ヴィエトナム社会主義共和国
電力技術者養成プロジェクト
事前調査団報告書

1999年12月

国 際 協 力 事 業 団

序　　文

ヴィエトナム社会主義共和国では、主要開発目標であるインフラ整備の改善・更新の一環として電力基盤の整備に取り組んでいます。同国政府は、エネルギーの安定供給を図るべく、発電能力の強化、電力設備の整備を、日本政府を含め他国、国際機関の協力を得て進めています。

同国の電力供給、電源開発を所管しているヴィエトナム電力公社（EVN：Electricity of Vietnam）では、電力技術者の養成を行っていますが、急増する新型設備の運転及び、既存設備の維持管理の指導体制としては、指導方法及び訓練設備ともに十分ではありません。

このような状況から、同国政府は、電力技術者養成のための訓練技術の向上を目的とするプロジェクト方式技術協力を我が国政府に要請しました。

同要請について、我が国は、1999年4月に派遣した基礎調査の中で、ヴィエトナムの要請内容の確認及びプロジェクト方式技術協力の可能性等について基本的な調査を実施しました。その結果、EVNにおいて、訓練学校の組織拡充を目的とした人材育成計画を、1999年6月を目途に策定中であることが判明しました。EVNの人材育成計画が9月末に提出されたのを受け、要請内容を再確認し、実施体制、プロジェクトサイト地、協力分野等についてヴィエトナム側関係者と協議することを目的として、1999年11月17日から11月27日まで事前調査団を派遣しました。

本報告書は、同調査団の調査結果を取りまとめたものです。

ここに本調査団の派遣に関し、ご協力をいただいた日本・ヴィエトナム両国の関係各位に対し、深甚の謝意を表すとともに、あわせて今後のご支援をお願いする次第です。

1999年12月

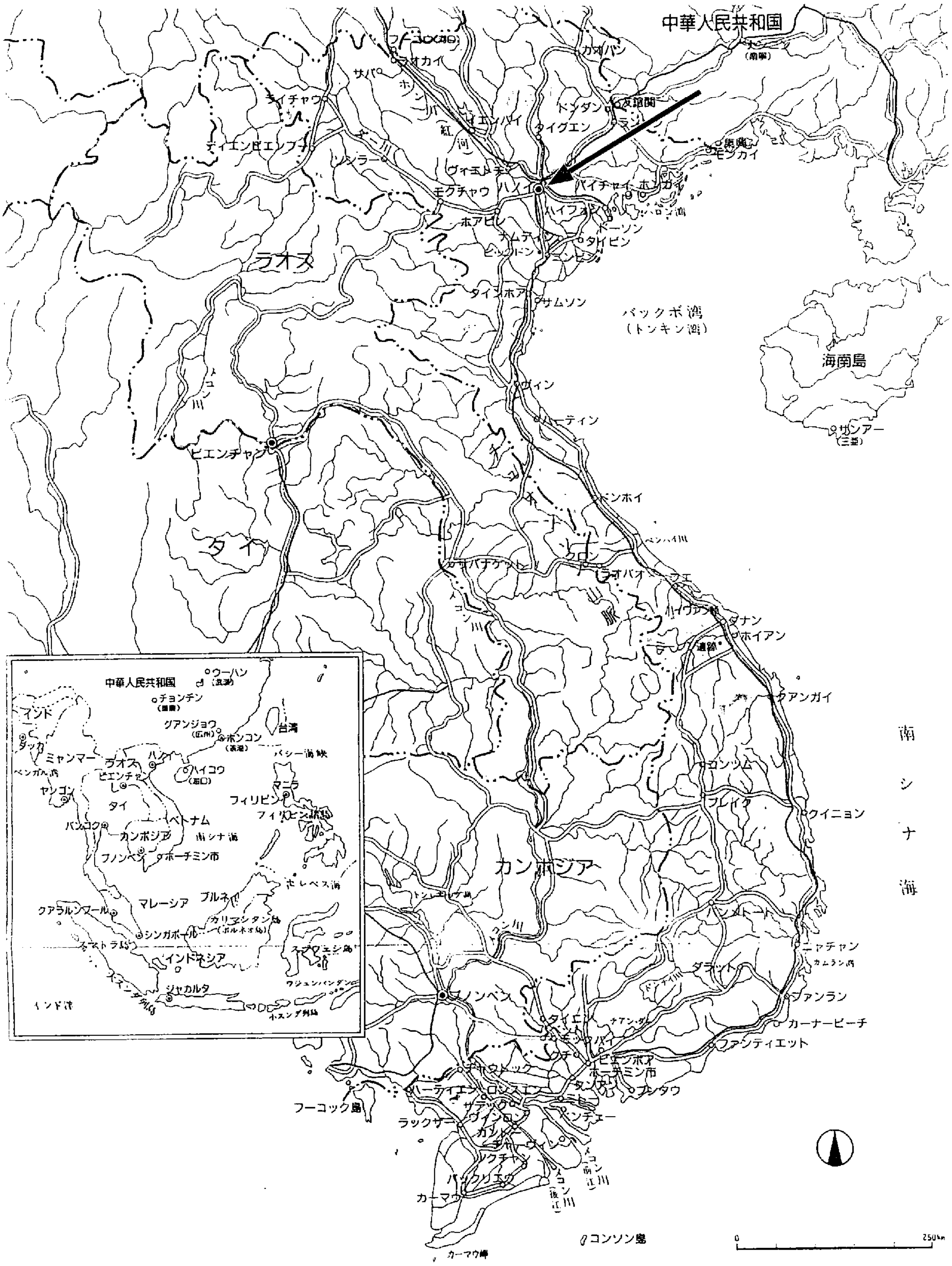
国際協力事業団
理事　大津　幸男

ミニッツ署名

In Service Training School

In Service Training School ワークショップ

プロジェクト位置図



中華人民共和国
ラオス
タイ
カンボジア
バックボ湾
(トンキン湾)
海南島
南シナ海
ハノイ
ハイフォン
ビエンチャン
プノンペン
ホーチミン市
ダナン
フエ
フーコック島
コンソン島

目　　次

序文
写真
プロジェクト位置図

1. 事前調査団の派遣 …… 1
　１－１　調査団派遣の経緯と目的 …… 1
　１－２　調査団の構成 …… 1
　１－３　調査日程 …… 2
　１－４　主要面談者 …… 3

2. 調査結果要約 …… 5

3. 調査・協議結果 …… 8

4. 技術移転分野の現状と課題 …… 22
　４－１　電気技術者のトレーニングの現状 …… 22
　４－２　技術分野の現状 …… 24
　４－３　協力の必要性 …… 24
　４－４　EVN 人材育成計画 …… 25

5. 団長所感 …… 27

付属資料
　資料１　協議議事録（Minutes of Discussions；M／D） …… 31
　資料２　人材育成計画 …… 49
　資料３　各学校統合後の EVN 組織図 …… 133
　資料４　In Service Training School パンフレット …… 134
　資料５　削減予定の世銀機材リスト …… 141

1. 事前調査団の派遣

1－1　調査団派遣の経緯と目的

ヴィエトナムにおいては経済成長のためのインフラ整備事業は重要であるが、特に電力基盤の整備は急務の一環であり、そのため同国の電力供給、電源開発を所管しているヴィエトナム電力公社（Electricity of Vietnam ；EVN）は、電力の安定供給を図るべく送電設備の増強、発電所の建設等を日本政府を含め他国、国際機関の協力を得て進めている。

また、同国では増加する電力設備に対応するため、電力技術者の養成を行っており、急増する新型設備の運転及び、既存設備の維持管理に対応できる技術者を養成することが求められている。しかしながら指導体制としては、指導方法及び訓練設備の充実が必要とされている。

このような状況から、ヴィエトナムは電力技術者養成のための訓練技術の移転を目的とするプロジェクト方式技術協力を要請した。

同要請について、我が国は、1999 年 4 月に派遣した基礎調査の中で、ヴィエトナム国の要請内容の確認及びプロジェクト方式技術協力の可能性等について基本的な調査を実施した。その結果、電力公社（EVN）の訓練学校の組織拡充を目的とした人材育成計画が 1999 年 6 月を目途に策定中であることが判明した。

EVN の人材育成計画が 9 月末に提出されたのを受け、要請内容を再確認し、実施体制、協力分野等について協議することを目的として、今般、事前調査団を派遣した。

1－2　調査団の構成

氏　　名	担当分野	所　　属
四　釜　嘉　総	団長・総括	国際協力事業団　鉱工業開発協力部　鉱工業開発協力第二課　課長
土　屋　　仁	技術移転計画	通商産業省資源エネルギー庁　公益事業部 電力技術課 開発振興室　課長補佐
佐　藤　　聡	電力技術	社団法人　海外電力調査会　電力国際協力センター　協力部　次長
今　村　栄　夫	研修計画	社団法人　海外電力調査会　電力国際協力センター　業務部　主任
高　木　邦　夫	協力企画	国際協力事業団　鉱工業開発協力部　鉱工業開発協力第二課　職員
赤　松　志　保	要請背景分析	国際協力事業団　鉱工業開発協力部　鉱工業開発協力第二課　職員

1－3　調査日程

	月日	調査日程			宿泊地
1	11月17日（水）	移動　成田(NH909 9:50)→香港（CX791 13:55/14:55）→ →ハノイ（15:55）			ハノイ
2	11月18日（木）	09:00　日本大使館表敬 10:00　JICA 事務所 15:30　工業省表敬			ハノイ
3	11月19日（金）	09:00　計画投資省表敬 10:30　世界銀行との協議 14:00　ヴィエトナム電力公社(EVN)表敬及び協議			ハノイ
4	11月20日（土）	ハノイ近郊電力設備視察			ハノイ
5	11月21日（日）	帰国研修員（集団コース）面談			ハノイ
6	11月22日（月）	09:00　EVN との協議 16:00　アジア開発銀行との協議			ハノイ
7	11月23日（火）	07:30　プロジェクトサイト視察 Secondary Electrical Vocational School No.1 In Service Training School			ハノイ
8	11月24日（水）	EVN との協議	技術移転計画 帰国	現地調査 Pha Lai 火力発電所	ハノイ
9	11月25日（木）	EVN との協議	現地調査　Hoa Binh 水力発電所		ハノイ
10	11月26日（金）	10:00　ミニッツ署名 14:00　日本大使館報告 15:30　JICA 事務所報告			ハノイ
11	11月27日（土）	移動　ハノイ（CX790 11:00）→ →香港（NH910 13:45/15:30）→成田（20:15）			－

1－4　主要面談者

〈ヴィエトナム側〉

(1) Ministry of Planning and Investment

Mr. Nguyen Quang Dung	Director, Industrial Department
Mr. Pham Kim Son	Senior Expert, Industrial Department
Mr. Nguyen Xuan Tien	Senior Expert, Foreign Economic Relations Department

(2) Ministry of Industry

Dr. Tran Minh Huan	General Director International Cooperation Department
Mr. Le Hoi	Personal and Training Expert

(3) Electricity of Vietnam

Mr. Dang Hung	Vice President
Mr. Tran Quoc Anh	Vice President
Mr. Nguyen Huu Duyen	Deputy Director, International Cooperation Department
Mr. Le Quang Khue	Director, Personnel and Training Department
Mr. Dinh Van Toan	Senior Expert, Personnel and Training Department
Mr. Trinh Duy Minh	Expert Personnel and Training Department
Mr. Cao Dat Khoa	Expert
Mr. Masayuki ITO	JICA Expert, Institute of Energy

(4) In Service Training School

Mr. Nguyen Quang Vinh	Director
Mr. Dang Tran Phong	Manager, Planning Division
Mr. Do Huu Hai	Expert
Mr. To Quy Vinh	

(5) Secondary Electrical Vocational School No.1

Mr. Nguyen Van Hieu	Vice Director
Mr. Dang Van Duong	

〈日本側〉

(1) JICA ヴィエトナム事務所

Mr. Takanori JIBIKI	Resident Representative
Mr. Takashi HATAKEYAMA	Deputy Resident Representative
Mr. Yuichi SUGANO	Assistant Resident Representative
Mr. Kozo WATANABE	Assistant Resident Representative

(2) 日本国大使館

Mr. Takeshi YASURAOKA	Second Secretary

〈国際機関〉

(1) 世界銀行 (International Bank for Reconstruction Development ; World Bank)

Dr. Anil K. Malhotra	Reginal Energy Advisor
Mr. Van Tien Hung	Operations Officer

(2) アジア開発銀行 (Asian Development Bank)

Mr. Thein Swe	Deputy Head
	Viet Nam Resident Mission

2. 調査結果要約

標記事前調査団は、1999 年 11 月 18 日から現地調査を開始し、ヴィエトナム側関係機関との協議及びサイト候補地調査を終了し、プロジェクト方式技術協力を実施するうえで、基本的事項に合意したため、26 日、調査団団長・四釜嘉総とヴィエトナム側電力公社（EVN） 副総裁・Mr. Dang Hung との間で協議議事録（Minutes of Discussions； M ／ D）を署名交換し、27 日に帰国した。

調査結果及び M ／ D 概要は以下のとおり。

(1) プロジェクトの名称

和文：電力技術者養成プロジェクト

英文：Instructor Training for Electric Power Sector in Viet Nam

(2) プロジェクトの実施機関

所管官庁：工業省

Ministry of Industry

実施機関：ヴィエトナム電力公社

Electricity of Vietnam； EVN

合同調整委員会に計画投資省、工業省の代表を含めることを確認した。

(3) プロジェクトの責任者

総括責任者：EVN の総裁

President of EVN

実施責任者：職員訓練センター所長

Director of In Service Training School

(4) 協力期間

協力期間は、5 年間とすることを確認した。

(5) 協力場所

In Service Training School

Address：Hoang Quoc Viet Street, Tu Liem, Hanoi, Viet Nam

Tel：84 - 4 - 8362065

(6) プロジェクトの協力分野

協力分野は以下の優先順位による5分野とすることを確認した。

火力発電運転保守

配電設備運転保守

変電設備運転保守

水力発電運転保守

送電設備運転保守

火力発電に関して、コンバインドサイクル発電を含めるようにヴィエトナム側から要請があった。

(7) プロジェクトの目標、成果

1) 上位目標

ヴィエトナムの電力設備が効率的に運転保守される。

2) プロジェクト目標

In Service Training Schoolが持続的に火力、配電、変電、水力、送電の運転保守技術指導者を養成できるようになる。

3) 成果

0　プロジェクト実施体制が確立される。

1　資機材が整備・維持管理される。

2　インストラクターを養成できるC／Pが養成される。

3　カリキュラムが作成される。

4　訓練教材が用意される。

5　C／Pによって研修が実施される。

(8) 日本側のとるべき処置

1) 長期専門家、短期専門家

1. チーフアドバイザー
2. 業務調整員
3. 火力発電運転保守
4. 配電設備運転保守
5. 変電設備運転保守
6. 水力発電運転保守
7. 送電設備運転保守

2）研修員受入

年間2名程度とすることを確認した。

3）供与機材

長期派遣される専門家が、世銀から導入される機材（2000年6月～8月に設置予定）を確認し、その利用度を生かした形でのカリキュラム編成を踏まえ、協力分野の講師育成のための訓練機材をヴィエトナム側要請機材の中から選別することとする。

(9) ヴィエトナム側のとるべき処置

1）ローカルコスト

プロジェクト運営に必要な予算の措置を要請した。

2）C／Pの配置

In Service Training School もしくは統合される Secondary Electrical Vocational School No.1から、大学卒で、教育経験を有する教師をC／Pとして配置し、さらにプロジェクト開始にあわせて、事前に英語研修を行うことも説明があった。またC／P同士で競争意識を高めるため、専門家1人に対し、2人以上のC／Pを配置したいとヴィエトナム側から説明があった。

3）日本側専門家の執務及び供与機材の設置スペースの確保

In Service Training School を現場調査し、日本側専門家の執務スペース及び供与機材の設置スペースの確保を確認した。

4）必要機材の購入と維持管理費の確保をヴィエトナム側に要請した。

3. 調査・協議結果

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
1. 要請の背景 (1) 国家計画等における対象セクターの位置づけ 1) 各計画の概要	現行の開発計画は、1996 年 6 月に第 8 回党大会にて発表された、1996～2000 年の社会経済開発計画 5 か年計画である。この中で、持続的かつ効率的な経済成長をめざす諸策のガイドラインの中に、開発のボトルネックとなっているインフラ整備・改善を優先課題としている。	・左記について、現状を確認する。	
2) 上位計画における当該セクターの位置づけ	年計画の中に1996 年から2000 年、さらに 2010 年までの目標設定をしている。2010 年までの鉱工業・エネルギー分野の成長率を 14%から 15%として、2000 年までに GDP の 30%を占め、2010 年までには 40% としている。また 2010 年までの優先分野として提示された 5 項目のうち、電力開発を基礎産業の基盤としている。また第 8 回党大会にて国民生活向上のために 2000 年までに 100%のコミューン、80%の村落、60%の村を電化する計画を掲げている。	・1999 年末に EVN から政府に提出される第 5 次マスタープラン(2001 年から 2010 年)概要について確認する。 ・電力センターの国家計画の位置づけについて再確認する。	・電力分野への年間投資額は10 億ドルで、重要分野である旨、工業省国際局長から説明があった。 ・第 5 次マスタープランは現在策定中で、概要は現時点ではまだ明らかにできない旨、EVN より説明があった。
3) プロジェクト実施後の想定される状況	電力需給の将来計画については、1994 年に実施された JICA のマスタープランに、最近の経済情勢を考慮して修正を加え、2020 年までを目標に策定中であるが、現時点においては、基準値として 2010 年における最大電力を 1 万 2,700MW、必要発生電力を 7 万 5,800GWh としている。これに対応するための供給力として準備中の主たるものは以下のとおり。		

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
(2) セクターの現状と課題 1) 現状	・水力 中部 ヤリ 720MW (2000 年運開予定) 北部 ソンラ 2,400MW-3,600MW (2010 年) ダイティ 300MW 南部 ハムトアン - ダミ 475MW (2001 年) ダイニン 300MW (2003 年) ドンナイ 500MW ・火力 南部 フーミー増設 3,350MW (ガスと複合型含む) オモン 600MW (重油またはガス) 北部 ファライ 2 600MW (石炭) 要請書によると EVN の傘下には、現在 13 の発電所があり、他に小規模の発電施設がいくつかある。 発電実績 総発電容量は 5,140MW で、発電設備の 55.2%は水力発電である。1997 年の発電電力量は前年比 18%の伸びを示した。 需要想定 過去数年間毎年の成長率は 13-14 %となっている。 開発計画 需要の増加に対応するために容量ベースで毎年 600MW の電源増強が必要である。基礎調査時にエネルギー研究所 (IE) のヒエン所長より入手した最近の電力事情は下記のとおり。	・左記について、現状を確認するとともに、最新の統計資料等を入手する。	・2000 年 1 月を目処に電力最新事情を取りまとめ中で、完成次第提出すると EVN から説明があった。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
	・1998 年　最大需要 3,875MW （1997 年度の最大値 3,582MW に対し、年率 13.1%の伸び率） ・1998 年　年間発生電力量 2 万1,654GWh ・1998 年　供給力　5,167MW		
	（人材育成計画概要） 現在各電力会社に属している 6 つの学校を EVN の直轄とし、4 つに統合することにより各学校を拡大・充実させる。 ハノイ近郊では In Service Training School に SecondaryElectrical Vocational School No. 1 を統合する。2003 年にカレッジ（Electricity of Vietnam'sCollege）に昇格し、高度専門技術者の養成、EVN 幹部の再教育を行う。	・工業省での承認状況について確認する。 ・人材育成計画のタイムスケジュールを確認する。	・工業省国際局長より、正式に EVN に通達していないが、工業省では承認された旨、説明があった。また工業省として全面的に EVN の人材育成計画を支援する旨説明があった。 ・工業省での正式な承認がおり次第、各訓練学校は EVN の直轄となる旨説明があった。直轄になった段階での、EVN の組織図は付属資料のとおり
	人材育成計画の中に述べられている訓練学校の問題 ・EVN 直轄ではなく、各電力会社に所属しているため、体系的な指導がでない。 ・資金が分散し、効果的な長期計画が立てられない。 ・教師の数が少ない。 ・教師用のトレーニングも行われていないため最新技術に対応できない。 ・設備、機材は十分でなく、古い。	・どのような知識、技能のためのインストラクターを養成する必要があるのか確認する a　電力会社業務に必要な特有の知識・技術 b　電気・電力に関する学術的な専門知識（日本の大学レベル） c　電気・電力に関する学術的な基礎知識（日本の高専レベル） ・本プロジェクトは、あくまでも電力分野での技術協力でカレッジ昇格へのアカデミックな支援を目的としないことを確認する。	・電力事業に必要とされる実用的技術を教えるためのインストラクターの養成をヴィエトナム側も望んでいる旨説明があった。 ・左記を確認した。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
		・ヴィエトナムの教育制度について確認する。（専門学校、訓練学校、カレッジの定義、レベル）	・カレッジがインストラクター養成、職員の再教育、職業訓練等様々な教育レベルのコースを併設することが、ヴィエトナムでは可能な旨、説明があった。
		・インストラクターを養成するのは、どの学校になるのかを確認する。	・インストラクター養成に適した学校はInService Training Schoolであることをヴィエトナム側に説明し、ヴィエトナム側も同意した。
2）課題	・工業基盤のインフラ整備のために、電力設備の増強が行われている。既設発電所の運転保守要員についても、技術者の高齢化による交代が近い将来必要とされている。これに従い、電力設備を維持管理する技術者の確保が急務となっている。 ・電力訓練学校の人的・設備的な増強が必要とされている。	・左記について、現状を確認する。	・設備増強されている火力発電、配電について、特に技術指導が必要な旨、説明があった。
2. プロジェクト内容			
（1）プロジェクト名称	要請書によると （和）電力技術者養成プロジェクト （英）Power Technology Instructor Training 基礎調査M／Dには （和）電力セクターにおける講師訓練計画に関する技術協力 （英） Project on Instructor Training for the Electric Power Sector	・プロジェクトサイトの学校の名称を含め、協力対象を限定したプロジェクト名に変更するよう要請する。	・プロジェクト名は現状のまま （和）電力技術者養成プロジェクト （英） Project on Instructor Training forthe Electric Power Sectorとすることで合意した。
（2）関係機関			
1）援助窓口機関	計画投資省 （MPI：Ministry of Planning and Investment）	・左記を確認する。	・左記を確認し、M／Dに記載した。
2）主幹省庁	工業省 （Ministry of Industry）	・左記を確認する。	・左記を確認し、M／Dに記載した。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
(3) 実施機関	ヴィエトナム電力公社 (EVN：Electricity of Vietnam)	・左記を確認する。	・左記を確認し、M／Dに記載した。
(4) ターゲットグループ	要請書、基礎調査M／Dには In Service Traiing Schoolのインストラクターと記載されている。 ＊人材育成計画にはインストラクター訓練をどこで行うか明記されていない。	・人材育成計画について協議しターゲットグループを確認する。	・In Service Trainingで研修を受けるインストラクター
(5) ターゲットエリア	ヴィエトナム北部 (Power Company 1管轄地域) プロジェクトサイトのIn Service Trainign Schoolがヴィエトナム全土の電力分野インストラクター要請地点となる場合、ターゲットエリアはヴィエトナム全土となる。	・ターゲットエリアを確認する。	・ターゲットエリアはヴィエトナム全土とすることを確認した。
(6) 上位目標	ヴィエトナムの電力設備が効率的に運転保守される。		・左記を提案し、合意を得たのでM／Dに記載した。
(7) プロジェクト目標	In Service Training School（プロジェクトサイト）が持続的に火力発電、配電、変電、水力発電送電の運転・保守技術指導者を養成できるようになる。		・左記を提案し、合意を得たのでM／Dに記載した。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
(8) 技術移転項目	要請書では以下の 4 分野 ・配電設備保守管理 ・送変電設備保守 ・変電設備運転保守 ・火力発電所運転保守 基礎調査 M ／ D ではさらに以下の分野 ・水力発電所運転保守 ・エネルギー経済学一般 ・電気制御と自動化 ・電気計測と試験 ・電気機器学 ・企業における電気技術 (さらに EVN 経営改善のため) ・市場調査と需要家サービス ・企業会計と財務 ・人事管理	・要請のあったすべての分野で協力できるわけではないことを説明する。要請書に明記されている 4 分野に加え、基礎調査時に要請のあった水力発電を加えて下記の分野での協力を検討する。ヴィエトナム側の優先順位を確認し、日本側が協力可能な分野を現地調査して確認する。 ・送電保守 ・変電運転保守 ・配電運転保守 ・火力発電所運転保守 ・水力発電所運転保守 ・上記以外の項目については、必要性をヴィエトナム側に確認し、電力分野の技術面の実務レベルの協力を目的としているので、長期専門家の協力項目に含めない旨説明する。 ・電気制御と自動化 ・電気計測と試験 ・電気機器学 については上記主要協力項目で対応可能な旨説明する。	・下記の 5 分野とすることで合意を得て、M ／ D に記載した。ヴィエトナム側から優先順位について説明あり、下記のとおり M ／ D に記載した。 1 火力発電運転保守 2 配電設備運転保守 3 変電設備運転保守 4 水力発電運転保守 5 送電設備運転保守 ・火力発電に関して、コンバインドサイクル発電を含めるようにヴィエトナム側から要請があった。同分野で来年度に個別専門家の派遣が決まっている旨、説明したが、エンジニアへの指導とは別に、インストラクター養成の観点から今回のプロジェクトの技術移転項目に含めてほしいとの要請があった。短期調査で詳細について調査する旨 M ／ D に記載した。
(9) 成果		0 プロジェクト実施体制が確立される 1 資機材が整備・維持管理される 2 インストラクターを養成できる C ／ P が養成される 3 カリキュラムが作成される 4 訓練教材が用意される 5 C ／ P によって研修が実施される	・左記を提案し、合意を得たので M ／ D に記載した。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
(10) 活動			・カリキュラム作成を進めながら、今後協議する。
(11) プロジェクト実施期間	ヴィエトナム側より協力期間は5年間との説明があった。	・左記を確認する。	・左記を確認し、M／Dに記載した。
(12) プロジェクトサイト	要請書によると Secondary Vocational Technical Training Center (Secondary Electrical Vocational School No.1)	・技術協力を円滑に行うために、実施機関があるハノイ市の中心部に近い職員訓練センターでプロジェクトを実施するよう要請する。	・In Service Training School とすることで合意し、M／Dに記載した。またプロジェクトサイト近郊地図を入手し、M／Dに添付した。ANNEX 3
	基礎調査時には、協力の成果を普及する観点、及びプロジェクト実施を円滑に行うために、実施機関があるハノイの近郊に位置する訓練学校を選定するよう説明し、ハノイ市に設置する旨、M／Dに記載した。またハノイ市中心部に近いIn ServiceTraining Schoolをプロジェクトサイトとしたい旨、口頭で説明した。	・世銀の機材が設置されるのも職員訓練センターであることからもプロジェクトサイトを職員訓練センターとするよう説明する。 ・各学校の統合後、開講される予定のコースについて確認する。	・オーストラリアのコンサルタント会社よりカリキュラム一覧を入手しているが、あくまでもサンプルであり、開講コースは現時点では未定との説明があった。
		・人材育成計画の中でのInService School の位置づけ、役割について確認する。	・ヴィエトナム側もInService Training School を全国の訓練学校の中核と位置づけている旨説明があった。
(13) 投入 1) プロジェクトに必要となる機材 a) 機材の構成 b) 維持管理体制 c) 機材コスト d) 運転費用 e) 維持管理費用		・プロジェクトに必要となる機材についてリストを入手する。	・カリキュラムの骨子が決まった後に必要機材について協議する。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
f）既存機材	基礎調査の報告によると ・In Service Training School 機器類は全くなく、教室機能だけで運営されている。2000 年 6 月に世銀ローンにより研修機材設置予定。 ・Secondary Electrical Vocational School No.1 1966 年開校当時からの機器で、中国製が多く、古い。コンピュータ類とオシログラフのみ比較的新しい。電力基礎の教育には使えるが、新しい技術修得には不適当。	・世銀ローンで 2000 年 6 月に設置予定の機材について調査する。 ・既存機材リストを入手する。	・世銀から導入される機材がヴィエトナム側の予算の関係で 15%-20%ほど削減される旨説明があった。リストは付属資料のとおり。
2）日本側投入			
a）専門家派遣			
a 長期専門家人数・分野 b 短期専門家人数・分野 c コスト（公算積算）	要請書には 1 チーフアドバイザー　1 名 2 業務調整員　1 名 3 変電運転技術　1 名 4 変電保守技術　1 名 5 送電保守技術　1 名 6 配電保守技術　1 名 7 火力発電技術　若干名	・ヴィエトナム側の優先順位を確認し協議する。 チーフアドバイザー 1 名 業務調整員　1 名 送電保守技術 変電運転保守技術 配電運転保守技術 火力発電技術 水力発電技術	・ヴィエトナム側の技術専門家の優先順位は下記のとおり。 1　チーフアドバイザー 1 名 2　業務調整員　1 名 3　火力発電運転保守 1 名 4　配電設備運転保守 1 名 5　変電設備運転保守 1 名 6　水力発電運転保守 1 名 7　送電設備運転保守 1 名 ・C／P 配置準備の都合上、優先順位にあわせ、段階を踏んで、専門家を派遣してほしい旨要請があった。
b）研修員受入			
a 研修員人数・分野 b コスト（公算積算）	要請書には 年間 2 名	・左記を確認する。	・左記を確認し、M／D に記載した。ヴィエトナム側から、研修員受入人数の増加の要請があった。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
c）供与機材 a 機材内容 b コ ス ト（公算積算）	要請書によると、 a）現業技術のトレーニングに必要なモデル b）計測器を要請しているが、詳細および総額は不明。	・技術移転に必要と考えられる機材について調査しリストを入手する。	・世銀から導入される機材との重複を避けるため、長期派遣される専門家が、機材内容を確認し、利用度を生かしたカリキュラム編成を踏まえ、ヴィエトナム側要請機材の中から選別する。
3）ヴィエトナム側投入 a）施設・土地等	In Service Training School 26 教室、9 実験室、講堂 ワークショップ、寄宿舎建設中 Secondary Electrical Vocational School No.1 10 教室、11 実験室、2 修理工場、寄宿舎	・工事等が必要かどうかについて確認する。 ・プロジェクトサイト建屋見取図を入手する。	・プロジェクトサイト建屋見取図を入手し、M／D に添付した。ANNEX 4
b）人員の配置	・C／P は、各訓練センターの指導者とする旨、基礎調査M／D に記載されている。	・C／P を入手しM／D に添付する。各C／P の経歴や学歴を確認する。	・In Service Training Shcool もしくは統合予定の Secondary Electrical Vocational School No.1 より大学卒で、7-10 年の教育経験を有するC／P を選出する旨説明があった。 ・ふさわしい人材がいない場合は EVN もしくは子会社のエンジニアから選出する旨説明があった。 ・C／P 同士で競争意識を高めるため、専門家 1 人に対し、2 人以上のC／P を配置したいという意見が出た。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
c）予算	・人材育成計画によると各学校を統合し、EVN が直轄することにより長期的な計画を立て、学校運営への投資額の増加を図る旨、明記されているが、プロジェクトに対する予算は不明。	・EVN が人材育成のために用意できる予算について確認する。（特に PC1 直轄学校の統合について）	・予算の明示はなかったが、技術協力協定に基づき、ヴィエトナム側が責任をもって予算確保をする旨、説明がありＭ／Ｄに記載した。
	・政府からの新入生用の奨学金等の多くが中部、南部の学校に使われている。 ・EVN 紹介パンフレットによると電力料金を低料金におさえる必要があり、財源は厳しい。	・EVN が全額負担するのか、職員訓練センター、また現在職員訓練センターを直轄している電力会社（PowerCompany 1）が部分的に負担することもあるのか確認する。	
（14）プロジェクトの自立発展性 1）財務			
2）組織			
3）技術			
3. プロジェクト実施体制 （1）プロジェクト実施機関 1）設立の経緯	EVN は、工業省傘下の電力事業を行うために設立された、国家が 100％出資している公社である。また、ヴィエトナム国内の電力需要に対する電力供給、電源開発を目的とする事業を行なっている。	・最新の EVN パンフレットがあれば入手する。	・1998 年のパンフレットが最新との説明があった。
2）活動内容	同国の電力技術者の養成は、6 か所ある EVN の電力訓練センターで行われている。	・各学校のパンフレットを入手する。	・In Service Training School のパンフレットを入手した。
	トレーニングコース 1　火力発電（OJT）： タービン、発電機及び ボイラー運転・保守	・既存コースのカリキュラム、テキストを入手する。	・In Service Training School で現在開講中のコースは、財務、コンピュータ等に限られており、外部の講師によって授業が行われているため、カリキュラム等は存在しないと説明があった。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
	2　送変電： 変電機器運転・保守 設備補修 計測、保護制御 3　電力保安基礎 技術者養成実績 Secondary Electrical Vocational School No.1 1975年以来累積 中級技術者　1万1,000名 技術者　335名 管理者　290名 Training School for Electrical Technique 熟練作業員（第3級） 750～800名／年 In Serivice Training Schol EVN職員の再教育 20～300名／年		
3）組織体制		・最新のEVN組織図を入手する。	・最新のEVN組織図を入手し、M／Dに添付した。ANNEX1
4）予算 ａ）予算の流れ ｂ）予算・執行実績	要請書によると予算状況は以下のとおり。 ・各電力訓練センターは独立会計となっており、各配電会社からの授業料で運営されている。 ・第二訓練センターの予算は以下のとおり 1997年　6億1,500万VND （約615万円） 1998年　9億1,400万VND （約914万円）	・左記を確認するとともに、プロジェクトサイトとなる訓練センターについての最新のデータを入手する。	・In Service Training Schoolの年間予算は職員の給料として10億ドン。各コース開講費は、ENVもしくはコース受講者が属する会社から支払われる旨説明があった。
5）人員配置			
6）プロジェクトの実施経験	なし 基礎調査時にプロジェクト方式技術協力のスキームについて説明を行った。	・プロ技について再度説明する。	・プロ技について説明を行った。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
(2) プロジェクト 実施体制		・プロジェクト実施体制組織図を入手しＭ／Ｄに添付する。	・プロジェクト実施体制組織図を入手しＭ／Ｄに添付した。ANNEX2
(3) プロジェクトダイレクター	総括責任者（Project Director）：EVN 総裁	・左記を確認する。	・左記を確認し、Ｍ／Ｄに記載した。
(4) プロジェクトマネージャー	実施責任者（Project Manager）：Director of a Training School in Hanoi City ＊人材育成計画で組織統合が進んだ場合、実施責任者はどうなるか。	・２校の統合が進む間、また統合後の実施責任者について確認する。	・In Service Training School の所長を実施責任者とする旨説明があり、Ｍ／Ｄに記載した。
(5) 合同調整委員会	日本・ヴィエトナム合同調整委員会が設置され、年１回開催される旨、基礎調査Ｍ／Ｄに記載した。	・左記を確認する。	・左記を確認し、Ｍ／Ｄに記載した。
(6) プロジェクト管理 1) PCM 2) モニタリング 3) 終了時評価	プロジェクト方式技術協力のスキームについて説明を行うとともに、PCM 特に PDM 及び評価５項目を説明し基礎調査Ｍ／Ｄに記載した。	・再度説明する。	・再度説明し、PDM 評価５項目をＭ／Ｄに添付した。ANNEX 6
4. その他 (1) 過去の類似案件 1) 案件概要	ジョルダン電力訓練センタープロジェクト 1986-1991（現在アフターケア中）発電、送電、変電、配電の分野でテクニシャン養成コース、上級コースを開設。　カリキュラム、教材を作成し、教員となるべき人材を養成。		
2) 評価時の教訓	ジョルダン電力訓練センタープロジェクト ・コース開設にあわせて半年程前に専門家を派遣。 ・経済事情の悪化から学生数減少の問題はあったが、ジョルダン政府はプロジェクトに対し、積極的でアラブ地域の電力技術者養成のための中心拠点とするべく努力している。		

