

No.

インドネシア共和国  
スマトラ化学工業研修開発センター事業  
エバリュエーションチーム報告書

昭和61年10月

国際協力事業団

鉦開技
J R
86-146



## 序 文

化学工業分野の中堅技術者の養成を目的とする本プロジェクトは、1986年11月には5年間の協力期限が到来する。

今般、当事業団は、1986年4月24日より5月3日まで本プロジェクトの協力実績、技術協力実施上の問題点の把握を目的として巡回指導チームを派遣し、その後、その調査結果を踏まえ、これまでの協力実績を評価するとともに、「イ」側とプロジェクト終結に係る必要な協議を行うことを目的として、1986年8月6日より8月16日までエバリュエーション調査団を派遣した。

本報告書は、上述した2件の調査結果を取りまとめたものである。

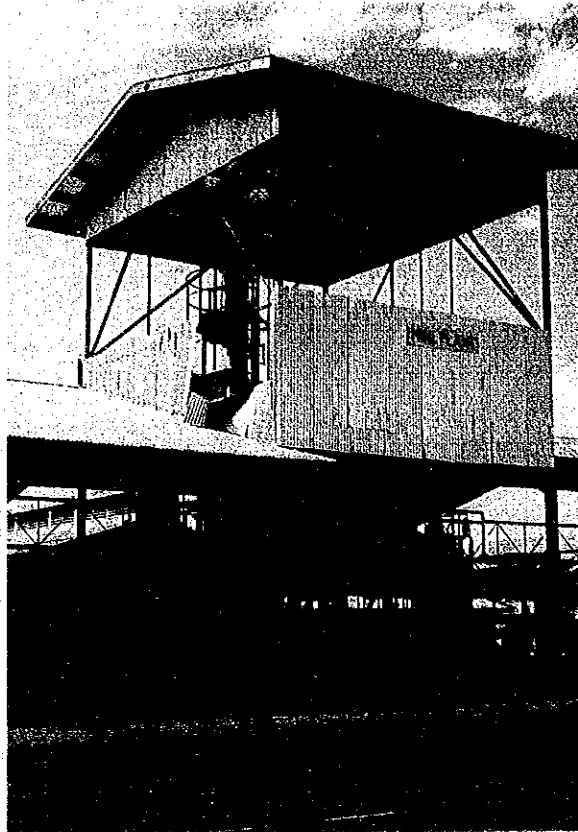
ここに、今般の調査に対して御協力を頂いた在インドネシア日本国大使館をはじめとする関係各位に対し心より謝意を表すものである。

昭和61年10月

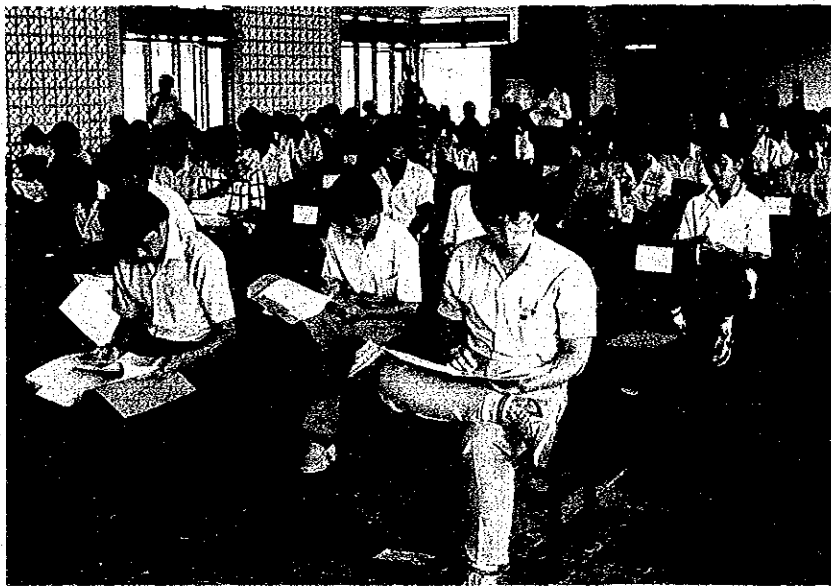
国際協力事業団

理事 古 閑 俊 彦

國際協力事業團		
受入 月日	87.2.25	108
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ミニプラント（アカデミーコース，短期コースの実習に利用されている）



アカデミーコース第4期生の入学試験風景  
（1986年8月）



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## 1. 巡回指導調査団派遣

### 1-1 調査団派遣の経緯と目的

本プロジェクトのR/D終了期限は、1986年11月18日に到来する。これに先立ち、「イ」側との合同エバを本年7～8月には実施する必要があるが、一方技術移転の現状に関する専門家チームからの報告は、各専門家がそれぞれの見方で現状分析をした内容となっており、専門家チームあるいは現地サイドの意見としてまとまりのあるものではない。

かかる状況では、円滑なエバリュエーションの実施が懸念されるところ、今般巡回指導チームを派遣し、実情の把握、専門家チーム等との協議により日本側、専門家チーム及びイ側がプロジェクトの現状について同一の認識を持つよう調整する。

### 1-2 調査団の構成

団長 総括 飯村圭司  
 国際協力事業団 鈹工業開発協力部 鈹工業開発技術課長  
 団員 業務調整 杉原敏雄  
 国際協力事業団 鈹工業開発協力部 鈹工業開発技術課

### 1-3 調査日程表

月日	曜日	行 程	調 査 内 容
4・24	木	10:00 JAL721 成田 → 17:40 ジャカルタ	(移動) ホテルにて福島書記官, JICA 榎本次長他と打合せ
25	金		JICA インドネシア事務所, 工業省教育訓練センター ( Pusbinlat )
26	土	ジャカルタ GA050 → メダン	(移動) 専門家と打合せ
27	日		関連施設見学, 専門家と打合せ
28	月		センター視察, 専門家と打合せ, 工業省メダン局表敬
29	火		専門家と打合せ, 総領事館と打合せ
30	水		「イ」側関係者と打合せ, 専門家と打合せ
5・1	木	メダン GA153 → ジャカルタ	総領事表敬 (移動)
2	金	19:00 ジャカルタ	工業省教育訓練センター, 日本大使館, JICA インドネシア事務所報告 (移動)
3	土	6:20 成田 (JAL722)	

1-4 主要面談者

	氏 名	所 属 先 及 び 職 名
工業省北 スマトラ 局	Mr. Buha Tanbunan	Director General, Regional Office of Northern Sumatra, Ministry for Industry
	Drs. Adat Sembiring	Director, Planning Division, Regional Office of Northern Sumatra, Ministry for Industry
	Ir. M. I. Nasution	Special Advisor for Training, Regional Office of Northern Sumatra, Ministry for Industry
センター	Mr. Endang Suprijatna, M. Sc	Director, Chemical Industry Training and Development Centre, Medan
	Mr. Kenakan Sembiring	Deputy Director, Chemical Industry Training and Development Centre
	Ir. Sujarno Suwandi	Chief, Students Affairs Dept., same as above
	Ir. Drs. S. Brahmana	Chief, Development Dept., same as above
	Ir. M. M. Simanjuntak	Chief, Mechanical Dept., same as above
	Mr. Sparto	Asst., Accounting Dept., Regional Office of Northern Sumatra, Ministry for Industry
専 門 家	鶴 岡 競	スマトラ化学工業研修開発センター(チーフ・アドバイザー)
	近 藤 芳 久	" " (業務調整)
	近 岡 貞 志	" " (化学工学)
	大久保 悌 二	" " (工業化学, 無機)
	久留宮 弘 幸	" " (工業化学, 有機)
	石 丸 精 祐	" " (計測工学)
	後 藤 博 文	" " (機械工学)
	大 野 淳 一	" " (機械工作)
	玉 山 昌 利 (短期)	" " (製缶加工)

日本大使館

福 島 二等書記官

工業省教育訓練センター (PUSBINLAT)

Ir. Soebroto M. Sc PUSBINLAT 所長

Mr. Guadi " 研修課長

在メダン日本国総領事館

鶴 田 剛 総 領 事

池 田 章 領 事

菊 池 正 剛 副 領 事

JICAインドネシア事務所

遠藤英夫	所長
榎本正義	次長
青木澄夫	所員

## 2. 調査団の業務内容及び対処方針

本調査団の業務は、本プロジェクトのエバリュエーションのための基礎資料を整理する事である。具体的には、以下に従って実施する事となった。

### (イ) アカデミーコース

ーカリキュラムに基づく技術移転状況の調査

ー調査表により調査すると同時に、未だ指導ができていない科目について今後の計画を作成する。

### (ロ) 短期コース

ーミニプラントを利用した短期コース（プラントメンテナンス及びプラントオペレーション）は、すでに専門家の指導下で実施されており、この両コースについては、C/Pの力で、ほぼ実施可能な状況となっている。

ー専門家よりワークショップを利用した機械保守コースを実施したいとの希望があるが、この実施の妥当性について検討する。

### (ハ) 技術サービス

ー60年2月21日廃水処理技術セミナー、60年3月28日水処理技術セミナーを開催し、C/Pに対しセミナー実施方法等について指導した。

ー専門家は、現在バナナ繊維の利用技術、水処理、材料評価技術について、研究開発をも含め指導中であるが、R/Dには『to prepare technical service system to meet the technical requirements of the local chemical industries』とあり、技術サービスシステムの準備の範囲にとどめる事とする。

### 3. 調査結果概要

#### 3-1 「イ」側との基本的合意事項

エバリュエーションの実施に先立ち、合同エバの方法を「イ」側に説明すると同時に、エバの基礎となる事項について、Questionnaire（別添）にて我方の考え方を示し、「イ」側の考え方を求めたところ、結果は以下の通り。

##### 〔A. Master Plan〕

#### 1. アカデミーコース

##### (1) カリキュラム

Experiment 及び Practice については、1983年にJICAより参考カリキュラムとして提出したものがそのまま使用されている事が確認された。

##### (2) 専門家の協力範囲

専門家は、Experiment 及び Practice について指導を行い、Lecture については協力範囲に含まれない事を確認した。

##### (3) 材料試験について

日本側より、本分野の専門家のリクルートが困難であったため、Mr. Warman に対し、日本における技術研修を実施した旨説明した。

「イ」側は、久留宮、後藤、玉山各専門家が現地にて引続き Mr. Warman を指導する事で合意した。

#### 2. 短期コース

短期コースについての協力範囲をミニプラントを使つての Operation Course 及び Maintenance Course に限定する事及び、初級者向けの Operation Course 及び Maintenance Course については、「イ」側への技術移転が完了したと考える旨説明した。

これに対し「イ」側は、上述の考え方に合意する一方、ミニプラント及びワークショップを利用した「Prevention Maintenance Course」及び「Repair Maintenance Course」の2つのコースについては企業のニーズも高く、現在、既に実施すべく準備中であるとし、この2つのコースの実施について強く要望越した。

