fault-finding, repair and maintenance of process automation equipment should enable the Instrumentation and Control Technician to undertake maintenance work of industrial control systems and also to assist professional engineers in system design.

COMPUTER TECHNOLOGY

Since the last decade computers have increasingly been used in all areas of human activity and this is expected to continue. With this proliferation of computers (especially mini and microcomputers), it has become imperative that there should be a pool of trained personnel to

maintain these equipment. In line with this, a Certificate course in Computer Technology was started in the 1984/85 session.

During the first year the basic electronic subjects are taught and the student is also given an introduction to Computer Engineering. In the second year the students will be given an opportunity to trouble-shoot common faults in microcomputer and peripheral equipment to complement the theory learnt in class.

CURRICULA

ELECTRICAL ENGINEERING (POWER)

First Year

English Language
Islamic Education
Mathematics I
Engineering Science
Engineering Drawing
Principles of Electricity
Electrical Installation
Workshop Processes and
Applied Heat
Basic Electronics

Second Year

Islamic Civilization
Industrial Management
Mathematics II
Electrical Instruments &
Measurement
Electrical Machines
Generation, Transmission
and Distribution
Industrial Electronics
and Control
Project

ELECTRONIC ENGINEERING (COMMUNICATION)

First Year

English Language
Islamic Education
Mathematics I
Engineering Science
Engineering Drawing
Principles of Electricity
Electronics I
Workshop Processes and
Basic Wiring Practice

Second Year

Islamic Civilization
Industrial Management
Mathematics II
Telecommunications
Electronic Equipment Repair
and Maintenance
Electronic Instruments
and Measurement
Pulse and Digital Systems
Project

INDUSTRIAL INSTRUMENTATION AND CONTROL

First Year

English Language
Islamic Education
Mathematics I
Engineering Science
Engineering Drawing
Principles of Electricity
Measuring Principles
Workshop Processes and
Basic Wiring Practice
Basic Electronics

Second Year

Islamic Civilization
Industrial Management
Mathematics II
Instrument Workshop Practice
Control Principles and
Systems
Computer Principles
Industrial Electronic Control
Project

COMPUTER TECHNOLOGY

First Year

English Language
Islamic Education
Mathematics I
Engineering Drawing
Principles of Electricity
Computer Technology I
Workshop Processes and
Basic Wiring Practice
Electronics I

Second Year

Islamic Civilization
Industrial Management
Mathematics II
Electronic Equipment and
Measurement
Electronic Equipment Repair
and Maintenance
Computer Maintenance and
Trouble-shooting
Programming
Project

MECHANICAL ENGINEERING DEPARTMENT

The Mechanical Engineering Department offers the following engineering courses at Certificate (Technician) level:

1. Mechanical Engineering (General)
2. Mechanical Engineering (Production)
3. Automotive and Diesel
4. Air-conditioning and Refrigeration

These courses are of two years and three months duration and are of the sandwich type, incorporating six months practical training in industry in between the first and second years. The courses are very practical-oriented and approximately fifty percent of the students' time are spent in the workshops and laboratories which also include a fair amount of drawing and design work in the drawing offices.

All the courses follow a fairly common syllabus in the first year with one or two special subjects in the respective specialities. This is to enable the students to have a strong grounding in basic mechanical engineering requirements. The second year of each course lays more stress on the specialist subjects relating to the five branches.

MECHANICAL ENGINEERING (GENERAL/PRODUCTION)

These courses are designed to give the students as broad a base as possible in general mechanical engineering principles. The common subjects are Mathematics, Engineering Science, Heat and Fluid Technology, Electrical Technology and Engineering Drawing. Basic workshop practice includes machining, fitting, welding and sheetmetal work. Specialised subjects in the second year include Jig and Tool Design, Workshop Management, Metallurgy and Materials Science, Plant Engineering and Control Systems Technology. Production Engineering students spend a considerable amount of time in the Metrology and Fine Measurement Laboratory as well as in the Instrumentation and Control Laboratory. Modern workshop equipment include a Capstan Lathe operated by a fully Automatic Pneumatic Programme Controller, a Bridgeport CNC milling machine (series I), 24 units centre lathes, a hydraulic profile milling machine, a Jig Boring Machine, TIG and MIG arc welding machines, a Universal Testing Machine, Ultra sonic flow detector, Strain Gauge equipment, 2 double stage air compressors, a Hydraulic dynamometer, Power

hydraulic equipment and a Steam Plant. The Polytechnic also houses a Foundry which has two oil-fired furnaces, a cupola and metallurgical equipment where students perform experiments in various foundry techniques.