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
	・訓練センターの訓練用機材が最新のものでないので、就職後、発電所等の設備に対応できないという問題がある。		
(2) 他の協力とのかかわり 1) 日本の協力	・開発調査 全国電力開発計画調査 (1995.5) 有償資金協力 ・フーミー火力発電所建設 ・ファライ火力発電所建設 ・ハムトゥアン・ダーミー水力発電所		
2) 他国・機関の協力	・In Service Training School に世界銀行のローン（300 万ドル）で研修用機材を購入（2000 年 6 月）予定。	・左記について現状を確認する。	・2000 年 3 月ごろに購入メーカー等は決定の予定。機材運用の研修等は含まれないことを確認した。
	・世銀、アジア開発銀行は電力セクターに対し、送配電線網の改修、拡充を主に支援している。		・送配電網の改修、拡充についてはごく限られた機器の運用についてのみ研修を行っており、総合的な研修は行っていないことを確認した。
(3) R／D の説明		・R／D の項目について説明する。	・今回説明を行わなかった。
(4) 次の調査団の派遣時期		・プロジェクト協力の詳細を協議するために、短期調査を実施する旨説明する。	・2000 年 3 月ごろに短期調査を派遣する旨、説明した。
(5) 使用言語	・英語を原則とする旨説明した。 ・必要があれば、ヴィエトナム語通訳をヴィエトナム側が用意する旨説明した。これに対し、ヴィエトナム側からは、プロジェクト開始までに C／P 予定者に対し、英語研修を行う旨説明があった。	・左記を確認する。	・左記を確認し、M／D に記載した。 ・C／P予定者に対し、事前に英語研修を行う旨、再度説明があった。
(6) 専門家特権・免除	日本・ヴィエトナム間では技術協力協定が締結されている	・技術協力協定に基づく特権免除につきヴィエトナム側の了解を得て、その旨M／D に記載する。	・左記を確認し、M／D に記載した。

調査項目	基礎調査結果、現状及び問題点等	対処方針	協議結果
(7)専門家の生活環境		・今後調査する。	・(食品、生活用品) 割高ではあるが、日本製品の購入は可能。 (治安) 特に問題なし。 (教育) 生徒数60名ほどの日本人学校がある。

4. 技術移転分野の現状と課題

今回、プロジェクトの実施候補地として、EVN 所管の Secondary Electrical Vocational SchoolNo.1 と In Service Training School を視察調査した。

また、Pha Lai No.1 火力発電所、Hoa Bihn 水力発電所、および隣接する 500kV 変電所を視察し、ヴィエトナム側の電力設備の運用と保守の状況を把握した。

4－1 電気技術者のトレーニングの現状

(1) EVN における電気技術者のトレーニング

EVN 技術職員は大学を卒業したエンジニア、高校卒業後に訓練学校で教育を受けた中級技術者、そして熟練作業員（ワーカー）の 3 グループに区別される。いくつもの大学を卒業するという日本ではまれなケースもあるが、EVN の業務そのものについてのトレーニングはいずれのグループも OJT が中心であり、技術分野によって差があるものの日本の電力会社のようなしっかりとした体系の教育システムや教材はない。

(2) 訓練学校の現状

調査団は基礎調査報告を踏まえたうえで、電気技術者を養成するための訓練学校である Secondary Electrical Vocational School No.1 と In-service Training School を訪ね、現在行われている教育内容やそのレベルについて調査を行った。

1) Secondary Electrical Vocational School No.1

ハノイ北方約 40km に位置し、ハノイ中心から車で約 45 分で到着した。学校周辺は田畑が広がる農村である。

建物は 30 年以上が経過し、老朽化している。図書館には新しい本は全くなく、かなり古い旧ソ連の資料が多くあったが、使われている様子はない。実習設備は基礎調査報告のとおりかなり古く、電動機、電気回路、保護リレー、開閉器等 30 ～ 40 年前のものが申し訳程度にあるに過ぎず、これらを使って新技術の習得をすることはできないと思われる。実習は配属後の現場での OJT に頼っていると推定する。

毎年、選抜にて高卒 300 人程度（短大卒以上はいない）が入学する。教育期間は 2 年半（5 学期）であるが、2 年に短縮する検討をしている。教育の技術レベルとしては、ワーカーとエンジニアの間をめざしている。現在は電力システムコースのみが開講されており、内容は発電（火力、水力）、送電、配電を含んでいる。その知識レベルは、入手した基礎電気理論と電気機械のテキストから判断すると、日本における高等専門学校程度と思われる。テキスト

は、教師が作成したものを印刷し生徒に配布したものを基に授業が進められている。

卒業者の 70 ～ 80%は EVN の直轄企業に就職するが、ワーカーになる人もいるし、技術者になる人もいる。また、卒業者は "Secondary Technical Staff" と呼ばれ、政府が決めているワーカーレベル（1 から 7 まであり、数値が大きい方が高度である）は正式認定ではないが 2 相当である。

また、この学校では EVN 就職後の再教育を行うことが多い。その内容には、マネージメントのほか、Power Company No.1 の要求に基づき専門教育を実施することもある。その期間は要求により 2 週間から 3 か月間と幅がある。

学校の先生の条件としては、大卒であり、EVN における実務経験が必要である。現在の先生の経験年数は 7 年から数十年である。

2）In-service Training School

In service Training School は、ハノイ西部に位置し、中心部からは車で約 15 分ほどである。学校の周辺の街並みはハノイ中心部と同じくらい整備されており、面している大通りは車やバイクの行き来が非常に多い。

1993 年に完成した学校の建物は立派である。受電設備 800kVA であり、水道はハノイより供給されており、排水にはハノイ市内の排水システムを使っている。この建物は旧ソビエトの協力により設計し、89 年からヴィエトナムの費用により建設した。ヴィエトナム独自の設計により建設したのは、現在建設中の寮だけである。

教育機材は基礎調査報告のとおり全くなく、教室機能だけである。図書館はあるが本はなく、EVN から参考書などの教材がほしいとの要望があった。また、2000 年 6 月～ 8 月に世銀から導入予定の機材の使い方を教えてほしいとの要望もあった。

現在、同学校には 7 人の先生がいるが、行われている教育には定期的なものはなく、希望に応じて開設されるコースのみである。教育計画は年度ごとに作成し、予算は Power Company No.1 を通して EVN に申請し、教育コース終了後、生徒の属する機関と受講料を精算する。

今後のワーカーとエンジニアのカリキュラムとして、オーストラリアコンサルタント会社より提供されたモジュール案があるが、これをどのように取り扱うかは未定である。

3）両学校の統合について

EVN の人材育成計画の中で、教育機関の一本化、教師のレベル向上、学校施設の改善を目的として、Secondary Electrical Vocational School No.1 と In Service Training School の両校を統合する予定である。

統合後のカリキュラムについては、まだ決まっていない。

4－2　技術分野の現状

(1) Pha Lai　No.1 火力発電所 (110MW × 4 基)

1983 年から 1986 年に運転を開始した石炭火力発電所で、2B1T 方式、2 ユニットごとの BT 制御監視室と発電所全体の中央制御室で構成され、勤務形態は 5 直 3 交代 (週休 2 日制が導入されたため)、1 シフト 20 名程度の当直要員で編成されている。

総職員は 600 人であることから、保守担当者など 4 年ごとに行う総合修理 (定期点検) に合わせた要員を確保していると思われる。

現場での OJT は、配管・煙風道等の系統図集、運転マニュアル、事故対応マニュアルがあり、それによって教育がなされている。しかし、運転員は運転開始後職種の変更が伴っていないことから、経験豊富ではあるが、Pha Lai　No.2 の運転員への異動後の補充などで、新人が配属された場合に、効果的な教育方法を準備すべきではないかと思われる。

なお、設備の保守管理はほぼ行き届いているものの、部品の供給が乏しいようで、1 号機は空気予熱器及び節炭器の不具合により 80MW に負荷制限されている。

また、電気集塵器の性能が悪く、排煙中の煤塵の飛散ははなはだしい。

(2) Hoa　Bihn 水力発電所 (240MW × 8 基)

洪水対策、発電、灌漑、水上輸送の改善 (流量確保) を目的として、旧ソ連の援助で建設された多目的ダムで、発電量はヴィエトナム全発電量の 4 割を占めている。

また、この発電所でヴィエトナム全土の周波数調整 (50 ± .5Hz) を行っており、周波数変動を見ていても比較的安定している。制御系設備の更新の間隔は、12 ～ 13 年で実施するといっており、現在、2 ユニットが旧ソ連製から西欧製に更新されていた。更新は予防保全の観点から計画され、EVN の承認後 ODA によって実施されている。

発電機本体・水車など主要機器は、外観から判断して保守管理は行き届いている。

Hoa　Bihn 水力発電所の職員は、採用後小水力発電所で教育を受けた後、ここに配属される。なお、現在ロシア人技術者の駐在はない。

(3) 500kV 変電所

1994 年に完成した設備で、近代的な施設である。当直は 2 名で監視しており、デジタルの保護装置と簡単な SCADA も設置されていた。

4－3　協力の必要性

ヴィエトナムの電力施設は、旧ソ連など旧社会主義国による技術援助により開発・運用されてきたが、近年の電力需要の急激な増加に対応するため、発電設備を中心に新たな設備の導入が計

画されている。このため、旧設備と最新設備の技術的格差があまりにも大きく、現場職員及び新規採用する職員の実践教育に強い不安感を持っているのが現状である。また、教育資料なども、数十年前のロシア語の蔵書が多く、最新の英語のものは皆無といってよい。

したがって、教育計画を体系的につくり上げ、短期間に効果的に教育を実施する体制をつくり上げることを望んでいる。

300万ドルの世銀機材が導入されるIn Service Training SchoolにおいてEVN、その機材に加え、教育計画に合わせた機材を日本側から付加することによって、効果的に電力技術者が養成できると思われる。今回のプロジェクトにおいて、派遣される専門家とC／Pが、意思疎通を十分に図りながら、ヴィエトナム側に最適な教育計画を策定すべきである。

4－4 EVN人材育成計画

基礎調査時にEVNにおいて、1999年6月末を目処に人材育成計画を立案していることが判明した。遅れてではあるが、9月末にEVN内で承認された人材育成計画案がJICAに提出された。今回の調査時点では、工業省での正式の承認を待っている段階であった。

(1) 概要

EVNの訓練学校が抱えている数々の問題点について指摘している。まず、教員の問題として、数が少なく、質に差があること、教員へのトレーニングがなく、また最新技術用のトレーニングがないことなどがあげられている。また、設備的な問題として図書館、テキスト等の不足、実習用の設備が古く、十分でないことなどが記されている。これらの問題は、資金不足が主な原因であるが、EVNが各訓練学校を直轄していないため、資金が分散し、効果的な計画が立てられず、投資が十分でなかったことも大きな原因として指摘されている。

これに加えて、各訓練学校が独自に教育を行っているので、トレーニングプログラムが統一されていない、訓練学校間の情報・経験の交換の場がないなどの問題も生じていると指摘している。また各訓練学校は電力セクター全体に、卒業生を労働力として供給しているにもかかわらず、それらの学校はEVNの下のPower Companyが運営しており、電力事業を総括しているEVNが直接かかわっていないことが、様々な問題の原因とされている。

上述の問題の解決策として、EVNは各訓練学校をEVNの直轄とし、統合することを提案している。

北部の学校に関しては、Power Company 1に属する4つの学校をEVNの直轄とし、2校に統合する。具体的には、In-service Training School と Secondary Electrical Vocational School No.1 を統合し、Secondary Electrical Training School No.1とする。またTraining School for Electric-Mechanics と Power Equipment Manufacturing Company を統合し、名

称を Training School for Electrical Techniques とする。Secondary Electrical Training School No.1 は EVN の人材育成の中核的役割を果たし、将来、カレッジへ昇格される予定である。

(2) プロジェクトとの関連性

まず本プロジェクトの実施機関は EVN であり、運営管理の観点からも、プロジェクトサイトの In-service Training School が、EVN の直轄となることは、プロジェクト開始の前提条件である。In-service Training School が Power Company に所属した状態では、人事配置等も困難であると EVN 側からも説明があった。また In service Training School と Secondary Electrical Vocational School を統合することで、教員の数を増やし、本プロジェクトの C／P 候補も増えることになるとも説明があった。工業省で人材育成計画が正式に承認され次第、各訓練学校が EVN の直轄となり計画が進められる予定であり、早急に承認されることが望まれる。

プロジェクトサイトの決定が本調査団の重要協議事項の 1 つであった。人材育成計画の中で、In-service Training School は Secondary Electrical Vocational School No.1 と統合され、Secondary Electrical Training School No.1 と改称し、中核的役割を担うと掲げられていることからも、本プロジェクトのサイト地に適していることを確認し、In-service Training School をプロジェクトサイト地とすることで合意した。

一方、本プロジェクトは、プロジェクトサイト予定地である In-service Training School をカレッジに昇格するためのアカデミックな協力ではなく、電力事業に必要な実務を教えることのできるインストラクターを養成するための協力であることを確認した。カレッジ昇格へのスケジュールとは別個に、プロジェクトを実施することとなる。

プロジェクトサイト地の In-service Training School が各学校の中心的役割を果たしていくことからも、工業省での承認も含めて、これからの EVN 人材育成計画の進捗状況に細心の注意を払っていく必要がある。

5. 団長所感

(1) 技術協力の妥当性

ヴィエトナム国内の需要電力は1991年～1998年度実績で年平均12.2%で推移し2010年までの需要見込みでも11.5%～12.8%の高い伸び率を予測している。市場経済化により増大する需要に対応するため同じく2010年までに設備容量を3倍以上に拡充するとしている。現在6か所の訓練学校において年間2000名が訓練を受けているが新規に導入される設備機材への保守及び維持管理への職員訓練が大きな課題となっている。

特に電力を統括する電力公社（Electricity of Vietnam；EVN）は、その対応のため人材育成計画を作成し、訓練学校の再編成を含めた組織改革を行い、新たなる職員訓練を最重要課題として策定している。この計画遂行のためENVは世界銀行（World Bank）から900万ドル（3か所の訓練学校に各300万ドル）を借入し基礎的な訓練機材導入を進めている。しかしながら既存及び新規に導入する近代設備に対応する人材を早急に確保する観点から、特に日本独自の電力会社で行われている社員教育、人材育成のノウハウを本計画に盛り込むことを期待している。EVNの人材育成計画は、その機構改革も含め2000年から行うとしており、本プロジェクトを人材育成の柱と考えていることから、日本政府がプロジェクト方式技術協力によりヴィエトナムの電力技術者育成計画に協力する意義は深いものと思料される。

(2) 留意事項及び提言

本件を実施するうえで以下の3点に留意する必要がある。

その1として、EVNでの基礎教育機材として世界銀行から2000年に導入される教育機材を有効活用するため、本件プロジェクトにより長期に派遣される専門家が、それらの機材を確認し、その利用を生かした形でカリキュラム編成を考察し、重複を避けたうえ、講師育成のための訓練機材を選別することが望ましい。

その2として、本件の協力分野は火力発電、配電、変電、水力発電、送電の5分野が対象となるが、アカデミックな電力知識ではなく、電力事業に必要とされる実用的な技術の移転を目的とすべきである。

最後に、EVNは人材育成計画に基づき本件を実施してていく観点から、既存訓練所の統廃合を実施するなどの公式な手続きが整理された時点からの日本の協力が無駄がなく有効的であるとして、本プロジェクトの開始時期を2000年度第4四半期とすることを望んでいる。

付　属　資　料

資料１　協議議事録（Minutes of Discussions；M／D）

資料２　人材育成計画

資料３　各学校統合後の EVN 組織図

資料４　In Service Training School パンフレット

資料５　削減予定の世銀機材リスト

資料１　協議議事録（Minutes of Discussions；M／D）

MINUTES OF DISCUSSIONS
BETWEEN THE JAPANESE PRELIMINARY STUDY TEAM
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT
OF THE SOCIALIST REPUBLIC OF VIET NAM
ON THE JAPANESE TECHNICAL COOPERATION FOR THE PROJECT
ON INSTRUCTOR TRAINING FOR ELECTRIC POWER SECTER

The Japanese Preliminary Study Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Yoshifusa SHIKAMA, Director, Second Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA, visited the Socialist Republic of Viet Nam from November 18 to November 26, 1999 for the purpose of clarifying the background of the project proposal made by the authorities concerned of the Government of the Socialist Republic of Vietnam (hereinafter referred to as "the Vietnamese side"), discussing the concept and scope of the Japanese Project-Type Technical Cooperation for the Project on Instructor Training for Electric Power Sector in the Socialist Republic of Viet Nam (hereinafter referred to as "the Project").

During its stay in the Socialist Republic of Viet Nam, the Team exchanged views and had a series of discussions on the Project with the Vietnamese side.

As a result of the discussions, both sides reached common understandings concerning the matters referred to the documents attached hereto.

Hanoi, November 26, 1999

Mr. Yoshifusa SHIKAMA
Leader
Preliminary Study Team
Japan International Cooperation Agency
Japan

Mr. Dang Hung
Vice President
Electricity of Vietnam
The Socialist Republic of Viet Nam

Witnessed by

Dr. Tran Minh Huan
General Director
International Cooperation Department
Ministry of Industry
The Socialist Republic of Viet Nam

THE ATTACHED DOCUMENT

1. Name of the Project

The Project on Instructor Training for Electric Power Sector in the Socialist Republic of Viet Nam

2. Implementing Agency of the Project

Both sides confirmed that Electricity of Vietnam (hereinafter referred to as "EVN") should bear overall responsibility for the implementation of the Project under supervision of the Ministry of Industry

The organization chart of EVN is shown in ANNEX 1.

3. Administration of the Project

President of EVN, as the Project Director, will bear overall responsibility for the administration and management of the Project.

Director of In Service Training School in Hanoi City, as the Project Manager, will be responsible for the managerial and technical matters of the Project.

The provisional organization chart of the Project is shown in ANNEX 2.

4. Duration of the Project

Both sides confirmed that the duration of the technical cooperation for the Project by the Government of Japan would be five (5) years from the date agreed by both sides in the Record of Discussions (hereinafter referred to as "R/D") to be concluded between JICA and the Vietnamese side.

5. Site of the Project

The Project will be implemented in the In Service Training School

Address:	Hoang Quoc Viet Street Tu Liem Hanoi, Viet Nam
Tel:	84 - 4 - 8362065

The location map of the building is shown in ANNEX 3.

6. Provisional Objective of the Project

(1) Overall Goal

The electric power system in Viet Nam will be operated and maintained effectively.

(2) Project Purpose

In Service Training School will be able to train instructors sustainably for operation and maintenance of facilities of thermal power generation, distribution, transformation, hydropower generation and transmission.

7. Provisional Outputs

1. Administrative system of the instructor training is established.
2. Facilities and equipment are installed, operated and maintained appropriately.
3. Counterparts for training instructors are trained.
4. Curricula for training are prepared.
5. Teaching materials for training are prepared.
6. Courses for instructors are offered by counterparts.

8. Contents of Technology Transfer

Both sides agreed that the appropriate technology transfer to Vietnamese counterparts would be made for the following priority fields:

(1) Thermal power operation and maintenance
(2) Distribution operation and maintenance
(3) Transformation operation and maintenance
(4) Hydropower operation and maintenance
(5) Transmission operation and maintenance

Vietnamese side requested combined cycle for thermal power operation and maintenance. The team stated that it would be examined by the technical mission.

9. Measures to be taken by the Government of Japan

(1) Dispatch of Japanese Experts

(Long-term experts)

The following Japanese experts will be dispatched.

1) Chief Advisor

2) Coordinator

3) Thermal power operation and maintenance

4) Distribution operation and maintenance

5) Transformation operation and maintenance

6) Hydropower operation and maintenance

7) Transmission operation and maintenance

(Short-term experts)

Both sides agreed that short-term experts would be dispatched in the related field of technology transfer in accordance with necessity.

(2) Training of Vietnamese Counterpart Personnel in Japan

About two (2) Vietnamese counterpart personnel will be accepted for training in Japan each year.

(3) Provision of Machinery and Equipment

The Team explained and the Vietnamese side understood that the Japanese side would examine the list of machinery and equipment requested by the Vietnamese side after consulting with Japanese experts, and would provide machinery and equipment necessary for the Project on the above mentioned contents of technology transfer based on priority of the Vietnamese side within the possible budgetary appropriation for the Project.

10. Measures to be taken by the Government of the Socialist Republic of Viet Nam

(1) Budget Allocation

The Vietnamese side explained to the Team that the budget necessary for implementation of the Project would be secured with responsibility of the Vietnamese side under the Agreement on Technical Cooperation between the Government of Japan

and the Government of the Socialist Republic of Viet Nam, signed in October 1998.

(2) Buildings and Facilities for the Project

The buildings and facilities necessary for the implementation of the Project will be prepared and necessary renovation of the buildings and facilities for the Project will be completed by EVN.

The office for the Japanese experts with adequate equipment will be prepared before the start of the Project.

The tentative floor plan of the building is shown in ANNEX 4.

(3) Machinery, Equipment and Materials

The Vietnamese side will prepare machinery, equipment and materials necessary for the implementation of the Project other than those provided by the Government of Japan through JICA.

(4) Long-term Assignment of Full-time Counterpart

Project Manager and the appropriate number of full-time technical counterpart personnel will be assigned before the start of the Project.

Should the allocation of counterpart personnel be changed for either personal or administrative reasons, the Vietnamese side will immediately take necessary measures to supplementarily assign appropriate number of personnel as counterpart for the Project.

(5) Privileges, Exemptions and Benefits to the Japanese Experts

The Vietnamese side will grant in the Socialist Republic of Viet Nam privileges, exemptions and benefits to the Japanese experts and their families in conformity with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Socialist Republic of Viet Nam, signed in October 1998, also the Vietnamese Government will take necessary measures to assure the security of all the Japanese experts and the members of the Japanese study team.

11. The Joint Coordinating Committee of the Project

The joint coordinating committee, composed of members appointed by both sides,

will be established and held at least once a year for the following purposes:

1) reviewing the progress of the Project implementation as well as its achievement

2) approving the Annual Plan of Operations (APO) of the Project in line with the Plan of Operations (PO) and the Tentative Schedule of Implementation (TSI) in the framework of R/D

3) coordinating necessary actions to be taken by both sides

4) exchanging views on major issues arising from or in accordance with the technical cooperation program

Candidates for the members of the joint coordinating committee are as follows:

(1) Chairperson

President & CEO, EVN

(2) Committee Members

(Vietnamese side)

a. Representative(s), MPI

b. Representative(s), MOI

c. Representative(s), EVN

d. Other personnel concerned with the Project decided by the Viet Nam side, if necessary

(Japanese side)

a. Chief Advisor

b. Coordinator

c. Japanese Experts designated by the Chief Adviser

d. Representative(s) of the JICA office in the Socialist Republic of Viet Nam

e. Other personnel concerned to be decided and dispatched by JICA if necessary

Note:

Official(s) of the Embassy of Japan in the Socialist Republic of Viet Nam may attend the Committee as observer(s).

12. Schedule of the Project

Both sides agreed on the Tentative Schedule of Implementation (TSI) as shown in ANNEX 5.

13. Joint Evaluation of the Project

Both sides agreed that evaluation of the Project would be conducted jointly by both Governments through JICA and Vietnamese authorities concerned, approximately in the middle and during the last six(6) months of the cooperation term, in order to examine the level of achievement of the Project.

Furthermore, both sides agreed to use the methodology of evaluation, especially, the Five (5) Basic Evaluation Components as shown in ANNEX 6.

14. Others

(1) Both sides agreed that common language used in any activities of the Project is English. The Japanese side requested for allocating interpreters as occasion demands and the Vietnamese side agreed.

(2) The Japanese side explained the Project-Type Technical Cooperation and the Vietnamese side understood the scheme and system of the Project-Type Technical Cooperation.

(3) Both sides agreed that PCM (Project Cycle Management) will be used to formulate, monitor and evaluate the Project.

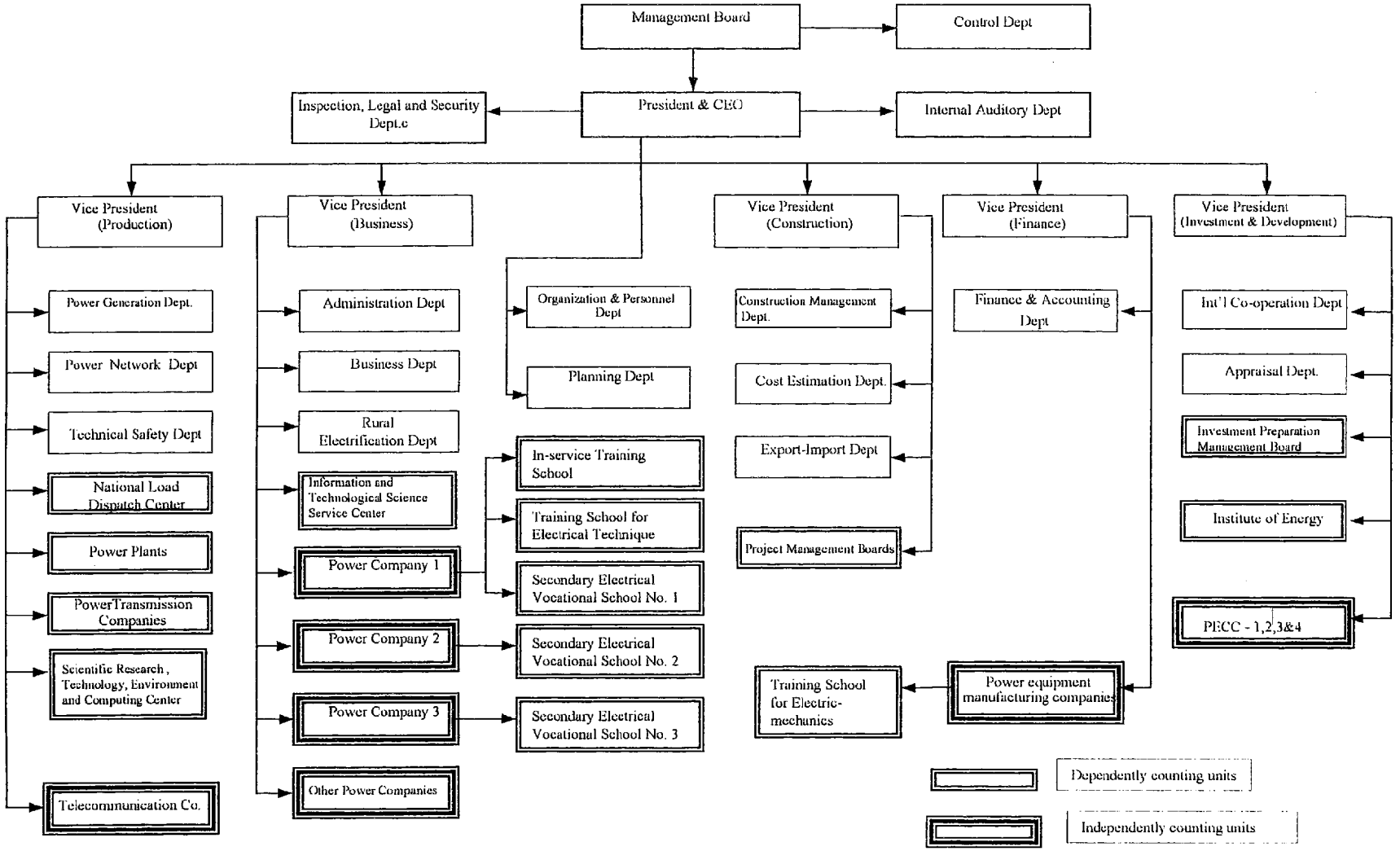
(4) List of attendance of the discussions is shown in ANNEX 7.

ANNEX LIST

ANNEX 1	Organization Chart of EVN
ANNEX 2	Provisional Organization Chart of the Project
ANNEX 3	Location Map of the site of the Project
ANNEX 4	Tentative Floor Plan of the Building
ANNEX 5	Tentative Schedule of Implementation (TSI)
ANNEX 6	Five Basic Evaluation Components
ANNEX 7	List of Attendance of the discussions