#### 3. 技術サービス

技術協力の範囲を、主として水処理、排水処理の分野についてセミナーの実施、巡回指導の実施、依頼試験の実施のためのシステムの確立とする事で合意した。

#### 4. 機材の供与

主要機材は、供与済であり今後は補完的な機材を供与する事で合意した。

#### 5. Technical Cooperation Program

センターの現状は、R/DのAttachmentにあるTechnical Cooperation ProgramのPhase 2の段階 (Development Stage) にあるという認識で一致した。

〔 B. プロジェクト延長に係る前提条件 〕

我方より、1. Full Time Directorの配置、2. 無税通関の迅速化、3. 運営予算の確保、4. A Formの手続きの迅速化を前提条件として要求した。これに対し、イ側より「最善の努力をする」との回答があった。

3-2 技術移転状況の調査結果

アカデミーコースの各カリキュラム毎に、実験指導書の作成状況、技術移転の進捗状況等の調査を調査表により実施した。技術移転の進捗状況に関する調査結果は以下の通り。

(技術移転状況は、次の6段階に分け記入を依頼した)

A ; Self Reliance の段階

B ; 一通り指導しており (又は61年11月までに指導可であり) あとはC/Pの努力次第

C ; 一通り指導したが (又は61年11月までに指導可だが) C/Pの能力が低い為指導の継続が必要

D ; 61年11月までに指導を完了させる見込みなし (機材不足)

E ; " (専門家又は「イ」側講師がいない)

F ; " (C/Pが不在)

(a) 久留宮専門家

化学	B 3		
有機工学化学	B 6	D 4	
工業材料		D 3	

(b) 大久保専門家

物理	B 10		
化学	B 6		
物理化学	B 23		
無機工業化学	B 5		

(c) 近岡専門家

化学工学	B 4	C 1	D 14
ミニプラント実習	B 5	C 4	

(d) 石丸専門家

計測工学	A 3	B 9	C 1	D 4
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基礎電気工学\*

B 4

D 8

( \*ただし阿部短期専門家(電気工学)の報告によればBなしC 9, D 3 )

(c) 後藤専門家

製 図

B 12

基礎機械工学

C 1

(f) 大野専門家

機械加工

A 1

C 1

(仕上)

(加工)

(g) 玉山専門家

機械加工

C 1

(溶接)

計 A 4, B 87, C 9, D 33

3% 65% 7% 25%

[まとめ]

1. AとBの合計が7割程度となるが、専門家との個別面談では、後藤専門家を除く他の専門家全員がC/Pの自立のためには、少なくとも2~3年の協力期間延長が必要と発言している事からも、この数値はむしろ努力目標としての数値であると考えられる。
2. 化学工学実験用機材としてトレーニングシミュレーター、連続式反応器等極めて高価な機材の要請があるところ、『本プロジェクトの進め方に関する考え方』を説明し、専門家の理解を求めた。

## 4. プロジェクト終結に係る予備考察

### 4-1 諸機関の意見

#### (1) 「イ」側意見

Self-Relianceの状態には致っており、3年間の延長を是非お願いしたい。

#### (2) 専門家意見

機械製図の分野を除き「イ」側による自立の状態を達成するためには、少なくとも2～3年の協力期間の延長が必要である。(個々の実験テクニックについては、一応マスター可能な見通しだが、講師として学生を指導する能力(マネジメントも含む)を有するまでには至らない)

#### (3) 総領事館意見

中途半端な状態で協力を打ち切る事のないよう、「イ」側が自立できる状態になるまで協力を続けて欲しい。

### 4-2 調査団意見

R/D期間終了後の対応は、本年7～8月に実施されるエバリュエーションの結果に待つところであるが、下記事項について考慮すると、延長にて対応せざるを得ない状況にあると思料する。

- (i) 日本側からの再々の要請にもかかわらず、専門家派遣後もC/Pが配置されない状態が続いた。C/Pが一応配置されたのは58年8月になってからであり、その後供与機材の開梱、据付、調整を了し、59年7～8月になりようやく指導が可能な状態となった。実質的な指導期間は、2年程度である。
- (ii) 現在配置されているC/Pは、大学卒業後ほとんど実務経験を持たぬまま配置された者ばかりであり、学校で実技の指導をほとんど受けた事のない彼らを自立できる状態にまで至らしめるためには、5～6年間の実質的な指導期間が必要であろう。
- (iii) 各専門家は、現状分析の結果として「イ」側による自立を達成するためには、本年11月以降さらに2～3年の継続指導が必要であるとしている。(ただし機械製図については継続指導の必要性なし)



4-3 今後協力が必要な事項について

	協力の範囲（及び現状）	今後協力が必要な事項
1. アカデミーコース	<p>アカデミーコースのカリキュラムのうち Experiment 及び Practical について指導する。</p> <p>（現状）</p> <p>約7割の項目については一通り指導したが、1側の自立のためには継続指導が必要</p>	<p>1. 機材不足のため指導が未実施の実験項目については、機材を供与し指導を行う。</p> <p>2. 一通り指導を終了した実験項目については、C/P がアカデミーの講師として十分通用する能力を持つよう引き続き指導する。</p>
2. 短期コース	<p>ミニプラントを使った次のコースの実施について指導する。</p> <p>1. 初級者向 Operation Course 及び Maintenance Course</p> <p>2. Prevention Maintenance Course</p> <p>3. Repair Maintenance Course</p> <p>（現状）</p> <p>1 についてのみ技術移転完了</p> <p>2 及び 3 については計画段階</p>	<p>Prevention Maintenance Course 及び Repair Maintenance Course について、C/P の力で実施できるように指導する。</p>
3. 技術サービス	<p>水処理、排水処理について(1)セミナーの実施、(2)巡回指導の実施、(3)依頼試験の実施についてシステムを確立する。</p> <p>（現状）</p> <p>1. セミナーを、水処理、排水処理について各1回ずつ実施した。</p> <p>2. 約30通りの水質検査方法について指導した。</p>	<p>水質検査法について引き続き指導するとともに、依頼試験の受付、料金設定、巡回指導の方法等についてシステムを確立する。</p>

## 5. エバリュエーション調査団の派遣

### 5-1 調査団派遣の経緯と目的

昭和56年11月19日より化学工業分野の中堅技術者の育成を目的として協力を開始した本プロジェクトは、本年11月18日には、5年間の協力期限が到来する。一方本年4月24日より5月3日まで派遣した巡回指導チームは、本プロジェクトのプレ・エバリュエーションを実施し、『インドネシア側による自立を達成するためには協力期間の延長にて対応せざるを得ない状況にある』と報告をしている。

今回のチーム派遣の目的は、プレエバリュエーションの結果を踏まえ、本件事業の当初目標の達成度を調査し、今後に残された課題を把握し解決を図ることにある。また本件協力の延長問題に関し相手側と協議し、その結果、協力継続が必要と判断された場合は、具体的な協力内容と方法について協議を行う。

### 5-2 調査団の構成

団長	総括	飯村圭司	国際協力事業団 工業開発技術課長
団員	技術協力 計画	徳増有治	通産省通商政策局 経済協力課 技術協力専門職
団員	業務調整	杉原敏雄	国際協力事業団 工業開発技術課

### 5-3 調査団の日程表

8月6日(水)	ジャカルタ着 (GA873)
7日(木)	PUSBINLAT 表敬 工業省国際協力局シアギアン局長表敬 JICA, 大使館 ジャカルタ——メダン (GA050)
8日(金)	エンダン所長表敬 総領事表敬 専門家と打合せ
9日(土)	エバレポート協議
10日(日)	専門家及び「イ」側と打合せ
11日(月)	エバレポート協議
12日(火)	専門家と打合せ (徳増団員帰国 GA940)
13日(水)	メダン——ジャカルタ (GA051)

8月13日(水) 技術協力調整委員会ウィドド局長表敬  
PUSBINLATにて打合せ

14日(木) 合同委員会

15日(金) エバレポート署名(於PUSBINLAT)  
延長R/D案の説明(於PUSBINLAT)  
JICA, 大使館報告  
ジャカルタ発(JL722)

## 6. 要 約

- (1) 本調査団は、8月7日から13日まで連日わたりエンダスマトラ化学工業研修開発センター所長を始めとする「イ」側関係者と本プロジェクトのエバリュエーションに関する協議を行い、14日PUSBINLAT本部に於て、「日」・「イ」合同委員会を開催し、両国関係者が合同で作成したエバリュエーションレポートをほぼ原案通り承認し、15日スプロトPUSBINLAT所長及び飯村団長との間で署名を行った。
- (2) 同委員会は本プロジェクトに対する「イ」側の強い期待を反映し、スプロトPUSBINLAT所長を議長にエンダ所長、工業省のシアギアン国際協力局長、及びハルヤント財務局長、大蔵省及びBAPPENAS担当者等30名近くの「イ」側関係者ならびにJICA事務所長以下5名の「日」側関係者の出席の下開催された。同委員会においては「イ」側C/Pの確保、機材の早期引取り及び予算措置を含め活発な討議が行われた。
- (3) 同委員会で承認されたレポートの骨子は、
  - 1) 現R/D期間中(1986年11月18日迄)に理論面に於る技術移転はほぼ終了する。
  - 2) しかしながら実習面での技術移転は、
    - a. 無償による施設の建設に1年半を要したこと、
    - b. 「イ」側C/Pの配置が遅延したこと、
    - c. 「日」側専門家は教材の作成等理論面を中心に技術移転を実施してきたこと等により当初の協力スケジュールより2年半程遅れていることから、協力期間を2年半延長する必要があること等である。

## 7 プロジェクトの実績

### 7-1 プロジェクトの投入実績

#### 7-1-1 専門家派遣実績

専門家氏名	専 門 分 野	派 遣 期 間	備 考
(長期)			
植 松 喜 稔	チーフ・アドバイザー	58. 4. 26 - 60. 4. 25	(兼無機工業化学)
山 本 愛一郎	業務調整	58. 4. 26 - 60. 4. 6	
境 純 哉	工業化学(有機)	57. 12. 21 - 59. 12. 20	
高 田 実	化学工学	58. 1. 25 - 60. 1. 24	
伊 原 道 明	計測工学	58. 4. 5 - 60. 4. 4	
相 原 徹	機械工学	58. 4. 5 - 60. 4. 4	
(短期)			
内 田 正 則	ミニ・プラント(計測)	59. 11. 27 - 60. 1. 30	
桑 原 正	ミニ・プラント(機械)	59. 11. 27 - 59. 12. 26	
玉 山 昌 利	ワーク・ショップ(維持管理)	60. 2. 19 - 60. 5. 9	
小 林 正 幸	プラント・オペレーション	59. 11. 27 - 60. 8. 31	
園 欽 哉	廃水処理	59. 11. 27 - 60. 2. 25	
高 永 久 志	用水処理	59. 1. 9 - 60. 4. 5	
(長期)			
鶴 岡 競	チーフ・アドバイザー	60. 5. 13 - 61. 11. 18	
近 藤 芳 久	業務調整	60. 3. 31 - 61. 11. 18	
近 岡 貞 志	化学工学	60. 4. 24 - 61. 11. 18	
石 丸 精 祐	計測工学	60. 4. 24 - 61. 11. 18	
大久保 悌 二	工業化学(無機)	60. 5. 22 - 61. 11. 18	
久留宮 弘 幸	工業化学(有機)	60. 3. 26 - 61. 11. 18	
後 藤 博 文	機械工学	60. 8. 14 - 61. 11. 18	
大 野 淳 一	機械工作	60. 10. 23 - 61. 11. 18	
(短期)			
阿 部 節 夫	電気工学	60. 10. 23 - 61. 2. 6	
玉 山 昌 利	機械工学(製缶加工)	60. 1. 29 - 61. 11. 18	