AUTOMOTIVE AND DIESEL

The course has been designed to give the students a sound and basic knowledge in the principles of Automotive and Diesel Engineering at the same time provide them with adequate mechanical engineering knowhow to enable them to assume a useful and responsible role either in an Automotive establishment or a mechanical engineering concern.

Specialised subjects include Internal Combustion Engines, Chassis Construction, Automotive Electrical Equipment and Power Hydraulics. The subject of Service Management provides the students with the basic need required to prepare them to be future garage supervisors and managers.

The Automotive and Diesel workshop contained the most up-to-date garage equipment which include such items as a Chassis Dynamometer, a Roller Brake Tester, Optic Wheel Alignment Tester, Electrical Equipment Testers, Petrol and Diesel engine test rigs, Battery Chargers and a Fuel Injection Test Bench. Small portable training models are used to illustrate the principle of operation of Automotive vehicle components.

AIR-CONDITIONING AND REFRIGERATION

Just like the Automotive and Diesel Engineering students, the Air-conditioning and Refrigeration students are given a very strong foundation in Mechanical Engineering in the first year while they study specialised subjects biased towards their speciality in the second year. Specialised subjects include Air-conditioning, Refrigeration, Control Systems, Systems Design and Architectural Drawing and Building Design.

The Air-conditioning and Refrigeration Workshop contains modern equipment such as a training model of a car air-conditioning system, a training model of a general refrigeration system, an ice-maker, a fault tracer trainer, window air-conditioning units, a central air-conditioning unit, a solar air-conditioning and refrigeration unit and a split air-conditioning unit. There is also an air handling duct where temperature and air flow can be adjusted and balanced.

CURRICULA

MECHANICAL ENGINEERING (GENERAL)

First Year	Second Year
English Language	Islamic Civilization
Islamic Education	Workshop Management
Mathematics	Materials Technology II
Engineering Science	Engineering Drawing II
Engineering Drawing	Mechanics of Machines
Materials Technology I	Heat & Fluid Technology II
Workshop Technology I	Strength of Materials
Heat & Fluid Technology I	Workshop Technology II
Electrical Technology	Plant Engineering Technology

MECHANICAL ENGINEERING (PRODUCTION)

First Year	Second Year
English Language	Islamic Civilization
Islamic Education	Workshop Management
Mathematics	Materials Technology II
Engineering Science	Engineering Drawing II
Engineering Drawing	Mechanics of Machines
Materials Technology I	Heat & Fluid Technology II
Workshop Technology I	Strength of Materials
Heat & Fluid Technology I	Workshop Technology II
Electrical Technology	Control Systems Technology

AUTOMOTIVE AND DIESEL

First Year	Second Year
English Language	Islamic Civilization
Islamic Education	Strength of Materials
Mathematics	Automotive Electrical Equipment
Engineering Science	Automotive Technology II
Engineering Drawing	Internal Combustion Engines
Automotive Technology I	Mechanics of Motor Vehicles
Workshop Technology I	Mobile Hydraulics
Heat & Fluid Technology I	Service Management
Electrical Technology	

AIR-CONDITIONING AND REFRIGERATION

First Year

English Language
Islamic Education
Mathematics
Engineering Science
Engineering Drawing
Air-conditioning and
Refrigeration I
Workshop Technology I
Heat & Fluid Technology I
Control Systems I

Second Year

Islamic Civilization
Strength of Materials
Workshop Management
Heat & Fluid Technology II
Air conditioning Systems
Design
Architectural Drawing and
Design
Control Systems II
Refrigeration II

MARINE ENGINEERING DEPARTMENT

The Marine Engineering Department offers only one course at Diploma level, i.e.

Marine Engineering.

The rapid development of Malaysia's own shipping line, MISC, has led to a great demand for technical personnel to man the ships and for this reason, the year 1972 saw the commencement of the first year of the Marine Engineering Courses.