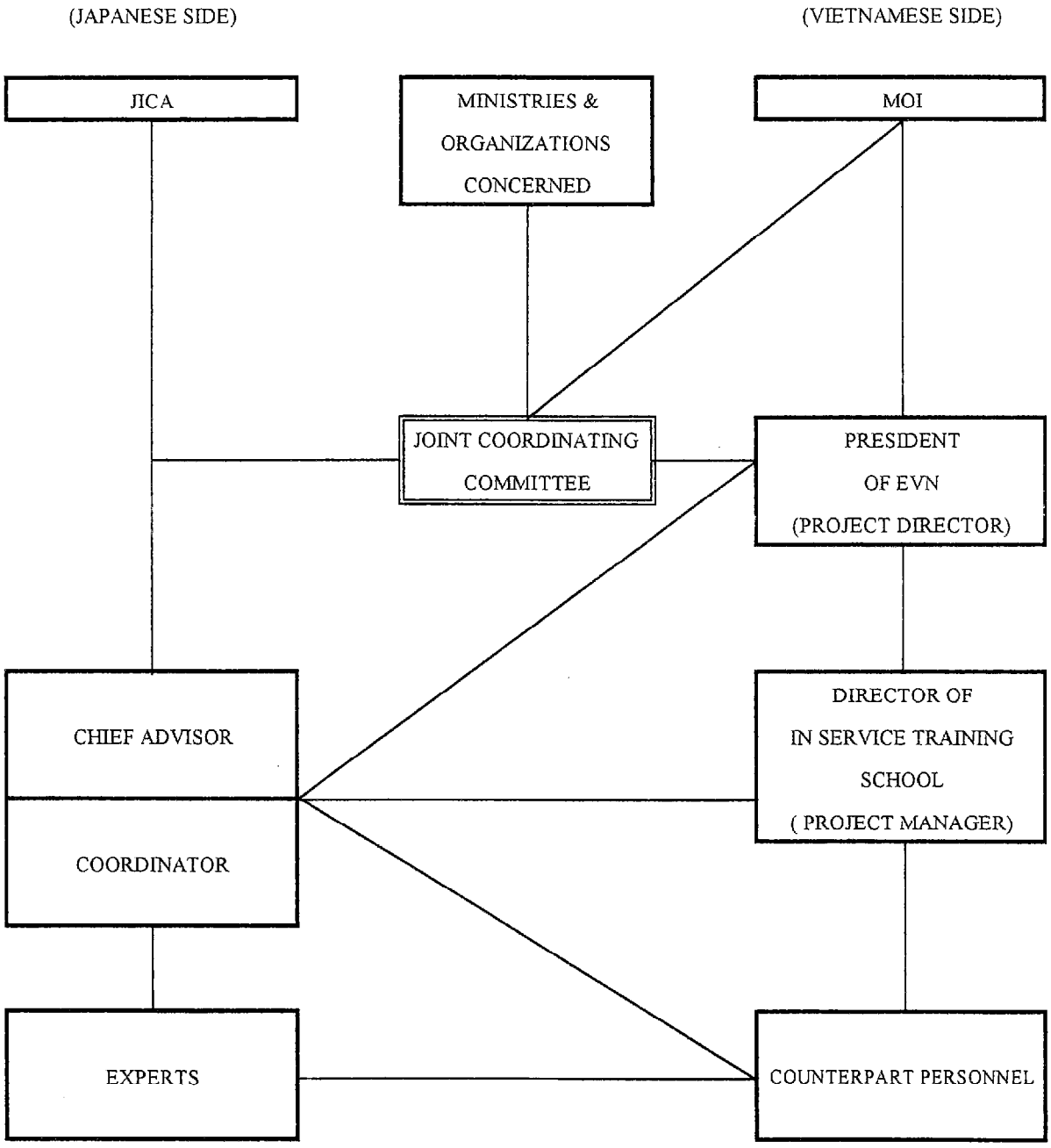
ANNEX 1

Organization Chart of EVN



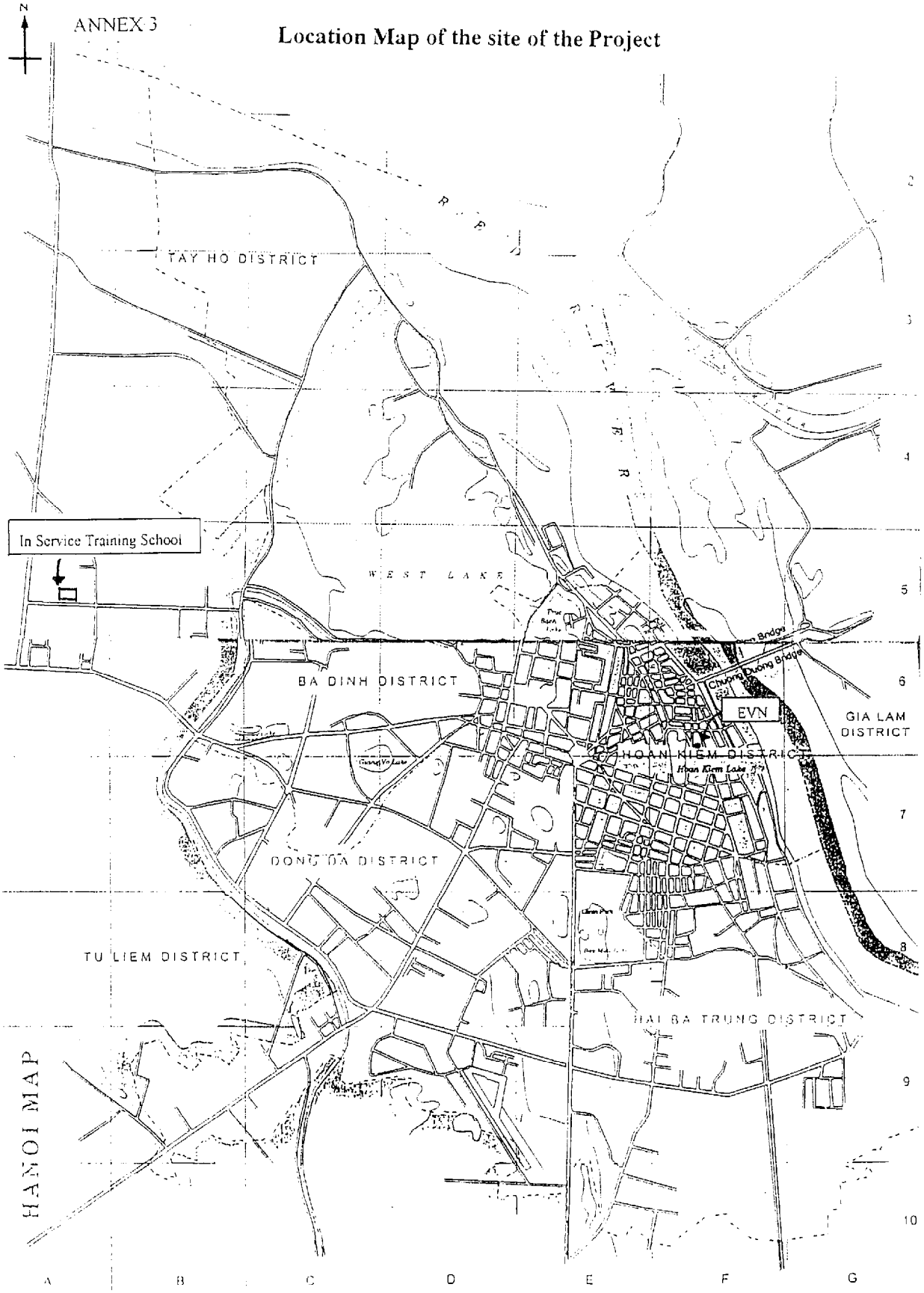
ANNEX 2

The Provisional Organization Chart of the Project



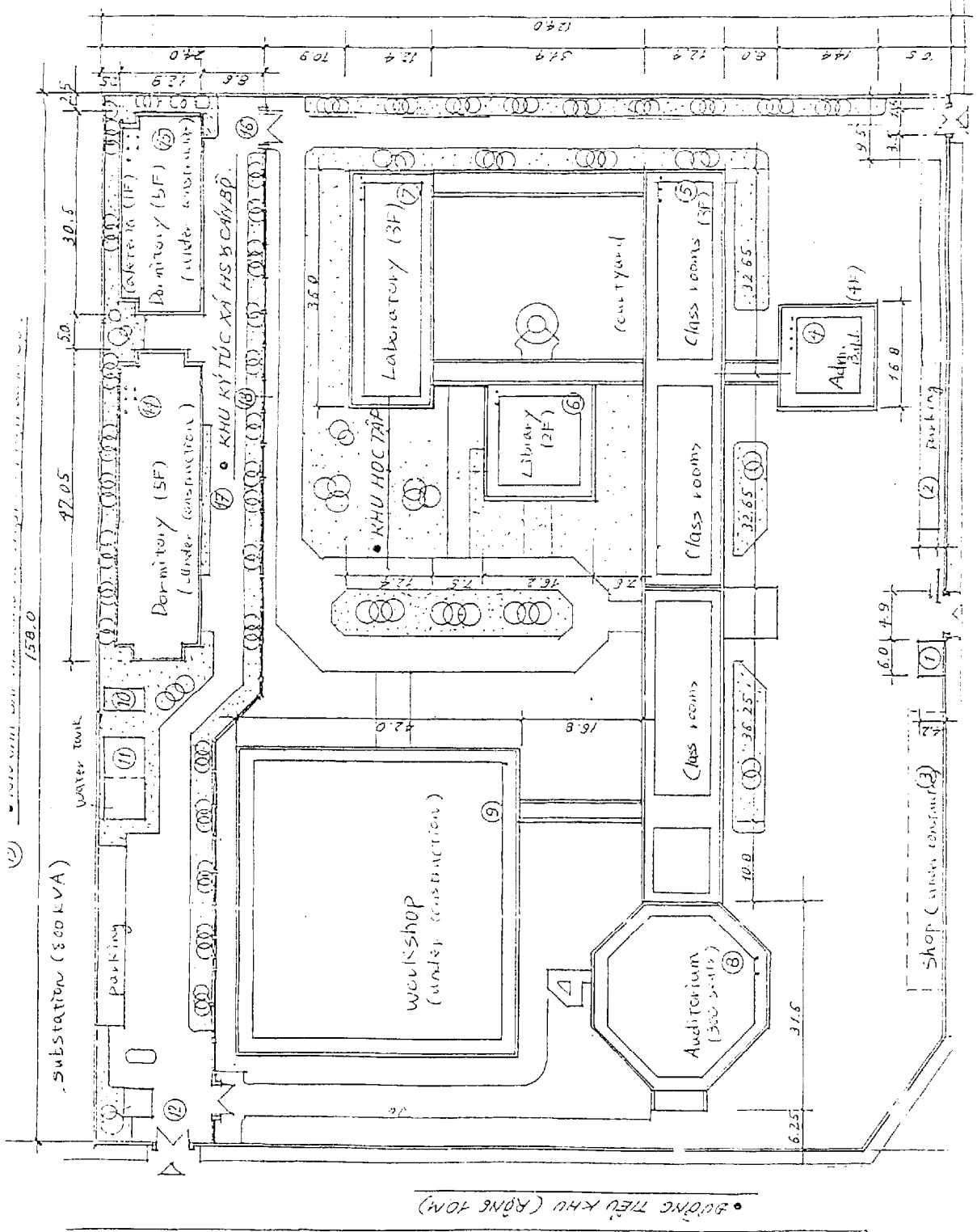
ANNEX 3

Location Map of the site of the Project



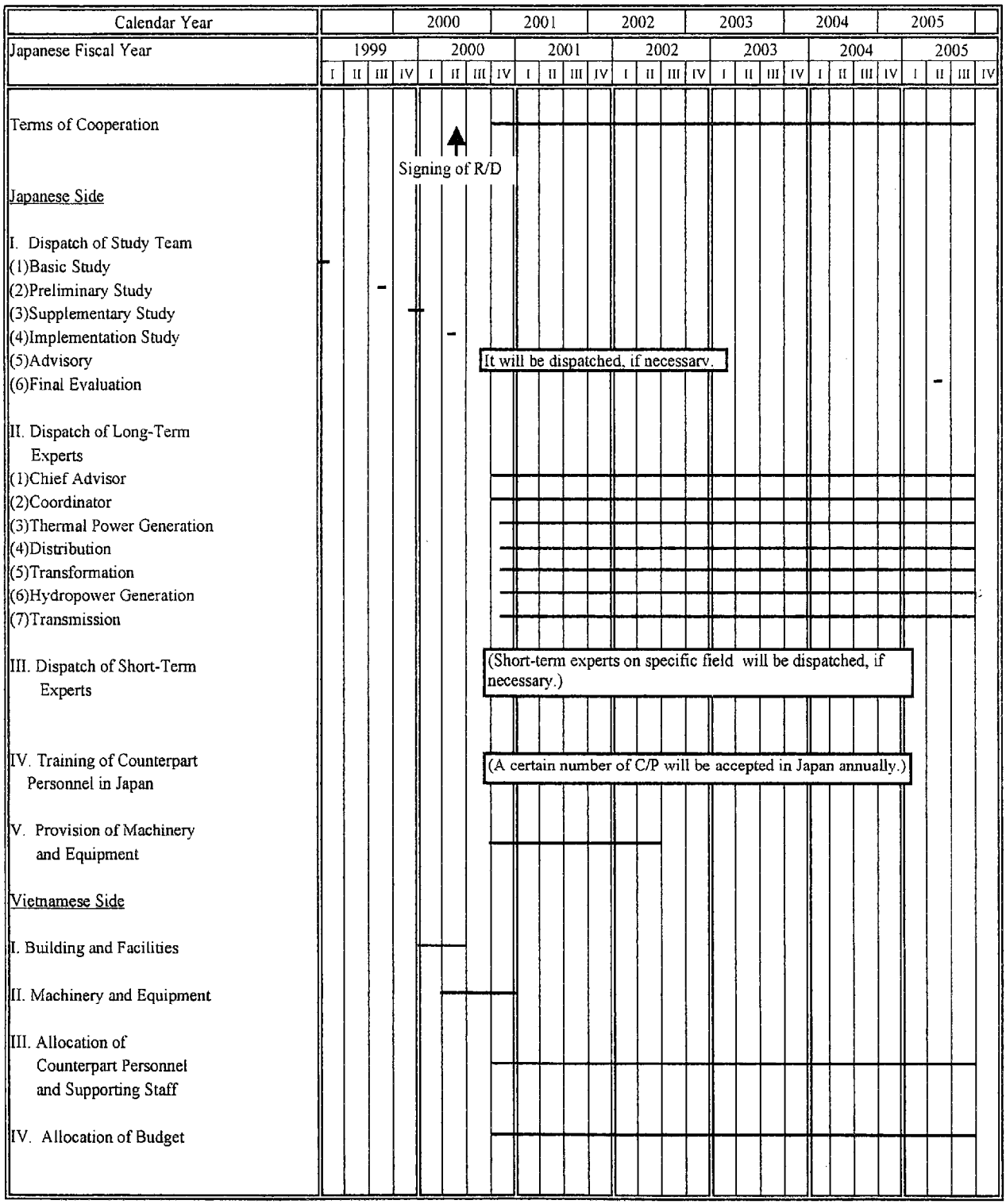
ANNEX 4

Tentative floor plan of the building



ANNEX 5

Tentative Schedule of Implementation (TSI)



Note:

1.Japanese fiscal year starts in April and ends in March.

2.This schedule is subject to change in accordance with the progress of the Project.

ANNEX 6 FIVE (5) BASIC EVALUATION COMPONENTS

1 Five (5) Basic Evaluation Components

The five (5) basic components defined by JICA as mentioned below are in line with those used for the evaluation works by DAC and other international assistance organization. Introduction of these components has enabled a consistent, well-balanced evaluation, which minimizes evaluator bias. Further, it allows us to share the results, knowledge and lessons with other aid organizations, since we are using common components and can discuss with them from the same viewpoints.

(1) Efficiency

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

(2) Effectiveness

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

(3) Impact

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

(4) Relevance

Preliminary evaluate whether the needs in the country have been correctly identified, and whether the design is consistent with the national and/or master plan.

(5) Sustainability

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

2 Relation between Five Basic Components and PDM

The following five components are used for the evaluation and a selection of a project.

(1) Efficiency

(2) Effectiveness

(3) Impact

(4) Relevance

(5) Sustainability

These components are directly connected to the elements of PDM as shown in the Figure in the following page.

The component "Efficiency" is a measure to qualitatively and quantitatively compare all resource (input) to the results (output) of the project in order to evaluate the economic efficiency o conversion from input to output.

The parameter "Effectiveness" us a measure to evaluate whether the purpose has been achieved or not, or to evaluate how much the outputs contributed to the achievement of the purpose, or to evaluate whether or not the characteristics of the outputs were as expected.

The parameter "Impact" is a foreseeable or unforeseeable, and a favorable or adverse effect of the project upon society. The evaluate impact, both the goal and project purpose should be referred to in the beginning of the evaluation. Evaluation with this components could lead to more than the confirmation as whether or not the goals have been obtained. Evaluation with this component requires comprehensive surveys in many cases.

The parameter "Relevance" is to comprehensively evaluate whether or not the project meets the overall goals, politics of both the donor and recipient, local needs and given priority levels, in order to decide whether the project should be continued, reformulated or terminated.

The component "Sustainability" is to comprehensively evaluate how long the favorable effect as a result of the project can continue after the project has been terminated. Evaluation with this component is required to decide how much the local resources should continue to be used for the project, and to evaluate how much the

country receiving the assistance has been considering important. According to OECD (1989), "Sustainability" is a component to be used for the final test of the success of a development project.

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

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

ANNEX 7 List of Attendance of the discussions

Vietnamese Side

Ministry of Planning and Investment

Mr. Nguyen Quang Dung	Director, Industrial Department
Mr. Pham Kim Son	Senior Expert, Industrial Department
Mr. Nguyen Xuan Tien	Senior Expert, Foreign Economic Relations Department

Ministry of Industry

Dr. Tran Minh Huan	General Director International Cooperation Department
Mr. Le Hoi	Personal and Training Expert

Electricity of Vietnam

Mr. Dang Hung	Vice President
Mr. Tran Quoc Anh	Vice President
Mr. Nguyen Huu Duyen	Deputy Director, International Cooperation Department
Mr. Le Quang Khue	Director, Personnel and Training Department
Mr. Dinh Van Toan	Senior Expert, Personnel and Training Department
Mr. Trinh Duy Minh	Expert Personnel and Training Department
Mr. Masayuki ITO	JICA Expert, Institute of Energy

In Service Training School

Mr. Nguyen Quang Vinh	Director
Mr. Dang Tran Phong	Manager, Planning Division
Mr. Do Huu Hai	Expert
Mr. To Quy Vinh	

Secondary Electrical Vocational School No.1

Mr. Nguyen Van Hieu	Vice Director
Mr. Dang Van Duong	

Japanese Side

Preliminary Study Team

Mr. Yoshifusa SHIKAMA
Mr. Hitoshi TSUCHIYA
Mr. Akira SATO
Mr. Shigeo IMAMURA
Mr. Kunio TAKAGI
Ms. Shiho AKAMATSU

JICA Viet Nam Office

Mr. Takanori JIBIKI	Resident Representative
Mr. Takashi HATAKEYAMA	Deputy Resident Representative
Mr. Yuichi SUGANO	Assistant Resident Representative
Mr. Kozo WATANABE	Assistant Resident Representative

Embassy of Japan

Mr. Takeshi YASURAOKA	Second Secretary

資料２　人材育成計画

The Electricity of Vietnam

PROPOSAL

Restructuring Organization and Managing of Training Schools under Electricity of Vietnam

Hanoi - August, 1999

CONTENTS

	Page
PREFACE	2
PART I: CURRENT STATE OF THE SCHOOL SYSTEM, TRAINING AND KNOWLEDGE IMPROVEMENT ACTIVITIES OF THE ELECTRICITY OF VIETNAM (EVN)	3
I. INTRODUCTION OF THE EXISTING TRAINING UNITS OF EVN	3
II. ORGANIZATION OF THE EXISTING SYSTEM OF TRAINING SCHOOLS	5
III. SCALE OF TRAINING	6
IV. IMPLEMENTION OF THE TRAINING ACTIVITIES (1995-1998)	6
PART II: SOLUTIONS	7
A. PROPOSAL OF REORGANIZING THE ORGANIZATION AND MANAGEMENT OF EVN'S SCHOOLS	8
I . AIMS AND DIRECTIONS OF CONSOLIDATING AND CONSTRUCTING THE TRAINING SYSTEM OF EVN UP TO THE YEAR 2010	8
II. PLAN OF SCHOOL REORGANIZATION	9
III. STEPS OF SCHOOL UNIFICATION IN THE NORTH AREA	10
1. Preparation work	10
2. Unification of Secondary Vocational Electrical School No.1 and In-service Training School	10
3. Unification of Training School for Electrical Technique and Training School for Electric-Mechanics	13
IV. PROBLEMS TO BE SOLVED AFTER SCHOOL UNIFICATION	15
B. THE PROJECT OF FOUNDING THE ELECTRICAL COLLEGE	16
I. THE NECESSITY OF CONSTRUCTING THE ELECTRICAL COLLEGE	16
II . CADRES OF "SENIOR ELECTRICAL STAFF" (COLLEGE LEVEL OF ELECTRICAL TECHNOLOGY)	18
III. PROJECT OF IMPROVING SECONDARY VOCATIONAL ELECTRCAL SCHOOL NO. 1 TO BE ELECTRICAL COLLEGE	19
C. TRAINING FUND AND ITS ALLOCATION	21
I. ADMISSION MECHANISM OF EVN IN THE NEW CONDITIONS	21
II. EXPENSES MECHANISMS FOR TRAINING	23
D. STRENGTHEN EVN'S MANAGEMENT AND TRAINING ACTIVITIES	23
I. DEPARTMENTS OF TRAINING MANAGEMENT AND HUMAN RESOURCE DEVELOPMENT IN EVN	23
II. MANAGEMENT OF TRAINING ACTIVITIES IN EACH EVN'S UNITS UNDER EVN	24
III. ALLOCATION OF RESPONSIBILITIES FOR TRAING ACTIVITIES BETWEEN EVN AND ITS UNIT COMPANIES UNDER EVN	24

PREFACE

Electricity of Vietnam (EVN) was established on January 27, 1995, pursuant to the State's policy to set up a powerful economic group. The establishment was aimed at mobilizing all resources optimally in the country's three regions for the construction and development of the electrical sector, industrialization and modernization in the nation.

EVN is the umbrella of six training schools, which were previously set up by the Ministry of Heavy Industry or the Ministry of Electricity and Coal to support enterprises. Despite decades of operation, these schools have not been reorganized and still under the management of unit companies of EVN. Three of the six schools have received improving projects funded by the World Bank through its soft loans under ODA form. The projects include the provisions of modern equipment and facilities, but they fail to address teacher training and learning documents for teachers and students. It is expected that in the nearest future, the non-refundable aid from the Japanese Government will be allocated to the training project for teachers, trainers, and training managers of EVN.

Training activities of EVN are taking a new step forwards: **Training activities in accordance with the demand on and linkage with employment, expenses for the training covered by the companies themselves**, instead of the head of the State annually makes a plan and provides a budget as previous years. Moreover, the quality of training must be continuously increased due to the need of updated knowledge on new technologies, techniques, professional and management skills of the staffs. Hence the reorganization of schools must be completed urgently, in order to concentrate the units, to focus on investments, and to unify management. In addition, the strategy establishment and the determination of funding sources for human resources development are important issues as well.

The reorganizing plan for the training schools' systems of EVN is divided into three main parts. Part I includes descriptions and evaluations of the state of existing schools, as well as training and knowledge improvement activities of EVN. Part II shows four principal measures, including the reorganization of each training schools, the plan on the establishment of an Electrical College, the measures for enrollments and training expenses, and the enhancement of training management system of EVN. In the end, Part III is explained by attached Annexes, Charts, and Figures.

PART I:

CURRENT STATE OF THE SCHOOL SYSTEM, TRAINING AND KNOWLEDGE IMPROVMENT ACTIVITIES OF THE ELECTRICITY OF VIETNAM (EVN)

I. INTRODUCTION OF THE EXISTING TRAINING UNITS OF EVN

Training and knowledge-Improvement schools are all under the management of the members of the EVN's unit companies. They include:

1. Secondary Vocational Electrical School No.1, under Power Company No.1;
2. Secondary Vocational Electrical School No.2, under Power Company No.2;
3. Secondary Vocational Electrical School No.3, under Power Company No.3;
4. Training School for Electrical Technique, under Power Company No.1;
5. Training School for Electric-Mechanics, under the Power Equipment Manufacturing Company;
6. In-service Training School, under the Power Company No.1.

In the North:

1. The management of Power Company No.1

- Secondary Vocational Electrical School No.1
Address: Tan Minh commune, Soc Son district, Hanoi. It was established in 1966 by the decision of the Ministry of Heavy Industry.
Total land area in use: 6.56 ha.
Scale of training: 250 High School students enroll every year for the long-term, full time program (see Chart 1, Annex III for yearly recruitment).
Total number of staffs: 86 persons, with 36 of whom are teachers; 8.6% of the teachers hold post-graduate degrees; 97.1% hold university and college degrees (see Chart 8, Annex II and Table 2, Annex IV).
Scope of activities: The school provides training for engineers at High School level in a term of 30 months. Its faculties include: Electrical System, Hydropower, Thermal power, Industrial Electricity, Electrical Economics. Since 1994, the school has offered courses only in the Electrical System.

- Training School for Electrical Technique
Address: Tan Dan commune, Soc Son district, Hanoi. It was established in 1967 by the decision of Ministry of Heavy Industry under the form of enterprise-supporting schools. In 1979, it was renamed to the Soc Son School for Electrical Engineer under the management of Northern Power Company (current name is Power Company No.1). In 1987, it was merged with Chi Linh School for Electrical Engineer (Northern Power Company) pursuant with the decision of the Ministry of Energy. Since 1997, it has been named as Training School for Electrical Technique and under Power Company No.1.
Total land area in use: 4.8 ha.
Scale of training: 450 students enroll every year for the long-term, full-time engineer-training program (see Chart 2, Annex III for yearly recruitment).
Total number of staffs: 104 persons, with 38 of whom are teachers; 68.4% of the teachers hold university and college degrees, 97% hold High School-leveled degrees of teaching qualification (see Chart 8, Annex II and Annex IV).
Scope of activities: The school trains engineers at 3/7 level in a term of 24 months. The faculties include: Electrical Operation, Electrical Line and Station Construction, Electrical Experiment, Line and Station Repair, Rural Electrical Management, Household Electricity.

- In-service Training School
Address: Hoang Quoc Viet street, Tu Liem district, Hanoi. It was established in 1974 by the decision of the Ministry of Electricity and Coal.

Total land area in use: 1.95 ha. The school is assigned to coordinate with a project of National Training Center, funded by the ODA from the World Bank. The project is expected to complete in the second quarter of 2000.
Scale of improvement: The school provides knowledge improvement courses for 1,200 turns of students per annum.
Total number of staffs: 50 persons, with 7 of whom are teachers engaging in training management and hold university and college degrees (see Table 2, Annex IV).
Scope of activities: The school provides re-training and knowledge improvement courses for engineers and managers, and organizes improvement courses for the staffs of Power Company No.1.

2. The management of Power Equipment Manufacturing Company

- Training School for Electric-Mechanics
Address: Yen Vien town, Gia Lam district, Hanoi.
Total land area in use: About 1 ha
Scale of training: 200 students enroll every year for the long-term, full-time engineer-training program (see Chart 2, Annex III).
Total staff: 60 persons, with 32 of whom are teachers; 3% of the teachers hold post-graduate degrees; 94% hold university and college degrees (see Chart 9, Annex II and Table 3, Annex IV).
Scope of activities: The school trains workers at level 3 for such faculties as Mechanics, Electrical Equipment Repair, Household Electricity, and Industrial Electricity.

In the South:

3. The management of Power Company No.2

- Secondary Vocational Electrical School No.2
Address: Thanh Loc commune, district 12, Ho Chi Minh City.
Total land area in use: 3 ha. The school is implementing an upgrading project funded by the ODA from the World Bank. The project is expected to complete by the end of 1999.
Scale of training: 700 students enroll every year for High School and engineer levels. See Annex 3 for annual enrollment.
Total staff: 87 persons, with 40 of whom are teachers; 5% of the teachers hold post-graduate degrees; 68.4% hold university and college degrees (see Chart 7, Annex II and Table 1, Annex IV).
Scope of activities: The school trains students in departments of Electrical System, Thermal power, Hydropower, and Electrical Economics equivalent to High School graduates. The school trains engineers in departments of Electrical Operation, Electrical Repair, Hydropower, Household Electricity, and Industrial Electricity.

In the Central:

4. The Management of Power Company No.3

- Secondary Vocational Electrical School No.3
Address: Hoi An town, Quang Nam province.
Total land area in use: 3.6 ha. The school is implementing an upgrading project funded by the ODA from the World Bank. The project is expected to complete by the end of 1999.
Scale of training: 600 students enroll every year for engineers and High School levels (see Annex 3 for annual enrollment).
Total staff: 54 persons, with 27 of whom are teachers; 77% of the teachers hold university and college degrees (see Chart 7, Annex II and Table 1, Annex IV).
Scope of activities: The school trains students in departments of Electrical System equivalent to High School level. The school trains engineers in departments of Electrical Operation, Electrical Line and Station Repair, Household Electricity and Industrial Electricity. It is not providing training courses on the thermal subject.

II. ORGANIZATION OF THE EXISTING SYSTEM OF TRAINING SCHOOLS

1. Labor System of Staffs, Current States of Teaching Staffs and Infrastructure

1.1. Staffs and the state of the teaching staffs

The number of teaching staffs is generally in short at the school, and the staffs vary in qualification. Many teachers need to work overtime, which affects the teaching quality and the teachers' skill for improvement schemes.

The ratio of teachers to the total number of staffs at the school is 180/441. It means that teachers account for 40.8% of the total number. This reflects an imbalance on the staffs: The shortage of teachers in charge of teaching and training management works is a concerned issue.

This school is in short of well-qualified teachers for each subjects due to the fact that the training courses for teachers have not been well performed. Only 2.8% of the teachers attended post-graduate courses and 52.7% hold university diplomas (See Index IV, Table 1). Their skills of foreign languages are also limited, and most of them can not read references and professional books printed in foreign languages.

1.2. Technical facilities

Secondary Vocational Electrical School No.2, Secondary Vocational Electrical School No.3, and In-service Training School are equipped with teaching facilities and modern storage rooms by the aids of loans from the World Bank. The projects, however, do not contain key items like teacher training courses, technological transfer, documents for both teachers and students, building a library, or textbooks. These programs are unsettled.

Capabilities of the remaining Secondary Vocational Electrical School No.1, Training School for Electrical Technique, and Training School for Electric-Mechanics are severely limited because of the shortage of equipment as well as old-styled educational equipment. This fact is resulted from a lack of the State capital for purchasing new equipment over past years. Thus, requirements for teaching and training in the new context are not satisfied.

2. Remaining Constraints

-The State management of the existing schools is not united as those schools are under different unit companies. The schools are directly managed by their companies, nevertheless, their training programs, enrollment plans, and other policies are guided by the Ministry of Industry, the Ministry of Education and Training, the Ministry of Labor- Invalids- Social Affairs, and the Ministry of Planning and Investment through EVN.

-The above-mentioned situation leads to the fact that the schools have limited opportunities to exchange their information and experiences. No professional conferences were held over the past five years among the schools. The teachers and the students, therefore, face with difficulties to improve their professions.

-Capital: Capital for equipment repairing and annual maintenance and long-term development are ineffective and dispersed.

-Management system: The schools are places of training labor force for the whole sector. On the other hand, they directly belong to local unit companies. So that, budget for new student training in each year is not fixed, and it is difficult to estimate the budget for grants from EVN as well as the budget for deep-investment in training program as project type. The schools are preparing and providing work force for the whole sectors, however, EVN has no training budget as a whole. It is

because the schools are directly managed by those unit companies. The companies and schools have not conducted training works for new engineering workers at power generating plants yet.

Organization and approval of teaching plans, programs, textbooks, study-subjects, and training evaluation works have been not paid attention nor concentrated to solve yet.
On the other hand, as well as the requirements of training quality, technological changes, expansion of international cooperation, cooperation with the countries in this region, the schools show week points on unrelated and disorganized training plans and teaching curriculums. Little attentions are paid to teaching programs, subject development, textbooks, and preparing and training investigations. Disorganized and outdated teaching programs and plans as well as low training quality fail to keep up with technological changes and requirements for international cooperation.

III. SCALE OF TRAINING

1. Training New Students

Over the past 4 years, annual enrollments of the EVN schools reached approximately 1,400 for technical workers and 500 for middle-level technical staff. Scholarships, granted from the State budget, and companies' or EVN's funds, were given to 1,200 and 300 students, respectively.

Among the total enrollments for the 5 schools offering official training courses, Secondary Vocational Electrical Schools No.2 and No.3 take up to 65% for technical workers and 75% for middle-level technical staff. Training demands of the schools in the central and the South regions tend to increase faster than in the North.

However, training plans are not in accordance with actual demand and mis- matching with practical requirements for labors. As the result, some regions are lack of qualified staffs while many graduates are unemployed.

2. Retraining and Fostering

In general, retraining and improvement for staffs are paid little attention in recent years. Of EVN's 60,000 workers, only 5,441 in total (approximately 10%) attended improvement courses by the end of last year (according statistic data provided by the units belonging to EVN See Index VII). The training and improving courses for workers are not systematically standardized because these are made separately by each unit.

Forecasting the demand on staffs in 1999 and 2000 statistics show that among the entire staffs of EVN, from the leaders of units or/and departments, leaders of provincial companies of electricity etc. groups of workers, working shifts, **1,064** are required to attend economic management retraining courses, **9,209** have to improve their professions, and **3,406** to improve foreign language skills (See Index IX). These numbers show that more than 10,000 persons are needed during 2001-2005 and 2004-2010 periods.

Over last 2 years, the colleges offered training programs for 1,837 people, cooperating with relevant organizations. The participants were trained in short courses for chiefs of branches, cadre business managers, and working leaders from rural areas (once completed, they are signed to work in those rural areas). In addition, qualified workers participated in the courses over 1,000 times. Nevertheless, the training courses were not systematical or acquainted because those were mainly held at only 3 electrical companies that had training schools. The aim of EVN was to re-train 80% of the total workers, hence the above numbers were still unsatisfactory.

IV. IMPLEMENTATION OF THE TRAINING ACTIVITIES (1995-1998)

1. Achievements

Since1995, the schools under EVN have fulfilled the following tasks (for 3 years):

- Supplied the required numbers of workers and cadres with High School-leveled engineering skills. In cases of new construction or expansion of buildings, those workers and cadres were assigned for substitution. The schools also fulfilled enrollment plans assigned by the State in past 3 years.

- All the program of subjects and training targets were re-checked, added and systemized, especially in improving teachers' pedagogical skills.

- Facility: The schools have focused on building new classrooms. Especially some 10 billions VND (ODA loan from the World Bank) were spent by EVN for investing on new equipment at a Training Center of each area; the North, the Central, and the South.

- The training expenses are granted mainly from the companies' budgets, partly by EVN's aid, and the State budget. Besides, some schools (very few, however) earn incomes very few by other activities like services and training and practicing production. Over past years, the schools have overcome difficulties step by step by renewing teaching equipment and improving teachers' skills to maintain the activities stable.

2. Difficulties and constraints in training programs

1) The implementation of the training programs: The aim and index of the annual training programs and managerial regulations of the schools are not well defined; dispersed, spontaneous, and sometime subjects are overlapped which causes ineffectiveness and inability to expose virtues of each school, and the project of the Training Center, in particular. Regarding training subjects in schools, these are spontaneous and lack of central entity.

2) The companies and schools face with difficulties in recruiting and training teachers to overcome new situations because of the teachers' inability of acquiring foreign language skills and new technologies. For the project of the new Training Centers which nearly open, the cadres and teachers have not been well trained to approach the modern training methods as well as explore facilities of projects.

3) The training has not well met with practical labor demands. The schools have not set up training programs on professions and management that meet with amended demand of the electrical sector. Most of the students are simply educated in technical terms; they do not possess enough knowledge of marketing, negotiation with clients, business management, etc. even after graduated.

4) Because of a lack of unity to direct activities, managerial regulations, and development plans of each schools, it is difficult to evaluate the circumstances of following works: (1) Workers and cadges training and improving activities; (2) Exchange the knowledge (studies) and experiences: (3) Activities in training and improving both teachers and trainers.
Up to date, EVN has not prepared the official and unified textbooks, even the document to improve management cadres and works. Some subjects like thermal or gas turbine are not considered or qualified, contrary to meet the requirements in the future.

5) Monetary sources granted on EVN's schools from the State budget is quite low and unfixed (In fact, the amount is only enough for salary and scholarship payment of teachers and students in accordance with the State regulation). The total amount of the funds from the State budget for the past 4 years was only 34% of the total. The remaining 66% were instead granted by EVN through the unit companies (See table 3, Index III).

PART II
SOLUTIONS

In order to overcome obstacles in the training system mentioned above, it is necessary for EVN to have new policies to promote and to strengthen its training capacity. Basic solutions for the coming period include: Reorganizing the system of schools, training teachers, establishing Electric Power

College, consolidating the management system of human resource training and development, constructing suitable mechanism on enrollment, expenditure resources, distribution of expenditure for training.

A. PROPOSAL OF REORGANIZING THE ORGANIZATION AND MANAGEMENT OF EVN'S SCHOOLS

I. AIMS AND DIRECTIONS OF CONSOLIDATING AND CONSTRUCTING THE TRAINING SYSTEM OF EVN UP TO THE YEAR 2010

To standardize EVN' cadres so that 80% to 100% of the working powers are trained under all forms including: new training, retraining, strengthening and improving professional skills in accordance with majors, improving EVN's training system up to the same level as that of other nations in the region. Significant duties in training works of EVN in each stage are as follows:

1. Stage 1: from 1999 to 2000

Necessary works to be carried out in this stage as well as the coming duties, include:

- Reorganizing, reinforcing, and completing the system of the training schools
- Strengthening the system of the training management in whole EVN from EVN's headquarter to local units.
- Strengthening and improving professional skills and foreign languages skills for teachers and trainers as well as the capability of training management cadres.
- Building the standard school program for High School level and worker training level in the whole of EVN, completing the training program of majors on thermal power, hydropower. Founding the branch of operation and maintenance of gas turbine.
- Building the school programs of business, marketing, customer services and introducing into the required teaching program at all education levels.
- Organizing and carrying out regular upgrading courses for managerial cadres, professional cadres and technical workers.

2. Stage 2: from 2001 to 2005

- Continuing to reinforce the training system in EVN, introducing information-technology into management and planning of training.
- Upgrading Secondary Vocational Electrical School No.1 to Electrical College.
- Building the standard training program for College education level. Training 80- 120 students / year of college level for the units in the remote areas.
- Completing the establishment and promulgation of the standardized and unified textbook system in EVN at all education levels.
- Establishing the regulations on organizing the course for improvement of the skill and managing highly skilled technical workers.
- Strengthening the combination between training in the college and productions as well as scientific researches.

- Attaching special importance to introduction and advertisement in order to attract more students to improve the quality of the enrolled students, raise the prestige of schools, step by step moving forward to self-determination and increasing competitiveness.

- Strengthening international cooperation with other nations both in the region and in the world on the training human resource field.

3. Stage 3: from 2006 to 2010

Besides continuing the implementation and promotion of the above works, the aims at this stage include:

- Training and developing human resource in EVN to meet the domestic demand and increase international competitiveness.

- Reinforcing the College education level, aligning with universities to train special field in post-graduate level.

II. PLAN OF SCHOOL REORGANIZATION

1. General principles

- Reorganizing schools by the way of directly managed by EVN, concentrating on the following matters; creating advantages for investment, upgrading schools, strengthening upgrading work. Carrying out the training for those who will be assigned duties after completion and using requirements, step by step socializing training - education in accordance with the policy of the Party and State.

- In the process of reorganization, schools must constantly keep the defined rate of educational progress, not causing great disorder to training works.

2. In North Area

Re-organizing 4 current schools into 1 Secondary School and 1 vocational school managed directly by EVN as follows:

a) Unifying 2 schools: In-service Training School and Secondary Vocational Electrical School No. 1 under Power Company 1 into a school under the direct control of EVN. In the coming time, this school continues training at High School education level, as well as improving cadres. After preparing enough conditions, it will be upgraded to Electrical College, where trains new students both at college and high school levels and simultaneously improving professional skill for in-service cadres in the North area, retraining and upgrading managerial cadres under the management of EVN.

b) Unifying the Training School for Electric-Mechanics under the direct control of Power Equipment Manufacturing Company and the Training School for Electrical Technique under the direct control of Power Company 1 in order to carry out duties of new-training, retraining and upgrading technical workers in the job of electric, electrical mechanics and electrical equipment maintenance.

3. In Central Area

Shifting Secondary Vocational Electrical School No.3 under the control of Power Company No. 3 to under the direct control of EVN, continuing reinforcing to become a human resource-training center for the Central area of EVN. The school has 2 levels of training: High School level and Vocational

level, simultaneously organizing retraining and upgrading the professional skills for workers in the Central area.

4. In South Area

Shifting Secondary Vocational Electrical School No.2 under the control of Power Company No.2 to under the direct control of EVN, continuing reinforcing to become a human resource training Center for the south area of EVN. The school trains new students in 2 levels: High School level and Vocational level, organizing retraining and upgrading professional skill for workers in the South area

III. STEPS OF SCHOOL UNIFICATION IN THE NORTH AREA

1. Preparation work

Requiring schools' reports with the following contents:

- Balance sheet reports up to June 30, 1999.
- Inventory reports of assets, technical facilities, training areas, goods, capital and debts up to June 30, 1999.
- Reports on planning work: Plans of training, construction, maintenance, etc.
- Organizing works:
  + Legal documents: School establishment decision, organizing regulations and structures, etc.
  + Personnel: Lists of staff at the reporting time, total of labor and salary, etc.
- Contracts in implementation.
- Problems to be solved.
- Current training situation: Number of students and graduates who are expected to graduate, etc.