## 7-1-2 研修員受入れ実績

年度	分野	研修員名	期間	受入時現職/現職
1982	有機工業化学	Budi Haryanto	57.10.28-58. 2. 4	有機工業化学O/P/退職
	視察	Buhan Tanbunan	58. 3. 2-58. 7. 6	北スマトラ工業省局長
	視察	Ramli Hassan	58. 3. 2-58. 7. 6	同中小企業課長/退職
	視察	Widjanarko	58. 3. 2-58. 7. 6	教育訓練センター総務課長
1983	化学工学	Sniarno Suwandi	59. 3. 2-59. 7. 6	技術開発部長/教務部長
	機械工学	M.M. Simanbuntah	59. 3. 2-59. 7. 6	機械科係長/機械科課長
	化学工学	Ahmed Sofian	59. 3. 2-59. 7. 6	化学科長/副所長→退職
	有機工業化学	Imasri Samir	59. 3. 2-59. 7. 6	/退職
1984	無機工業化学	Ratnawaty Trg	59. 2.28-60. 8. 4	物理化学主任
	分析化学	Nasim	59. 2.28-60. 8. 4	電子顕微鏡
1985	有機工業化学	Irawan Rachmiadi	60.10.30-61. 2.28	化学科アシスタント
	技術開発	Soharman Brahmana	60.10.30-61. 2.28	技術開発係長/同部長
	流体力学	Warman	61.10.30-61. 2.28	機械科アシスタント
	ミニ・プラント	Tole Purba	61. 3.14-61. 9.13	ミニ・プラント科長
	ミニ・プラント	Hendry Si Teoa	61. 3.14-61. 9.13	ミニ・プラント・アシスタント
1986	視察	Endang Suprijatna	61. 6.27-61. 7.15	所長

## 7-1-3 機材供与実績

	年度	BI/AWB	価格*	備考
1	57	126-6408761-3	¥ 1,594,056	携行(エア・コン)
2	57	BEL-1001	¥ 16,613,553	供与(鋸盤他)
3	57	BEL-1004	¥ 15,793,802	供与(18/5:9)
4	57	618-4112339	¥ 2,912,881	携行:実験機器
5	57	BEL-1002	¥ 295,571	供与
6	57	BEL-1003	¥ 26,195,053	供与
7	57	BEL-1013	¥ 41,617,954	供与
8	57	BEL-1003	¥ 6,263,237	供与
9	58	618-4209135	¥ 525,404	携行:試薬
10	58	618-4209136	¥ 12,672,267	携行:書籍, パソコン
11	58	618-4377334	¥ 663,333	携行:ハイグロメーター

	年度	B L / A W B	価 格*	備 考
12	58	BEL-1003	¥ 4,715,120	供与 (化学機器)
13	58	618-5077124	¥ 2,239,505	携行: マイコン
14	58	BEL-1004	¥ 59,335,962	供与 (万能機)
15	59	618-5054836-3	¥ 3,107,197	携行: 薬品・機器
16	59	618-5054848	¥ 1,927,287	携行: ポリボックス
17	59	YHBW-801	¥ 23,109,339	供与機材
18	59	618-5154896-0	¥ 329,045	携行 (ルバノメーター)
19	59	618-5500612-5	¥ 84,905	携行 (スタンド) 小林
20	59	BEL-1001	¥ 401,026	携行 (テキスト) 小林
21	59	YHBW-801	¥ 19,044,660	供与機材
22	59	YHBW-001	¥ 6,697,120	同上
23	60	618-5767105-1	¥ 846,355	携行: 事務用品
24	60	618-5500643-1	¥ 648,590	携行: 刃物後藤
25	60	618-5819621-3	¥ 988,217	携行: メーター阿部
26	60	618-5819623-5	¥ 711,630	携行: 大野

年代別供与機材額

項目 会計年度	供与機材額 (¥)	
	C I F	F O B
1982	11,128,610.7	8,947,559.5
1983	68,746,591	69,642,265
1984	54,700,579	49,038,895
1985	3,194,792	2,574,574
合 計	237,928,069	210,731,329

7-1-4 調査団派遣実績

調査区分	期 間	団 員	所 属 先
事前調査	'79/9/6-9/22	坪井 弘司 田中 政彦 福永 健文 佐野 美則 石塚 幹夫	JICA 鉦工業開発協力部 日本化学工業会 通産省基礎産業局 JICA 鉦工業開発協力部 通産省技術協力課
実施協議	'81/11/5-11/18	内藤 隆三 田中 正躬 高田 実 中村 信 村岡 敬一	JICA 技術嘱託 通産省基礎産業局 コスモ・インターナショナル(株) JICA 鉦工業開発技術協力課 同 上
計画打合せ	'84/2/30-3/2	角南 平 藤堂 直 渡辺 政一 奥山 明	JICA 鉦工業開発協力部 通産省化学技術研究所 コスモ・インターナショナル(株) JICA 鉦工業開発技術課
巡回指導	'84/10/5-10/14	久留 義雄 八代大六郎 小塩 洋三 八木 悌二 杉原 敏雄	JICA 理事 通産省化学技術研究所 (財)化学品検査協会 コスモ・インターナショナル(株) JICA 鉦工業開発技術課
巡回指導	'86/4/25-5/3	飯村 圭司 杉原 敏雄	JICA 鉦工業開発技術課 同 上

7-2 プロジェクトの活動実績

(1) アカデミーコース (3年制)

i) 教職員数

総務 36, 教務 7, 化学 25, 機械 19, 技術サービス 9

施設 10, 合計 106名

ii) 学生数

	1年生	2年生	3年生
化学コース	55	53	53
機械コース	55	56	47



小計 110名 109名 100名

合計 319名

### III 活動実績

約7割の実験項目について一通りC/Pに対する指導を行っている。(しかしながら、C/Pがアカデミーの講師として十分通用する能力を持つようにするには、引き続き指導が必要である。)

#### (2) 短期コース

—下記の2コースを実施した。(両コース共ミニ・プラントを使用)

##### i) Mechanical Maintenance コース

60. 4. 2 ~ 60. 4. 30 (1ヶ月)

参加者数：22名

##### ii) Operation Technology コース

60. 7. 21 ~ 60. 8. 23 (1ヶ月)

参加者数：34名(全員ARUN社の社員)

(初級者向けのこれら2コースについては、技術移転が完了した。「イ」側は、中～上級コースの実施について強く要望し、現在計画立案中である。)

#### (3) 技術サービス

—セミナーを、水処理、排水処理について各1回ずつ実施した。

—約30通りの水質検査方法について指導した。

(今後、水質検査法について引き続き指導するとともに、依頼試験の受付け、料金設定、巡回指導の方法等のシステムを確立する必要がある。)

## 8 プロジェクトの評価

### 8-1 「イ」側との協議

本エバリュエーション調査団は、本年4月に派遣した巡回指導調査団が専門家及び「イ」側と協議しつつ実施したプレエバリュエーションの結果に基づき取りまとめられたエバレポート案に沿って「イ」側と必要な協議を行った。エバレポートの内容は、ほぼ原案通り承認されたが、協議の概要は次の通りである。

(i) 本センターは、Balai (研修所)として近くStatusが決定される。それに伴い、本センターの名称は、Akademi Teknologi Kimia Industri (Academy for Industrial Chemical Industry)となる。(ただし暫定名称)

(ii) 「イ」側より以下について要望があり、「イ」側要望通りエバレポートを変更した。

—本年度供与機材の引取料として「イ」側は1500万ルピアを準備する必要がある事をエバレポートに明記して欲しい。

—アカデミーコースの現状について説明する文章を入れて欲しい。

—技術移転の達成度の調査方法に関する記述を本文ではなくANNEX 8の表に入れて欲しい。

—Wordingの変更

evaluated → appreciated

COMMENTS → REMARKS 他

### 8-2 その他

本調査団が、本プロジェクト関係者を訪問し意見交換を行った結果は次の通りである。

① エンダン所長 (スマトラ化学工業研修開発センター所長)からの要望事項

a. 技術図書供与 (チームの回答: 予算枠内で検討)

b. 工場見学時のイ側C/Pの旅費も日本側にて支出して欲しい。(チームの回答: R/Dにも記載されているように不可能)

c. 基礎電気実験室、機械工作室の拡充、物理実験室の拡充等追加施設要請。(チームの回答: 技術と無償は別要請。いずれにしても困難かと思われる)

② 在メダン総領事館意見

技術移転には時間がかかる。2年半ないし3年の本プロジェクトの協力期間の延長は極めて常識的なラインと思う。

③ 技調委ウィドド局長表敬

チームより本プロジェクト供与機材の引取りに長期間を要している点を指摘し、何らか

の方策を講じるよう要請した。「ウ」局長より手続きの簡略化を検討したいとの発言があった。

④ 工業省シアギアン国際協力局長表敬

工業大臣、及び官房長（Secretary General）も本プロジェクトに極めて強い関心を示している。「イ」側としてもできる限りの事はする。

## 9 今後の課題

今回のエバリュエーションの結果に基づき、1986年10月22日日本プロジェクトの2年半の協力期間延長に関するR/Dが署名された。延長協力期間中の主要課題として以下の事項が挙げられる。

### 9-1 今後協力が必要な事項

#### (1) アカデミーコース

- 一本アカデミーコースのカリキュラムに記載された実験項目の約7割について一通り指導がなされている。これらについてさらに指導を継続し、G/Pの実験実習指導能力の向上を計るとともに未指導の実験項目について早急に指導する。
- 指導の内容について、「イ」側は、理論面の指導ではなく実験実習の指導を要望している。指導の内容及び方法については、「イ」側と十分協議の上進める事が肝要である。

#### (2) 短期コース

- Operation Technologyコース(Advanced)及びRepair Maintenanceコースについて、実施計画を関係機関と協議の上立案し実施に向けて必要な措置(G/Pのトレーニング、機材の調達、短期専門家の派遣要請等)を講ずる。

#### (3) 技術サービス

- 水処理、排水処理について、技術サービスシステムを確立するために、水質検査法等について継続的に指導するとともに、依頼試験の受け付け、料金設定、巡回指導の方法等のシステム確立に関し指導を行う。

### 9-2 供与機材について

#### (1) メンテナンスの方法の指導

本センターには、現時点で約350品目の試験・計測機器が供与され活用されているが、これら試験機器のメンテナンスについても「イ」側にて何らかの対策が講じられるよう指導する必要がある。消耗品、スペアパーツについては、現地サイドで入手する方法を指導する必要がある。

#### (2) 延長期間における機材供与について

- 既供与済機材の活用を前提として検討する。
- 新しく機材の供与が必要な場合、上記(1)の事情を十分検討し、現地のレベルに適合した機材を選定する。

## 附属資料（巡回指導調査団関連）

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## 1. QUESTIONNAIRE

The technical cooperation by JICA to The Chemical Industry Education and Development Center Project, which started upon the signing of Record of Discussion (R/D) on November 19, 1981, is to be terminated on November 18, 1986.