This course has been set up with the assistance of the Japanese Government under the Colombo Plan. The Japanese Government is providing equipment to the value of \$1.3 million and five Advisers while the Malaysian Government provides the workshops, local teaching staff, additional equipment and operating costs.

Marine Engineering, which is closely related to Mechanical Engineering emphasises the operation and maintenance of the ship, marine power plants, associated equipment as well as ship construction and naval architecture.

The students who succeed in this course with sufficient credits and after obtaining sufficient sea-experience are exempted from Part A of Class I and Class II of the Certificate of Competency for Foreign-Going Ship Examinations conducted by the Malaysian Government. The students are required to sit for only certain papers of Part B.

The duration of this course is four years, the third year being spent on board ship.

CURRICULUM

First Year

English Language
Islamic Education
Mathematics
Engineering Science
Engineering Drawing
Workshop Technology I
Electrical Technology
Heat & Fluid Technology I
Marine Engineering Practice
Naval Architecture I

Second Year

Islamic Civilization
Strength of Materials
Mechanics of Machines
Steam Engineering
Auxiliary Engineering
Marine Control Systems
Technology
Marine Workshop Technology
Naval Architecture II
Electrical Technology
Internal Combustion
Engineering

Fourth Year

Mechanical Technology
Internal Combustion Engineering
Mathematics
Drawing and Design
Steam Engineering
Naval Architecture III
Marine Engineering Practice & Legislation
Marine Control Systems
Applied Electronics & Electrical Technology
Materials Technology
Auxiliary Engineering

COMMERCE DEPARTMENT

The Commerce Department offers the following courses:-

1. Accountancy
2. Business Studies.

ACCOUNTANCY

This course takes three years and three months and leads to the award of a Diploma. This period includes a six-month industrial attachment with private or public organisations and takes place during the period between the second and third year of study.

As Accounting is concerned with planning, controlling, recording, reporting and evaluating the financial affairs of an organisation, this course places great emphasis on specialised aspects of accounting including:-

Elements of Accounting; Cost Accounting; Financial Accounting; Management Accounting; Business Finance; Auditing and Investigations.

Equal emphasis is given to other subjects allied to commerce such as Economics, Statistics and Law (Company, Taxation, Commercial) so that a complete framework of the commercial sector is presented.

The organisations which have need for accounting services include Government Departments, public authorities, business organizations, accounting firms, clubs and unions. Accountancy is a new and dynamic profession, offering opportunities for personal development and services to the community.

BUSINESS STUDIES

The Business Studies course takes two years and three months, including a six-month industrial attachment between the first and second year of study. It is designed to provide students with a comprehensive basic knowledge of commerce. By studying basic subjects like Marketing, Accounting, Statistics, Economics, Elements of Management, Commercial Practice, Business Mathematics the students will be provided with a basic

knowledge of commerce to venture into their own business. For those who wish to be employees in business organizations, the course should make them more readily adaptable to the branch of business activity within which they are placed and thus reducing the period of training to the advantage of their employers.

In addition, all students doing this course, are required in the final year to submit a written project concerning a business topic relevant to Malaysia, of not less than three thousand words.

This course is of the sandwich type, where students spend their first year in the Polytechnic in attending lectures, then do practical training for twenty four weeks in firms and Government or statutory agencies, followed by another nine months of academic studies.

CURRICULA

ACCOUNTANCY

First Year

English Language
Islamic Education
Accounting I - Paper A
Accounting I - Paper B
Commercial Law
Applied Statistics
Economics
Management Mathematics

Second Year

English Language
Accounting II - Paper A
Accounting II - Paper B
Cost Accounting
Auditing
Company Law
Business Administration
Data Processing

Third Year

Islamic Civilization
Accounting III - Paper A
Accounting III - Paper B
Management Accounting - Paper A
Management Accounting - Paper B
Auditing and Investigation
Business Finance
Malaysian Taxation

BUSINESS STUDIES

First Year

English Language
Islamic Education
Accounting I
Statistics I
Marketing I
Economics I
Office Management
Commercial Practice