2. Unification of Secondary Vocational Electrical School No.1 and School of improving In-Service Cadres

2.1. Name of the school

Name of the school after unified will be:

Secondary Vocational Electrical School No. 1

2.2. Working location

a) Location 1(Head quarter): located at In-service Training School, Hoang Quoc Viet street, Tu Liem, Hanoi.
b) Location 2: Tan Ninh village, Soc Son, Hanoi(Former Secondary Vocational Electrical School No.1)

2.3. Training scale

a) Training forms:

+ Improving managerial cadres and professional cadres managed by EVN and cadres in the North area.
+ Training and retraining technicians at High School level.
+ Training highly technological job (new technology) to technicians, to be the place of organizing the improvement and upgrade for senior workers.

b) Professions to be trained and improved

- Electrical system: Hydropower, thermal power, gas turbine.
- Industrial and civil electricity

- Economics: Accounting, statistics
- Telecommunication in Electrical field
- Foreign languages, computer, electronics, automatic equipment

c) Number of students

As forecasted, requirement of training for EVN from 1999 to 2010 on the basis of data reported in the Annex VIII from the units that are under the direct control of EVN, the average number of laborers at High School level and worker training level necessary to be supplied to the whole EVN is 3,362 persons/year (excluding the number at college, graduate and post-graduate levels).
According to formula used in some national research projects, the number of cadres and technical cadres necessary to be supplied each year is estimated as follows:

$$C = \frac{KP}{100}$$

In which: C: number of cadres and technical cadres need to be trained (High School and worker training levels).

P: total number of current staff in EVN

K: Experiential coefficient from 2.3 to 3. In this case, K= 2.8 (according to Report on construction project of the South Training Center by WB in May 1995). When the experiential coefficient equals to 2.8, it includes estimated factor of development of electric power industry in the coming time.

Thus:

$$C = \frac{KP}{100} = \frac{2.8 \times 56{,}990}{100} = 1595 \text{ persons/year}$$

Annually, Secondary Vocational Electrical Schools No.2 and No.3 train 800 students. The number of needed newly trained at schools in the North area are 795 students, in which: High School level: 120 students, worker training level: 675 students, professional skill upgrading: 1500- 2000 students in total. These data are oriented and estimated on the basis of analyses on EVN's labor situation as well as the development of science and technology at the planning stage. The number of trainees each year will be calculated based on the real demand of each EVN's unit.

Therefore, the scale of Secondary Vocational Electrical School No. 1 is as follows: In the short future, continuing to enroll about 120 students/year of High School level (full-time), to upgrade about 1500- 2000 cadres/year in total. It is possible to align to train at college level about 1-2 classes/year. After upgraded to college level (2003), 100-150 students will be enrolled.

2.4. The structure of school's organization

- Organizing structure of Secondary Vocational Electrical School No.1 is formed to make sure that the organization will operate well in the transition stage of merging and running in stability. Organizational structure as in Chart 1.

2.5. Arrangement after unification

a) School managing board:

In the process of unification, appointing 1 Principal and 2 vice-principals

b) School cadres in sections:

- Current number of cadres in the two locations are 16 persons
- Forecasted appointment: Choosing qualified cadres in managing positions of sections

2.6. Responsibility assignment in locations

a) Head quarter:

Duty: Carrying out the function of upgrading cadres, teaching basic theories, practices and experiments when the location No. 2 does not have enough conditions for them.

Training fields: Telecommunication in Electric field, opening the course to improve profession, retraining cadres, improving theories and practices for senior workers (under management of EVN), strengthening English, computer skill, basic technique for some fields. Gradually accepting cadres, teachers, and students from the location No. 2, then upgrading to a college after completing conditions.

b) Location No. 2:

Duty: Teaching basic and professional theories, having practical training of High School level: Electric generation, enterprise electricity, hydropower, thermal power, economics.

2.7. Number of teachers and cadres of Secondary Vocational Electrical School No. 1

After unified, teachers of Secondary Vocational Electrical School No. 1 will be reinforced, improved on the basis of the current teachers at college level to work for upgrading to a college. Therefore, estimation of number of teachers shall be counted to teachers of college level (having bachelor degree or more) to form the personnel of teacher of the college. Total of teachers and cadres in each location (detailed in Annex V) are defined as follows:

a) Head quarter:

- Teachers in charge of management and improvement	18 persons
- Administrative and serving cadres	33 persons
	Total: 51 persons

b) Location No. 2:

- Theory and practice teachers	30 persons
- Teachers of college level	42 persons
- Administrative and serving cadres	36 persons
	Total: 108 persons

- Total of teachers and cadres of Secondary Vocational Electrical School No. 1 in needed is 159 persons (teachers of High School level: 30 persons, teachers of college level: 42 persons, teachers in charge of management and improvement: 18 persons, administrative and serving cadres: 69 persons)

- Number of teachers and cadres currently in the branch schools: 136 persons

  In which:
  + Teachers of High School level: 36 persons
  + Teachers in charge of management and improvement: 7 persons
  + Administrative and serving cadres: 93 persons

Therefore, teachers and cadres are in short of 23 persons. In which:

- Teacher lacked (incl. 42 for college level): 47 persons

- Administrative and serving cadres excessive: 24 persons

The above personnel numbers are reckoned in the plan. New Secondary Vocational Electrical School No.1 must appoint duties to each location and prepare suitable plan for each stage. Plans of training, recruiting college teachers shall be presented in the project of founding Electrical College.

2.8. Arrangement of Management in Secondary Vocational Electrical School No.1

Besides the head quarter in Nghia Do, the location No.2 in Soc Son is 35 km away from the former. In order to avoid difficulties in training work, the school managing department of Secondary Vocational Electrical School must arrange in training management, finance, general administration in details for the head quarter and location No. 2. Regulations of arrangement must follow the instruction documents of the Ministry of Training and Education based on the duties, functions, and working operation of EVN's schools.

2.9. Progress of implementing unification

Stabilizing the organizing structure of stage 1 in 1999. Transferring staffs, teachers, and students from Soc Son to Nghia Do, meanwhile reducing number of enrolled students in location No. 2, concentrating on improving teachers. The estimated finishing time of this stage is the end of 2003.

3. UNIFICATION OF TRAINIGN SCHOOL FOR ELECTRICAL TECHNIQUE AND TRAINING SCHOOL FOR ELECTRIC-MECHANICS

3.1. Name of the school after unified will be:

Training School for Electrical Technique

3.2. Working and training location

a) Working location: located at the head quarter in Soc Son, Hanoi

b) Training locations:
- Head quarter in Soc Son
- Location No. 2: located at Yen Vien, Gia Lam(Former Training School for Electric-mechanics)

3.3. Training scale

a) Training forms:
- New training workers in level 2/7 and 3/7, retraining, improving workers to upgrade their levels
- Training rural electricians and training job in short-term courses on electric and mechanical electric.

b) Professions to be trained:
- Electric wire and station (to 220 KV) management and maintenance
- Electrical equipment maintenance
- Electrical automation test and measurement
- Electrical Chemistry-Thermal checking
- Machine and stove equipment operation (Hydropower, thermal power, gas turbine)
- Machine and stove equipment maintenance (Hydropower, thermal power, gas turbine)
- Mechanical engineering
- Other professions for social requirements such as foreign languages, computers, civil electricity, etc.

c) Number of trainees:

As presented in point 2.3, section 2, part IV, the number of students at worker training level trained each year is 675 persons.

3.4. Organizing structure

Organizing structure of Training School for Electrical Technique is in Chart 2

3.5. Appointing, arranging leaders and managing cadres of Training School for Electrical Technique

a) The school managing department consists of 4 persons:
- 1 principal
- 1 vice-principal in charge of training activity
- 1 vice- principal managing location No.2
- 1 vice-principal in charge of administration

Currently, the school-managing department of the two locations consists of 6 persons including 2 principals and 4 vice-principals.

b) Cadres in sections include 12 persons:

- 5 managers of departments
- 7 deputy managers
  1 deputy manager of the Training Department of location No.1
  1 deputy manager of the Training Department of location No.2
  1 deputy manager of the General Administrative Department of location No.2
  1 deputy manager of the Administrative Organization
  1 deputy manager of the Life Administration
  1 deputy manager of the Materials Planning
  1 deputy manager of the Accounting and Finance

Currently, the number of leading cadres in two schools is 12 persons including:
- Manager of the departments: 04 persons
- Manager of the Vocational Department: 01 person
- Deputy Manager of the Vocational Department: 01 person
- Deputy Manager of the departments: 06 persons

3.6. Assigning work to each location

Location 1: Training professional workers in electrical operation; managing, repairing networks and electric stations (generating a voltage up to 110 KV); experimenting; determining the electrical automation; chemical electric; thermal checking; operating steam oven, gas turbine, steam turbine, hydropower. Here is an open-air studying place which has the electric wire and power station generating 110KV in the North area.
Location 2: Training professional workers in mechanics, repairing steam oven, water turbine, gas turbine, repairing electric equipment; training English skill, computers, and civil electricity, meeting the requirements of the industry and the society.

3.7. Number of teachers and cadres of Training School for Electrical Technique

a) With the average trainees of 675 per year, the labor system of school is determined as follows:

- Teachers of theories, practice and instruction: 85 persons
- Administrative and serving cadres: 57 persons

Required total number in school : 142 persons

b) The current number of teachers is as follows:

- Location 1: 38 persons
- Location 2: 32 persons

Total: 70 persons

Therefore, concerning with the need, **the deficiency number is 15 persons (= 85 –70)**

- Current number of the cadres and staff at the location 1: 66 persons
- Current number of the cadres and staff at the location 2: 28 persons

Total : 94 persons

Therefore, the 37 persons are excessive. (= 94 – 57)

3.8. Managing arrangement of Training School for Electrical Technique

Each location is 50 km far from the other. Hence, in order to avoid difficulties in training activities, the college managing department is to arrange the training management, finance, general administration, etc in Location 2. Such arrangements are based on the aim, the responsibility of the location, the plan in training scale, and both current and afterwards organization mechanism of the college in EVN.

IV. PROBLEMS TO BE SOLVED AFTER SCHOOL UNIFICATION

1. Works created by the schools in order to solve labor-problem

a) For teachers:

After unification, the number of teachers of two colleges, in general, has not met the requirement. The leading board of the two colleges should study on the training mechanisms and faculties in order to assign works to the teaching staff suitably. The main and facing solutions are to arrange teaching staff to approach the general teaching progress; to upgrade and retrain current cadres in order to supplement for the teaching powers. (Those who are capable enough to be upgraded and trained following the criteria such as: ages, degrees, pedagogic styles.)

In the future, the school can recruit new teachers or make changes in the cadres in the same sector; candidates shall be engineers (for Vocational School of Electrical Training) and post graduate students (for Secondary Vocational Electrical School No.1).

b) For excessive cadres

- Those who are under the ages of 35 shall be retrained in accordance with required majors.
- Cadres with technology degrees shall be improved with the pedagogic qualification to be teachers if they demand to do so.
- Those who desire to change their occupation (inside or outside their majors) shall be accepted.
- Those who are over the age of 50 and are expected to retire with social insurance benefit shall wait to retire in accordance with the regulations or early retirement.
- The college actively recruits auxiliary workers to attract the redundant manpower while the college has yet to implement social insurance regulations so that all staffs have works and incomes.

2. Duties to be solved by the unit companies and EVN

- For the cadres under the management of the unit companies and EVN: EVN or the unit companies shall arrange, appoint and facilitate the management of the new School Managing Department.

- The unit companies and EVN shall coordinate with the manufacturers to help and accept the cadres who want to change their occupations.
- The unit companies and EVN shall aid those who had to retire early in cause of their inability of creating suitable jobs.

- EVN should equip buses for transporting the cadres and students between the two locations and to field studying places.

3. Proposals

- For Secondary Vocational Electrical School No.1, after the year of 2003, shall concentrate on the main location to invest to become a modern Electrical College.

- In order to gradually develop Secondary Vocational Electrical School No.1 into the electrical college and upgrade and reinforce the Training School for Electrical Technique to become a national vocational training school, it is necessary to give out some financial support policies to the teachers who study for higher education and to create conditions to increase the cardes' basic wage of the schools equal to that of the staff in the producing section in EVN.

- Currently, Training School for Electrical Technique is still maintaining the two training locations in order to develop and take advantages of each location, and in the future it will have a suitable planning policy, in accordance with the developing conditions and concrete training requirement of the whole industry.

B. THE PROJECT OF FOUNDING THE ELECTRICAL COLLEGE

I. THE NECESSITY OF CONSTRUCTING THE ELECTRICAL COLLEGE

1. The development of Vietnamese electric power in the coming years

To meet the demand in electric power for socio-economic development in the course of industrialization and modernization, the Prime Minister has given a decision of 725/TTG dated Sep. 3rd, 1997 that approves the general outline of electrical development at the stage from 1996 to 2000 and the forecast year of 2000 (the stage No. IV of general outline). Based on this, EVN has been rapidly increased both quality and quantity.

a) In additional charge

Year	Generated Electricity (billion kWh)	Extended Rate
1998	20.859	13.1% up over 1997
1999	22.730	9% up over 1998
2000	30.000 (estimated based on high project)	32% up over 1999

The project forecasts the produced capacity (according to the high project) of 53.65 billions kWh in 2005 and of 87.3 billions kWh in 2010.

b) In current conducting network

From today to 2005, in order to meet synchronically with the current resource, the current network-developing plan (divided upon electric voltage) is as follows:

Voltage (KV)	Length of transmission line (Km)	Capacity of transformer (MVA)
500	809	2700
220	4886	14,039
110	4830	18,241

Besides, the investment and management of the rural and mountainous current network will rapidly increase. To implement the Resolution of the Central Party by the year 2000, 100% of the districts of provinces, 80% of the communes, and 60% of the households shall have electricity; the duty of training and developing EVN's human resource is very hard.

To be able to get the developing aims of EVN mentioned above, one of the preparations is to organize a human resource training and improving, setting up plans, meeting a high qualified working staffs who can be responsible for planning, designing, operating management, equipment manufacturing, and electric business. One of specialized engineers who can meet the operation requirements, equipment maintenance with modern technology is senior engineer (college-bachelor) to be trained based on the program established by the construction consultant department of National Training Center (In-Service Improving College).

Constructing an electrical college in the National Training Center will help EVN have a modern training infrastructure connecting training with scientific study and business -production, often improving the quality of the cadres. With the two colleges in the Central and the South, this will be a main location of training and developing human force for EVN in short term and in long term as well.

2. Production requirements for college degrees

The development of EVN in the industrialization and modernization requires; cadres to master progressive new technology, working staffs and managers to be more qualified in specialized activities and managing ability. Currently, the role of cadres from higher electrical schools as an engineer, a bridge between engineers and workers, is losing. In fact, most of the higher school students after graduated work as workers. This is due to a limitation in theoretical standards, the difficulties in applying theories in practice. Consequently, it is necessary to give a training course to senior technical staffs who have a practical theory background from the university or higher school and have good qualifications in theoretical practicing, organizing, instructing, and operating the production.

Moreover, in recent years, the modernization of equipment and technology of EVN are advanced, especially after the conducting line of 500 KV put into operation. Modern technology of some stages and equipment is equivalent to that of the developed countries. Meanwhile, training colleges are training only workers and High School leveled students with backward teaching programs and methods. In general, teaching programs focus on only theoretic but practice. Hence, suitable improvement of targets and teaching programs with a view of developing engineer standard is an urgent problem.

3. Feasibility conditions for upgrading electrical college from Secondary Vocational Electrical School No.1

Secondary Vocational Electrical School No.1 was basically founded from the electrical faculty of High Electrical and Mechanic School pursuant with the decision 180 BCNN-TC of the Ministry of Heavy Industry dated on Feb.8th, 1966. Since then, it has trained over 11,000 cadres in the field of electric generation and conduction, enterprises' electrification, thermal power, hydropower, electric equipment manufacturing, electric economics. Paralleling to the training High School system, the managerial ministry assigns the school to organize 8 professional courses on electric generation and conduction, thermal power to and it has trained 355 engineers to the employee force of the industry. Besides, the school opens business management improving courses for over 290 leaders, who are potential successors in enterprises owned by energy industry.

Infrastructure of Secondary Vocational Electrical School No.1 (after unifying) such as laboratories, foreign language labs, computer labs, practicing workshops, open-field studying places, and libraries

can meet general requirements for the college. Most of the teaching staffs have University degrees, some have Master degree, many years of working experience and be enthusiastic with training career.

II. CADRES OF "SENIOR TECHNICAL STAFF" (COLLEGE LEVEL OF ELECTRICAL TECHNOLOGY)

Senior technical staffs are those who hold bachelor in technological colleges and universities (according to current regulations). They play important roles as bridges between workers and engineers in the production line and are equipped with basic theoretical knowledge of the university and the ability in practicing their majors.

1. Functions and duties

1.1. Functions

Senior technical staffs are to implement the technological duties in production line, directly control and manage the production.

1.2. Duties

Senior technical staffs have the following duties:

- Instructing workers to implement technological process or professional jobs in all production chains.
- Organizing, managing, and controlling work in workshops, in production groups or in one stage in production lines.
- Partial designing, considering technical projects in the range of management.

2. Working positions

Senior technical staffs of electrical industry shall be in charge of positions in workshops, in production teams or groups, in technical departments of the production lines of electricity from producing, conducting, maintaining to generating.

3. Requirement of qualifications and abilities:

3.1. Political qualifications

The senior technical staffs of electrical industry shall be trained to get a good qualification of politics to lead the development of electrical industry and the course of industrialization and modernization of the country:

- Having patriotism and always devoting to the course of "rich people and prosperous country", to the happiness of people and to the carrier of EVN.
- Having will of striving and improving morals and professional knowledge; having solidarity and cooperative spirits to do the tasks well.

3.2. Professional abilities

- To be able to implement and exactly instruct standard manipulations of technology to workers.
- To be able to instruct, supervise and check the implementation of technical process in the production.
- To be able to suggest technical measurements of constructing the process of equipment operation, trial & assembly and safe working organization.
- To be able to construct and manage production norms and technical criteria.

3.3. Managing skills

- Having general and partial economic managing knowledge of partial producing management and organization.
- To be able to organize and manage the production in a workshop or a stage in the production lines.

III. PROJECT OF IMPROVING SECONDARY VOCATIONAL ELECTRICAL SCHOOL NO. 1 TO BE ELECTRICAL COLLEGE

1. Training Scale

1.1. Current training Scale of Secondary Vocational Electrical School No.1

The scale of cadre training and improving in Secondary Vocational Electrical School No. 1 (after being merged) is of 450 new students and 2000 old students to be retrained. Thus, the annually average students at the main location are of about 300 and of 450 students at the location No.2.

1.2. Training requirement for new students at college level

Training requirement for fresh students at college level in each stage is as below (details in Annex VIII):

1999-2000	2001-2005	2006-2010
235	804	966

Thus, annually it is necessary for EVN to train from 150 to 200 new students at college level.

1.3. Requirement of retraining improving electric engineers

The group of laborers at graduate and college education levels (excluding postgraduate students) currently in the Department of Electricity Electro-Computer is of 5,380. If this number of laborers were intended to be retrained and improved in 10 years after graduating, the annual number of employees needed to be trained would be of 515 due to the rapid development of technology - science and continually renewed producing techniques.

1.4. Scale of Electrical College

Based on the training scale of Secondary Vocational Electrical School No. 1 (that is improved to be Electrical College); Based on the training requirement of new cadres at college level; Based on the retraining and improving requirement of cadres, staffs and electrical engineers of EVN, the training scale of the College is expected to be:

No.	Training Level	Average Time of Training	Annual enrollment examination	Average number of student
1	College	36 months	150 students	} 810
2	High School	30 months	120 students	
3	In-service cadre Improving	01 month	2000 students	300

2. Teaching Staffs

2.1. Current group of teachers at Secondary Vocational Electrical School No. 1 (6/1999)

Total	Master Degree	University Level	College Level	Middle Level	Worker
43	2	34	3	4	0

2.2. Number of teachers required for College Level

According to the training program of College level at Hanoi University of Technology, the number of teachers required for College level shall be estimated as below (details in Annex X-Table 4):

+ Required teachers per class: 14
+ Required teachers for 3 classes at college level (120 students): 42

2.3. Direction of establishing group of teachers for Electrical College

Based on the current groups of teachers and compared with the conditions of the College (20%-25% of the teachers shall have postgraduate education):

+ Current number of teachers can teach at College education level: 34
+ Number of teachers can proceed further study for postgraduate courses 10
+ Number of teachers to be recruited (from Master Degree level) 8

Thus, in order to have a group of teachers for improving Secondary Vocational Electrical School No.1 to be the College, the coming matters are:

- Training the current teachers in the limited ages (10 people) to have Master Degree majoring in the College's appropriate departments.
- Recruiting new and young teachers (postgraduate level) to supplement for the year 2000 to approach training tasks and to establish the training program's content.
- Training the other teachers who can not proceed for Master Degree, in professional ability, foreign language and computer skills.

3. Budget Plan of improving the College

The necessary budget for improving the College is in the below table (details in Annex X - from table 5 to table 7):

No.	Content	Amount of money (VND)
1	Training teachers	220,000,000
2	Building objectives, programs and subjects taught at the College	379,393,000
3	Materials for training	420,000,000
	Total	1,019,393,000

4. Specific plan of implementation (details in Annex X)

4.1. Sending teachers for postgraduate course:

- Quantity: maximum of 10 persons
- Academic year: from 2000
- Estimated Cost: 160,000,000 VND

4.2. Improving teachers

- Academic year: 1999-2000
- Estimated Cost: 60,000,000 VND

4.3. Recruiting more teachers

- 8 teachers to be recruited (from Master education)
- Academic year: 2000 -2001

4.4. Building training objectives and programs

- Academic year: 1999-2000
- Estimated cost: 379,393,000 VND

4.5. Buying materials for training purpose

- Before the year 2001
- Planned expenses: 42,000,000 VND

4.6. College admission

- From 2001-2002 school year
-Number of admission: 120 (3 classes)

C. TRAINING FUND AND ITS ALLOCATION

I. ADMISSION MECHANISM OF EVN IN THE NEW CONDITIONS

Bases to build up admission mechanism:
- The demand of labor in EVN and society.
- The regional labor force allocation (economic, industrial, remote areas)
- For the purpose of training development in the period 2000, 2005, 2010.
- -Circulars, guiding documents on enrolment activities of the Ministry of Education and Training, General Department of Vocational Training
- Labor Codes (Articles of Job Training Activities)
- Education Acts (applied since June 1,1999)

1. Vocational course (for workers)

Applicant:
High School Certificate (HSC) and Junior High School Certificate (JSC) (need further study which is equivalent to High School Certificate holder)
Training period:
- For level 2/7 workers: 18 months for HSC holders and 24 months for JSC holders
- For level3/7 workers: 24 months for HSC and 30 months for JSC holders

Process:

a) Training Course opened as ordered by EVN's unit (Duties assigned after completion)

Common rules: EVN plans when there is a demand. Students are only funded if they make contracts to work in the areas, which the sector assigned after graduated. Enrolment depends on the location where the training is needed (provinces or cities). The unit which is on labor demand must be responsible for the training expenses and assign duties for students after graduation. EVN will approve these plans.

- EVN's units make the plans for annually new-training demands which divide into occupations and location, and those are approved by EVN in the same planned year.
- EVN allocates the planned training norm for the training schools which is suitable to their strengths.
- EVN's units with training demand will contact with the training schools and assign duties after graduation.

b) Training for non-EVN's units and self full payment (training for the society's need)

Besides training as EVN's norm, the training schools also train financially sufficient students; those students pay school fees and look for jobs by themselves.
Companies and units outside EVN with training demands can sign training contracts with the training schools and have to pay full fees.

2. Professional Secondary School level Training

Applicants: High School graduates
Period: 30 months

Enrollment procedures:

General rules: Admission is like the regulation of the National admission which depends on the regions (provinces, cities, etc.) with demand. EVN grants funds to only students who have signed contracts (at and after entering the schools) for performing assigned works after graduated. Those Units which demand on labors or dispatch their staffs are responsible for paying the training expenses as well as creating jobs for those trained workers after their graduation. ENV makes admission plans when there is a demand of training. The processes are as follows:

- Based on the companies' and units' training demands, EVN makes training plans and reports to the Ministry of Education and Training.
- After receiving official letter about the admission's norm which is divided into provinces and cities from the Ministry of Education and Training, EVN makes the plans in detail.
- After being admitted, (applicants are informed about the labor demand in each EVN's unit), if the students wish to work for EVN and sign the contracts, EVN will pay the training expenses. Graduates will be assigned duties as agreed contracts.

The companies and the units with training demands have to pay full expenses for the training schools. Admitted students without agreed contracts with EVN have to pay full expenses by themselves.

3. Retraining and improving for cadres and engineers

Based on the plan of annual retraining and cadre-improving demands, EVN makes the norms for the training contents and expenses. Then it assigns the units and the training schools to manage.

Courses:
1. Retraining
2. Improving high-skilled workers: 4, 5, 6, 7/7
3. Training on topics for engineers and economic officers
4. Improving professions, computer, foreign language
5. Retraining for managers and leaders

4. Electrical Training

Applicants: High School or High School Leveled Vocational School graduates
Period: 36 months
General rule: As High School above

Processes:

+ After being admitted, students are granted the funds for the training courses if they have agreed to work as appointed and approved by EVN after graduated. (Students are informed about the regional training norms). After graduated, the students are assigned duties pursuant to the contract.
+ Students without contracts have to pay full fees and the EVN has no obligation to provide jobs after graduated.

II. EXPENSES MECHANISMS FOR TRAINING

1. Skill training

General rules:

- Locational training: The units with training demands need to contribute the fund. (The fees can be added to the Training expenses)
- Self-sufficiency (training for the society's needs): Students pay expenses by themselves.
- For training rural electrical manager, EVN is responsible to provide expenses for teaching materials, documents, and organizing classes. Students dispatched by the local Units have to pay expenses for travelling, foods, and accommodation.

2. High skill training

General rules:

- Locational training: Expenses of the courses are paid by the EVN's units which require the courses and (The fees can be added to the Training expenses)
- Training courses opened for society's needs: Expenses are paid by those who wish to study.

3. Re-training and improving

General rules:

- Retraining courses: Expenses of the courses are paid by the EVN's units which require the courses.
- Intensively improving courses: Expenses are mainly paid by the units requiring the courses while EVN only supports in finance or gives specific direction for referring the aims and requirements of each course.

D. STRENGTHEN EVN'S MANAGEMENT AND TRAINING ACTIVITIES

I. DEPARTMENTS OF TRAINING, MANAGEMENT, AND HUMAN RESOURCE DEVELOPMENT IN EVN

For the objective of Training and Human Resource Development for the whole sector in short-term and long-term strategies, it is a pressing demand to strengthen the Department of Training, Management, and Human Resource Development in EVN's entity.

This department constitutes a part in the Personnel Organizing and the Training Departments, acting for advising staffs of EVN and assisting EVN's leaders in human resource development of the whole sector, managing contents, plans, and costs of training courses intensively and sufficiently. It also studies educational and training policies and systems of the Party and the State so as to apply to EVN's training activities.

The Training Department is also responsible for setting up plans for upgrading cadres by co-operating with the Department of Cadre's Management and plans for new training courses, retraining, and improving worker's skill by co-operating with the Department of Labor and Wages. At the same time, being co-operated with the Department of Foreign Relations, it also promotes international co-operation in training and implements training programs and projects which are sponsored by or co-organized with external sides.

In order to fulfil the above functions and tasks, the following experts are needed in the department:

1. Experts are responsible for annually setting up new training plans, policies, and international co-operations.
2. Experts are responsible for teaching plans, curriculum, textbooks, teaching methods, management for both teachers and students.
3. Experts are responsible for intensively retraining for managing cadres, retraining cadres, and workers.

II. MANAGEMENT OF TRAINING ACTIVITIES IN EACH EVN'S UNITS UNDER EVN

Strengthen (or newly establishing) specialized departments in training under the Department of Labor Organization of each member units. In addition, with the assistance of the unit's director, this department defines the training demands, designs training and short and long term upgrading programs. Furthermore, this department is in charge of implementing on each activity concerning human-resource training, coordinating with the other training schools of EVN to make enrolment activities every year.

III. ALLOCATION OF RESPONSIBILITIES FOR TRAING ACTIVITIES BETWEEN EVN AND ITS UNIT COMPANIES UNDER EVN

1. EVN is responsible for:

- Studying human-resource development strategy for the whole sector.
- Designing plans on engineer training in colleges and technical schools for retraining course, domestic or foreign training courses, etc.
- Allocating responsibilities and approving the aim for training and the plan on training expenses for the EVN's units. Furthermore, directing the implementation of the above after the units have been approved.
- Directly controlling each training school, summarizing the training and improving activities in the whole sector.

2. EVN's unit companies are responsible for:

2.1. Independent expense-accounting units

- Designing plans on the demands for training and the annually training expense of the unit companies for EVN's approval and implementation.
- Signing the training contracts with EVN's training schools (under the plans with EVN's approval). Coordinating with the schools in the implementation.

2.2. Dependent cost-accounting units

- Designing plans on annually training expenses of the units for EVN's approval and implementation **Training schools**

- Setting up course plans and programs under the direction of relevant organizations, agencies for EVN's approval and implementation.
- Setting up plans on annually training expenses for EVN's approval and implementation.
- Holding enrolment under the EVN's planned targets, and reporting to EVN and relevant Ministries.
- Arranging to upgrade courses for teachers, organizing productions, promoting construction activities on material bases for teaching and training.
- Signing the training contracts with EVN's units. (self-financing method), and reporting to EVN.

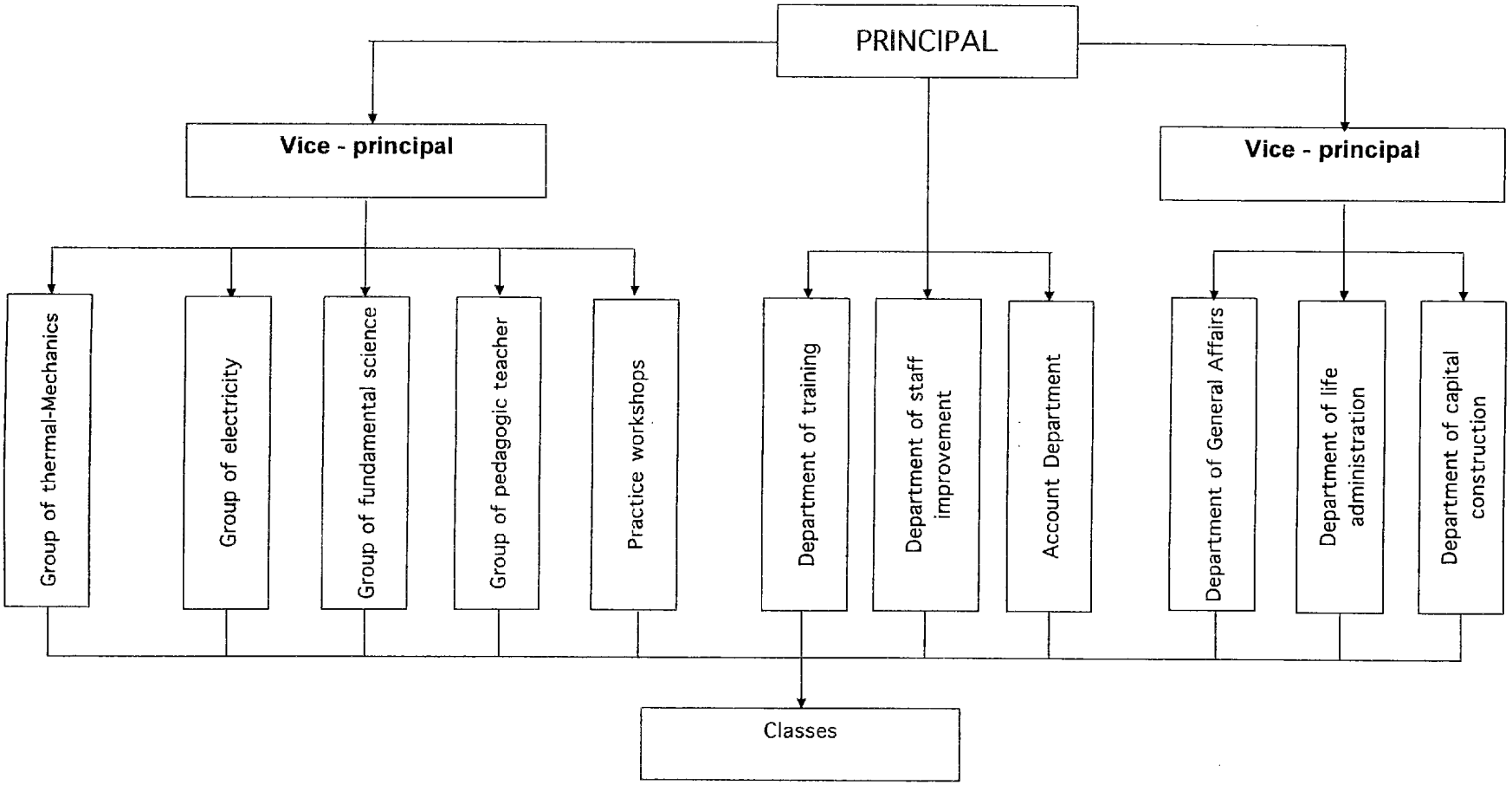
- Units outside EVN (training for society's needs) also can sign the training contracts on the base of keeping the balance of revenues and expenses, and must be reported to EVN. Accepted training for society's needs must be guaranteed in quality and no influence on EVN's planed activities.
- Signing co-organized training contracts for basic training with domestic or foreign training schools if approved by EVN.