In the case of JICA's project type technical cooperation, one of which is our Center, the evaluation of the Project is carried out in the following manner.

- (1) Several months before the termination of the Project --- Japanese experts and counterpart personnel make the pre-evaluation of the Project and send the pre-evaluation report to JICA headquarters.
- (2) Before dispatching JICA evaluation Team --- JICA headquarters studies the pre-evaluation report and hold the consultation meetings with the Japanese ministries concerned on the future plan of the Project, and thus JICA's policy is decided.
- (3) Dispatch of JICA Evaluation Team --- JICA evaluation team is dispatched about five to six months before the termination of the Project and the JICA Team evaluate the Project together with the Evaluation Team of the recipient country mainly from the viewpoint of the progress of the technology transfer. As a result of the evaluation and discussion the Joint Evaluation Report, which includes the future plan of the Project, is finalised.

Accordingly, JICA is planning to dispatch the Evaluation Team to this Project in July, 1986 to make joint evaluation. To prepare for it, you are kindly requested to give your opinion on the following articles.

### A. Master Plan of the Project

(Refer to the ANNEX-I of the R/D)

#### 1. Academy Courses

##### (1) Curriculum

JICA Team understands that the curriculums of the Center has been modified and improved for a few times in the course of implementing the academy courses at the Center. For the purpose of

studying the latest curriculums of the Center, JICA Team would like to have a copy of their syllabus preferably in English.

(2) The part to be taken care of by the Japanese Experts

The Japanese side understands that the Japanese Experts are in charge of the guidance of the experiment and practice of the subjects but not the guidance of the lecture.

Is this the right understanding ?

(3) The subject of material testing

As for the subject of material testing, though JICA Headquarters has been trying to recruit the expert, it is unsuccessful to find proper expert on this subject so far.

Instead of dispatching the expert, however, JICA Headquarters gave Mr. Warman an opportunity to have technical training in Japan in this field. JICA believes that the technology transfer in the field has been attained considerably as a result of this training.

JICA Team would like to know your opinion on this subject.

## 2. Short Term Courses

(Refer to the Note of ANNEX-I of the R/D)

With reference to the Note of ANNEX-I of the R/D, the actual plan of the short term courses was made in the Annual Work Plan signed on February 29, 1984. The operation course and maintenance course were conducted in April and in July, 1985 respectively. According to the report of the Japanese short term experts, these courses has been successfully conducted and the same kind of future courses could be carried out only by Indonesian counterpart personnel. We would like to know your opinion on these courses.

## 3. Technical Services

As for the scope of the activities of technical services, JICA Team thinks that the seminar on some specialized theme, technical consultation to the relevant industries, and execution of laboratory



test upon request from neighbouring industries are included in it.

What is your opinion on this matter ?

#### 4. Provision of machinery and equipment

( Refer to the paragraph III of the attached document of the R/D)

As to the provision of machinery and equipment described in the paragraph III of the attached document of the R/D as well as in the Annex III, the opinion of JICA Team is as follows.

As the main articles of machinery and equipment has been already provided, only the supplementary equipment would be provided hereafter. The activity of technology transfer from the Japanese experts to Indonesian counterpart personnel by utilizing the provided machinery and equipment should be continued and stressed from this time on, so that laboratory experiment and practice of the Center could be satisfactorily conducted only by the Indonesian counterpart personnel in the near future.

JICA Team would like to know your opinion on this matter.

#### 5. Technical Cooperation Program of the Project

( Refer to the Technical Cooperation Program of hte Project, signed on November 19, 1981 )

After the careful study of all the available document, the JICA Team regards the current situation of the Project as on the stage of phase 2.

We would like to know your opinion on this matter.

## B. Precondition for the extension of the cooperation period of the Project

The JICA team would like to request the Indonesian side to take following measures for the successful attainment of the purpose of the Project. JICA as well as Japanese ministries concerned think that the fulfillment of these measures is an essential prerequisite to the possible extension of the Project.

### 1. Assignment of the full time director of the Center

The assignment of the full time director as well as the necessary number of counterpart personnel as described in the ANNEX IV of the R/D is a must for the attainment of the effective technology transfer.

### 2. Promotion of the smooth custom clearance

The JICA Team would like to ask the Indonesian side to make their further effort to realize the prompt custom clearance procedures of the machinery and equipment provided by JICA. In order to carry out the technology transfer effectively in a limited cooperation period, it is necessary to have the equipment at the Center at the earliest possible date.

### 3. Securing of the running cost

The JICA Team would like to ask the Indonesian side to secure all the running expenses necessary for the implementation of the Project. Related to this issue, according to the report from the JICA experts, it is necessary to have some facility at the Center for the treatment of waste water from the laboratory. JICA Team would like to ask the Indonesian side to take some measures for this.

### 4. Procedures of A Forms

JICA Team would like to ask the Indonesian side to submit A Forms relevant to this Project, especially A4 Form, as soon as possible for the smooth and effective implementation of the Project.

2. Questionnaire に対する回答

QUESTIONS AND ANSWERS

Refer to pre-evaluation team of the Project, Chemical Industry Training and Development Centre, Medan.

A. Master Plan of the Project

1. Academy Courses

(1) Curriculum

The curriculum is hereinwith attached in separate papers.

(2) The Responsibility of the Japanese Experts

Yes, it is.

(3) The Subject of Material Testing

As for the subject of material testing, we would like to see how far Mr. Warman has achieved the knowledge and techniques of material testing in Japan. Meantime, Mr. Kurumiya, Mr. Goto, and Mr. Tamayama as experts will continue to assist him further on the subject.

2. Short Term Courses

As far as the beginner's course is concerned, the Indonesian side has unanimously agreed to the opinion of the Japanese side. However, the Indonesian side also requested to conduct courses on prevention maintenance, and repair-maintenance, which could be conducted with supplementary equipment in accordance with the budgetary limit of the Government of Japan.

Cont/d...

3. Technical Services

The Indonesian side agreed to the scope of the activities, namely the seminars, technical consultation, and execution of laboratory tests, and the fields of technical services, mainly in water treatment, industrial waste water treatment, which were proposed by the Japanese side.

4. Provision of Machinery and Equipment

The Indonesian side agreed to the opinion of the Japanese side.

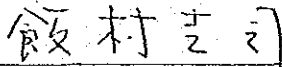
5. Technical Cooperation Program of the Project

The Indonesian side agreed to the opinion of the Japanese side.

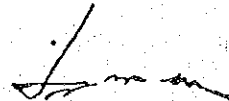
B. Precondition for the extension of the cooperation period of the Project

The Indonesian side will make the best effort in order to realize the pre-conditions proposed by the Japanese side.

In addition to the above questions and answers, the Indonesian side strongly requested the extension of the term of the Project for another three years in order to obtain the self-reliant stage.



Keiji Iimura,  
Leader, Pre-Evaluation  
Team, JICA.



Endang Suprijatna, M.Sc.  
Director, Sumatra Chemical  
Training & Development  
Centre, Medan Indonesia.

April 30, 1986.

3. 調査表の例

INSTRUCTIONS

Please fill up each column in accordance with the following instructions.

- 1 . Name of expert.
- 2 . Name of counterpart personnel.
- 3 . Achievement of the preparation of experimental manual.
- 4 . Degree of sufficiency of the machinery and equipment.  
(Write the name of equipment in short if any)
- 5 . Degree of achievement of technology transfer according to the following classification.

A : Self-reliant stage.

B : Expert has given instruction thoroughly, so that C/P could deepen his knowledge by his own efforts afterwards.

C : Though the instruction has been thoroughly given to the C/P, it is necessary to keep teaching, because the ability of C/P is too low.

D : It is impossible to give all the necessary instruction by November, 1986, because of the lack of equipment.

E : It is impossible to give all the necessary instruction because there is no instructor.

F : It is impossible to give all the necessary instruction because there is no C/P.

- 6 . Result of evaluation.

Subject: Experiment of Chemistry (E)	1	2	3	4	5	6
1. Basic Chemical Experiment 1.1 Measurement of Boiling Point 1.2 Measurement of Melting Point	H. KURUMIYA	IRWAN ROSMIATY REMPAH	Draft Text Book Completion until Nov.	<ul style="list-style-type: none"> <li>◦ Flask for melting</li> <li>◦ Point measurement</li> </ul>	B	
2. Chemical Analysis 2.1 Neutralization Analysis 2.2 Oxidation-Reduction Titration 2.3 Qualitative Analysis of Cation 2.4 Analysis of Anion 2.5 Analysis by Precipitation Method 2.6 Chelate Titration	T. OHKUBO	ADIL TEDY S. SHDMALANGU	Draft Text Book Completion until Nov.	<ul style="list-style-type: none"> <li>◦ Platinum Electrode</li> <li>◦ Direct current source</li> <li>◦ Atomic absorbance spectrometer</li> <li>◦ Spectrophotometer</li> <li>◦ Flame spectrometer</li> <li>◦ Gaschromatograph</li> </ul>	B	The following items (2.1, 2.2, 2.3, 2.4, 2.5, 2.6) are included analytical chemistry. Gravimetric analysis and instrument analysis shall be added to this practice, but the instruments in column 4 are necessary.
2.7 Identification of Organic Compounds	H. KURUMIYA	IRWAN ROSMIATY REMPAH	Draft Text Book Completion until Nov.	<ul style="list-style-type: none"> <li>◦ Abbe Reflect Meter</li> </ul>		

Subject: Experiment of Metallurgy and Industrial Minerals (P)	1	2	3	4	5	6
1. Measuring of Transformation points by Thermal Analysis of Metals and Drawing of Basic Equilibrium Diagrams	(H. KURUMIYA)	Warman Aman Polempung Mahaa	*		D	* Text for operation of several machine are prepared in Indonesia by Indonesian staffs. Not yet completed.
2. Observation of Microstructure of Metals					Target B	
3. Heat Treatment Exercise 3.1 Quenching, Tempering and Annealing 3.2 Observations of Strength Changes and Structure Changes after Heat Treatment 3.3 Drawing Transformation Curves					target B	Mechanical Engineering Course 2nd grade, 3rd semester Study of operation of tester 3rd grade, 5th semester Study for properties of material and heat treatment.
4. Experiment of Corrosion 4.1 Measuring of Metal Corrosion by Electrochemical Methods (1) Measuring of Electrode Potential (2) Measuring of Polarization Curves 4.2 Measuring of Weight Loss 4.3 Measuring of Generated Gas Volume 4.4 Oxidation Test by a Thermobalance				Thermal analyzer is necessary for all items.	D	Chemical Course 2nd grade, 4th semester Study of operation of tester and properties of various materials.  In future, we should consider other industrial materials, such as organic, inorganic, composite etc. except metal.