Second Year

Islamic Civilization
Accounting II
Statistics II
Economics II
Business Management
Marketing II
Business Mathematics
& Costing
Business Law
Project

POLITEKNIK UNGKU OMAR, IPOH

CALENDAR FOR ACADEMIC YEAR 1984/85 AND 1985/86

Tarikh	No. of weeks	Year 1 (All courses, intake 1984) Year 2 (Accountancy, intake 1983)	Year 2 (All courses, intake 1983) Year 3 (Accountancy, intake 1982)
2. 7.84- 7. 9.84	10	First Term	Undergoing industrial training
8. 9.84-23. 9.84	2	Term holidays	from 8.7.84 until 15.12.84.
24. 9.84-30.11.84	10	Second Term	Report to PUO on 7.1.85 as
1.12.84- 1. 1.85	4	Term holidays	Second/Third Year students
2. 1.85- 8. 3.85	10	Third Term	First Term
9. 3.85-24. 3.85	2	Term holidays	Term holidays
25. 3.85-31. 5.85	10	Fourth Term	Second Term
			1.6.85- Term holidays
Undergoing Industrial Training from 1.7.85 until 15.12.85	30.6.85		(4 weeks)
Report to PUO on 6.1.86 as Second/Third Year students	1.7.85-		Third (Final) Term
	6.9.85		(10 weeks)
MARINE ENGINEERING COURSE			
3rd Year students (intake 1982) undergoing training on board ship from Oct 84 till Oct 85			
4th Year students (intake 1981) to study in Polytechnic from March 85 till November 85			
Tarikh	No. of weeks	Year 1 (All courses, intake 1985) Year 2 (Accountancy, intake 1984)	Year 2 (All courses, intake 1984) Year 3 (Accountancy, intake 1983)
1. 7.85- 6. 9.85	10	First Term	Undergoing industrial training
7. 9.85-22. 9.85	2	Term holidays	from 1.7.85 until 15.12.85.
23. 9.85-29.11.85	10	Second Term	Report to PUO on 6.1.86 as
30.11.85- 1. 1.86	4	Term holidays	Second/Third Year students
2. 1.86- 7. 3.86	10	Third Term	First Term
8. 3.86-23. 3.86	2	Term holidays	Term holidays
24. 3.86-30. 5.86	10	Fourth Term	Second Term
			31.5.86- Term holidays
Undergoing Industrial Training from 1.7.86 until 15.12.86	29.6.86		(4 weeks)
Report to PUO on 5.1.87 as Second/Third Year students	30.6.86-		Third (Final) Term
	5.9.86		(10 weeks)
MARINE ENGINEERING COURSE			
3rd Year students (intake 1983) undergoing training on board ship from Oct 85 till Oct 86			
4th Year students (intake 1982) to study in Polytechnic from January to September 1986			

POLITEKNIK UNGKU OMAR, IPOH

COURSE STRUCTURE

For the academic year 1985/86, the following courses are offered:-

Department	Courses	Level	Code	Period of study
Civil Engineering Department	Civil Engineering (Construction)	Certificate	AP	27 mth
	Civil Engineering (Highways & Waterworks)	Certificate	AK	27 mth
	Architecture	Certificate	SB	27 mth
	Land Survey	Certificate	UT	27 mth
Electrical Engineering Department	Electrical Engineering (Power)	Certificate	EK	27 mth
	Electronic Engineering (Comm.)	Certificate	EP	27 mth
	Industrial Instrumentation & Controls	Certificate	JK	27 mth
	Computer Technology	Certificate	TK	27 mth
Mechanical Engineering Department	Mechanical Engineering (General)	Certificate	JA	27 mth
	Mechanical Engineering (Production)	Certificate	JP	27 mth
	Automotive & Diesel Engineering	Certificate	AD	27 mth
	Air-conditioning & Refrigeration	Certificate	PU	27 mth
Marine Engineering Department	Marine Engineering	Diploma	DP	48 mth
Commerce Department	Accountancy	Diploma	DA	39 mth
	Business Studies	Certificate	PP	27 mth