BIBLIOGRAPHY

1/ Prime Minister's Decision No: 725TTg dated Sep. 3rd, 1997 "Approval: Electricity Development Master Plan in 1996 to 2000 "
2/ Annual Report 1998 of Vietnam Electricity
3/ Decision of Minister of Education and Training No: 781/Education and Training dated Mar. 3rd, 1997. " Regulations about State-funded Professional School"
4/ Resolution of 2nd Meeting of Party Politburo Committee (8th Round) " Strategic Orientation for Education and Training Development in Industrialisation and Modernization
5/ Code of Labor
6/ Education Act
7/ Circular No: 98/1997/TT-BTC dated Feb. 6th, 1997, and Amendment to Circular 98 No: 16/1998/TT-TBC dated Feb. 2nd, 1998
8/ Ministry of Finance: " Direction on Finance Management of Administration agencies in the State Corporation.
9/ Joint Circular No: 01/1999/TTLT/BVGCP-BCN dated Feb. 10th, 1999 of Government Pricing Committee and Ministry of Industry " Direction on selling price of consuming - electricity to household " (Part 4: Responsibilities in management of electricity in rural areas)
10/ Management Hierarchy between EVN and its companies, units.
11/ Statistics on present labor-force of EVN's companies before Dec. 31st, 1998
12/ Statistics on retrained labor-force of EVN and its companies and units
13/ Statistics: " Estimation on demand for newly trained workers " of EVN in the period from 1999 - 2010
14/ Project on Objective, Training Program of Electrical College level of Secondary Vocational Electrical School No.1
15/ Report on feasibility study of project of Electricity training centers in Southern area.
16/ Report on feasibility study (revised) of project of Hanoi Electrician Training Center
17/ Decision of Principal of Secondary Vocational Electrical School No.1 No:47/DL1_THD1 dated May.13th,1993: "Regulation on the teacher's management activities
18/ Reports of training centers of EVN before Dec.31st,1998 on "Training, Enrolment and material, technical bases"

ORGANIZATION Chart OF Secondary Vocational ELECTRICAL SCHOOL No.1

Chart 1



ELECTRICITY OF VIETNAM

ANNEX

EVN'S TRAINING SCHOOL

REORGANISATION PROJECT

Hanoi 8/99

CONTENTS

OF THE ANNEX ATTACHED TO THE EVN'S TRAINING SCHOOL REORGANISATION PROJECT

Annex I: EXISTING ORGANISATION CHART OF EVN AND ITS TRAINING SCHOOLS

Annex II: EXISTING ORGANISATION AND PERSONNEL OF EVN'S TRAINING SCHOOLS

Chart 1. In-service Training School: Organisation chart
Chart 2. Training School for Electrical Technique: Organisation chart
Chart 3. Secondary Vocational Electrical School No.1: Organisation chart
Chart 4. Training School for Electric-Mechanics: Organisation chart
Chart 5. Secondary Vocational Electrical School No.2: Organisation chart
Chart 6. Secondary Vocational Electrical School No.3: Organisation chart
Chart 7. Overall Personnel Situation of EVN's Training Schools
Chart 8. Overall Personnel Situation of Secondary Electrical Vocational School No.1 & In-service Training School
Chart 9. Overall Personnel Situation of Training School for Electric-Mechanics & Training School for Electrical Technique

Annex III: ENROLMENT SITUATION AND TRAINING BUDGET OF EVN'S TRAINING SCHOOLS

Table 1. Enrolment for secondary level for period 1995-1998
Table 2. Enrolment for worker level for period 1995-1998
Table 3. Budget for training from 1995 to 1998

Annex IV: EXISTING TEACHER SITUATION

Table 1. Overall teacher situation of EVN's training schools
Table 2. Overall teacher situation of Secondary School No.1 and In-service Training School
Table 3. Overall teacher situation of Training School for Electrical Technique and Training School for Electri-Mechanics

Annex V: CALCULATION OF TRAINING SCHOOLS' PERSONNEL AFTER INTEGRATION

Annex VI: EVN'S OVERALL PERSONNEL SITUATION (as of 12/1998)

Annex VII: TOTAL PERSONNEL TAKEN TRAINING AND IMPROVEMENT COURSES HELD BY EVN

Annex VIII: LABOUR DEMAND FORECAST FOR THE WHOLE EVN

Annex IX: RETRAINING AND IMPROVEMENT PLAN FOR EVN'S PERSONNEL

Annex X: LIST OF PREMISES, EQUIPMENT AND PERSONNEL FOR ELECTRICAL COLLEGE

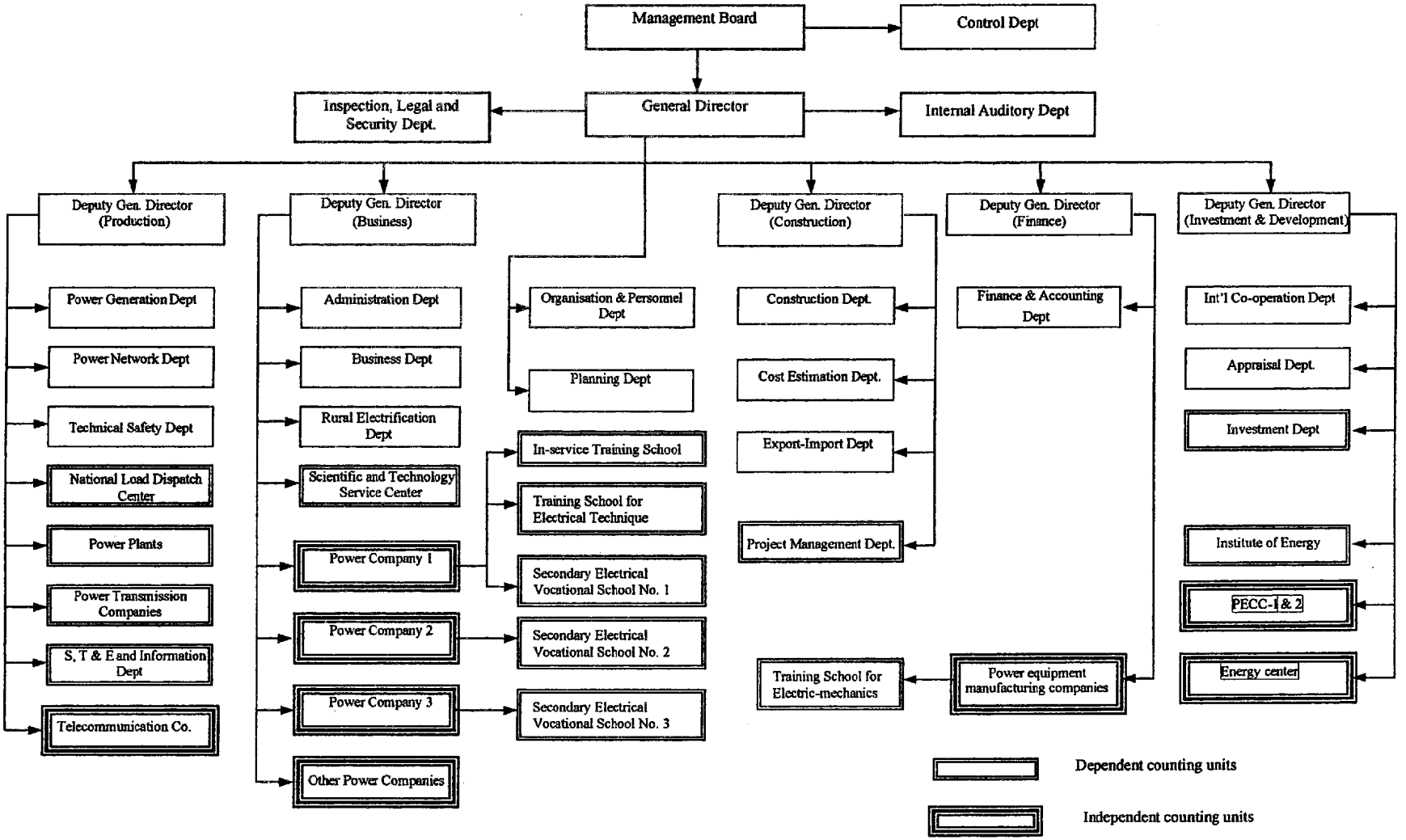
Table 1. Existing premises and equipment in Branch 2
Table 2. Existing premises and equipment in the Headoffice
Table 3. Number of teacher necessary for college level
Table 4. Training and improvement budget
Table 5. Budget for setting up targets, programs and curricula at college level
Table 6. Book expenses

Annex XI: LIST OF PREMISES AND EQUIPMENT IN TRAINING SCHOOL FOR ELECTRICAL TECHNIQUE

Table 1. List of existing premises and equipment in Branch 1
Table 2. List of existing premises and equipment in Branch 2

Annex XII: ORGANISATION CHART OF EVN AND ITS TRAINING SCHOOLS AFTER REORGANISATION

Annex I: Existing Organization Chart of EVN & its training schools



Annex II

PHỤ LỤC II

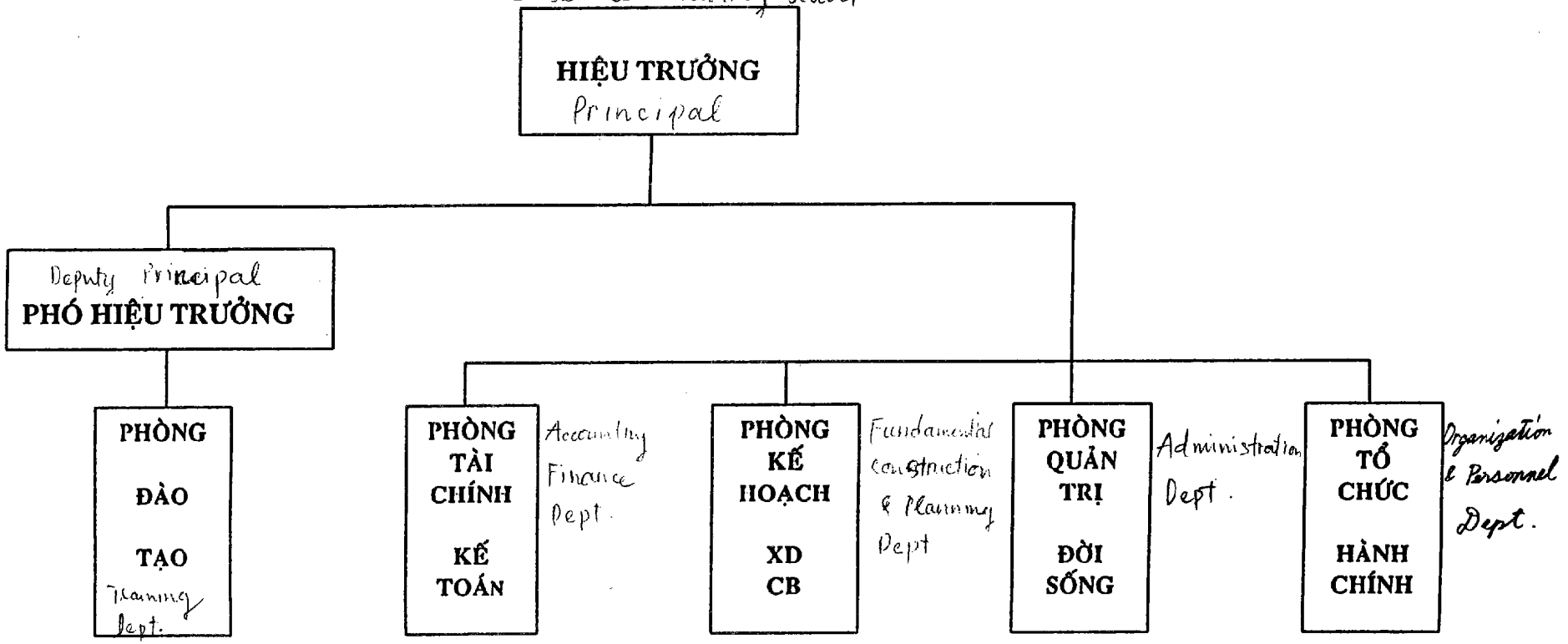
Biểu1 :

chart1

Organisation chart

SƠ ĐỒ TỔ CHỨC
TRƯỜNG BỒI DƯỠNG TẠI CHỨC

Inservice Training School



ANNEX II

PHỤ LỤC II

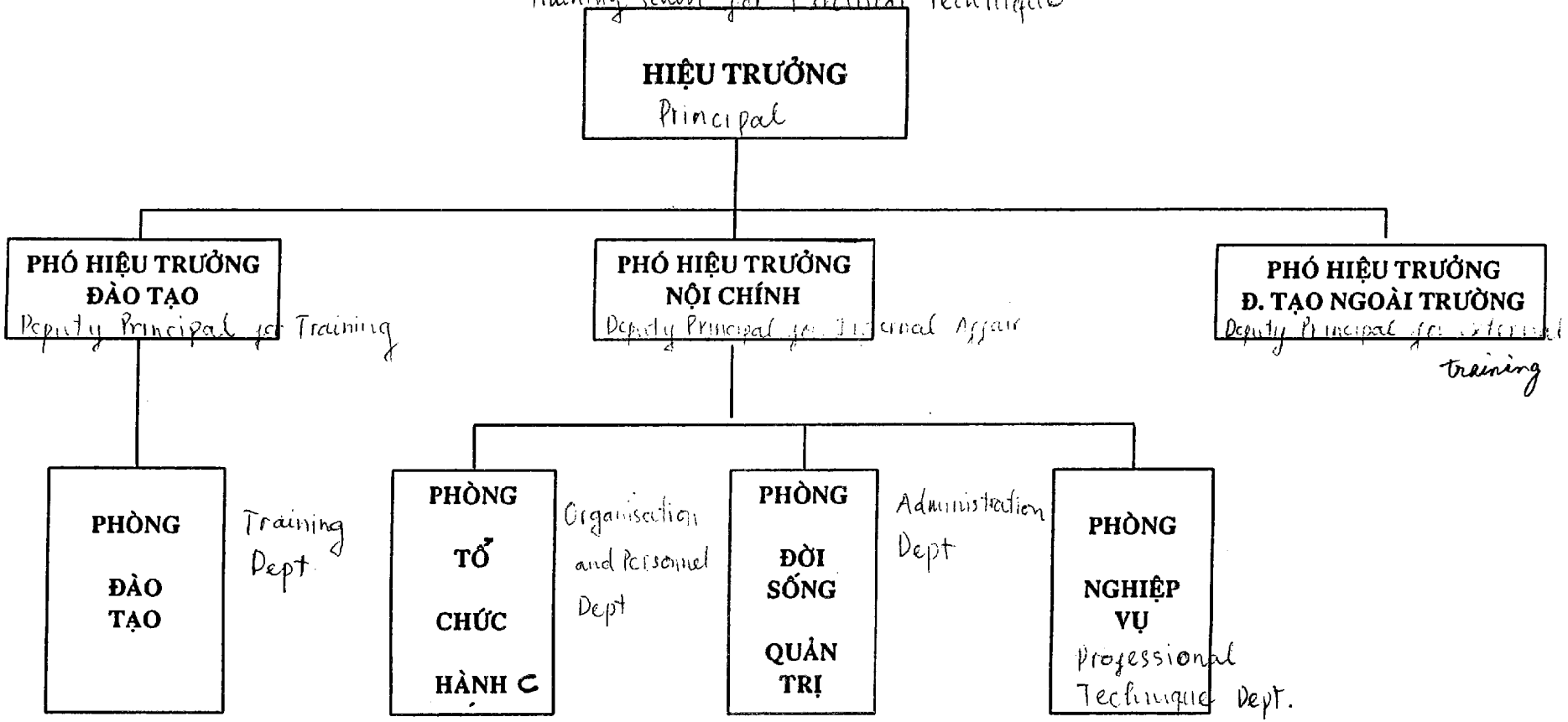
Biểu2 :

Chart 2

Organisation Chart

SƠ ĐỒ TỔ CHỨC
TRƯỜNG ĐÀO TẠO NGHỀ ĐIỆN

Training School for Electrical Technique



ANNEX II.

PHỤ LỤC II

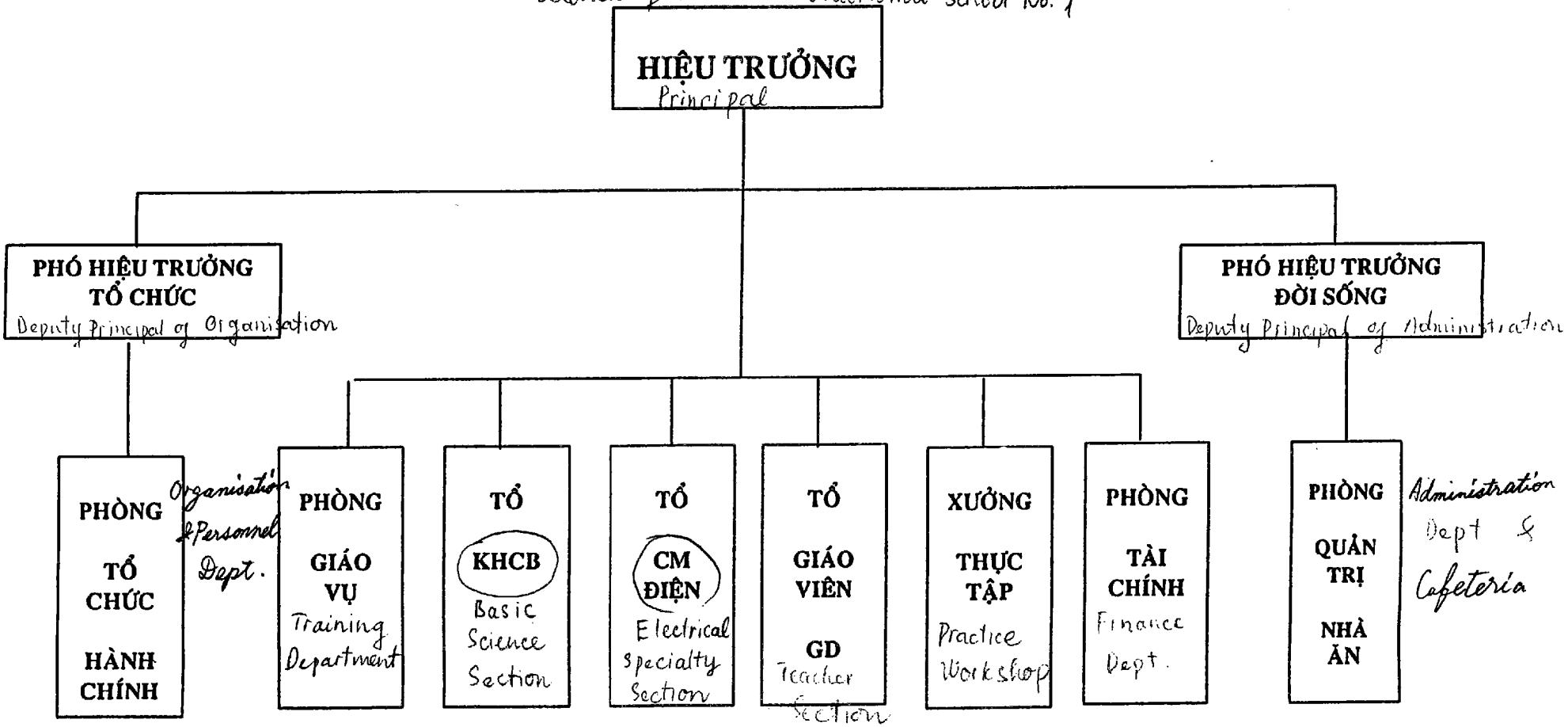
Biểu3 :

Chart 3

Organisation Chart

SƠ ĐỒ TỔ CHỨC
TRƯỜNG TRUNG HỌC ĐIỆN 1

Secondary Electrical Vocational School No. 1



ANNEX II

PHỤ LỤC II

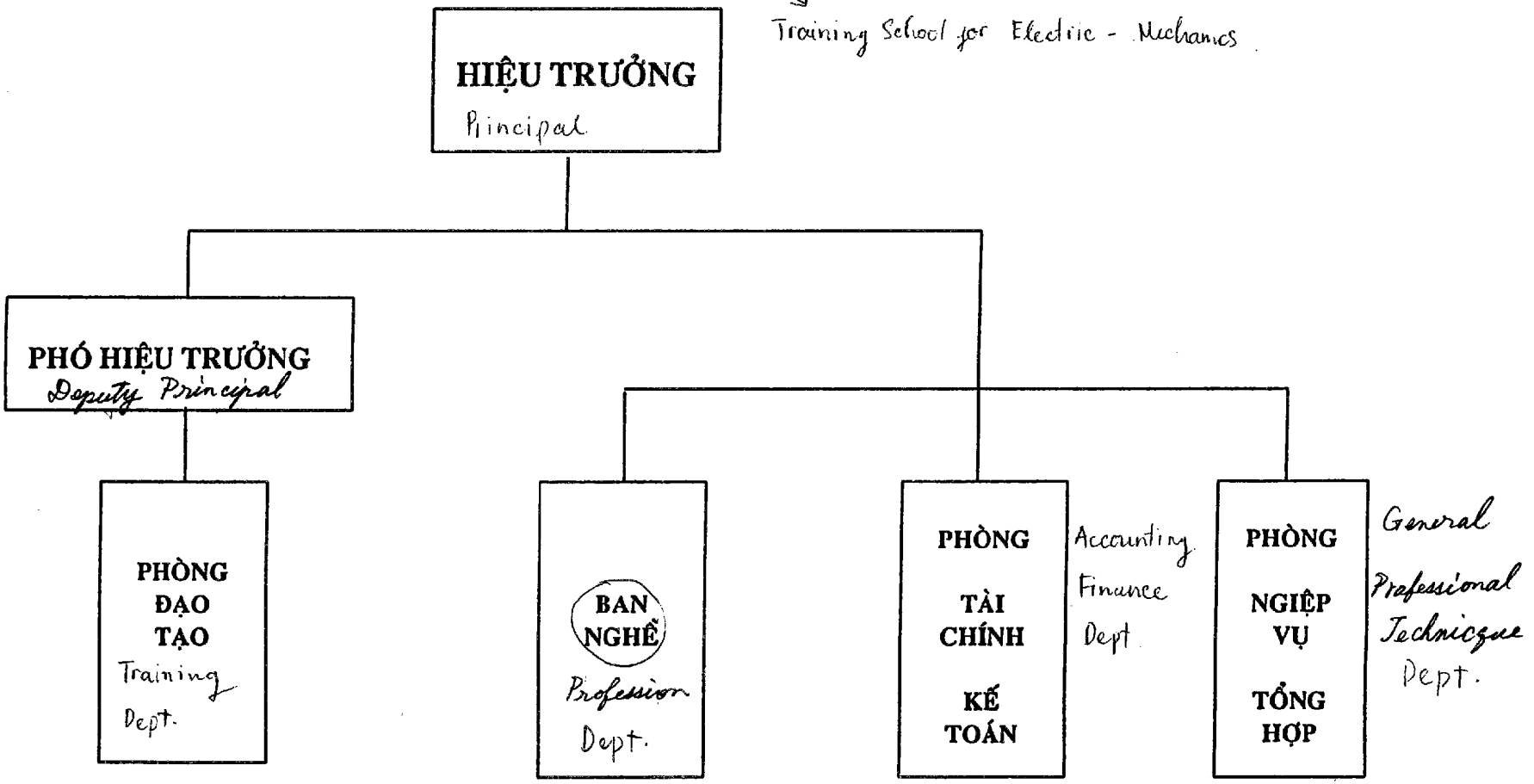
Biểu4 :

Chart 4

Organisation chart

SƠ ĐỒ TỔ CHỨC
TRƯỜNG ĐÀO TẠO NGHỀ CƠ ĐIỆN- ĐIỆN LỰC

Training School for Electric - Mechanics



Annex II

PHỤ LỤC II

Biểu5 :

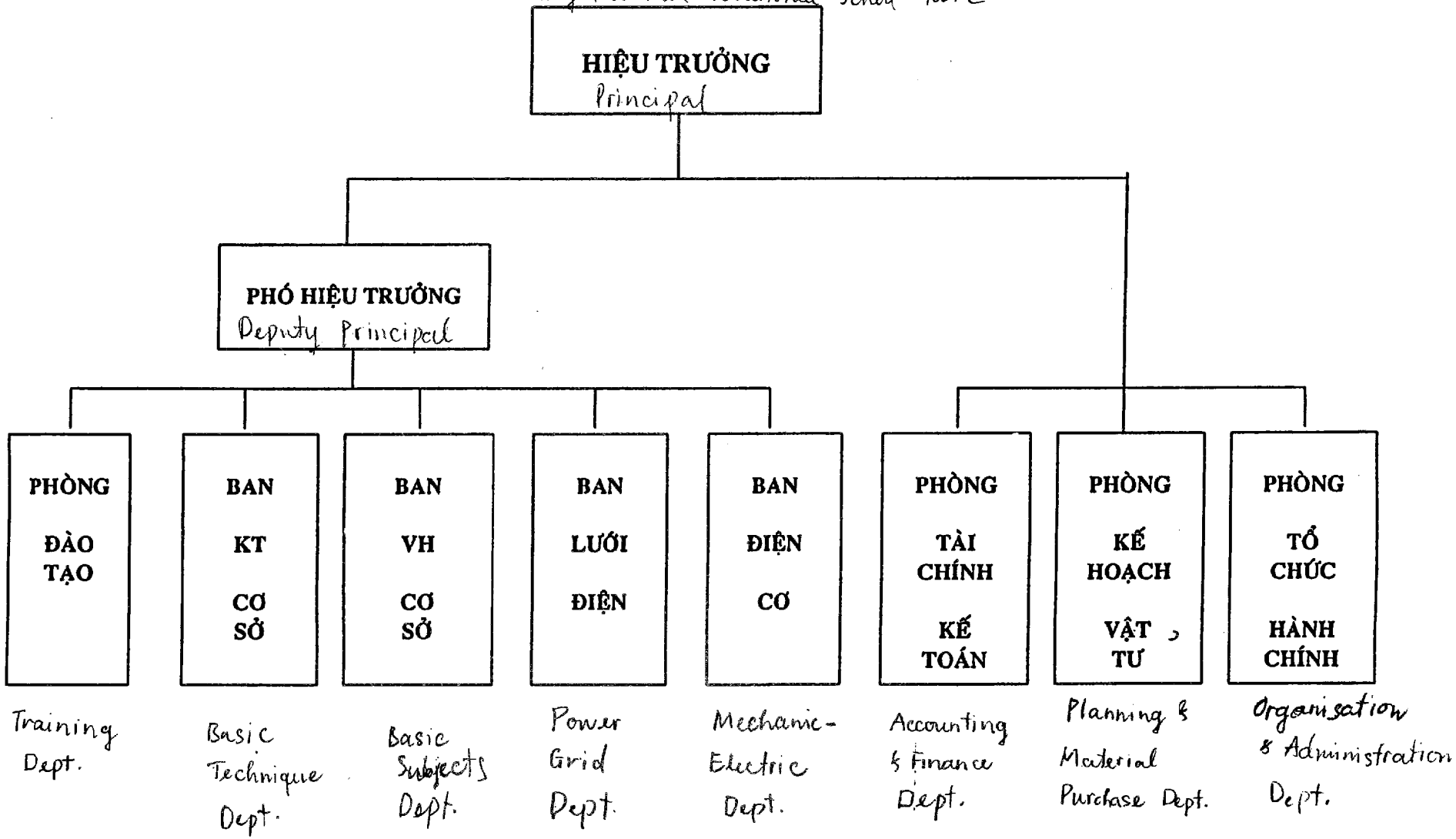
Chart 5

Organisation Chart

SƠ ĐỒ TỔ CHỨC

TRƯỜNG TRUNG HỌC ĐIỆN 2

Secondary Electrical Vocational School No. 2



ANNEX II

PHỤ LỤC II

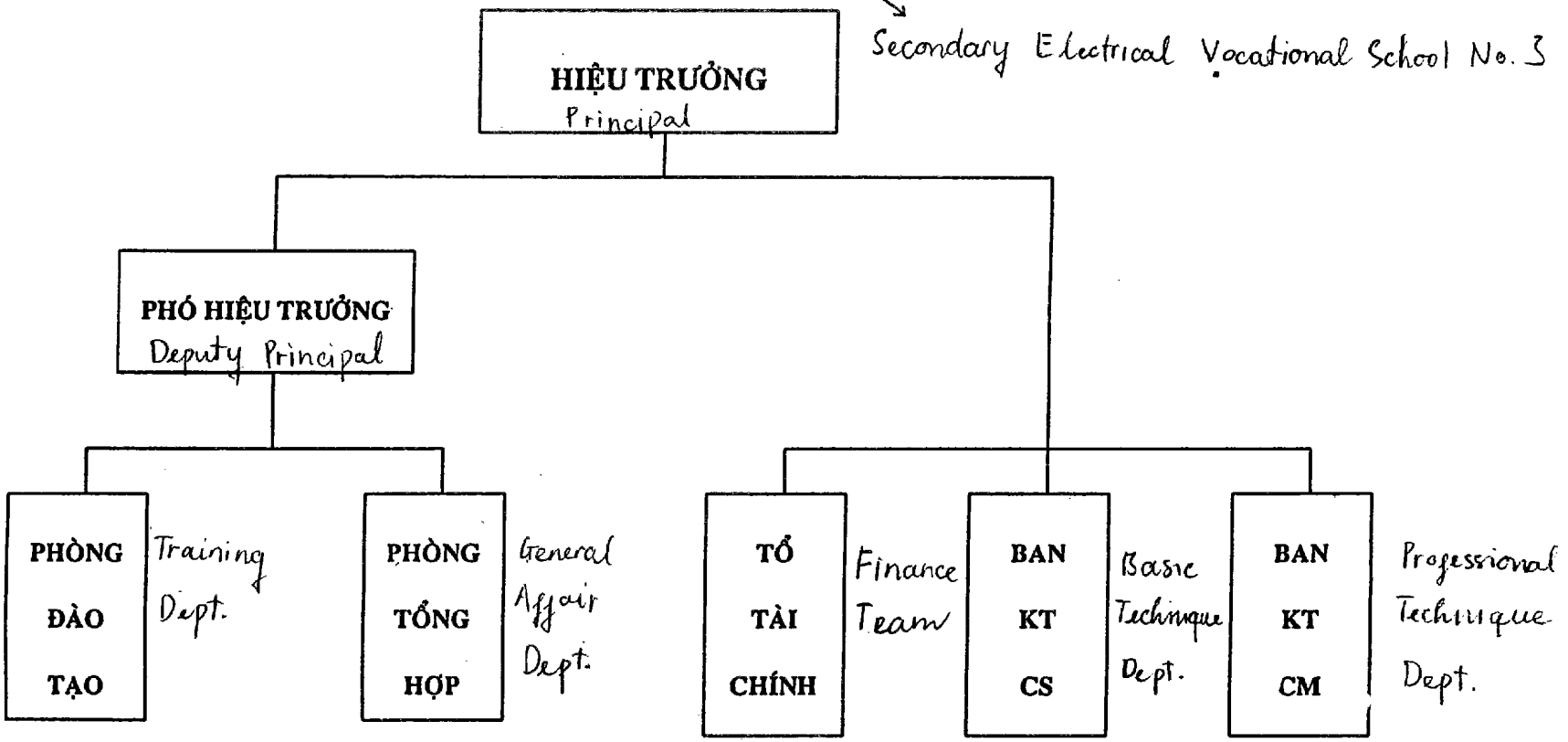
Biểu 6:

Chart 6

Organisation Chart

SƠ ĐỒ TỔ CHỨC
TRƯỜNG TRUNG HỌC ĐIỆN 3

Secondary Electrical Vocational School No. 3



ANNEX II
PHỤ LỤC II
Biểu 7:
Chart 7

OVERALL PERSONNEL SITUATION OF EVN'S TRAINING SCHOOLS

BẢNG TỔNG HỢP ĐỘI NGŨ CÁN BỘ - GIÁO VIÊN- CNV CÁC TRƯỜNG CỦA TỔNG CÔNG TY ĐIỆN LỰC VIỆT NAM

(As of December 1998)
(Tính đến tháng 12/1998)

Post Graduate, University, College, High school, Technical worker, Free labour

Số TT No.	Tên Trường School	Tổng số Total	Nam Male	Nữ Female	Trình độ chuyên môn Education						Độ tuổi Age				Remark Ghi chú
					Trên ĐH	Đại học	Cao đẳng	Trung học	CNKT	LĐ. P.thông	Dưới <35	Từ 35÷42	Từ 42÷50	Trên >50	
1	Trung tâm bồi dưỡng tại chức In-service Training School	50	30	20	0	21	2	6	21	0	11	9	18	12	
2	Trường đào tạo nghề điện Training School for Electrical Technique	104	61	43	0	10	29	25	14	26	13	30	36	25	
3	Trường đào tạo nghề cơ điện Điện lực Training School for Electric Mechanics	60	29	31	1	17	14	7	21	0	19	26	12	3	
4	Trường trung học điện1 Secondary Electrical Vocational School 1	86	53	33	2	37	1	20	26	0	13	29	20	24	
5	Trường trung học điện 2 Secondary Electrical Vocational School 2	87	55	32	2	34	5	10	16	20	25	30	22	10	
6	Trường trung học điện 3 Secondary Electrical Vocational School 3	54	35	19	0	21	2	14	5	12	15	26	11	2	
	Tổng cộng Total	**441**	**263**	**178**	**5**	**140**	**53**	**82**	**103**	**58**	**96**	**150**	**119**	**76**	

ANNEX II

PHỤ LỤC II

Biểu8: Chart 8

Overall Personnel Situation of Secondary Electrical Vocational School No 1 and In-service Training School

BẢNG TỔNG HỢP ĐỘI NGŨ CÁN BỘ - GIÁO VIÊN - CNV TRƯỜNG TRUNG HỌC ĐIỆN I VÀ TRƯỜNG BỒI DƯỠNG TẠI CHỨC

(Tính đến tháng 12/1998) (As of December 1998)

Postgraduate | University | College | Highschool | Technical worker | Free labour

Total Personnel

Số TT No.	School Tên trường	T. số CB-GV CNV	Male Nam	Female Nữ	Trình độ chuyên môn Education						Độ tuổi Age				Ghi chú Remark
					Trên ĐH	Đại học	Cao đẳng	Trung học	CNKT	LĐ P.thông	Dưới <35	Từ 35÷42	Từ 42÷50	Trên >50	
1.	Trung tâm bồi dưỡng tại chức Inservice Training School	50	30	20	0	21	2	6	21	0	11	9	18	12	
2.	Trường trung học điện I Secondary Electrical Vocational School No.1	86	53	33	2	37	1	20	26	0	13	29	20	24	
	Tổng cộng Total	136	83	53	2	58	3	26	47	0	24	38	38	36	

OVERALL PERSONNEL SITUATION OF TRAINING SCHOOL FOR ELECTRICAL TECHNIQUE & TRAINING SCHOOL FOR ELECTRIC - MECHANICS

ANNEX II
PHỤ LỤC II
Biểu9:
Chart 9

BẢNG TỔNG HỢP ĐỘI NGŨ CÁN BỘ, GIÁO VIÊN, CNV TRƯỜNG ĐÀO TẠO NGHỀ CƠ ĐIỆN ĐIỆN LỰC VÀ TRƯỜNG ĐÀO TẠO NGHỀ ĐIỆN

(As of 12/1998)

(Tính đến tháng 12/1998)

Total Personnel

Postgraduate

University

College

Highschool

Technical Worker

Free labour

Số TT No.	School Tên trường	T. số CB-GV CNV	Male Nam	female Nữ	Trình độ chuyên môn Education						Độ tuổi Age				Ghi chú Remark
					Trên ĐH	Đại học	Cao đẳng	Trung học	CNKT	LĐ P.thông	Dưới < 35	Từ 35÷42	Từ 42÷50	Trên > 50	
1.	Trường đào tạo nghề cơ điện điện lực	60	29	31	1	17	14	7	21	0	19	26	12	3	
2.	Trường ĐTN điện	104	61	43	0	10	29	25	14	26	13	30	36	25	
	Tổng cộng Total	164	90	74	1	27	43	32	35	26	32	56	48	28	

→ Training School for Electrical Technique

→ Training School for Electric - Mechanics

ANNEX III
PHỤ LỤC III

Table 1 : Enrolment for Secondary level for 1995-1998

BIỂU 1: TUYỂN SINH HỆ TRUNG HỌC NĂM 1995 - 1998

STT No.	NĂM Year / TÊN TRƯỜNG School	1995	1996	1997	1998
1.	Trường Trung học điện III Secondary Electrical Vocational School No. 3	33	37	50	87
2.	Trường Trung học điện II - ditto - No 2	74	70	78	111
3.	Trường Trung học điện I - ditto - No 1	100	110	110	175
	Cộng Total	**207**	**217**	**238**	**373**

Table 2 : Enrolment for worker level for 1995 - 1998

BIỂU 2: TUYỂN SINH HỆ CÔNG NHÂN NĂM 1995 - 1998

STT No.	NĂM Year / TÊN TRƯỜNG School	1995	1996	1997	1998
1.	Trường Đào tạo nghề Điện Training School for Electrical Technique	508	510	516	598
2.	Trường Cơ điện Điện lực Training School for Electric - Mechanics	100	216	210	208
3.	Trường Trung học điện II Secondary Electrical Vocational school No 2	177	155	156	209
4.	Trường Trung học điện III - ditto - No. 2	122	108	173	262
	Cộng Total	**907**	**989**	**1.055**	**1.277**