Subject: Experimenta of Basic Mechanical Engineering (E)	1	2	3	4	5	6
1. Experiment of Stress Concentration	(H. KURUMIYA)	Warman Aman Palempung Mahea			D	
2. Measurement of Modulus of Longitudinal Elasticity						
3. Material Testing						Items 1. Hardness Rockwell Hardness Vickers Hardness 2. Impact test Charpy impact test 3. Tensile strength test (not yet) 4. Composition observation (Microscope: photo & electron) 5. Flaw test Ultrasonic Magnetic Color paint



Subject: Experiment of Organic Industrial Chemistry (E)	1	2	3	4	5	6
1. Synthesis of Benzoic Acid	H. KURUMIYA	IRWAN ROSMIATY REMPAH	Completion		B	
2. Synthesis of Nitrobenzene					B	
3. Synthesis of Aniline					B	
4. Synthesis of Acetic Acid Ethyl Ester					B	
5. Polymerization of Styrene				Styrene monomer is not obtained in Medan.	D	The study of polymerization reaction is the purpose of this practice. So urea resin synthesis is adopted for this item.
6. Flash Point Test of Petroleum				Brookfield Viscometer Tag flash point tester	D	Two instruments in column 4 is necessary for practice.
7. Synthesis of Dyestuff					B	
8. Preparation of Soap					B	
9. Preparation of Detergents				Alkyl Benzene is not obtained in Medan.	D	
10. Purification of Organic Substances				Fraction column is necessary.	D	

4. Program of Practice

PROGRAM OF PRACTICE

GRADE	CHEMICAL ENGINEERING COURSE		MECHANICAL ENGINEERING COURSE	
	I SEMESTER	II SEMESTER	I SEMESTER	II SEMESTER
1	<ul style="list-style-type: none"> <li>* PHYSICS</li> <li>* CHEMICAL ANALYSIS</li> <li>* BASIC ELECTRICAL ENGINEERING</li> <li>* DRAWING (BASIC)</li> </ul>	<ul style="list-style-type: none"> <li>* PHYSICS</li> <li>* CHEMICAL ANALYSIS</li> <li>* INSTRUMENT</li> <li>* ORGANIC CHEMISTRY</li> </ul>	<ul style="list-style-type: none"> <li>* PHYSICS</li> <li>* BASIC CHEMISTRY</li> <li>* BASIC ELECTRICAL ENGINEERING</li> </ul>	<ul style="list-style-type: none"> <li>* PHYSICS</li> <li>* DRAWING (BASIC)</li> <li>* INSTRUMENT</li> </ul>
2	<ul style="list-style-type: none"> <li>* INSTRUMENT</li> <li>* PHYSICAL CHEMISTRY</li> <li>* INDUSTRIAL CHEMISTRY</li> <li>* CHEMICAL ENGINEERING</li> </ul>	<ul style="list-style-type: none"> <li>* MECHANICAL ENGINEERING</li> <li>* PHYSICAL CHEMISTRY</li> <li>* INDUSTRIAL CHEMISTRY</li> <li>* CHEMICAL ENGINEERING</li> <li>* MATERIAL TEST</li> </ul>	<ul style="list-style-type: none"> <li>* INSTRUMENT</li> <li>* CHEMICAL ENGINEERING</li> <li>* BASIC MECHANICAL ENGINEERING</li> <li>* DRAWING (MACHINERY)</li> </ul>	<ul style="list-style-type: none"> <li>* CHEMICAL ENGINEERING</li> <li>* WORK SHOP</li> <li>* MATERIAL TEST</li> <li>* DRAWING (MACHINERY)</li> </ul>
3	<ul style="list-style-type: none"> <li>* MATERIAL TEST (METAL)</li> <li>* MINI PLANT</li> </ul>		<ul style="list-style-type: none"> <li>* MATERIAL TEST (METAL)</li> <li>* WORK SHOP</li> <li>* MINI PLANT</li> </ul>	

5. 本プロジェクトの進め方に関する考え方（専門家への説明用）

本プロジェクトの進め方に関する考え方

(1) 技術協力の範囲について

技術協力の範囲が、スマトラ化学工業研修開発センターの現状（カウンターパートの能力、予算等）に適した規模以上に拡大された場合には、日本の協力が終了し全てがインドネシア側にて運営される事となった時、インドネシア側は、その活動及び施設を維持できない事となる。このような状態とならないよう何を、どの程度指導するかについては、慎重にご検討願いたい。

(2) 技術移転の達成目標について

技術移転の達成目標については、インドネシア国の現状に適したレベルを設定し、それを技術移転の目標として計画を立てられたい。

(3) 機材について

インドネシアの企業のレベル（技術レベル、試験設備の現状）あるいはカウンターパートのレベル等をあまり考慮せず、日本のレベルを基準に判断し、機材要請がなされる傾向にある。

日本のレベルでなく、インドネシアのレベルを基準にして機材供与の妥当性をご検討願いたい。



附属資料 (エバリュエーション調査団関連)

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7. 延長 R / D .....	63
8. オリジナル R / D .....	68



6. Joint Evaluation Report

JOINT EVALUATION REPORT  
ON THE TECHNICAL COOPERATION  
PROJECT FOR THE CHEMICAL INDUSTRY  
TRAINING AND DEVELOPMENT CENTER


AUGUST 1986


JAKARTA, INDONESIA



MUTUALLY ATTESTED AND SUBMITTED  
TO ALL CONCERNED

Jakarta, Indonesia

August 14, 1986

  
\_\_\_\_\_  
Keiji TIMURA,  
Leader,  
Japanese Evaluation Team,  
Japan International  
Cooperation Agency,  
Japan.

  
\_\_\_\_\_  
Soebroto,  
Chief,  
Industrial Skill and Vocational  
Training Development Centre,  
Ministry of Industry,  
Indonesia.

 (B.H.C.)  
 (B. Keu.)  
ass (Biro KEN)  
XH (IKD)  
72 (Biro Casu)



MUTUALLY ATTESTED AND SUBMITTED  
TO ALL CONCERNED

Jakarta, Indonesia

August 14, 1986

*elc) 1986*  
~~Keiji ICHURA.~~

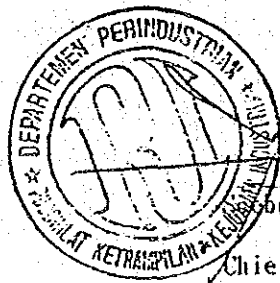
Leader,

Japanese Evaluation Team,

Japan International

Cooperation Agency.

Japan.



*Abroto*  
Abroto.

Chief,

Industrial Skill and Vocational

Training Development Centre.

Ministry of Industry,

Indonesia.

INDONESIAN PANEL

PUSBINLAT

- Ir. Soebroto, M.Sc. : Chief of Centre for Skill and Vocational Training and Development, Department of Industries
- Ir. Goenadi : Centre for Skill and Vocational Training Development Centre
- Drs. Haryatmo : Centre for Skill and Vocational Training Development Centre
- Ir. Sudiharto, SH : Centre for Skill and Vocational Training Development Centre
- Drs. Rasisman : Centre for Skill and Vocational Training Development Centre
- Drs. Imasri Sanir : Centre for Skill and Vocational Training Development Centre

DEPARTMENT OF INDUSTRIES

- Drs. Harjanto Arjunadi : Chief of Bureau of Finance, Department of Industries
- Drs. Oton Suhadi : Bureau of Finance, Department of Industries
- Ny. Erly Pardede, SH : Bureau of Low and Organization, Department of Industries
- Drs. A.S. Siagian : Chief of Bureau of International Technical Cooperation, Department of Industries
- Drs. Djarwadi : Bureau of International Technical Cooperation, Department of Industries
- Mr. M. Munir : Bureau of International Technical Cooperation, Department of Industries
- Mr. D. Tjitro Projitno : Directorate General of Basic Chemical Industries, Department of Industries
- Mr. Suyanto : Directorate General of Basic Chemical Industries, Department of Industries
- Prihatiningrum : Bureau of Planning and Programming Department of Industries

Discussion seeting between the evaluation team of the Japan International Cooperation Agency (JICA) and the indonesian evaluation team on the evaluation of the Technical Cooperation Project for the Chemical Industry Training and Development Center.

Date : August 14, 1986

Place : Industrial Skill and Vocational Training Development Center  
(PUSBINLAT)

Attendance:

#### JAPANESE PANEL

#### JAPANESE EVALUATION TEAM :

1. Mr. Keiji Iimura, Leader, Japanese Evaluation Team.
2. Mr. Yuji Tokumasu, Member, Japanese Evaluation Team.
3. Mr. Toshio Sugihara, Member, Japanese Evaluation Team.

#### JICA INDONESIA OFFICE :

1. Mr. Hideo Endo, Resident Representative, JICA Indonesia Office.
2. Mr. Hisamitsu Nishio, Asst. Resident Representative, JICA Indonesia Office.

#### JICA EXPERTS

1. Mr. Kiso Tsuruoka - Chief Advisor
2. Mr. Yoshihisa Kondo - Coordinator

DEPARTMENT OF FINANCE

Drs. Kadarisman, SH : Directorate General of Budgeting Department of Finance  
Drs. S.P. Saragih : Directorate General of Budgeting, Department of Finance  
Abdul Rochim : Directorate General of Budgeting, Department of Finance

PUS-PPIK

Mr. Endang Supriatna, M.Sc : Director, Chemical Industry Training and Development Centre

INDUSTRIAL EDUCATION PROJECT OF NORTH SUMATRA

Drs. Adat Sembiring : Project Officer, Industrial Education of North Sumatra

## I INTRODUCTION

### 1. Objective

The Japanese Evaluation Team organized by the Japan International Cooperation Agency (JICA), headed by Mr. Keiji Iimura, visited the Republic of Indonesia from August 6 to 15, 1986 in order to jointly evaluate with the Indonesian Evaluation Team organized by the Industrial Skill and Vocational Training Development Center, headed by Mr. Soebroto, the Japan-Indonesia Technical Cooperation Project on the Chemical Industry Training and Development Center which has been carried out for five (5) years on the basis of the Record of Discussions signed on November 19, 1981 between the Japanese Implementation Survey Team and Authorities concerned of the Government of the Republic of Indonesia.