The structure for the various courses are as follows:-

Period	All certificate courses	Accountancy	Marine Engineering
July 1985 - June 1986	12 mth First Year	First Year	First Year
July 1986 - Dec. 1986	6 mth Training	-	Training
July 1986 - June 1987	12 mth -	Second Year	-
Jan. 1987 - Sept 1987	9 mth Final Year	-	Second Year
July 1987 - Dec. 1987	6 mth	Training	-
Oct. 1987 - Sept. 1988	12 mth	-	Sea Training
Jan. 1988 - Sept 1988	9 mth	Final Year	-
Jan. 1989 - Sept 1989	9 mth		Final Year

(資料 1 2)

POLYTECHNICS

IN

MALAYSIA

HANDBOOK

Technical & Vocational
Education Division.
Ministry of Education
Malaysia.

Introduction

There is a pressing need for well educated and trained technicians who have followed courses reaching at least the post secondary school level. It is the technician who makes the link between research and management on the one hand and production and the shop floor on the other.

To meet the acute shortage of trained technician, the Ministry of Education of Malaysia have established 5 Polytechnics namely:

- Politeknik Ungku Omar, Ipoh, Perak. (estab. 1969)
- Politeknik Sultan Haji Ahmad Shah, Kuantan Pahang (1976)
- Politeknik Batu Pahat, Johor (estab. 1983)
- Politeknik Alor Setar, Kedah (estab. 1984)
- Politeknik Kota Bharu, Kelantan (estab. 1985)

Two more Polytechnics are being planned at Port Dickson, Negeri Sembilan and Kucing, Sarawak.

At the Polytechnics, every endeavour has been made to provide the students with as much practical training and laboratory work as possible and this is sufficiently balanced by lectures. In general, a technician student spend 60% of his time in the workshops and laboratories and 40% in the lecture rooms.

In addition to the practical-biasèd content of the courses, the Polytechnic students serve a six-month industrial training immediately after successful completion of the first year course. Those training places are obtained in government and the private sector all over country. The objective of this training period is to enable each student to experience actual working conditions and to appreciate the productive application of engineering and management knowledge in industry. At the end of the industrial training period, each student is required to prepare a report of what he has done and this is taken into account when his overall performance is considered at the end of the final year.

Courses of Study

The course of study being offered at present are:—

Civil Engineering:

- Construction
- Public Works and Hydraulics
- Architecture
- Land Surveying

Electrical Engineering:

- Power
- Electronics and Communication
- Industrial Instrumentation and Control
- Computer Technology

Mechanical Engineering

- General
- Production
- Automotive and Diesel
- Air-Conditioning and Refrigeration

Marine Engineering

In addition to 1 year and 9 months course, Marine students do 12 months sea training, 6 months shipyard training and 9 months speciality training at the Polytechnic.

Commerce:

- Accountancy – 3¼ year Diploma Course
- Business Studies
- Secretarial Science
- Book-Keeping

Process Technology

- Food Processing

More courses will be introduced when the new polytechnics are fully operational.

All certificate courses are of two years and three months certificate level except the Marine Engineering and the Accountancy which are at Diploma level. Upon successful completion of the First Year Course for the majority of the courses, students will undergo industrial training for a period of 25 weeks. Every effort is made to seek industrial training places from private industrial and government organisations capable of providing a comprehensive and high standard of practical training. The Polytechnic also expects a high standard of student performance whilst undergoing the training. In the teaching programmes in the Polytech itself equal emphasis is given to theory and practice – students spend about 50% of the course time in laboratory work and the relevant workshop practice. Every aspect of course work is taken into consideration for final assessment in each year of the course.

Entry Qualifications

A candidate must have sat one of the following examinations:

Sijil Pelajaran Malaysia (or equivalent)
or Malaysian Vocational Certificate of Education

A candidate for Dip. Accountancy and Certificate courses must obtain the following minimum qualification.

pass in Bahasa Malaysia
credit in Mathematics
pass in any physical science subject, General Science, or other relevant technical subject

or

pass in Bahasa Malaysia
pass in Mathematics
credit in any Physical Science subject, General Science, or other relevant technical subject.
(for Dip. Accountancy SPM Grade I & II only).

For Food Processing Technology

pass in Bahasa Malaysia
credit in Chemistry/related vocational subject.
pass in any of these subjects: physics, biology, additional mathematics or Science.