Table 3: Budget for Training from 1995 - 1998 ANNEX III

PHỤ LỤC III

BIỂU 3: KINH PHÍ CẤP PHÁT CHO ĐÀO TẠO TỪ NĂM 1995 - 1998

Year / NĂM	School / TÊN TRƯỜNG	Total granted / TỔNG SỐ CẤP	TRONG ĐÓ / In which		KP ngân sách cấp đạt % tổng kinh phí thực cấp
			Ngân sách cấp / From State budget	Tổng Công ty + Công ty cấp / Fr. EVN + Companies	
1995	1) Trung học điện III	1.101.417.000	1.101.417.000	0	100%
	2) Trung học điện II	1.510.000.000	0	1.510.000.000	0%
	3) Trung học điện I	2.423.256.984	641.403.000	1.781.853.984	26%
	4) Đào tạo nghề điện	1.873.939.000	0	1.873.939.000	0%
	5) ĐT nghề cơ điện ĐL	1.118.785.684	1.103.785.684	15.000.000	98%
	Total 1995 / Cộng năm 1995	8.027.398.668	2.846.605.684	5.180.792.984	35%
1996	Trung học điện III	994.059.000	994.059.000	0	100%
	Trung học điện II	1.579.007.354	0	1.579.007.354	0%
	Trung học điện I	1.308.266.964	638.222.000	625.044.964	52%
	Đào tạo nghề điện	1.736.349.916	180.000.000	1.556.349.916	10%
	ĐT nghề cơ điện ĐL	1.361.354.000	1.346.354.000	15.000.000	98%
	Total 1996 / Cộng năm 1996	6.979.037.234	3.203.635.000	3.775.402.234	46%
1997	Trung học điện III	1.005.740.000	985.740.000	20.000.000	98%
	Trung học điện II	1.759.654.090	288.930.590	1.470.723.500	16%
	Trung học điện I	1.632.474.786	833.722.000	798.752.786	51%
	Đào tạo nghề điện	2.711.664.000	899.341.000	1.812.323.000	33%
	ĐT nghề cơ điện ĐL	1.536.934.000	1.516.934.000	20.000.000	98%
	Total 1997 / Cộng năm 1997	8.646.466.876	4.524.667.590	4.121.799.286	52%
1998	Trung học điện III	1.514.399.000	200.000.000	1.314.399.000	13%
	Trung học điện II	2.126.400.000	0	2.126.400.000	0%
	Trung học điện I	2.436.778.000	324.000.000	2.111.878.000	13%
	Đào tạo nghề điện	3.404.831.218	218.490.000	3.186.341.218	6%
	ĐT nghề cơ điện ĐL	1.675.433.000	589.000.000	1.086.433.000	35%
	Total 1998 / Cộng năm 1998	11.157.841.218	1.331.490.000	9.826.351.218	11%
	Total 4 years / Cộng 4 năm (95 - 98)	34.810.743.960	11.907.298.238	22.903.445.722	34%

Percentage of State budget

1) Secondary Electrical Vocational School No 3
2) - ditto - No 2
3) - ditto - No. 1
4) Training School for Electrical Technique
5) Training School for Electric - Mechanics

ANNEX IV
PHỤ LỤC IV
Bảng 1:
Table 1

Overall teacher situation of EVN's training schools

BẢNG TỔNG HỢP ĐỘI NGŨ GIÁO VIÊN CÁC TRƯỜNG CỦA TỔNG CÔNG TY ĐIỆN LỰC VIỆT NAM

(Tính đến tháng 12/1998) (As of 12/1999)

Số TT No.	Tên Trường School	Tổng số Total	Male Nam	Female Nữ	Trình độ chuyên môn					Độ tuổi Age				Ghi chú Remark
					Trên ĐH	Đại học	Cao đẳng	Trung học	CNKT	Dưới < 35	Từ 35÷42	Từ 42÷50	Trên > 50	
1	Trường bồi dưỡng tại chức Inservia Training School	7	4	3	0	5	2	0	0	2	0	4	1	
2	Trường đào tạo nghề điện Training School for Electrical Technique	38	24	14	0	3	23	11	1	7	9	15	7	
3	Trường đào tạo nghề cơ điện điện lực Electric-Mechanics	32	17	15	1	16	14	1	0	9	9	12	2	
4	Trường trung học điện1 Secondary School 1 *	36	28	8	2	29	1	4	0	5	9	11	11	
5	Trường trung học điện 2 Secondary School 2 *	40	32	8	2	23	5	5	5	17	10	8	5	
6	Trường trung học điện3 Secondary School 3 *	27	25	2	0	19	2	4	2	10	12	5	0	
	Tổng cộng Total	**180**	**130**	**50**	**5**	**95**	**47**	**25**	**8**	**50**	**49**	**55**	**26**	

(* Secondary School = Secondary Electrical Vocational School)

Postgraduate ↓ University ↓ College ↓ Highschool ↓ Free labour

Overall teacher situation of Secondary School No 1 and
In - Service Training School

ANNEX IV
PHỤ LỤC IV
Bảng2:
Table 2

BẢNG TỔNG HỢP ĐỘI NGŨ GIÁO VIÊN
TRƯỜNG TRUNG HỌC ĐIỆN I VÀ TRƯỜNG BỒI DƯỠNG TẠI CHỨC

(Tính đến tháng 12/1998)

(As of 12/1998)

Total teachers — Education

Số TT No.	School Tên trường	T. số GV	Male Nam	Female Nữ	Trình độ chuyên môn					Độ tuổi Age				Ghi chú
					Trên ĐH	Đại học	Cao đẳng	Trung học	CNKT	Dưới < 35	Từ 35÷42	Từ 42÷50	Trên 50 > 50	Remark
1.	Trường bồi dưỡng tại chức Inservice Training School	7	4	3	0	5	2	0	0	2	0	4	1	
2.	Trường trung học điện I Secondary School No 1	36	28	8	2	29	1	4	0	5	9	11	11	
	Tổng cộng Total	**43**	**32**	**11**	**2**	**34**	**3**	**4**	**0**	**7**	**9**	**15**	**12**	

University — Highschool

Post graduate — College — Technical worker

Overall teacher situation of Training School for Electrical Technique and Training School for Electric-Mechanics.

ANNEX IV
PHỤ LỤC IV
Bảng 3:
Table 3

BẢNG TỔNG HỢP ĐỘI NGŨ GIÁO VIÊN
TRƯỜNG ĐÀO TẠO NGHỀ CƠ ĐIỆN ĐIỆN LỰC VÀ TRƯỜNG ĐÀO TẠO NGHỀ ĐIỆN

(Tính đến tháng 12/1998) (As of 12/1998)

Postgraduate ↑ University ↑ College ↑ Highschool ↑ Technical worker

Số TT No.	Tên trường School	T. số GV Total teacher	Nam Male	Nữ Female	Trình độ chuyên môn Education					Độ tuổi Age				Ghi chú Remark
					Trên ĐH	Đại học	Cao đẳng	Trung học	CNKT	Dưới < 35	Từ 35÷42	Từ 42÷50	Trên > 50	
1.	Trường đào tạo nghề cơ điện điện lực Training School for Electric-Mechanics	32	17	15	1	16	14	1	0	9	9	12	2	
2.	Trường đào tạo nghề điện Training School for Electrical Technique	38	24	14	0	3	23	11	1	7	9	15	7	
	Tổng cộng Total	**70**	**41**	**29**	**1**	**19**	**37**	**12**	**1**	**16**	**18**	**27**	**9**	

Annex V Calculation of Training Schools' personnel

Phụ lục V: TÍNH TOÁN SỐ LƯỢNG GIÁO VIÊN, CBCNV CỦA CÁC TRƯỜNG

I. Cơ sở để tính lượng giáo viên, CBCNV

Calculation bases

1. Theo số tiết học: Calculation by learning period

- Số tuần học trong một năm là (Total training weeks per year) : 52 tuần weeks
- Số tuần nghỉ hè, nghỉ tết là (Holidays) : 10 tuần weeks
- Số tuần thực học là (Actual learning weeks) : 42 tuần weeks
- Số tiết học bình quân trong 1 tuần là: 30tiết/tuần (Average periods per week) periods / week
- Số tuần giáo viên lên lớp trong một năm: 36 tuần (Lecturing weeks per year) weeks
- Số tiết giảng của giáo viên bậc Công nhân: 560 ÷ 630tiết/năm (Lecturing periods for worker level) periods / year
- Số tiết giảng của giáo viên bậc Trung học: 504 tiết/năm, (Lecturing periods for high school level) periods / year
- Số tiết giảng của giáo viên bậc Cao đẳng: 260 tiết/năm (Lecturing periods for college level) periods / year
- Số lượng giáo viên giáo dục : 150÷ 200 học sinh/giáoviên (No of students per teacher / Students / teacher)
- Tiêu chuẩn được hưởng của giáo viên chủ nhiệm lớp: 2 tiết/tuần (For class teacher) 2 periods aff / week

2. Theo định mức cán bộ công chức trong sự nghiệp giáo dục:

Calculation based on the criteria for education officials

a. Đối với trường CNKT: As for Technical worker training school

- Giáo viên: 8học sinh/ giáo viên Teacher : 8 students / teacher
- Cán bộ quản lý hành chính: 27 học sinh/1 người (Administration clerk) 27 students / person
- Cấp dưỡng: 25 học sinh/1người (caterer) 25 students / person
- Y tế: 150 học sinh/1người (Health care) 150 students / person

b. Đối với trường Trung học, bồi dưỡng cán bộ: As for Secondary School, In service T. Sch

- Giáo viên: 15học sinh/ giáo viên Teacher . 15 students / teacher
- Cán bộ quản lý hành chính: 18÷25 học sinh/1 người (Administration clerk) 18 → 25 students / pers
- Phục vụ giảng dạy: 30 học sinh/ 1 người (Lecture-supporting) 30 students / person
- Cấp dưỡng: 15÷ 25 học sinh/1người (Caterer) 15 → 25 students / person
- Y tế: 150 học sinh/1người (Healthcare) 150 students / person .

II. Số lượng giáo viên, CNV của Trường Trung học điện 1.

Number of personnel of Secondary school No 1

1. Cơ sở 1 Unit 1

- Giáo viên, quản lý giảng dạy: 300 học viên/ 16 = 18 người

Teacher, training-related staff : 300 students / 16 = 18 persons

Administration clerk - Cán bộ quản lý hành chính: 300 học viên/ 20 = 15 người 300 students / 20 = 15 p

Caterer - Cấp dưỡng: 300 học viên/ 19 = 16 người 300 students / 19 = 16 persons

Healthcare - Y tế: 300 học viên/ 150 = 2 người 300 students / 150 = 2 persons

2. Cơ sở 2 Unit 2

High school level teacher - Giáo viên bậc trung học: 450 học sinh/15 = 30 người 450 students / 15 = 30 pers

Administration clerk - Quản lý hành chính: 450 học sinh /25= 18 người 450 students / 25 = 18 perso

Service - Phục vụ: 450 học sinh/ 30 = 15 người 450 students / 30 = 15 persons

Health care - Y tế: 450 học sinh/ 150 = người 450 students / 150 = 3 persons

College teacher - Giáo viên bậc Cao đẳng: 42 người 42 person

Cộng (1+2): 159 người

Total (1+2) 159 persons

III. Số lượng giáo viên, CBCNV Trường đào tạo nghề điện lực

Number of personnel of Training School for Electrical Technique

Teachers - Giáo viên: 675 học sinh/ 8 = 85 người 675 students / 8 = 85 person

Administration - Cán bộ quản lý hành chính: 675 học sinh/ 27 = 25 người 675 students / 27 = 2

Caterer - Cấp dưỡng: 675 học sinh/ 25 = 27 người 675 students / 25 = 27 perso

Health care - Y tế: 675 học sinh/ 150 = 5 người 675 students / 150 = 5 persons

Cộng : 142 người

Total : 142 persons

EVN's overall existing personnel situation

BẢNG TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG HIỆN CÓ TRONG EVN

Tính đến tháng 12/1998 As of 12/1998

ANNEX VI

PHỤ LỤC VI

Biểu 1 Table 1

Divided by education & skill

Technical worker Level 5 up ↑ | Technical worker level 4 down ↑ | Free labour ↑

Số TT No.	Phân theo nhóm ngành Divided by sectors	Tổng số Total	Phân theo trình độ đào tạo và cấp bậc kỹ thuật								Ghi chú Remark
			Post graduate Trên đại học		Đại học University	Cao đẳng College	High school Trung học CN	CNKT Bậc 5 trở lên	CNKT Bậc 4 trở xuống	LĐ phổ thông	
			TS,PTS Doctor	Thạc sĩ Master							
1	2	3	4	5	6	7	8	9	10	11	12
1	Cơ khí động lực	3.429	-	3	577	13	224	1.506	993	113	
2	Luyện kim	3	-	-	3	-	-	-	-	-	
3	Hoá chất	761	1	-	69	3	8	192	433	55	
4	Mỏ, địa chất	449	-	-	146	2	59	133	99	10	
5	Xây dựng	1.401	-	1	418	-	229	206	357	190	
6	Điện, điện tử, tin học	37.050	29	22	5.005	375	4.681	9.931	15.814	1.193	
7	Dệt, May, Da giầy	-	-	-	-	-	-	-	-	-	
8	Bột và giấy	-	-	-	-	-	-	-	-	-	
9	Lương thực, thực phẩm	3	-	-	-	-	2	-	1	-	
10	Kinh tế	3.956	5	9	1.602	84	2020	66	121	49	
11	Pháp lý	98	-	-	80	-	16	-	-	2	
12	Ngoại ngữ	324	-	1	214	63	31	-	6	5	
13	Y, Dược	180	-	-	43	1	119	3	11	3	
14	Các ngành khác	9.336	11	4	493	35	447	1.448	5.125	1.773	
Total	Tổng cộng	56.990	46	40	8.654	576	7.836	13.485	22.960	3.393	

1. Power mechanics
2. Metallurgy
3. Chemical
4. Mining, Geology
5. Engineering
6. Electric, Electronics, Informatics
7. Textile, Garment, Leather
8. Paper & Pulp
9. Food, Food stuff
10. Economics
11. Law
12. Foreign language
13. Medical
14. Others

overall existing personnel sheet

BẢNG TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG HIỆN CÓ

As of 12/1998 ***Tính đến tháng 12/1998***

Khối hạch toán ĐL(5 Cty ĐL)

Independent counting companies (5 Power Co.)

ANNEX VI

PHỤ LỤCVI

Table 2 ***Biểu 2***

(Items same as table 1)

Số TT	Phân theo nhóm ngành	Tổng số	Phân theo trình độ đào tạo và cấp bậc kỹ thuật								Ghi chú
			Trên đại học		Đại học	Cao đẳng	Trụng học CN	CNKT Bậc 5 trở lên	CNKT Bậc 4 trở xuống	LĐ phổ thông	
			TS,PTS	Thạc sĩ							
1	2	3	4	5	6	7	8	9	10	11	12
1	Cơ khí động lực	*855*	-	-	195	3	92	224	339	2	
2	Luyện kim	*3*	-	-	3	-	-	-	-	-	
3	Hoá chất	*74*	1	-	21	2	7	15	19	9	
4	Mỏ, địa chất	*14*	-	-	11	-	3	-	-	-	
5	Xây dựng	*427*	-	-	91	-	76	50	173	37	
6	Điện, điện tử, tin học	*29.334*	14	5	3.598	342	3.620	7.986	13.013	756	
7	Dệt, May, Da giầy	-	-	-	-	-	-	-	-	-	
8	Bột và giấy	-	-	-	-	-	-	-	-	-	
9	Lương thực, thực phẩm	*3*	-	-	-	-	2	-	1	-	
10	Kinh tế	*3.107*	-	4	1.162	78	1.669	28	118	48	
11	Pháp lý	*60*	-	-	47	-	11	-	-	2	
12	Ngoại ngữ	*109*	-	1	75	16	11	-	6	-	
13	Y, Dược	*73*	-	-	20	1	50	2	-	-	
14	Các ngành khác	*5.758*	1	2	124	16	168	945	3.601	901	
	Tổng cộng	39.817	16	12	5.347	458	5.709	9.250	17.270	1.755	

Overall existing personnel sheet

BẢNG TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG HIỆN CÓ

Tính đến tháng 12/1998 As of 12/1998

Khối các nhà máy điện

Power plants

ANNEX VI

PHỤ LỤC VI

Table 3 Biểu 3

(Same as T: 1)

Số TT	Phân theo nhóm ngành	Tổng số	Phân theo trình độ đào tạo và cấp bậc kỹ thuật								Ghi chú
			Trên đại học		Đại học	Cao đẳng	Trụng học CN	CNKT Bậc 5 trở lên	CNKT Bậc 4 trở xuống	LĐ phổ thông	
			TS,PTS	Thạc sĩ							
1	2	3	4	5	6	7	8	9	10	11	12
1	Cơ khí động lực	*1.516*	-	1	120	5	49	1.009	302	30	
2	Luyện kim	-	-	-	-	-	-	-	-	-	
3	Hoá chất	*340*	-	-	21	1	1	169	102	46	
4	Mỏ, địa chất	*29*	-	-	2	-	3	19	5	-	
5	Xây dựng	*374*	-	-	37	-	54	121	71	83	
6	Điện, điện tử, tin học	*4.109*	-	1	445	14	748	1.101	1.422	378	
7	Dệt, May, Da giầy	-	-	-	-	-	-	-	-	-	
8	Bột và giấy	-	-	-	-	-	-	-	-	-	
9	Lương thực, thực phẩm	-	-	-	-	-	-	-	-	-	
10	Kinh tế	*324*	-	1	92	2	188	38	3	-	
11	Pháp lý	*6*	-	-	6	-	-	-	-	-	
12	Ngoại ngữ	*44*	-	-	27	10	2	-	-	5	
13	Y, Dược	*40*	-	-	4	-	24	1	11	-	
14	Các ngành khác	1.238	-	-	38	4	54	145	657	340	
	Tổng cộng	8.020	0	3	792	36	1.123	2.611	2.573	882	

BẢNG TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG HIỆN CÓ

Tính đến tháng 12/1998

Khối các Công ty truyền tải điện

Power Transmission Stations

ANNEX VI

PHỤ LỤC VI

(same as T.1)

Table 4 Biểu 4

Số TT	Phân theo nhóm ngành	Tổng số	Phân theo trình độ đào tạo và cấp bậc kỹ thuật								Ghi chú
			Trên đại học		Đại học	Cao đẳng	Trụng học CN	CNKT Bậc 5 trở lên	CNKT Bậc 4 trở xuống	LĐ phổ thông	
			TS,PTS	Thạc sĩ							
1	2	3	4	5	6	7	8	9	10	11	12
1	Cơ khí động lực	*47*	-	2	72	3	40	-	300	-	
2	Luyện kim	-	-	-	-	-	-	-	-	-	
3	Hoá chất	*4*	-	-	2	-	-	1	1	-	
4	Mỏ, địa chất	*1*	-	-	-	-	1	-	-	-	
5	Xây dựng	*155*	-	-	28	-	27	-	100	-	
6	Điện, điện tử, tin học	*2.415*	8	5	388	5	196	635	1.149	29	
7	Dệt, May, Da giầy	-	-	-	-	-	-	-	-	-	
8	Bột và giấy	-	-	-	-	-	-	-	-	-	
9	Lương thực, thực phẩm	-	-	-	-	-	-	-	-	-	
10	Kinh tế	*94*	2	2	72	-	18	-	-	-	
11	Pháp lý	*13*	-	-	10	-	3	-	-	-	
12	Ngoại ngữ	*78*	-	-	53	20	5	-	-	-	
13	Y, Dược	*34*	-	-	9	-	25	-	-	-	
14	Các ngành khác	977	3	1	16	14	81	257	493	112	
	Tổng cộng	4.188	13	10	650	42	396	893	2.043	141	

ANNEX VI
PHỤ LỤC VI
Table 5 - **Biểu 5**

BẢNG TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG HIỆN CÓ

Tính đến tháng 12/1998

Khối các công ty hạch toán độc lập khác

Other independent counting companies

(Same as T.1)

Số TT	Phân theo nhóm ngành	Tổng số	Phân theo trình độ đào tạo và cấp bậc kỹ thuật								Ghi chú
			Trên đại học		Đại học	Cao đẳng	Trung học CN	CNKT Bậc 5 trở lên	CNKT Bậc 4 trở xuống	LĐ phổ thông	
			TS,PTS	Thạc sĩ							
1	2	3	4	5	6	7	8	9	10	11	12
1	Cơ khí động lực	*531*	-	-	128	1	34	268	49	51	
2	Luyện kim	-	-	-	-	-	-	-	-	-	
3	Hoá chất	*323*	-	-	15	-	-	7	301	-	
4	Mỏ, địa chất	*374*	-	-	104	2	50	114	94	10	
5	Xây dựng	*208*	-	1	113	-	46	15	13	20	
6	Điện, điện tử, tin học	*971*	1	4	400	13	102	209	216	26	
7	Dệt, May, Da giầy	-	-	-	-	-	-	-	-	-	
8	Bột và giấy	-	-	-	-	-	-	-	-	-	
9	Lương thực, thực phẩm	-	-	-	-	-	-	-	-	-	
10	Kinh tế	*299*	1	-	176	3	118	-	-	1	
11	Pháp lý	*13*	-	-	13	-	-	-	-	-	
12	Ngoại ngữ	*47*	-	-	24	13	10	-	-	-	
13	Y, Dược	*16*	-	-	4	-	9	-	-	3	
14	Các ngành khác	*1.105*	6	1	193	-	102	95	371	337	
	Tổng cộng	3.887	8	6	1.170	32	471	708	1.044	448	

BẢNG TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG HIỆN CÓ

Tính đến tháng 12/1998

Khối hành chính sự nghiệp

Administration Unit

ANNEX VI

PHỤ LỤC VI

(Same as T. 1)

Table 6 *Biểu 6*

Số TT	Phân theo nhóm ngành	Tổng số	Phân theo trình độ đào tạo và cấp bậc kỹ thuật								Ghi chú
			Trên đại học		Đại học	Cao đẳng	Trung học CN	CNKT Bậc 5 trở lên	CNKT Bậc 4 trở xuống	LĐ phổ thông	
			TS,PTS	Thạc sĩ							
1	2	3	4	5	6	7	8	9	10	11	12
1	Cơ khí động lực	*21*	-	-	8	1	4	5	3	-	
2	Luyện kim	-	-	-	-	-	-	-	-	-	
3	Hoá chất	-	-	-	-	-	-	-	-	-	
4	Mỏ, địa chất	-	-	-	-	-	-	-	-	-	
5	Xây dựng	*11*	-	-	10	-	1	-	-	-	
6	Điện, điện tử, tin học	*92*	6	7	75	1	3	-	-	-	
7	Dệt, May, Da giầy	-	-	-	-	-	-	-	-	-	
8	Bột và giấy	-	-	-	-	-	-	-	-	-	
9	Lương thực, thực phẩm	-	-	-	-	-	-	-	-	-	
10	Kinh tế	*40*	2	2	30	1	5	-	-	-	
11	Pháp lý	-	-	-	-	-	-	-	-	-	
12	Ngoại ngữ	*2*	-	-	2	-	-	-	-	-	
13	Y, Dược	*1*	-	-	1	-	-	-	-	-	
14	Các ngành khác	*42*	1	-	19	-	4	-	1	17	
	Tổng cộng	209	9	9	145	3	17	5	4	17	

BẢNG TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG HIỆN CÓ

Tính đến tháng 12/1998

Khối đơn vị sự nghiệp kinh tế

Economic Non-productive Unit

ANNEX VI

PHỤ LỤC VI

(Same as T.1)

Table 7 *Biểu 7*

Số TT	Phân theo nhóm ngành	Tổng số	Phân theo trình độ đào tạo và cấp bậc kỹ thuật								Ghi chú
			Trên đại học		Đại học	Cao đẳng	Trung học CN	CNKT Bậc 5 trở lên	CNKT Bậc 4 trở xuống	LĐ phổ thông	
			TS,PTS	Thạc sĩ							
1	2	3	4	5	6	7	8	9	10	11	12
1	Cơ khí động lực	*89*	-	-	54	-	5	-	-	30	
2	Luyện kim	-	-	-	-	-	-	-	-	-	
3	Hoá chất	*29*	-	-	10	-	-	-	10	-	
4	Mỏ, địa chất	*31*	-	-	29	-	2	-	-	-	
5	Xây dựng	*226*	-	-	139	-	25	12	-	50	
6	Điện, điện tử, tin học	*129*	-	-	99	-	12	-	14	4	
7	Dệt, May, Da giầy	-	-	-	-	-	-	-	-	-	
8	Bột và giấy	-	-	-	-	-	-	-	-	-	
9	Lương thực, thực phẩm	-	-	-	-	-	-	-	-	-	
10	Kinh tế	*92*	-	-	70	-	22		-	-	
11	Pháp lý	*6*	-	-	4	-	2	-	-	-	
12	Ngoại ngữ	*44*	-	-	37	4	3	-	-	-	
13	Y, Dược	*16*	-	-	5	-	11	-	-	-	
14	Các ngành khác	*216*	-	-	103	1	38	6	2	66	
	Tổng cộng	869	-	-	550	5	120	18	26	150	

Total Personnel taken training & improvement courses held by EVN

TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG ĐÃ QUA CÁC LỚP BỒI DƯỠNG CỦA EVN

Tính đến tháng 12/1998 As of 12/1999

ANNEX VII

PHỤ LỤC VII

Training course taken

Table 1 **Biểu 1**

Số TT No.	Chức danh quản lý Position	Tổng số Total	Đã qua các lớp bồi dưỡng					
			Political Theory Lý luận CT		Quản lý Business kinh Management tế	Quản lý Administration hành Management chính	Chuyên Professional môn Skill N. vụ	Ngoại Foreign ngữ Language
			Cao 高 Senior cấp 級	Trung 中 Junior cấp 級				
1	2	3	12	13	14	15	16	17
1	***Cấp đơn vị trực thuộc TCT***							
a	LĐ Cty, Viện, trung tâm	*102*	7	13	28	7	13	34
b	Lãnh đạo BQLDA	*11*	-	5	4	2	-	-
c	Lãnh đạo nhà máy Leaders of Power Plants	*38*	3	8	10	1	3	13
d	T, P phòng, ban, tương đương	*492*	9	83	68	22	37	273
2	***Cấp đơn vị cơ sở*** Sub - subsidiaries							
a	LĐ nhà máy, XN, Trường	*165*	18	35	37	16	17	42
b	LĐ ĐL tỉnh, TP, Quận	*413*	36	99	104	41	51	82
c	T,P phòng, ban, PX, đội	*797*	22	244	151	40	144	196
3	**Ca, kíp, tổ, đội** Shift, team, group	*512*	2	42	13	1	391	63
4	**Chuyên viên KT, nghiệp vụ** Expert, Engineer	*1.601*	4	43	99	3	389	1.063
5	**Nhân viên** Clerk	*540*	1	11	19	14	353	142
6	**Công nhân** Worker	*733*	1	15	9	-	466	242
7	**Các loại khác** Others	*37*	5	7	5	-	-	20
	Tổng cộng Total	**5.441**	**108**	**605**	**547**	**147**	**1.864**	**2.170**

1. Subsidiaries & Dept.
   a. Leaders of Co, Inst, Center
   b. Leaders of project Management Committee
   d. Head, Deputy head of Dept.

2-a. Leaders of P/P, Training School.
   b. Leaders of provincial, districtal, P/S
   c. Head/Deputy of Dept., Section, Team

ANNEX VII

PHỤ LỤC VII

Table 2 *Biểu 2*

TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG ĐÃ QUA CÁC LỚP BỒI DƯỠNG

Tính đến tháng 12 /1998

Khối các Cty hạch toán độc lập (5 Cty ĐL)

Independent counting companies (5 power companies)

(Items same as table 1)

Số TT	Chức danh quản lý	Tổng số	Đã qua các lớp bồi dưỡng					
			Lý luận CT		Quản lý kinh tế	Quản lý hành chính	Chuyên môn N. vụ	Ngoại ngữ
			Cao cấp	Trung cấp				
1	2	3	12	13	14	15	16	17
1	*Cấp đơn vị trực thuộc TCT*							
a	LĐ Cty, Viện, trung tâm	*52*	4	5	12	7	9	15
b	Lãnh đạo BQLDA	-	-	-	-	-	-	-
c	Lãnh đạo nhà máy	-	-	-	-	-	-	-
d	T, P phòng, ban, tương đương	*172*	4	30	32	16	15	75
2	*Cấp đơn vị cơ sở*		-	-	-	-	-	-
a	LĐ nhà máy, XN, Trường	*101*	8	26	21	12	14	20
b	LĐ ĐL tỉnh, TP, Quận	*413*	36	99	104	41	51	82
c	T,P phòng, ban, PX, đội	*674*	17	233	138	32	129	125
3	Ca, kíp, tổ , đội	*474*	2	42	13	1	391	25
4	Chuyên viên KT, nghiệp vụ	*789*	3	25	77	-	294	390
5	Nhân viên	*331*	1	5	4	4	263	54
6	Công nhân	*588*	1	11	9	-	466	101
7	Các loại khác	*17*	5	6	5	-	-	1
	Tổng cộng	3.611	81	482	415	113	1.632	888

ANNEX VII

PHỤ LỤC VII

Table 3 Biểu 3

TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG ĐÃ QUA CÁC LỚP BỒI DƯỠNG

Tính đến tháng 12/1998

Khối các nhà máy điện

Power Plants

(Same)

Số TT	Chức danh quản lý	Tổng số	Đã qua các lớp bồi dưỡng					
			Lý luận CT		Quản lý kinh tế	Quản lý hành chính	Chuyên môn N. vụ	Ngoại ngữ
			Cao cấp	Trung cấp				
1	2	3	12	13	14	15	16	17
1	*Cấp đơn vị trực thuộc TCT*							
a	LĐ Cty, Viện, trung tâm	-	-	-	-	-	-	-
b	Lãnh đạo BQLDA	-	-	-	-	-	-	-
c	Lãnh đạo nhà máy	*36*	2	7	10	1	3	13
d	T, P phòng, ban, tương đương	*94*	-	21	4	-	5	64
2	*Cấp đơn vị cơ sở*		-	-	-	-	-	-
a	LĐ nhà máy, XN, Trường	*9*	-	-	3	3	-	3
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	*11*	-	1	-	2	-	8
3	Ca, kíp, tổ, đội	*34*	-	-	-	-	-	34
4	Chuyên viên KT, nghiệp vụ	*91*	-	3	-	3	-	85
5	Nhân viên	*3*	-	2	-	-	-	1
6	Công nhân	*98*	-	2	-	-	-	96
7	Các loại khác	*1*	-	-	-	-	-	1
	Tổng cộng	377	2	36	17	9	8	305

TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG ĐÃ QUA CÁC LỚP BỒI DƯỠNG

Tính đến tháng 12/1998

Khối các Cty Truyền tải điện

Power Transmission Stations

Annex VII

PHỤ LỤC VII

Table 4 *Biểu 4*

(Same)

Số TT	Chức danh quản lý	Tổng số	Đã qua các lớp bồi dưỡng					
			Lý luận CT		Quản lý kinh tế	Quản lý hành chính	Chuyên môn N. vụ	Ngoại ngữ
			Cao cấp	Trung cấp				
1	2	3	12	13	14	15	16	17
1	*Cấp đơn vị trực thuộc TCT*							
a	LĐ Cty, Viện, trung tâm	*23*	1	3	6	-	4	9
b	Lãnh đạo BQLDA	-	-	-	-	-	-	-
c	Lãnh đạo nhà máy	-	-	-	-	-	-	-
d	T, P phòng, ban, tương đương	*92*	3	10	12	3	17	47
2	*Cấp đơn vị cơ sở*							
a	LĐ nhà máy, XN, Trường	-	-	-	-	-	-	-
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	*29*	-	-	-	-	10	19
3	Ca, kíp, tổ , đội	-	-	-	-	-	-	-
4	Chuyên viên KT, nghiệp vụ	*100*	-	3	15	-	25	57
5	Nhân viên	*205*	-	3	15	10	90	87
6	Công nhân	*47*	-	2	-	-	-	45
7	Các loại khác	*2*	-	1	-	-	-	1
	Tổng cộng	498	4	22	48	13	146	265

TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG ĐÃ QUA CÁC LỚP BỒI DƯỠNG

Tính đến tháng 12/1998

Khối các đơn vị hạch toán độc lập khác

Other independent counting companies

(same)

ANNEX VIII

PHỤ LỤC VII

Table 5 *Biểu 5*

Số TT	Chức danh quản lý	Tổng số	Đã qua các lớp bồi dưỡng					
			Lý luận CT		Quản lý kinh tế	Quản lý hành chính	Chuyên môn N. vụ	Ngoại ngữ
			Cao cấp	Trung cấp				
1	2	3	12	13	14	15	16	17
1	*Cấp đơn vị trực thuộc TCT*							
a	LĐ Cty, Viện, trung tâm	*22*	2	4	9	-	-	7
b	Lãnh đạo BQLDA	-	-	-	-	-	-	-
c	Lãnh đạo nhà máy	-	-	-	-	-	-	-
d	T, P phòng, ban, tương đương	*82*	1	10	17	1	-	53
2	*Cấp đơn vị cơ sở*							
a	LĐ nhà máy, XN, Trường	*44*	9	6	10	1	1	17
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	*72*	5	8	12	5	1	41
3	Ca, kíp, tổ , đội	*4*	-	-	-	-	-	4
4	Chuyên viên KT, nghiệp vụ	*454*	1	5	7	-	70	371
5	Nhân viên	*1*	-	1	-	-	-	-
6	Công nhân	-	-	-	-	-	-	-
7	Các loại khác	*17*	-	-	-	-	-	17
	Tổng cộng	**696**	**18**	**34**	**55**	**7**	**72**	**510**

TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG ĐÃ QUA CÁC LỚP BỒI DƯỠNG

Tính đến tháng 12/1998

Khối các đơn vị hành chính sự nghiệp

Administration Unit

ANNEX VII

PHỤ LỤC VII

(Same)

Table 6 *Biểu 6*

Số TT	Chức danh quản lý	Tổng số	Đã qua các lớp bồi dưỡng					
			Lý luận CT		Quản lý kinh tế	Quản lý hành chính	Chuyên môn N. vụ	Ngoại ngữ
			Cao cấp	Trung cấp				
1	2	3	12	13	14	15	16	17
1	*Cấp đơn vị trực thuộc TCT*							
a	LĐ Cty, Viện, trung tâm	*5*	-	1	1	-	-	3
b	Lãnh đạo BQLDA	-	-	-	-	-	-	-
c	Lãnh đạo nhà máy	-	-	-	-	-	-	-
d	T, P phòng, ban, tương đương	*41*	-	9	1	-	-	31
2	*Cấp đơn vị cơ sở*							
a	LĐ nhà máy, XN, Trường	-	-	-	-	-	-	-
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	-	-	-	-	-	-	-
3	Ca, kíp, tổ, đội	-	-	-	-	-	-	-
4	Chuyên viên KT, nghiệp vụ	*123*	-	3	-	-	-	120
5	Nhân viên	-	-	-	-	-	-	-
6	Công nhân	-	-	-	-	-	-	-
7	Các loại khác	-	-	-	-	-	-	-
	Tổng cộng	169	-	13	2	-	-	154