Both teams discussed and studied with the Indonesian counterpart personnel concerned and the Japanese experts on a number of aspects regarding the performance of commitments achievements of the functions of the Chemical Industry Training and Development Centre (hereinafter referred to as "PUS-PPIK") and constraints which hampered past activities.

Through careful studies and discussions, both teams summarized their findings and observations as described in the following chapters.

### 2. Brief background of the project

The Government of Indonesia has been enthusiastically exerting to foster chemical industry which is one of the main targets to be achieved in the third and fourth 5-year Development Plans (1979-1983, 1984-1988). Especially in the Sumatra Island enriched with natural resources i.e. petroleum natural gas, vegetable oil and many others a demand for middle class skilled workers in the various fields of chemical industry has been increasing.

In March 1979, the Republic of Indonesia requested the government of Japan to provide a grant aid to establish the Chemical Industry Training and Development Center (PUS-PPIK), which aimed at

fostering middle class skilled workers in the field of chemical industry and thus contributing to the development of regional industries concerned in Sumatra as a whole.

Upon request, the Government of Japan through JICA sent the preliminary survey team to Indonesia from September 6 to 22, 1979. The preliminary survey team conducted surveys, studies and discussions on the details of the project with the authorities concerned of the government of Indonesia. On the basis of the report and recommendations of the preliminary survey team, the Government of Japan decided to provide a grant aid to establish the Chemical Industry Training and Development Center.

On June 20, 1981, the Exchange of Notes (E/N) being concluded between the two governments, about 4Km south east of the heart of Medan City was constructed the Centre with the granted sum of ¥1,730,000,000.- consisting of an administrative ward, educational wards (class rooms & labs), research development & technical service wards, a machine workshop, an utility ward, a mini-plant, etc.

Meanwhile, the Japanese Implementation Survey Team organized by JICA visited Indonesia from November 5 to 18, 1981 for the purpose of working out the details of the Technical Cooperation Programme for the Project on the Chemical Industry Training and Development Center.

After careful studies and discussions, both parties agreed to recommend to their respective Governments the implementation of the project as described in the "Record of Discussions" signed on November 19, 1981 between the Chief of the Education & Training Centre and the Leader of the Japanese Implementation Survey Team. This recommendation was accepted by both governments and as a result, the technical cooperation programme was started.

## II METHODOLOGY OF EVALUATION

1. In order to evaluate the past performance and achievement both quantitatively and qualitatively, following items are adopted as reference.
  - (1) The Record of Discussions
  - (2) The official request made by the Government of Indonesia with respect to expert services, training of counterpart personnel in Japan and provision of equipment by means of A-1, A2-3, and A-4 Forms respectively.
  - (3) Minutes of Meetings and the Annual Work Plans agreed or accepted in the course of implementation of project.
2. For the purpose of evaluation, both teams discussed various aspects of the Project and observed the buildings, machinery, equipment, facilities and utilities made available for the Project.

### III. RESULT OF EVALUATION

#### 1. Building and Facilities

Upon the signing of the Exchange of Note on June 20, 1981, the construction of the Chemical Industry Training and Development Center was started. The Center consisting of an administrative building, training and development building, training affairs building, lecture hall and work-shop was completed and handed over from the Government of Japan to the Government of Indonesia in February, 1983.

Meanwhile, the dormitory, staff houses, garage, roof for the mini-plant were constructed by the Indonesian Government.

#### (REMARKS)

In spite of the limitation of the national budget of the Government of Indonesia, the effort made by the Indonesian side for the construction of the dormitory and staff houses, etc. is highly appreciated.

#### 2. Staffing

- (1) When the building of PUS-PPIK was handed over from the Japanese side to the Indonesian side, the number of staff is not enough to operate PUS-PPIK. However, the situation has been improved year by year and at present PUS-PPIK has 84 permanent staff and 20 temporary teaching Staff.
- (2) The list of counterpart personnel as of August, 1986 is in Annex 1.
- (3) The Indonesian side fully recognized the importance of local training and provided 6 staff with the opportunity of local training in the various fields such as analytical chemistry, treasury, etc.



(REMARKS)

- (1) Though the present director of PUS-PPIK is not assigned on the full time basis, PUS-PPIK has been managed and operated considerably well.
- (2) The assignment of the full time director as well as the necessary number of counterpart personnel is necessary for the attainment of the effective technology transfer.
- (3) Some counterpart personnel hold two posts at PUS-PPIK. For the promotion of the effective technology transfer, it is desirable that each counterpart personnel belongs exclusively to some specialized section.
- (4) The local training, if it is available, is considered to be the most useful and effective means of training. The effort made by the Indonesian side for the realization of the local training is highly appreciated.

3. Management and Administration

All administrative and managerial services especially for operating the academy courses are being provided by the existing staff of the PUS-PPIK, Ministry of Industry.

The joint committee which consists of delegates from the PUS-PPIK, PUSBINLAT, Ministry of Industry, and other ministries concerned and the Japanese side were held at least once a year for the smooth implementation of the project. Besides, the regular Project review meetings were held among the PUS-PPIK, PUSBINLAT, and Ministry of Industry.

The organization chart of PUS-PPIK is as in Annex 2.

(REMARKS)

- (1) Thanks to the effort made by the Indonesian side, especially by the Director of PUS-PPIK, the management and administration of PUS-PPIK has been carried out without much difficulty.
- (2) The Joint Committee and Project Review Meetings are well organized and these meetings were very useful for the smooth and effective implementation of the project.

- (3) The further effort by the Indonesian side is expected to be made for the speedy custom clearance of the machinery and equipment provided by the Japanese Government in order to carry out the technology transfer effectively in a limited cooperation period.
- (4) In addition to (3) above, the further effort by the Indonesian side is expected to be made for the timely presentation of A Forms relevant to this Project for the smooth and effective implementation of the Project.

#### 4. Equipment

Between November 1981 and July 1986, machinery and equipment worth CIF ¥ 237,928,069 have been donated by the Japanese Government. (Refer to Annex 3).

The machinery and equipment so far provided have been installed and put on operation under the guidance of JICA experts and local counterpart personnel.

In addition to the equipment shipped as above, some more will be provided before November 1986. The amount of which is estimated to be approximately ¥ 45,000,000.

#### (REMARKS)

- (1) The main articles of machinery and equipment which are needed for the PUS-PPIK to function as Chemical Industry Training & Development Center have been already provided.
- (2) The maintenance system should be established and improved.
- (3) The Indonesia side should provide Rp 15,000,000.- within a shortest time for the handling cost in this fiscal year.

#### 5. Japanese Expert

JICA has dispatched fourteen(14) long term experts and eight (8) short term experts. (Refer to Annex 4). In addition, five (5) JICA teams were also dispatched in connection with the Project. (Refer to Annex 5).

(REMARKS)

- (1) In general, all the experts worked very closely with Indonesian counterpart personnel in all lines of activities.
- (2) All the efforts exerted by the experts in an attempt to achieve the successful technology transfer are appreciated by the Indonesian staff.

6. Training of Counterpart Personnel in Japan

A total of sixteen (16) persons consisting of four (4) officials and twelve (12) counterpart personnel have been sent to Japan either for observation or technical training. (Refer to Annex 6)

(REMARKS)

The individual training courses carried out at National Chemical Laboratory for Industry, Industrial Research Institute of Kanagawa Prefecture and others were satisfactory with the efficient coordination of JICA.

7. Budget

A summary of the Project cost spent by the Indonesian side is shown in Annex 7.

(REMARKS)

In spite of the limitation of the national budget of the Government of Indonesia, the effort made by the Indonesia side for securing the budget as above is greatly appreciated.

## 8. Project Accomplishment

### (1) Academy course

The academy course consists of two departments, chemical and mechanical, in which 311 students are at present enrolled in three levels of two classes through the entrance examination given to those who are graduated from senior high schools. The number of enrollments/applications are about three hundred each year, whereas the accepted students are about 110 each year for both departments.

The degree of technology transfer on all practical and experimental subjects in academy course that could be achieved by the end of the cooperation period set by the Record of Discussions in each field was summarized in Annex 8.

### (REMARKS)

- (1) As to the items of measurement of length, measurement of humidity, basic technical drawing, mechanical drawing, and finishing of metal machining, the technology transfer on these items has been almost achieved.
- (2) Technology transfer on many experimental items of chemical engineering are behind schedule because of the lack of equipment.
- (3) According to the result of evaluation, 63 percent of experimental items are on the B stage in its degree of achievement of technology transfer.

Through the discussions with the Indonesian counterpart personnel and the Japanese experts as well as the observation of situation, the evaluation teams understand that the Project is on the development stage. The Indonesian counterpart personnel have just learned the basic training techniques by the practical training facilities and have not yet obtained the ability of practical application which is indispensable to the attainment of the self-reliance.

(2) Short Term Courses

With reference to the Note of ANNEX-I of the R/D, the actual plan of the short term courses was made in the annual work plan signed on February 29, 1984. The operation course and the maintenance course were conducted in April and in July, 1985 respectively.

(REMARKS)

- 1) These courses, mentioned above, have been successfully conducted and the same kind of future courses could be carried out only by Indonesian counterpart personnel.
- 2) The evaluation teams recognized that it would be necessary to conduct courses on operation technology and repair-maintenance to meet the needs of industries and other relevant organizations.

(3) Technical Services

The seminars on industrial waste-water treatment and water treatment were conducted on February 21, 1985 and on March 28, 1985 respectively with the technical assistance of the Japanese experts.

(REMARKS)

The technical service system, which was stated in the Record of Discussions, has not yet been established at the Center. Therefore, it is necessary to start the preparation for establishing the technical service system, namely the seminars, technical consultation, and execution of laboratory tests mainly in the field of water treatment and industrial waste-water treatment as soon as possible.

## Conclusion and Recommendation

1. As a result of the above evaluation, it became apparent that most of the activities programmed in the Record of Discussions and other pertinent papers are behind schedule, and the current situation of the Project are on the Development Stage (Phase 2). (Refer to the Technical Cooperation Programme of the Project)

The technical cooperation started on November 19, 1981. However, because the construction of the Center had been carried out until February 1983, there was no activity in the beginning of the cooperation period. The actual technology transfer activities started around July or August 1984 when most of the counterpart personnel had been appointed to the Center.

2. In accordance with the above observations, it is deemed that further cooperation between both countries are still needed for two years and a half from November 19, 1986.

The objectives of the technical cooperation during the extended cooperation period is to improve the training method and thus achieve the self-reliance by the Indonesians through the following activities.

- (a) Academy course

Continuation of the academy courses in chemical engineering and mechanical engineering.