Candidates must be prepared to appear for our interview set out by the Polytechnic prior to an offer for admission.

Fees

All fees are payable in advance.

Tuition Fee

\$300/- per academic year or \$100/- per term payable by all students on registration.

Security Deposit

\$50/- payable by all students on receipt of a formal acceptance from the polytechnic.

Term Times

The Academic year starts in July and ends in June the following year. The year is divided into 4 terms as follows:

- First Term: July – September
- Second Term: October – December
- Third Term: January – March
- Fourth Term: April – June

Times of Study: Lectures are held from 7.30 am – 4.15 pm – Monday – Friday, Lunch break is from 12.20 pm – 1.30 pm except on Friday when it is 12 noon – 2.30 pm.

Academic Calender

First Term	10 weeks
Mid Term Break	2 "
First Term	10 "
Terminal Holidays	4 "
Second Term	10 "
Mid-Term Break	2 "
Second Term	10 "
Terminal Holidays	4 "
Industrial Training	24 "

Training Programmes for Technical courses include:

Laboratory Work: All laboratory work is obligatory, students are divided into various groups to carry out experiments are divided into various groups to carry out experiments. Students in a group are expected to cooperate among themselves and to write out individual or group reports about the experiments carried out. Lecturers will mark these reports and the total marks will be included for final assessment of student performance.

Workshop Practice; Practical experience in the workshop is vital to all the technical courses of study. Experienced instructors are assigned for each course of study to train students in the practical aspects of their subjects. Practical tests are part of every Terminal Examination, and students are expected to pass their practicals before being considered to have passed their final Exam.

Assignments: In addition to lectures, students are given assignments in the various subjects to be done by themselves outside lecture hours. The standard of work put into the completion of these assignments will help in the final assessment of the students.

Industrial Visit: All first and second year students are taken for Industrial visits to various industrial organisations to familiarise themselves with the sort of industrial environment they may have to work in later on.

Industrial Training: This is an integral part of all the courses offered in the Polytechnic. The objectives of this Industrial Training are to provide the students with practical experience in their respective courses of study and with insights into their eventual careers as well as to improve their opportunities for employment upon graduation. Students who have passed their First Year Examination are placed in some suitable industrial organisation for six months of on-the-job training, before proceeding to the second year of study. The staff of the various departments make arrangements with suitable organisations for the emplacement of the student trainees. A full report containing all relevant details about their Industrial Training should be written up by the students concerned. Where it is felt that the practical training has not been satisfactory, students may be asked to repeat their Industrial Training after they have finished their second year of study.

A booklet with full information about all aspects of the Industrial Training Programme will be issued to the students before they commence their training.

Examinations:

Terminal Examinations: These are held at the end of the first three terms, in September, November and March. Marks for the three terminal examinations will be added to the final examination marks in the final assessment of student performance. Students are advised to follow their daily work regularly to prepare for these examinations.

Final Examination: First year final exam will normally be held in the final week of May or early June. Students must pass this examination before being allowed to go for Practical Industrial Training and on to the second year of study students who fail in 3 technical subjects are allowed to take a supplementary exam held in July of that year. Student who fail in more than 3 of the technical subjects have to repeat the First year or leave the Polytechnic. The decision in this matter rests with the Examination Board of the Polytechnic.

Second year students set for their final examination in September. The rules governing their success are similar to the first years. The supplementary examination for second year students is held in October.

Scholarships/Bursaries

A number of scholarships and bursaries are awarded to students in need of financial assistance. Although the majority of invitations to apply are announced at the Polytechnic at the commencement of each new session, some awarding Bodies do advertise in the local press inviting application for scholarships prior to registration at the Polytechnic.

Job Employment

Students, after completion of their studies, are expected to find their own employment, Polytechnic offer help by channelling notices of employment opportunities from firms to the suitable students/graduates. Polytechnic also provides facilities for firms wishing to interview graduating students.

Among the posts held by Engineering Certificate holders in the various government departments are technician, radio officers, assistant project supervisors, instructors, plan drafters, works supervisors and assistant quantity surveying officers. For graduates in the Commercial Studies courses, among the posts are Accounts clerks, Account examiners, stenographer, book-keepers and others.

JICA