Annex VII
PHỤ LỤC VII
Table 7 Biểu 7

TỔNG HỢP ĐỘI NGŨ LAO ĐỘNG ĐÃ QUA CÁC LỚP BỒI DƯỠNG

Tính đến tháng 12 /1998

Khối các Ban Quản lý dự án
Project Management Committees

(same)

Số TT	Chức danh quản lý	Tổng số	Đã qua các lớp bồi dưỡng					
			Lý luận CT		Quản lý kinh tế	Quản lý hành chính	Chuyên môn N. vụ	Ngoại ngữ
			Cao cấp	Trung cấp				
1	2	3	12	13	14	15	16	17
1	*Cấp đơn vị trực thuộc TCT*		-	-	-	-	-	-
a	LĐ Cty, Viện, trung tâm	-	-	-	-	-	-	-
b	Lãnh đạo BQLDA	*11*	-	5	4	2	-	-
c	Lãnh đạo nhà máy	*2*	1	1	-	-	-	-
d	T, P phòng, ban, tương đương	*11*	1	3	2	2	-	3
2	*Cấp đơn vị cơ sở*		-	-	-	-	-	-
a	LĐ nhà máy, XN, Trường	*11*	1	3	3	-	2	2
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	*11*	-	2	1	1	4	3
3	Ca, kíp, tổ , đội	-	-	-	-	-	-	-
4	Chuyên viên KT, nghiệp vụ	*44*	-	4	-	-	-	40
5	Nhân viên	-	-	-	-	-	-	-
6	Công nhân	-	-	-	-	-	-	-
7	Các loại khác	-	-	-	-	-	-	-
	Tổng cộng	**90**	**3**	**18**	**10**	**5**	**6**	**48**

DỰ BÁO NHU CẦU BỔ SUNG MỚI LAO ĐỘNG CẦN ĐÀO TẠO CÁC NGÀNH NGHỀ CỦA EVN

Labour demand forecast for the whole EVN

Annex VIII
PHỤ LỤC VIII

Table 1 Biểu 1

Số TT No.	Phân theo nhóm ngành Divided by sectors	1999 - 2000						2001 - 2005						2006 - 2010					
		Trên đại học Post graduate		Đại học University	Cao đẳng College	Trung học High School	Công nhân kỹ thuật Technical Worker	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật
		TS Doctor PTS	Thạc Master sĩ					TS, PTS	Thạc sĩ					TS, PTS	Thạc sĩ				
1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Cơ khí động lực	-	-	52	-	3	81	-	1	119	4	50	150	3	2	109	1	15	152
2	Hoá chất	-	-	7	2	3	5	-	-	23	3	1	25	1	-	36	3	1	19
3	Mỏ, địa chất	-	-	11	-	3	10	1	-	20	1	-	55	1	-	14	-	2	60
4	Xây dựng	-	3	54	2	5	100	2	3	72	2	1	53	1	3	68	-	2	53
5	Điện, điện tử, tin học	13	21	605	235	1.021	3.172	29	64	1.752	804	2.682	9.689	42	83	2.178	966	3.774	11.718
6	Kinh tế Economics	2	10	156	40	71	-	5	20	493	117	224	-	10	33	664	11	156	-
7	Pháp lý Law	-	-	23	1	-	-	1	20	29	-	-	1	3	24	47	-	-	-
8	Ngoại ngữ Foreign Language	2	2	9	1	1	-	-	-	35	1	-	-	-	-	37	2	-	3
9	Y, Dược Medical	-	-	-	-	2	-	-	-	9	-	8	2	-	-	6	-	9	-
10	Các ngành khác: Others	2	2	26	-	14	72	1	2	31	-	11	56	1	1	25	-	9	72
	Tổng cộng Total	19	38	943	281	1.123	3.440	39	110	2.583	932	2.977	10.031	62	146	3.184	983	3.968	12.077

1. Power - mechanics
2. Chemical
3. Mining. Geology
4. Engineering
5. Electric, Electronics, Informatics

Labour demand forecast

DỰ BÁO NHU CẦU BỔ SUNG MỚI LAO ĐỘNG CẦN ĐÀO TẠO CÁC NGÀNH NGHỀ

Khối hạch toán độc lập (5 Cty điện lực)

Independent counting companies (5 Power Companies)

Annex VIII

PHỤ LỤC VIII

Table 2 *Biểu 2*

(Same items as Table 1)

Số TT	Phân theo nhóm ngành	1999 - 2000						2001 - 2005						2006 - 2010					
		Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật
		TS PTS	Thạc sĩ					TS, PTS	Thạc sĩ					TS, PTS	Thạc sĩ				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Cơ khí động lực	-	-	4	-	1	8	-	-	16	-	3	8	1	-	28	1	5	12
2	Hoá chất	-	-	2	2	2	2	-	-	7	3	1	4	-	-	18	3	1	-
3	Mỏ, địa chất	-	-	5	-	-	-	-	-	5	1	-	-	-	-	-	-	-	-
4	Xây dựng	-	-	7	-	-	75	-	-	16	-	-	-	-	-	24	-	-	-
5	Điện, điện tử, tin học	7	10	200	92	826	2.740	16	37	1.340	743	2.243	8.249	31	63	1.867	966	3.460	10.471
6	Kinh tế	1	6	75	35	42	-	3	11	389	106	160	-	5	21	563	11	87	-
7	Pháp lý	-	-	7	1	-	-	1	20	13	-	-	1	3	24	35	-	-	-
8	Ngoại ngữ	2	2	-	1	-	-	-	-	19	1	-	-	-	-	23	2	-	-
9	Y, Dược	-	-	-	-	2	-	-	-	5	-	7	-	-	-	5	-	8	-
10	Các ngành khác:	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-
	Tổng cộng	10	18	300	131	873	2.837	20	68	1.810	854	2.414	8.262	40	108	2.563	983	3.561	10.483

Labour Demand Forecast

DỰ BÁO NHU CẦU BỔ SUNG MỚI LAO ĐỘNG CẦN ĐÀO TẠO CÁC NGÀNH NGHỀ

Khối các nhà máy điện

Power plants

Annex VIII

PHỤ LỤC VIII

Table 3 Biểu 3

(same as T. 1)

Số TT	Phân theo nhóm ngành	1999 - 2000						2001 - 2005						2006 - 2010					
		Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật
		TS PTS	Thạc sĩ					TS, PTS	Thạc sĩ					TS, PTS	Thạc sĩ				
1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Cơ khí động lực	-	-	20	-	1	45	-	-	53	2	47	131	1	-	19	-	10	119
2	Hoá chất	-	-	-	-	-	3	-	-	5	-	-	21	-	-	1	-	-	19
3	Mỏ, địa chất	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
4	Xây dựng	-	-	8	2	3	15	-	-	6	2	-	28	-	-	4	-	1	28
5	Điện, điện tử, tin học	-	-	81	4	43	73	-	-	95	10	81	283	-	-	28	-	3	84
6	Kinh tế	-	-	11	5	6	-	-	-	17	7	9	-	-	-	8	-	14	-
7	Pháp lý	-	-	4	-	-	-	-	-	4	-	-	-	-	-	1	-	-	-
8	Ngoại ngữ	-	-	2	-	1	-	-	-	2	-	-	-	-	-	-	-	-	3
9	Y, Dược	-	-	-	-	-	-	-	-	3	-	1	2	-	-	-	-	-	-
10	Các ngành khác:	-	-	5	-	-	6	-	-	3	-	-	19	-	-	-	-	-	22
	Tổng cộng	-	-	131	11	54	142	-	-	188	21	138	484	1	-	62	-	28	275

Labour Demand Forecast

DỰ BÁO NHU CẦU BỔ SUNG MỚI LAO ĐỘNG CẦN ĐÀO TẠO CÁC NGÀNH NGHỀ

Khối các Công ty Truyền tải điện và TTĐĐ HTĐ QG

Power Transmission Stations and National Power System Regulating Center

Annex VIII

PHỤ LỤC VIII

Table 4 *Biểu 4*

(Same as T.1)

Số TT	Phân theo nhóm ngành	1999 - 2000						2001 - 2005						2006 - 2010					
		Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật
		TS PTS	Thạc sĩ					TS, PTS	Thạc sĩ					TS, PTS	Thạc sĩ				
1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Cơ khí động lực	-	-	2	-	-	-	-	-	5	-	-	-	-	-	5	-	-	-
2	Hoá chất	-	-	2	-	-	-	-	-	7	-	-	-	-	-	7	-	-	-
3	Mỏ, địa chất	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Xây dựng	-	-	6	-	-	-	-	-	20	-	-	-	-	-	20	-	-	-
5	Điện, điện tử, tin học	2	3	199	135	130	313	4	11	222	48	358	1.119	2	7	185	-	310	1.119
6	Kinh tế	-	-	28	-	15	-	-	4	51	-	55	-	-	-	45	-	55	-
7	Pháp lý	-	-	2	-	-	-	-	-	6	-	-	-	-	-	6	-	-	-
8	Ngoại ngữ	-	-	3	-	-	-	-	-	9	-	-	-	-	-	9	-	-	-
9	Y, Dược	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Các ngành khác:	-	-	6	-	-	10	-	-	4	-	-	4	-	-	2	-	-	-
	Tổng cộng	2	3	248	135	145	323	4	15	324	48	413	1.123	2	7	279	-	365	1.119

Labour Demand Forecast

DỰ BÁO NHU CẦU BỔ SUNG MỚI LAO ĐỘNG CẦN ĐÀO TẠO CÁC NGÀNH NGHỀ

Khối các đơn vị hạch toán độc lập khác

Other independent counting units

Annex VIII

PHỤ LỤC VIII

Table 5 *Biểu 5*

(Same as T. 1)

Số TT	Phân theo nhóm ngành	1999 - 2000						2001 - 2005						2006 - 2010					
		Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật
		TS PTS	Thạc sĩ					TS, PTS	Thạc sĩ					TS, PTS	Thạc sĩ				
1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Cơ khí động lực	-	-	23	-	1	10	-	1	45	2	-	11	1	2	57	-	-	21
2	Hoá chất	-	-	3	-	1	-	-	-	4	-	-	-	1	-	10	-	-	-
3	Mỏ, địa chất	-	-	6	-	2	10	1	-	15	-	-	55	1	-	13	-	2	60
4	Xây dựng	-	1	15	-	-	5	1	1	19	-	1	25	1	1	18	-	1	25
5	Điện, điện tử, tin học	2	4	79	4	-	17	4	8	75	3	-	38	3	5	70	-	1	44
6	Kinh tế	-	-	25	-	-	-	-	1	23	4	-	-	-	-	32	-	-	-
7	Pháp lý	-	-	7	-	-	-	-	-	4	-	-	-	-	-	3	-	-	-
8	Ngoại ngữ	-	-	4	-	-	-	-	-	3	-	-	-	-	-	3	-	-	-
9	Y, Dược	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	1	-
10	Các ngành khác:	2	2	11	-	12	27	1	2	22	-	11	32	1	1	21	-	9	49
	Tổng cộng	4	7	173	4	16	69	7	13	211	9	12	161	8	9	228	-	14	199

Labour Demand Forecast

DỰ BÁO NHU CẦU BỔ SUNG MỚI LAO ĐỘNG CẦN ĐÀO TẠO CÁC NGÀNH NGHỀ

Khối hành chính sự nghiệp

Administration Unit

Annex VIII

PHỤ LỤC VIII

Table 6 *Biểu 6*

(Same as T. 1)

Số TT	Phân theo nhóm ngành	1999 - 2000						2001 - 2005						2006 - 2010					
		Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật
		TS PTS	Thạc sĩ					TS, PTS	Thạc sĩ					TS, PTS	Thạc sĩ				
1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Cơ khí động lực	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Hoá chất	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Mỏ, địa chất	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Xây dựng	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
5	Điện, điện tử, tin học	2	2	9	-	-	-	3	3	10	-	-	-	4	3	12	-	-	-
6	Kinh tế	1	-	2	-	-	-	2	-	2	-	-	-	2	2	3	-	-	-
7	Pháp lý	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Ngoại ngữ	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-
9	Y, Dược	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Các ngành khác:	-	-	2	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-
	Tổng cộng	3	2	13	-	-	-	6	3	17	-	-	-	6	5	19	-	-	-

Labour Demand Forecast

DỰ BÁO NHU CẦU BỔ SUNG MỚI LAO ĐỘNG CẦN ĐÀO TẠO CÁC NGÀNH NGHỀ

Khối sự nghiệp kinh tế

Economic non-productive unit

Annex VIII

PHỤ LỤC VIII

Table 7 *Biểu 7*

(same as T. 1)

Số TT	Phân theo nhóm ngành	1999 - 2000						2001 - 2005						2006 - 2010					
		Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật	Trên đại học		Đại học	Cao đẳng	Trung học	Công nhân kỹ thuật
		TS PTS	Thạc sĩ					TS, PTS	Thạc sĩ					TS, PTS	Thạc sĩ				
1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Cơ khí động lực	-	-	3	-	-	18	-	-	-	-	-	-	-	-	-	-	-	-
2	Hoá chất	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Mỏ, địa chất	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Xây dựng	-	2	18	-	2	5	-	2	10	-	-	-	-	2	2	-	-	-
5	Điện, điện tử, tin học	-	2	37	-	22	29	2	5	10	-	-	-	2	5	16	-	-	-
6	Kinh tế	-	4	15	-	8	-	-	4	11	-	-	-	3	10	13	-	-	-
7	Pháp lý	-	-	3	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-
8	Ngoại ngữ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Y, Dược	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Các ngành khác:	-	-	2	-	2	17	-	-	-	-	-	1	-	-	-	-	-	1
	Tổng cộng	-	8	78	-	35	69	2	11	33	-	-	1	5	17	33	-	-	1

Retraining & Improvement Plan for EVN's personnel

DỰ BÁO KẾ HOẠCH BỒI DƯỠNG ĐÀO TẠO LẠI ĐỘI NGŨ LAO ĐỘNG CỦA EVN

Annex IX
PHỤ LỤC IX
Table 1 Biểu 1

Political theory · Business Management · Administration Management · Professional Skill · Foreign language · Informatics

Số TT No.	Chức danh quản lý Position	1999 - 2000 Số lượng từng loại Subject						2001 - 2005 Số lượng từng loại						2006 - 2010 Số lượng từng loại					
		Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	*Cấp đơn vị trực thuộc TCT*																		
a	LĐ Cty, Viện, trung tâm	25	23	10	5	14	11	17	21	9	3	14	2	16	17	10	5	4	2
b	Lãnh đạo BQLDA	2	4	2	1	2	1	-	3	2	1	2	1	2	4	2	2	2	2
c	Lãnh đạo nhà máy	6	7	2	-	10	6	6	8	4	1	11	8	5	7	-	-	3	6
d	T, P phòng, ban, tương đương	121	146	70	36	146	118	87	143	65	36	132	109	116	107	69	56	106	102
2	*Cấp đơn vị cơ sở*																		
a	LĐ nhà máy, XN, Trường	81	60	55	37	72	38	88	101	54	74	89	37	100	103	54	83	78	48
b	LĐ ĐL tỉnh, TP, Quận	81	82	64	57	80	53	98	140	89	91	505	51	121	120	88	92	109	60
c	T,P phòng, ban, PX, đội	291	366	138	595	488	508	205	459	211	748	743	762	296	458	212	831	810	804
3	Ca, kíp, tổ, đội	31	87	11	1.270	193	124	41	47	12	2.686	315	273	37	37	10	3.669	497	395
4	Chuyên viên KT, nghiệp vụ	199	246	98	672	554	551	210	241	31	1.196	501	537	198	211	82	1.337	567	563
5	Nhân viên	31	6	30	412	371	365	69	23	21	934	605	617	70	25	23	1.047	526	642
6	Công nhân	42	33	14	6.092	1.453	980	72	25	13	10.307	1.827	1.383	165	23	21	12.712	1.046	1.903
7	Các loại khác	5	4	1	32	23	6	6	4	3	4	21	13	5	3	3	3	3	21
	Tổng cộng	915	1.064	495	9.209	3.406	2.761	899	1.215	514	16.081	4.765	3.793	1.131	1.115	574	19.837	3.751	4.548

Same as Annex VII table 1

Retraining & Improvement Plan

DỰ BÁO KẾ HOẠCH BỒI DƯỠNG ĐÀO TẠO LẠI ĐỘI NGŨ LAO ĐỘNG

Khối hạch toán độc lập (5 Cty điện lực)

Independent counting companies (5 Power Companies)

Annex IX

PHỤ LỤC IX

Table 2 *Biểu 2*

(Items same as T. 1)

Số TT	Chức danh quản lý	1999 - 2000						2001 - 2005						2006 - 2010					
		Số lượng từng loại						Số lượng từng loại						Số lượng từng loại					
		Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	*Cấp đơn vị trực thuộc TCT*																		
a	LĐ Cty, Viện, trung tâm	9	8	6	2	3	4	2	8	7	-	2	-	5	5	7	-	2	-
b	Lãnh đạo BQLDA	2	2	2	-	-	-	-	2	2	-	-	-	2	2	2	-	-	-
c	Lãnh đạo nhà máy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d	T, P phòng, ban, tương đương	44	43	26	3	26	16	23	45	28	4	20	15	52	51	30	7	20	15
2	*Cấp đơn vị cơ sở*																		
a	LĐ nhà máy, XN, Trường	40	36	30	31	37	26	57	82	52	56	62	30	74	77	52	61	57	27
b	LĐ ĐL tỉnh, TP, Quận	81	82	64	57	80	53	98	140	89	91	505	51	121	120	88	92	109	60
c	T,P phòng, ban, PX, đội	206	261	125	566	377	416	174	425	198	737	667	676	280	447	207	820	765	758
3	Ca, kíp, tổ , đội	21	33	3	1.167	112	86	38	45	11	2.653	215	248	35	35	10	3.647	441	391
4	Chuyên viên KT, nghiệp vụ	115	150	24	443	261	301	133	126	15	1.058	274	334	134	132	37	1.209	396	406
5	Nhân viên	2	4	1	308	207	221	30	2	-	846	436	466	6	1	1	947	478	519
6	Công nhân	9	12	-	5.558	302	327	17	13	1	9.810	703	759	15	13	1	12.160	1.023	1.150
7	Các loại khác	2	3	1	1	3	3	3	3	2	2	3	3	3	3	3	3	3	3
	Tổng cộng	531	634	282	8.136	1.408	1.453	575	891	405	15.257	2.887	2.582	727	886	438	18.946	3.294	3.329

Retraining & Improvement Plan

DỰ BÁO KẾ HOẠCH BỒI DƯỠNG ĐÀO TẠO LẠI ĐỘI NGŨ LAO ĐỘNG

Khối hạch toán phụ thuộc (Các nhà máy)

Dependent - counting unit (Power Plants)

Annex IX
PHỤ LỤC IX
Table 3 *Biểu 3*

(Same as T. 1)

Số TT	Chức danh quản lý	1999 - 2000						2001 - 2005						2006 - 2010					
		Số lượng từng loại						Số lượng từng loại						Số lượng từng loại					
		Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	*Cấp đơn vị trực thuộc TCT*																		
a	LĐ Cty, Viện, trung tâm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b	Lãnh đạo BQLDA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c	Lãnh đạo nhà máy	6	7	2	-	10	6	6	8	4	1	11	8	5	7	-	-	3	6
d	T, P phòng, ban, tương đương	14	35	12	8	34	29	6	35	10	3	32	21	11	-	10	13	22	31
2	*Cấp đơn vị cơ sở*																		
a	LĐ nhà máy, XN, Trường	5	1	-	-	3	4	5	4	1	2	5	5	2	2	1	2	-	-
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	20	15	11	6	54	49	13	21	12	5	54	67	6	3	3	5	20	20
3	Ca, kíp, tổ , đội	8	-	8	9	80	36	2	1	1	11	99	24	1	1	-	-	54	2
4	Chuyên viên KT, nghiệp vụ	17	41	21	33	76	75	11	47	2	34	85	90	11	46	10	35	30	32
5	Nhân viên	1	1	27	30	48	44	2	2	20	43	55	52	-	5	5	30	20	20
6	Công nhân	23	21	10	228	41	21	4	12	12	320	41	21	-	10	20	325	20	-
7	Các loại khác	1	1	-	2	1	1	1	1	1	2	-	-	-	-	-	-	-	-
	Tổng cộng	95	122	91	316	347	265	50	131	63	421	382	288	36	74	49	410	169	111

Annex IX
PHỤ LỤC IX
Table 4 Biểu 4

DỰ BÁO KẾ HOẠCH BỒI DƯỠNG ĐÀO TẠO LẠI ĐỘI NGŨ LAO ĐỘNG

Khối các công ty truyền tải và TTĐĐ

Power transmission stations & Regulating Center

(Same as T.1).

Số TT	Chức danh quản lý	1999 - 2000						2001 - 2005						2006 - 2010					
		Số lượng từng loại						Số lượng từng loại						Số lượng từng loại					
		Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	*Cấp đơn vị trực thuộc TCT*																		
a	LĐ Cty, Viện, trung tâm	11	8	1	1	9	4	7	7	1	2	7	-	7	7	1	3	1	1
b	Lãnh đạo BQLDA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c	Lãnh đạo nhà máy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d	T, P phòng, ban, tương đương	32	32	17	5	40	36	21	21	11	-	31	31	21	21	11	11	31	31
2	*Cấp đơn vị cơ sở*																		
a	LĐ nhà máy, XN, Trường	19	5	19	-	19	-	19	10	-	15	19	-	19	19	-	19	19	19
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	44	47	-	7	35	35	5	5	-	-	10	10	5	5	-	-	20	20
3	Ca, kíp, tổ , đội	-	-	-	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
4	Chuyên viên KT, nghiệp vụ	14	16	2	70	92	83	21	31	2	55	55	50	32	7	27	60	65	65
5	Nhân viên	15	-	-	54	92	92	30	10	-	25	92	92	60	15	15	50	15	95
6	Công nhân	10	-	-	84	1.109	631	50	-	-	103	1.082	602	150	-	-	155	2	752
7	Các loại khác	-	-	-	27	19	2	-	-	-	-	18	-	-	-	-	-	-	18
	Tổng cộng	145	108	39	250	1.416	884	153	84	14	200	1.314	785	294	74	54	298	153	1.001

Retraining & Improvement Plan

DỰ BÁO KẾ HOẠCH BỒI DƯỠNG ĐÀO TẠO LẠI ĐỘI NGŨ LAO ĐỘNG

Khối hạchtoán độc lập khác

Other independent counting units

Annex IX

PHỤ LỤC IX

Table 5 ***Biểu 5***

(Same as T.1)

Số TT	Chức danh quản lý	1999 - 2000						2001 - 2005						2006 - 2010					
		Số lượng từng loại						Số lượng từng loại						Số lượng từng loại					
		Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	*Cấp đơn vị trực thuộc TCT*																		
a	LĐ Cty, Viện, trung tâm	4	7	2	2	2	2	7	5	1	1	5	1	3	5	2	2	1	-
b	Lãnh đạo BQLDA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c	Lãnh đạo nhà máy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d	T, P phòng, ban, tương đương	24	26	11	17	44	36	33	31	12	21	34	32	24	27	10	17	23	14
2	*Cấp đơn vị cơ sở*																		
a	LĐ nhà máy, XN, Trường	10	13	6	6	10	8	6	5	1	1	2	2	5	5	1	1	2	2
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	5	29	2	16	8	4	8	3	1	6	6	9	5	3	2	6	5	6
3	Ca, kíp, tổ , đội	2	54	-	92	-	1	1	1	-	22	1	1	1	1	-	22	2	2
4	Chuyên viên KT, nghiệp vụ	8	9	44	97	73	57	10	3	5	18	42	36	11	1	2	16	44	29
5	Nhân viên	2	1	2	5	3	3	2	3	1	5	2	2	4	4	2	5	3	3
6	Công nhân	-	-	4	222	1	1	1	-	-	74	1	1	-	-	-	72	1	1
7	Các loại khác	2	-	-	2	-	-	2	-	-	-	-	10	2	-	-	-	-	-
	Tổng cộng	57	139	71	459	141	112	70	51	21	148	93	94	55	46	19	141	81	57

Retraining & Improvement Plan

DỰ BÁO KẾ HOẠCH BỒI DƯỠNG ĐÀO TẠO LẠI ĐỘI NGŨ LAO ĐỘNG

Khối các đơn vị sự nghiệp

Administration Units

Annex IX

PHỤ LỤC IX

Table 6 ***Biểu 6***

(Same as T.1)

Số TT	Chức danh quản lý	1999 - 2000						2001 - 2005						2006 - 2010					
		Số lượng từng loại						Số lượng từng loại						Số lượng từng loại					
		Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học	Lý luận C. trị	Qlý kinh tế	Q. Lý hành chính	C.môn nghiệp vụ	Ngoại ngữ	Tin học
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	*Cấp đơn vị trực thuộc TCT*																		
a	LĐ Cty, Viện, trung tâm	1	-	1	-	-	1	1	1	-	-	-	1	1	-	-	-	-	1
b	Lãnh đạo BQLDA	-	2	-	1	2	1	-	1	-	1	2	1	-	2	-	2	2	2
c	Lãnh đạo nhà máy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d	T, P phòng, ban, tương đương	7	10	4	3	2	1	4	11	4	8	15	10	8	8	8	8	10	11
2	*Cấp đơn vị cơ sở*																		
a	LĐ nhà máy, XN, Trường	7	5	-	-	3	-	1	-	-	-	1	-	-	-	-	-	-	-
b	LĐ ĐL tỉnh, TP, Quận	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
c	T,P phòng, ban, PX, đội	16	14	-	-	14	4	5	5	-	-	6	-	-	-	-	-	-	-
3	Ca, kíp, tổ , đội	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Chuyên viên KT, nghiệp vụ	45	30	7	29	52	35	35	34	7	31	45	27	10	25	6	17	32	31
5	Nhân viên	11	-	-	15	21	5	5	6	-	15	20	5	-	-	-	15	10	5
6	Công nhân	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Các loại khác	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tổng cộng	87	61	12	48	94	47	51	58	11	55	89	44	19	35	14	42	54	50

Annex X List of premises, equipment & personnel for Electrical Col

Phụ lục X: CƠ SỞ VẬT CHẤT KỸ THUẬT, NHÂN LỰC CHO TRƯỜNG CAO ĐẲNG ĐIỆN LỰC

Table 1 Existing premises and equipment in Branch 2

Bảng 1 Bảng tổng hợp cơ sở vật chất kỹ thuật hiện có ở cơ sở 2

STT No.	Tên tài sản cố định Items	Quy cách Specification	Công suất, DTích (capacity)	Số lượng (number)
1	**NHÀ THÍ NGHIỆM** Laboratory 2floors	2 tầng	723 m^2	01
2	Xưởng thực tập Practice Workshop	Cấp 4	1300 m^2	02
3	*Máy phát điện một chiều* DC generator	3kW	3kW	01
4	Von-Ampe-Watt mét K540		Tile roof house	02
5	Cầu đo điện trở XC P5206M Resistant Measuring Bridge			01
6	Xe 4 chỗ ngồi MAZDA 323 Car Mazda 323	Nhật		01
7	Xe 4 chỗ ngồi LADA 2107 Car Lada 2107			01
8	Xe tải 2,5 tấn MEKONG Truck 2.5tons Mekong			01
9	Xe ca 50 chỗ ngồi Coster 50 seats			01
10	Máy vi tính AT286 Computer AT286			03
11	Máy vi tính 386DX — 386 DX			02
12	Máy vi tính 486DX — 486 DX			01
13	Máy vi tính IBM — IBM			01
14	Máy vi tính SERVEX 2000 – servex 2000			10
15	Máy in kim FX 1050 Printer FX1050			01
16	Máy in kim LQ 1170 Printer LQ1170			01
17	Máy in laze 4L Laser printer 4L			01
18	Máy in laze 6L Laser printer 6L			02
19	Máy điều hoà nhiệt độ 2 cục 2 chiều Air Conditioner			03
20	Máy photocopy Photocopy machine			01
21	Bàn thử nghiệm công tơ Table for testing Watt			01
22	Động cơ điện xoay chiều Spinning Turbine		3,7 kW	01
23	Động cơ điện xoay chiều – ditto –		5,5 kW	02
24	Máy cắt điện nhiều dầu Oil-type Switch		6 kV	04
25	Mô hình trạm biến áp Transformer			01
26	Máy tiện Lathe			01
27	Máy khoan Driller			01
28	Dao động ký BS10 Fluctuation Recorder (or Frequency)			01

Annex X

PHỤ LỤC X

Table 2 Existing premises & equipment in the headoffice

Bảng 2: **Bảng tổng hợp cơ sở vật chất kỹ thuật hiện có ở cơ sở chính**

No. STT	Tên công trình, thiết bị máy móc Item	Số lượng, ghi chú Quantity, Remark
I	**Thiết bị nhà xưởng** Premises	Machine & equipment
1	***Phân xưởng cơ khí*** Mechanic workshop	27 loại máy và thiết bị
2	Phân xưởng cho kỹ thuật viên Engineer workshop	12 loại máy và thiết bị
3	Phân xưởng điện Electrical workshop	19 loại máy và thiết bị
4	Bãi thực tập ngoài trời Practice yard	36 loại máy và thiết bị
5	Nhà xưởng lắp đặt điện Electricity assembling workshop	11 thiết bị equipment
II	**Thiết bị phòng thí nghiệm** Laboratory	machine & equipment
Thermal Power Lab. 1	***Phòng thí nghiệm Nhiệt động lực học***	8 loại máy và thiết bị
Liquid - mechanics Lab. 2	Phòng thí nghiệm Cơ học chất lỏng	11 loại máy và thiết bị
Gas/Hydro Power Lab. 3	Phòng thí nghiệm Khí lực học/Thuỷ lực học	5 thiết bị equipment
Material checking Lab. 4	Phòng thí nghiệm Kiểm tra vật liệu	4 loại máy và thiết bị
Chemical Lab. 5	Phòng thí nghiệm Hoá	27 loại máy và thiết bị
Physical Lab 6	Phòng thí nghiệm Vật lý Experiment	(TN) 19 hạng mục items
Microscope Room 7	Phòng Kính hiển vi Microscope & sample preparation equipment	Kính hiển vi và TBị chuẩn bị mẫu soi
Electric – Electronics Lab. **III**	**Thiết bị phòng thí nghiệm Điện - Điện tử**	
Electric Lab. 1	***Phòng thí nghiệm Điện***	
Distribution & Transmission Lab. *a*	Phòng thí nghiệm Phân phối và truyền dẫn	13 máy và thiết bị machines &
Electric machine Lab. *b*	Phòng thí nghiệm Máy điện	63 máy và thiết bị equipment,
Relay Lab *c*	Phòng thí nghiệm Rơ le	5 thiết bị dụng cụ equipment & tools
Electric Tool Lab. *d*	Phòng thí nghiệm Dụng cụ điện Experiment	37 máy và thiết bị
Electronics Lab 2	Phòng thí nghiệm Điện tử	(TN) 50 hạng mục items
Information & control lab. 3	Phòng thí nghiệm Thông tin và điều khiển	(TN) 41 hạng mục items
Energy system Lab. 4	***Phòng thí nghiệm Hệ thống năng lượng***	6 thiết bị mô phỏng 6 pattern equip
Software of pattern by computer 5	Phần mềm mô phỏng dựa trên máy tính	Chương trình mô phỏng chuyển mạch AC Pattern program
IV	**Thiết bị chung và thiết bị phòng học lý thuyết** other equipment	
1	***Thiết bị phòng học*** For class room: Black board, Screen & projector, television set, video (both receiver & transmitter)	Bảng, phông chiếu, máy chiếu, màn hình vô tuyến có đầu phát video
2	Thiết bị sao chép Copy machine Quick copy machine, photocopy machine, stapler, paper cutter	Máy copy nhanh, máy photocopy, thiết bị đóng, máy xén giấy
Computers & assessories 3	Máy vi tính và thiết bị ngoại biên Personal Computer (connect to network) personal computer (Laboratory), master computer.	Máy vi tính cá nhân (nối mạng), máy vi tính cá nhân (phòng

4	Máy in và thiết bị ngoại biên Printer & assessories laser Printer, High-speed printer, Diagram-drawing machine	TN), máy chủ Master Máy in laze, máy in tốc độ cao, máy vẽ sơ đồ
5	Thiết bị phòng vẽ và phác hoạ thiết kế Drawing	& sketch equipment
6	Phòng học tiếng Foreign language classroom	24 học sinh students
7	Thiết bị nghe nhìn Audio-visual equipment Studio where produce training video tape	Phòng quay nghe nhìn để sản xuất các tài liệu đào tạo trên băng video
8	Trang bị đồ đạc trong các phân xưởng, phòng học, phòng thí nghiệm, thư viện	

Furniture in shops, classroom, lab., library.

Table 3 Number of teachers necessary for college level

Bảng 3 Tính số giáo viên cần có dạy hệ Cao đẳng

Number of learning periods per 1 class of practical engineers

SỐ GIỜ GIẢNG CỦA 01 LỚP HỆ KSTH (Dựa theo chương trình đào tạo cao đẳng điện của ĐH Bách khoa)		Tiêu chuẩn giờ giảng của GV cao đẳng	Số GV cần có dạy 01 lớp CĐ
1. Các môn dạy lý thuyết: Theories	2220 tiết	Standard number of lecturing periods for college teacher	Number of teachers necessary for 1 college class
2. Các môn thực hành Practices	420 " Periods		
3. Thí nghiệm Experiments	440 "		
4. Thực tập tốt nghiệp	98 "		
5. Coi thi chấm thi, HD bài tập dài	333 "		
6. Chuẩn bị giảng môn học ...	130 "		
Total Cộng	3641 tiết	260 tiết/năm	14

periods/year

(Based on training curricula for electrical college by Poli-technique University)

4. Prior-graduation Practice
5. Exams supervising, long exercise guidance
6. Preparation for lecture

Annex X

PHỤ LỤC X

Table 4 Training & improvement budget

***Bảng 4*: Kinh phí đào tạo, bồi dưỡng giáo viên**

Postgraduate training budget

I. Kinh phí đào tạo giáo viên đi học cao học

Number of teachers taking postgraduate course

1. Số lượng giáo viên đi học cao học 8

2. Thời gian đào tạo cao học Training time 2 năm years

Estimated cost/ 1 person / 1 year 3. Kinh phí dự kiến cho một người/năm 8.000.000 đồng VND

4. Tổng kinh phí đào tạo: 10 x 2 x 8.000.000 = 160.000.000 đồng. VND.

Total cost

II- Kinh phí bồi dưỡng giáo viên Improvement budget

Improvement subjects English, Informatics & retraining

1. Nội dung bồi dưỡng : bồi dưỡng Anh văn, Tin học và đào tạo lại

Improvement form 2. Hình thức bồi dưỡng: Tập trung 03 tháng cho 01 khoá học 3-month crash course

3. Kinh phí dự kiến : 60.000.000 đồng VND

Estimated cost

Annex X

PHỤ LỤC X

Table 5: Budget for setting up targets, programs & curricula

Bảng 5 **Kinh phí xây dựng mục tiêu, chương trình, giáo trình**

(Ngành Hệ thống điện) (Power System)

I- Số liệu căn cứ để tính toán: Data base

Theory Lecture	1. Dạy lý thuyết: 27 chương trình programs	2220 tiết periods
Practice	2. Dạy thực hành: 5 chương trình; 21 tuần x 20 tiết/tuần =	420 tiết
Experiment	3. Thí nghiệm: 5 chương trình . weeks periods/week	444 tiết
Total	**Cộng: 37 chương trình**	**3084 tiết**

Estimated cost for setting up & approving training targets & plans (incl. printi

II- Xây dựng và duyệt mục tiêu, kế hoạch đào tạo (cả in ấn)

No. of People	1. Số người tham gia	10
No. of seminar	2. Số lần hội thảo	3
Estimated Cost	3. kinh phí dự tính là	9.000.000 đồng VND

Estimated cost for setting up & approving curricula (incl. printing)

III- Xây dựng và duyệt chương trình đào tạo các môn học (cả in ấn)

1. Viết chương trình: Program preparation

Preparation periods	- Số tiết viết chương trình	3084 x 60% = 1850 tiết
Cost for preparation	- Kinh phí viết chương trình	1850 x 30.000 = 55.500.000 đồng

2. Hiệu đính, phản biện Correction & comments

- Số người tham gia Number of attendents	10
- Số lần phản biện Comment-giving times	3
- Kinh phí dự tính là Estimated cost	6.000.000 đồng

3. Đánh máy Typewriting

	- Số chương trình No. of programs	37
No. of pages/program	- Số trang cho một chương trình	10
Estimated cost	- Kinh phí dự tính là	37 x 10 x 4.000 = 1.480.000 đồng

4. Photo Photocopy

No. of programs	- Số chương trình	37
No. of copies/program	- Số bản cho một chương trình	10
Estimated cost	- Kinh phí dự tính là	37 x 10 x 10 x 150 = 555.000 đồng

IV- Viết giáo trình Curriculum preparation

Preparation	1. Viết giáo trình	3084 tiết x 45.000đ/tiết = 138.780.000 đồng
Correction	2. Hiệu đính	138.780.000 x 30% = 41.634.000 đồng
Format	3. Chế bản	3084 tiết x 2 trang/tiết x 10.000đ/trang = 61.680.000 đồng
Printing	4. In ấn	pages

- Số lượng in No. of copies	300 cuốn
- Đơn giá in Unit price	35đ/trang
- Kinh phí in ấn 3084 x 2 x 300 x 35 = 64.764.000 đồng	

Estimated cost

Total cost for setting up targets, programs & curricula:

Tổng kinh phí cho xây dựng mục tiêu, chương trình, giáo trình là: 379.393.000 đồng.