- (b) Short-term course

Operation technology and repair-maintenance courses for engineers and technicians from industries and others.

- (c) Technical service

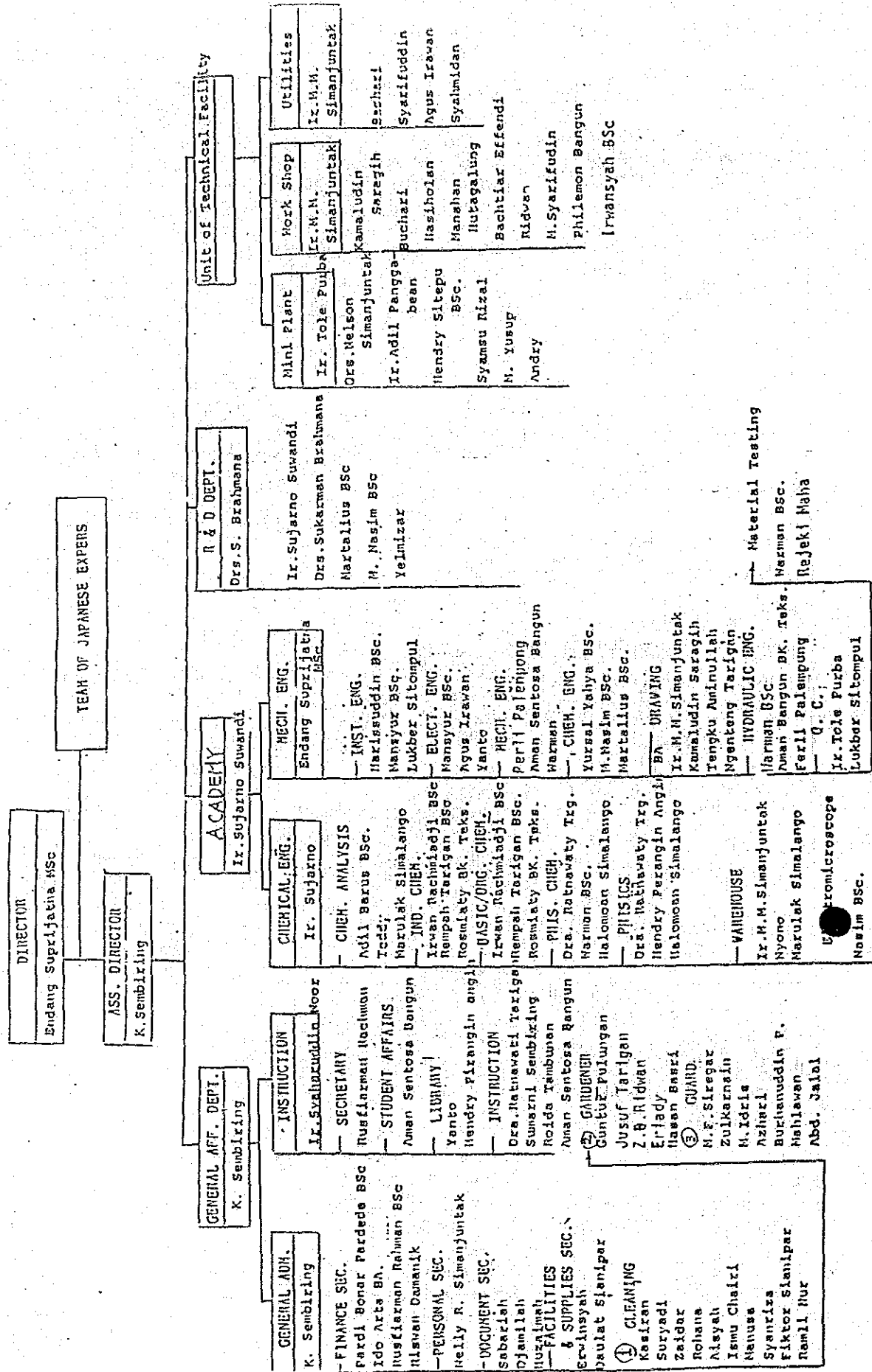
Preparation of technical service system, namely the seminars, technical consultation, and execution of laboratory tests mainly in the field of water treatment and industrial waste-water treatment.

## ANNEX I. ASSIGNMENT STATE OF COUNTERPART PERSONNEL

Chemical Industry Training & Development Centre  
(As of Aug. '86)

NAME	FIELDS	NAME OF COUNTERPARTS	PRESENT POST	
K. TSURUOKA Y. KONDO	ADMINISTRATION OF THE PROJECT	Ir. Soeharto	CHIEF, PUSBINLAT	
		Ir. Goenadi	ASST. CHIEF, PUSBINLAT	
		Drs. A. Sembiring	Head, Planning, MOI, Sumatra	
		Endang Suprijatna, MSc. K. Sembiring	Director of the CENTRE Deputy Director	
S. CHIKAKA	CHEMICAL ENGINEERING	Yursal Yahya B.Sc.	A-CHIEF, Mech. engineering	
		Aman Sentosa Bangun	Assistant	
		Warman	Assistant	
		Ir. Tole Purba	Chief, Mini Plant	
		Drs. Nelson Simanjuntak	Asst. Chief, Mini Plant	
	MINI PLANT	Ir. Adji Panggabean	Assistant	
		Hendry Sitepu B.Sc.	Assistant	
		Syamsu Rinal	Assistant	
		M. Yusup	Assistant	
		Andry	Assistant	
S. ISHIMARU	INSTRUMENT ENGINEERING	Harissuddi B.Sc.	Asst. Chief, Instrument	
		(Mansyur B.Sc.)	Assistant	
	ELECTRICAL ENGINEERING	Lukber Sitompul	Assistant	
		Mansyur B.Sc. Agus Irawan Yanto	Asst. Chief, Electrical eng. Assistant Assistant	
T. OKUBO	ANALYTICAL CHEMISTRY	Ir. Sujarno Suwandi	Chief, Chemical eng.	
		Adil Barus B.Sc.	Asst. Chief, Chemical eng.	
		Teddy	Assistant	
	(H. KURUMIYA)	INDUSTRIAL CHEMISTRY	Marulak Simalango	Assistant
			Irwan Rahmiadji B.Sc.	Asst. Chief, Analytical Ch.
		Rempah Tarigan B.Sc.	Assistant	
		Rosmiaty Bk. Teks.	Assistant	
	PHYSICAL CHEMISTRY	Dra. Ratnawaty Trg.	Asst. Chief, Industrial Ch.	
		Warman B.Sc.	Assistant	
		Halowan Simalango	Assistant	
	PHYSICS	(Dra. Ratnawaty Trg.)	Asst. Chief, Physics	
		H. Perangin Angin B.A. Halozan Simalango	Assistant Assistant	
	(H. KURUMIYA)	TECHNICAL DEVELOPMENT	Drs. S. Brahma	Chief, Technical Development
(Ir. Sujarno Suwandi)			Assistant	
Mattalius B.Sc.		Asst. Chief, Tech'l Development		
M. Nasim B.Sc. Yelmizar		Assistant Assistant		
H. KURUMIYA	ORGANIC IND'L CHEMISTRY	(Irwan Rahmiadji B.Sc.)	Asst. Chief, Ind'l Chemistry	
		Rempah Tarigan B.Sc. (Rosmiaty Bk. Teks.)	Assistant Assistant	
	(H. GOTO)	ELEC. MICROSCOPY MATERIAL DYNAMICS	(Nasim B.Sc.)	Assistant
			(Warman B.Sc.) Rejeki Maha	Assistant Assistant
H. GOTO M. TAHAYAMA J. ONO	MECHANICAL ENGINEERING	M. M. Simanjuntak	Chief, Work Shop eng.	
		Kamaludin Saragih	Asst. Chief, Work Shop Eng.	
		Buchari Hasilolan	Assistant	
		Manaban Hutagalung	Assistant	
		Bachtiar Effendi	Assistant	
		Ridwan	Assistant	
		M. Syarifudin	Assistant	
		Irawansyah B.Sc. Tengku Aminullah Ngentang Tarigan	Assistant Assistant to the drawing Assistant to the same	

ANNEX 2 Organization for chemical industry training & Development Center





( ANNEX 3 ) PROVISION OF EQUIPMENT

	FY	BL/AWB	CIF PRICE	FOB PRICE	REMARKS
1	'82	126-64087613	¥ 1,594,056	¥ 1,032,000	Accumulated amount of
2	'82	BEL-1001	¥ 16,613,553	¥ 15,743,200	CIF:
3	'82	BEL-1004	¥ 15,793,802	¥ 14,637,350	Provided equipment: PE
4	'82	618-4112339	¥ 2,912,881	¥ 2,550,943	¥106,779,170.-
5	'82	BEL-1002	¥ 295,591	¥ 256,800	Accompanied/non-accom-
6	'82	BEL-1003	¥ 26,195,053	¥ 24,625,000	panied equipment: AE
7	'82	BEL-1013	¥ 41,617,954	¥ 39,892,650	¥ 4,506,937.-
8	'82	BEL-1003	¥ 6,263,237	¥ 5,375,000	
9	'83	618-4209135	¥ 525,404	¥ 129,320	
10	'83	618-4209136	¥ 1,267,267	¥ 974,945	
11	'83	618-4377334	¥ 663,333	¥ 616,500	
12	'83	BEL-1003	¥ 4,715,120	¥ 4,346,500	PE: ¥ 64,051,082.-
13	'83	618-5077124	¥ 2,239,505	¥ 2,000,000	AE: ¥ 4,695,509.-
14	'83	BEL-1004	¥ 59,335,962	¥ 56,200,000	
15	'84	618-50548363	¥ 3,107,197	¥ 2,517,400	
16	'84	618-5054848	¥ 1,927,287	¥ 1,297,495	
17	'84	YIBW--801	¥ 23,109,339	¥ 20,719,030	
18	'84	618-51548160	¥ 329,045	¥ 300,000	
19	'84	618-55006125	¥ 84,905	¥ 26,000	
20	'84	BEL-1001	¥ 401,026	¥ 300,000	PE: ¥ 48,851,119.-
21	'84	YIBW-801	¥ 19,044,660	¥ 17,643,970	AE: ¥ 5,849,460.-
22	'84	YIBW-001	¥ 6,697,120	¥ 6,235,000	
23	'85	618-57671051	¥ 846,355	¥ 532,350	
24	'85	618-55006431	¥ 648,590	¥ 533,754	PE: ¥ 0.-
25	'85	618-58196213	¥ 988,217	¥ 898,000	AE: ¥ 3,194,792.-
26	'85	618-58196235	¥ 711,630	¥ 610,470	

CHRONOLOGICAL AMOUNT OF GRANTED EQUIPMENT

F.Y. YEAR	AMOUNT OF EQUIPMENT	
	C I F	F O B
1982	111,286,107	89,475,595
1983	68,746,591	69,642,265
1984	54,700,579	49,038,895
1985	3,194,792	2,574,574
TOTAL	237,928,107	210,731,329