Annex X

PHỤ LỤC X

Table 6 Book expenses

Bảng 6: **Kinh phí mua tài liệu**

1. Tài liệu khoa học cơ bản (Basic science book)	70.000.000 đồng VNP
2. Tài liệu chuyên môn ngành (Professional book)	350.000.000 đồng
Cộng: (Total)	420.000.000 đồng

Annex XI List of premises & equipment in Training School for Electrical Technique

Phụ lục XI: CƠ SỞ VẬT CHẤT KỸ THUẬT CHO TRƯỜNG ĐÀO TẠO NGHỀ ĐIỆN LỰC

Table 1 List of existing premises & equipment in branch 1

***Bảng 1*: Bảng tổng hợp cơ sở vật chất kỹ thuật hiện có ở cơ sở 1**

STT No.	TÊN THIẾT BỊ MÁY MÓC công trình Item	Đơn vị Unit	Số lượng Quantity	GHI CHÚ Remark
1	Máy biến áp 250kVA 10/0,4	cái	01	1. Transformer 250KVA 10/0,4
2	Máy chiếu ELMOHO 285S	cái	06	2 Projector ELMOHO 285S
3	Máy photocopy XEROX VIVACE 160	cái	01	3. photocopy machine XEROX VIVACE 160
4	Bộ kiểm định biến dòng xách tay	bộ	01	4. Portable Current convertor checker for
5	Thiết bị điện tử phát hiện lỗi cáp	cái	01	5. Cable fault electronic detecte
6	Cầu đo điện trở một chiều	cái	01	6. DC Resistant Measuring Bridg.
7	Tủ cắt chân không hợp bộ ZS8	cái	01	7. Vacuum circuit breaker cubical ZS
8	Cầu dao phụ tải NPS 24B 1.0152	bộ	02	8. Disconnector NPS 24 B 1.01
9	Chống sét van POLIM D12N	bộ	02	9. Valve Arrester POLIM
10	SECTOR			10. Sector ?
11	Máy vi tính	bộ	01	11. Computer
12	Mô hình hoà đồng bộ MFĐ	cái	09	12 Synchronizing Model MFD
13	Bộ thí nghiệm đ/c một pha và ba pha	bộ	01	13. One-phase & 3 phase experimenting set
14	Điều hoà nhiệt độ TOSHIBA	bộ	02	14. Air conditioner Toshiba
15	Xưởng TBị điện, lưới điện, vi tính	bộ	04	15. Workshop of electric equipm. system, computer
16	Xưởng rèn, gò, nguội	cái	01	16. Workshop of forge & fitting 433m²
17	Xưởng Đo lường, Sửa chữa điện, Điện cơ bản, Thí nghiệm điện	cái	01	443 m²
	Workshop of Electric Measuring, Repairing, Elemental Electricity, Electric Experiment	cái	01	288 m²

Annex XI

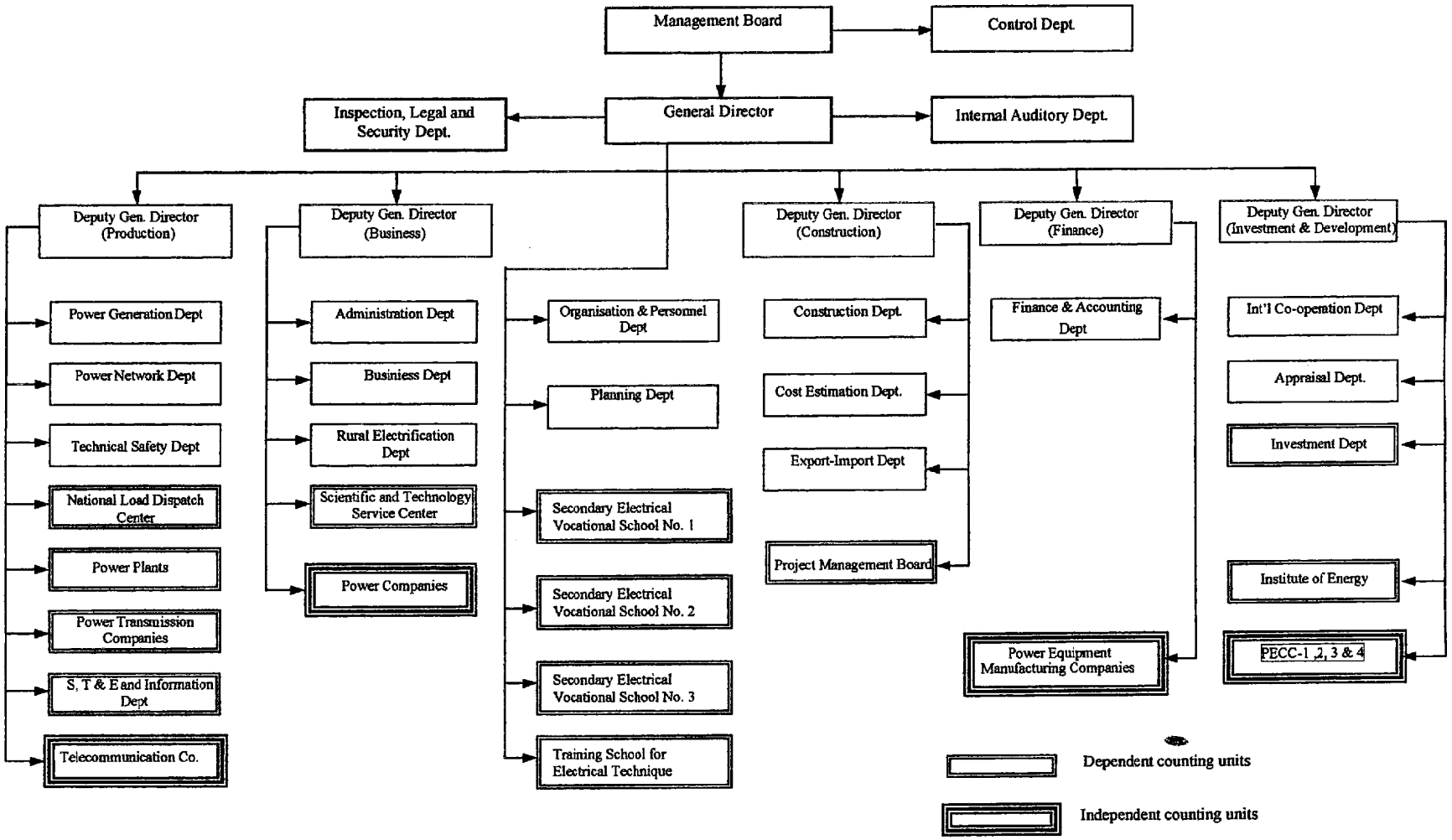
PHỤ LỤC XI

Table 2 List of existing premises & equipment in branch 2

***Bảng 2*: Bảng tổng hợp cơ sở vật chất kỹ thuật hiện có ở cơ sở 2**

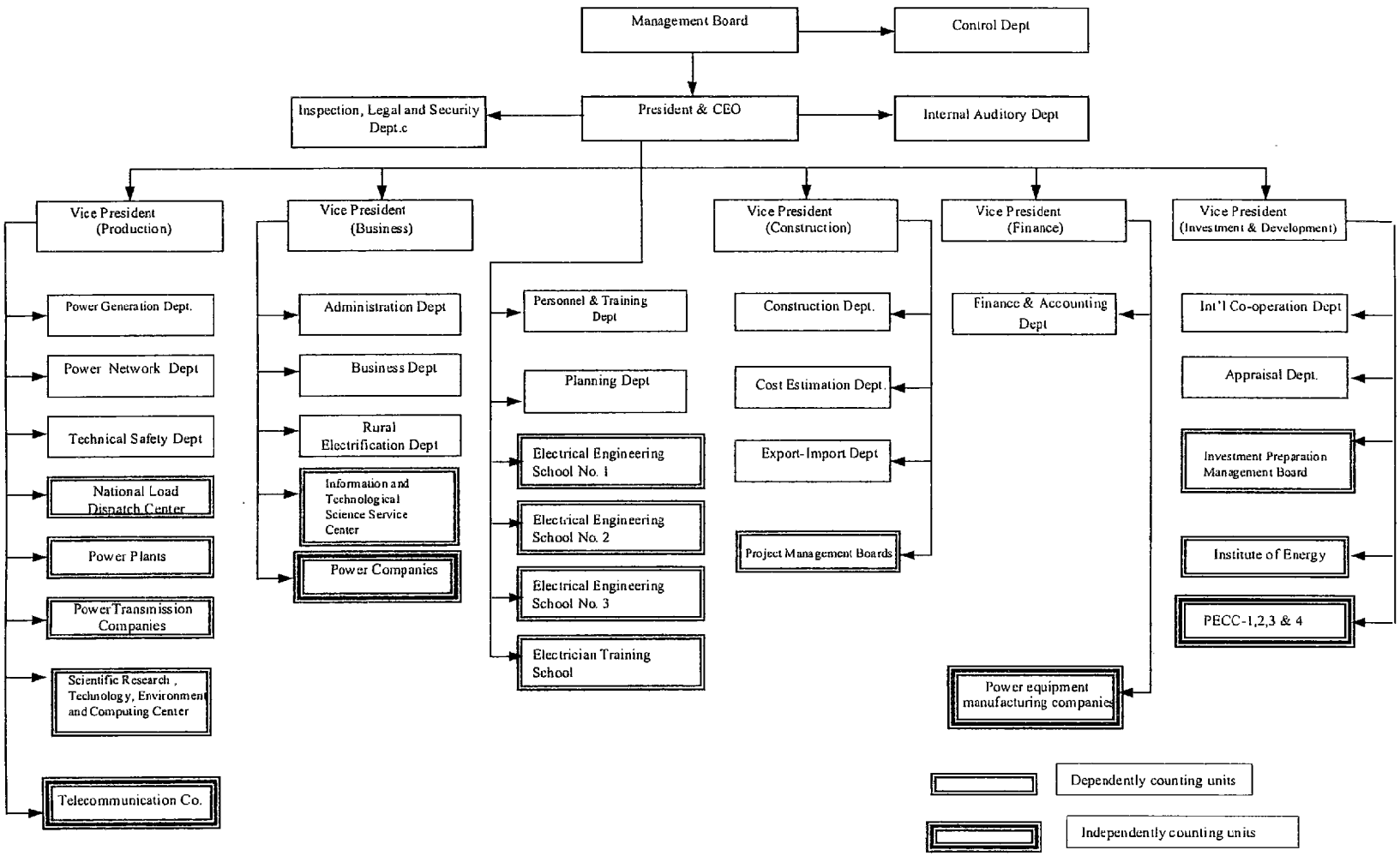
No **SốTT**	Item **Tên tài sản cố định**	Unit **Đơn vị**	Quantity **Số lượng**	Specification **Qui cách**	Remark **Ghi chú**
1.	Nhà lớp học Classroom	m2	750	3 tầng 3 floors	
2.	Nhà lớp học Classroom	m2	955	2 tầng 2 floors	
3.	Nhà tập thể học sinh Dormitory for students	m2	1008	2 tầng và 2 floors cấp 4 & tile roof house	
4.	Nhà ở cán bộ , CNV Apartment	m2	560		
5.	Xưởng thực tập Practice workshop	m2	746	cấp3 concrete roof house	
6.	Xe ô tô con TOYOTA Car	Cái	01		
7.	Xe ô tô Zil 130 Truck	Cái	01		
8.	Thiết bị phòng học tiếng Foreign language learning lab.	Cái	01	48 ca bin 48 cabin	chuyên dùng
9.	Máy cắt dầu 35 Kw Oil circuit breaker	Cái	01		
10.	Máy chiếu để bàn Table projection	Cái	01	Đức Germany	
11.	Máy chiếu tinh thể lỏng Liquid cristal Projector	Cái	01	Đức ~	
12.	Máy đèn chiếu OHP	Cái	01	Nhật Japan	
13.	Máy hàn 1 chiều Welding machine (DC)	Cái	01	Pháp France	
14.	Máy hàn xoay chiều (AC) ditto	Cái	05	Việt nam	
15.	Máy búa Hammer	Cái	01	Việt nam	
16.	Máy khoan Driller	Cái	03	Việt nam	
17.	Máy cưa cần Sawing machine	Cái	01	Việt nam	
18.	Máy tiện Turner	Cái	02	Liên xô Russia	
19.	Máy thu hình JVC TV set	Cái	01	Nhật Japan	
20.	Đầu video JVC Video	Cái	01	Nhật -	
21.	Tủ lạnh Refrigerator	Cái	02	Nhật -	
22.	Máy điều hoà nhiệt độ A/C	Cái	02	Nhật -	
23.	Điện thoại di động Mobile Phone	Cái	01	Nhật -	
24.	Máy FAX	Cái	01	Nhật -	
25.	Máy photocoppy Copy machine	Cái	02	Nhật -	
26.	Máy vi tính + máy in Computer + Printer	Cái	14	Nhật -	

Annex XII: Organisation Chart of EVN & its training schools after integration



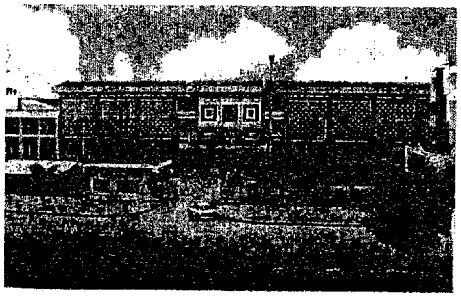
資料３　各学校統合後のＥＶＮ組織図

Organization Chart of EVN after integration



電力会社１

在職研修学校



創立 25 周年記念

(1974－1999)

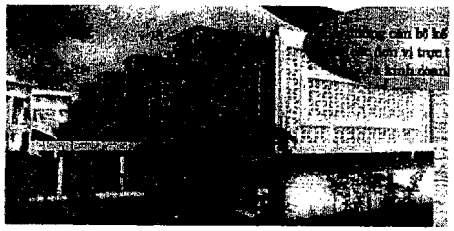
住所：ハノイ市トゥーリエム区
ホァン・クォック・ヴィエト通り

電話：8.362.672

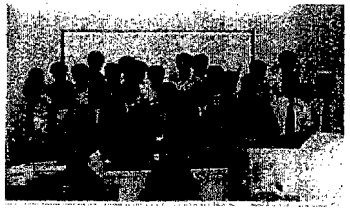
ファックス：8.362.065

25年間の教育実績（1974－1999）

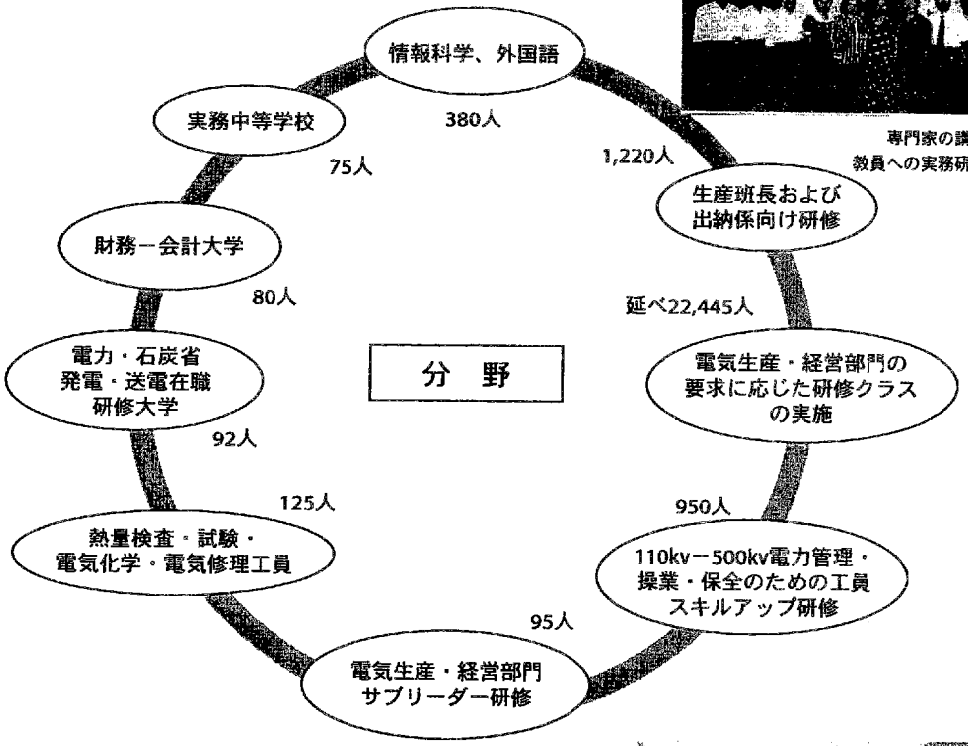
専門家の講義による
教員への実務研修クラス



実習棟



カナダ人専門家の講義による
最新技術の変電所操業クラス



設立および発展の経緯

在職研修学校は 1974 年7月1日付電力・石炭省（現工業省）1074 号 QD/NCQLKT 決定に基づいて設立された、電力会社（現電力会社1）直轄の学校である。

同校は、電力会社1をはじめとした電力分野一般において、生産・経営活動に携わる管理職員・工員の教育への要求に応じるため設立された。

在職研修学校は、設立および発展の過程において、3カ所への移転を行っている。

*1974－1984　フンイェン省ヴァンラム郡ラックダオ村サィンティ集落
*1984－1990　ハイフン省ミーヴァン郡ラックダオ駅地区
*1990－現在まで　ハノイ市トゥーリエム区ホァン・クォック・ヴィエト通り

現在、在職研修学校は世界銀行からの ODA 資金援助によるスキルアッププロジェクトを進めている。同プロジェクトは、基本的には 2000 年に終了する。プロジェクトの成果により、以下の3つの教育形態が実現する。:

1. 電力分野において生産・経営活動に携わる管理職員、高等技術工員を対象とした教育、研修、スキルアップ
2. 電力分野の高等専門学校卒業資格
3. 熟練工員養成

本校における管理職員、教員、工員は現在５０人で、構成は以下のとおり。

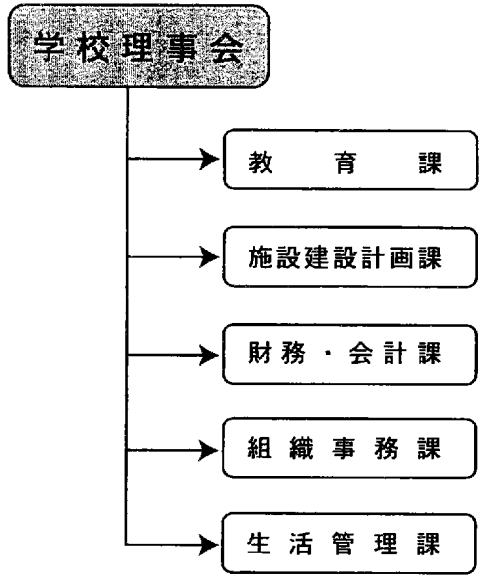
* 大学卒　：42%
* 高等専門学校卒　：　4%
* 高等学校卒　：12%
* その他　：42%

教育の任務と役割

技術および業務の指導・管理職員を対象とした、専門的技術・業務に関する在職研修計画を実施する。生産・経営の品質保証および任務遂行計画に基づき、社内の全工員に対して理論および技術面でのスキルアップを図る。

（1974 年7月1日付 1074 号 QD/NCQLKT 決定より抜粋）

管理組織



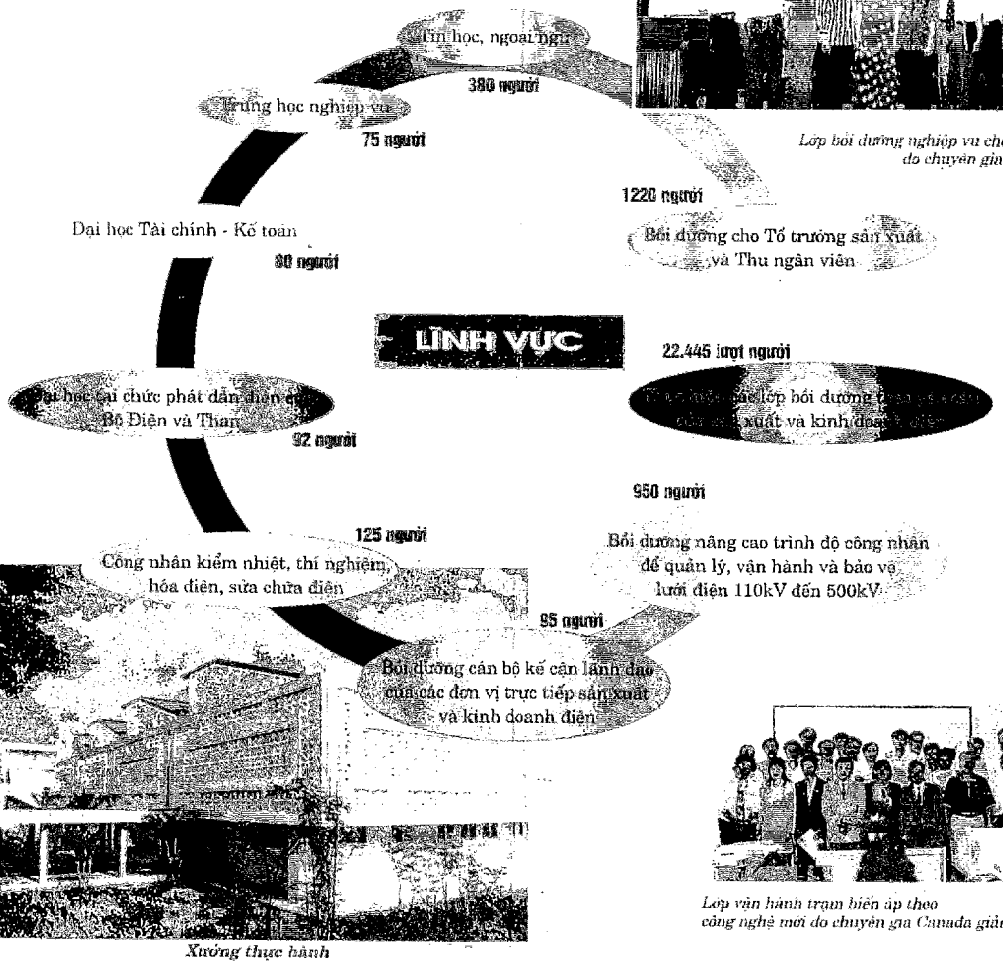
校内施設・設備の計画書を手渡す専門家

在職研修学校

電力会社1

KẾT QUẢ ĐÀO TẠO TRONG 25 NĂM (1974 - 1999)

Lớp bồi dưỡng nghiệp vụ cho giáo viên do chuyên gia giảng dạy



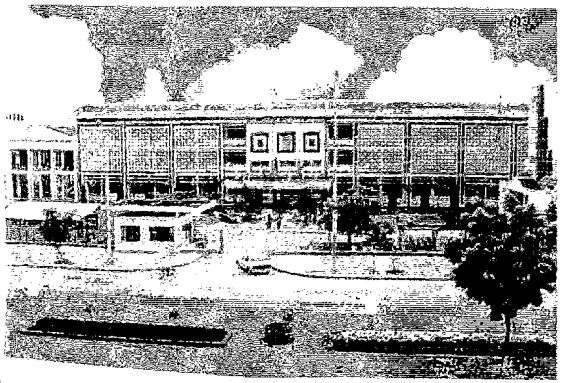
Xưởng thực hành

Lớp vận hành trạm biến áp theo công nghệ mới do chuyên gia Canada giảng dạy

EVN

TỔNG CÔNG TY ĐIỆN LỰC 1

TRƯỜNG BỒI DƯỠNG TẠI CHỨC



25 năm KỶ NIỆM 1974-1999 THÀNH LẬP TRƯỜNG

Địa chỉ: Đường Hoàng Quốc Việt
Từ Liêm, Hà Nội

Điện thoại: 8.362 67:
Fax: 8 362 065

QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỂN

Trường Bồi dưỡng Tại chức được thành lập theo Quyết định số 1074 QĐ/NCQLKT ngày 1/7/1974 của Bộ Điện và Than (nay là Bộ Công nghiệp) trực thuộc Công ty Điện lực, nay là Công ty Điện lực 1.

Trường thành lập để đáp ứng yêu cầu công tác đào tạo cán bộ công nhân viên đang hoạt động sản xuất kinh doanh của Công ty Điện lực 1 nói riêng, cho ngành Điện nói chung.

Trường Bồi dưỡng Tại chức trong quá trình xây dựng và phát triển đã chuyển qua 3 địa điểm:

* 1974 - 1984, tại thôn Xanh Tý, xã Lạc Đạo, huyện Văn Lâm, Hưng Yên.

* 1984 - 1990, tại khu ga Lạc Đạo, huyện Mỹ Văn, Hải Hưng.

* Từ 1990 đến nay, tại đường Hoàng Quốc Việt, Từ Liêm, Hà Nội.

Hiện nay Trường Bồi dưỡng Tại chức đang thực hiện dự án nâng cấp bằng nguồn vốn ODA của Ngân hàng Thế giới. Dự án sẽ cơ bản hoàn thành vào năm 2000. Kết quả của dự án sẽ bảo đảm thực hiện 3 loại hình đào tạo:

1. Đào tạo, bồi dưỡng, nâng cao trình độ cho cán bộ quản lý, công nhân lành nghề bậc cao đang tham gia hoạt động sản xuất và kinh doanh trong ngành điện.

2. Cử nhân cao đẳng ngành điện.

3. Đào tạo công nhân lành nghề.

Đội ngũ cán bộ quản lý, giáo viên, công nhân viên của Trường hiện nay là 50 người, trong đó:

* Trình độ đại học: 42%

* Trình độ cao đẳng: 4%

* Trình độ trung học: 12%

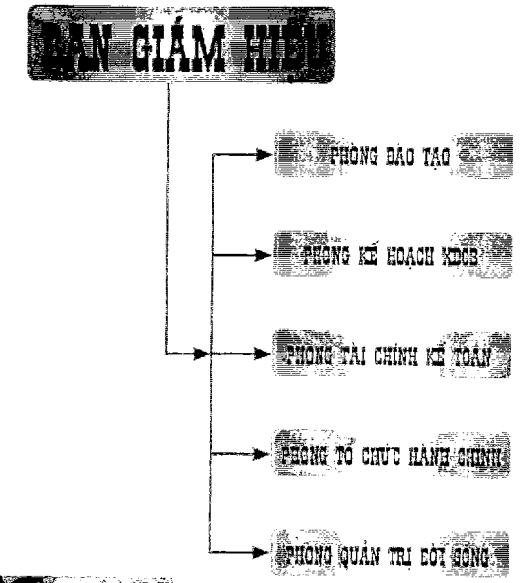
* Trình độ khác: 42%

CHỨC NĂNG NHIỆM VỤ ĐÀO TẠO

Thực hiện kế hoạch bồi dưỡng tại chức về mặt kỹ thuật nghiệp vụ chuyên môn cho đội ngũ cán bộ làm công tác chỉ đạo, quản lý kỹ thuật, nghiệp vụ. Bồi dưỡng trình độ lý thuyết, tay nghề cho công nhân trong toàn công ty theo kế hoạch đảm bảo chất lượng, đáp ứng nhiệm vụ sản xuất kinh doanh (trích Quyết định số 1074 QĐ/NCQLKT ngày 1/7/1974)

Chuyên gia bàn giao hồ sơ dự án trang thiết bị của trường

CƠ CẤU TỔ CHỨC QUẢN LÝ



TRƯỜNG BỒI DƯỠNG TẠI CHỨC

CÔNG TY ĐIỆN LỰC 1

EQUIPMENT FOR REDUCTION DUE TO BUDGET LIMIT

Items	Name of equipment	Qty as req.in BDs	Reduced qty as req. by Consultant	Reduced qty as req. of PMB	Red qty ater contract. neg.tion	Unit price (USD)	Total (USD)	Explantation
98/101	Mechanical workshop							
Lot 1	**Mechanical workshop, Schmidt**							
A1001	Lathes, 200 mm dia swing	6	4	4	4			
A1002	Lathes, 350 mm dia swing	3	3	3	3			
A1003	Shaping machine, 450 mm Stroke	2	1	1	1			
A1004	Pedestal Drill - 13 mm dia drills	4	3	3	3			
A1005	Column Grinder - 200 mm dia	6	4	4	4			
A1006	Universal Milling Machine	2	1	1	1			
A1019	Electric Welding booths	16	8	8	8			
	Total amount for reduction of lot 1							
Lot 2	*-Teacher' s Workshop, Schmidt*							
B1004	Universal Milling Machine	1	1	1	1			
B1007	Microscopes	2	2	1	1			
B1010	PCB Fabrication equipment	1	1	1	1			
	Total amount for reduction of lot 2							
Lot 3	*Electrical Workshop, Schmidt*							
C1003	Column Grinder - 200 dia	2	0	1	1			
	Total amount for reduction of lot 3							
Lot 4	*Training Field, Schmidt*							
D1001 to D1009	Tools for the training field	Various amount	Reduced entire	Reduced entire	Reduced entire			
D1016 to D1036	Tools for the training field	Various amount		Reduced entire	Reduced entire			
	Total amount for reduction of lot 4							
98/103	Electrical Laboratory Equipment							
Lot 1	**Electrical Laboratory Equipment**							
1.1	*Transmission and Distribution Lab*							

A1011	High Voltage supply for AC, DC and impulse voltage Reduces High Voltage testing Set 260 kV DC, 4m A-184 kV DC, PGK 26 HB Purchase High Voltage test kit 200 kV AC, 280 kV DC, 280 kV impulse, KIT 2W 2 G2S Complete with: Impulse analysis system &jPC, Printer Partial discharing measuring system Vessel for Vacuum & Pressure Set of electrodes Oil test cup Safety cage							
A1012	Training kits for cable termination 1 kV cable	8	8	8	8			
A1013	Training kits for jointing 1kV cable	8	8	8	8			
A1014	Training kits for cable termination 12 kV XLPE cable	8	8	8	8			
A1015	Training kits for jointing 12 kV XLPE cable	8	8	8	8			
	Total amount for reduction of 1.1							
1.2	*Electrical machines laboratory*							
B 1033	Power Factor Meter	8	2		2			
B 1035	Phase Angle Meter	8	2		2			
B 1046	Induction Motor (2 Speed)	1		1	1			
B 1053	AC Tacho-generator	2		1	1			
B 1058	DC Link Filter	1		1	1			
	Total amount for reduction of 1.2							
1.3	*Relay Laboratory*							
	Quantity is unchanged							
1.4	**Instrument laboratory**							
B3000	**Power supply 0-30 V**	8		4	4			
B3001	Multimeter.Digital	8		6	6			
B3002	Multimeter.Digital, true RMS	8		6	6			
B3003	Multimeter.Analogue	8		6	6			
B3005	Loboratory kit for DC and 1-phase AC	8		4	4			
B3006	Loboratory kit for 3-phase AC	8		4	4			
B3007	Function generator	8		4	4			
B3008	Set of selected standard resistors 10 Ω - 2.7 kΩ	16		6	6			
B3009	Set of selected standard resistors 3.3k Ω - 1 MΩ	16		6	6			

B3010	Set of selected inductors 0.01 mH - 1H	16		6	6			
B3011	Set of selected capacitors 47 nF -2,2 µF, >50 VAC	8		3	3			
B3012	Prototype experiment panels	16		8	8			
B3013	Set of connection cables for B3012	8		4	4			
B3019	Oscilloscope, analogue, dual channel, DC - 20 MHz	9		8	8			
B3020	Differential probe to the oscilloscope B3019	20		15	15			
B3025	Compass needle with socket pin	4		2	2			
B3026	Installation cable 0.5 mm2,1000m	4		4	4			
B3027	Installation cable 1.5 mm2,1000m	4		4	4			
B3028	Installation cable 2.5 mm2,1000m	4		4	4			
B3029	Installation cable 4 mm2,1000m	4		4	4			
B3030	Single cable 2 x 0.22 mm2, 1000m	4		4	4			
B3031	Decade Resistance Boxes 0.1Ω to 99999.9Ω 1W	8		4	4			
B 3032	Slidewire resistor 0-20Ω 100W	8		4	4			
B 3033	Slidewire resistor 0-100Ω 30W	8		4	4			
	Total amount for reduction of 1.4							
98/104	***Supply of classrooms and workshops***	***Lab***	*library*					
Lot 1 -	*Supply of clssrooms, Genpacific*							
	White Boards	25		5	5			
	Projector Screens (Permanently Mounted)	25		5	5			
	Slide Projectors	3		1	1			
	Overhead projectors (250W)	15		5	5			
	Total amount for reduction of lot 1							
Lot 2 - Reprographic Equipment, VINEMATIM								
	There is no change in quantity							
	Total amount for reduction of lot 2							
Lot 3	*Computers and Peripherals VINEMATIM*							
	Laser Printer	22		6	6			
	Scanner	1		1	1			
	Total amount for reduction of lot 3							
Lot 6	*- Audio Visual Studio, Genpacific*							
	(Consultants have intended to reduce this whole lot)	1	1	0	0			
	Total amount for reduction of lot 6							
	TOTAL THE COST OF REDUCED EQUIPMENT FOR PROCUMENT IS:						**650.511,63 USD**	