(ANNEX 4) JAPANESE EXPERTS DISPATCHED BY JICA

PHASE	IMPLEMENTATION OF THE PROJECT																	
	0. PREPARATION				I. BASIC ESTABLISHMENT				II. DEVELOPMENT									
	YEAR	1982			1983			1984			1985			1986				
ITEM	MONTH	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4	
1. Chief Advisor (Organic)																		
Kitoshi UEMATSU																		
2. Coordination																		
Aiichiro YAMAMOTO																		
3. Industrial Chemistry				12/21														
Junya SAKAI																		
4. Chemical Engineering																		
Mitsuru TANADA																		
5. Instrument Engineering																		
Mitsuhiko IHARA																		
6. Mechanical Engineering																		
Tooru AIHARA																		
7. Mini Plant (Instrument)																		
Masao UCHIDA																		
8. Mini Plant (Mechanical Eng.)																		
Tadashi KUNIHARA																		
9. Work Shop (Maintenance) & Canning engineering																		
Nasatoshi TAMAYAMA																		
10. Mini Plant Operation																		
Masayuki KODAYASHI																		
11. Waste Water Treatment																		
Kinya SONO																		
12. Water Treatment																		
Mitsashi TAKANAGA																		
13. Chief Advisor																		
Kiso TSURUOKA																		
14. Coordination																		
Yoshihisa Kondo																		
15. Chemical Engineering																		
Sadashi CHIKAKA																		
16. Instrument Engineering																		
Setsuke ISHIMARU																		
17. Industrial Chemistry (Inorganic)																		
Teiji OKUBO																		
18. Industrial Chemistry (Organic)																		
Mitsuyuki KURUMIYA																		
19. Mechanical Engineering																		
Hirofumi Goto																		
20. Mechanical Machining																		
Junichi ONO																		
21. Electrical Engineering																		
Satsuo ABE																		

(ANNEX 6) COUNTERPARTS TRAINED IN JAPAN

PHASE	IMPLEMENTATION OF THE PROJECT											
	D. PREPARATION			I. BASIC ESTABLISHMENT				1985			11. DEVELOPMENT	
	1982	1983	1984	1984	1985	1985	1985	1985	1985	1986	1986	
YEAR	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4
MONTH	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4
A. OBSERVATION												
1. Sohan Tambunan												
2. Nemi Hassan												
3. Mijensako												
4. Endang Supriatna												
B. TECHNICAL TRAINING												
5. SuJarno Suwandi (Chemical Engineering)					3/2	7/6						
6. M. H. Siamih Juntak (Chemical Engineering)					3/2	7/6						
7. Ahmed Sofien (Chemical Engineering)					3/2	7/6						
8. Imasri Samir (Organic Industrial Che.)					3/2	7/6						
9. Ratnavaty Tri. (Inorganic Industrial Che.)								2/28	8/4			
10. Nesi (Analytical Chemistry)								2/28	8/4			
11. Irawan Rachmadji (Organic Industrial Che.)									10/30	2/28		
12. Sukarman Brahmaha (Water Treatment)									10/30	2/28		
13. Werman (Material Testing)									10/30	3/30		
14. Tole Purba (Mini Plant Process Control)										3/14	9/13	
15. Hendry Sitepu (Mini Plant Mechanical Maintenance)										3/14	9/13	
16. Budi Haryant (Organic Chemistry)												

(ANNEX 5) JAPANESE SURVEY TEAM DISPATCHED BY JICA  
IMPLEMENTATION OF THE PROJECT

PHASE	D. PREPARATION			I. BASIC ESTABLISHMENT			II. DEVELOPMENT						
	YEAR	1982	1983	1984	1985	1986	1987	1988	1989				
ITEM	MONTH	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4
1. Preliminary Survey Team Kooji TSUBOI Masahiko TANAKA Takafumi FUKUNAGA Hironori SANO Mikio ISHIZUKA		1/4 (September 6~22, 1979)	2/4	3/4	4/4	1/4	2/4	3/4	4/4	1/4	2/4	3/4	4/4
2. Implementation Survey Team Ryuzo NAITO Hisaya TANAKA Hironori TAKADA Shin NAKAHARA Keiichi MURAKAMI													
3. Consultation Survey Team Taira SUNAMI Nayuki TODO Seiichi WATANABE Akira OKUYAMA													
4. Technical Guidance Team Yoshio HISATSU Daiirokuro YASHIRO Yozo OSHIO Teiji YAGI Toshio SUGIHARA Keiji HIRURA Toshio SUGIHARA										10/5	10/14		
5. Technical Guidance Team Keiji HIRURA Toshio SUGIHARA													4/25
													5/3

## ANNEX 7

INPUT ON NATIONAL BUDGET BY THE GOVERNMENT OF INDONESIA TO THE CHEMICAL  
INDUSTRY TRAINING AND DEVELOPMENT CENTRE PROJECT IN TERMS OF RUPIA VALUE

( UNIT: One thousand Rupiah )

Fiscal year	1980/1981	1981/1982	1982/1983	1983/1984	1984/1985	1985/1986	1986/1987	TOTAL	REMARKS
Personnel cost	-	2.340	5.460	14.940	36.870	44.436	45.678	149.724	
Construction cost	700.000	225.900	598.955	162.471	3.900	87.300	77.850	1.856.376	
Operation cost	-	2.279	61.031	6.668	35.261	75.566	45.670	226.475	
Cost of receiving & inst- alling equipment	-	-	30.000	-	10.000	19.000	4.000	63.000	
Cost of facility of Jap- anese experts	-	-	7.400	-	2.720	3.000	3.000	16.120	
Others	-	525	885	1.428	11.325	20.456	7.240	41.859	
PLANNED TOTAL	700.000	231.044	703.731	185.507	100.076	249.758	183.438	2.353.554	
ACTUAL TOTAL	700.000	112.915	668.754.71	160.739.50	97.415.27	199.649			
UNEFFECTIVE EXPENDITURE (Δ)	-	118.129	34.976.22	24.767.50	2.660.73	50.109			

(ANNEX B) PROJECT ACCOMPLISHMENT

REMARKS :

SUBJECT (Practice In Academy)	1 EXPERT	2 INSTRUCTOR	3 EXP. MANUAL	4 EQUIPMENT	5. DEGREE OF ACHIEVEMENT OF TECHNOLOGY TRANSFER							
					S	A	B	C	D	E	F	Overall
1. Experiment of physics	Okubo	Rahawaty etc.	completed	Insufficient								B
2. Experiment of Chemistry	Kurumiya	Irwan etc.	will complete	Insufficient	10							B
3. Experiment of metallurgy and Industrial minerals	Okubo	Adji etc.	not completed	Insufficient	2							C
4. Basic technical drawing	Kurumiya	Warman etc.	completed	sufficient	2							B
5. Experiment of basic electrical engineering	Goto	Si-manjuntak etc.	45%	Insufficient	4							D
6. Experiment of instrumentation (control engineering)	(Abe)	Mansyur etc.	85%	75%	2							B
7. Experiment of physical chemistry	Ishimaru	Harisuddin etc.			10							B
8. Experiment of organic industrial chemistry	Okubo	Rahawaty etc.	will be completed	Insufficient	10							B
9. Experiment of Inorganic industrial chemistry	Kurumiya	Irwan etc.	completed	Insufficient	6							C
10. Experiment of chemical engineering (chem.)	Okubo	Irwan etc.	will be completed	Insufficient	4							B
11. Practice by practical training facility	Chikaoka	YursaI etc.	100%	70%	6							D
12. Experiment of basic mechanical engineering	Chikaoka	Purba etc.	100%	nearly sufficient	8							B
13. Experiment of chemical engineering (mech.)	Goto	Warman etc.	80%	sufficient	4							C
14. Mechanical drawing	Kurumiya	YursaI etc.	will be completed	70%	4							D
15. Practice of metal machining	Chikaoka	Purba etc.	100%	sufficient	2							B
* Machine work	Goto	Si-manjuntak etc.	100%	sufficient	1							C
* Welding & canning	Ono	Si-manjuntak	80%	sufficient	1							C
* Finishing	Tamayama	B. Hashihara	50%	Insufficient	2							A
16. Practice of practical training facility	Ono	Bachtiar	100%	100%	1							A
	Tamayama	Ridwan etc.										
	Goto	purba etc.	100%	nearly sufficient	8							B
	Chikaoka											
TOTAL:					0	3	88	13	36			140
					0%	2%	63%	9%	26%			B

- 1) Name of expert.
- 2) Name of counterpart personnel.
- 3) Achievement of the preparation of experimental manual.
- 4) Degree of sufficiency of the machinery and equipment.
- 5) Degree of achievement of technology transfer according to the following classifications.

- S: Self-reliant stage.  
A: Self-reliant preparation stage.  
B: Expert has given theoretical instruction to C/P, so that C/P could deepen his theoretical knowledge by his own effort afterwards. As to the practice and experiment, however, it is necessary to keep teaching.  
C: Though the instruction has been thoroughly given to the C/P, it is necessary to keep teaching, because the ability of C/P is too low.  
D: It is impossible to give all the necessary instruction by November 1986, because of the lack of equipment.  
E: It is impossible to give all the necessary instruction by November 1986, because there is no instructor.  
F: It is impossible to give all the necessary instruction by November 1986, because there is no C/P.

THE RECORD OF DISCUSSIONS ON THE JAPANESE TECHNICAL  
COOPERATION FOR THE PROJECT ON THE CHEMICAL INDUSTRY  
TRAINING AND DEVELOPMENT CENTER

The Japanese Evaluation Team organized by the Japan International Cooperation Agency, and headed by Mr. Keiji IIMURA, visited the Republic of Indonesia from August 6 to August 15, 1986 for the purpose of identifying past achievements and future prospects of the Japan-Indonesia Technical Cooperation on the Chemical Industry Training and Development Center, based on the Record of Discussions signed on November 19, 1981 between the Japanese Implementation Survey Team and the Authorities concerned of the Government of the Republic of Indonesia.

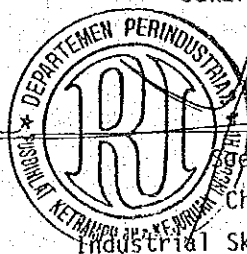
Following the visit of the Japanese Evaluation Team, mentioned above, the Resident Representative of JICA Indonesia Office had a series of discussions with the Indonesian authorities concerned on the possible extension of the period of technical cooperation from November 19, 1986 based on the Joint Evaluation Report signed on August 14, 1986.

As a result of the discussions, both sides agreed to recommend to their respective governments that the period of the technical cooperation as stipulated in the Record of Discussions of November 19, 1981 be extended until May 18, 1989 and that the technical cooperation be carried out in accordance with the Attached Document in order to fully achieve the objectives which were planned in the said Record of Discussions.

Jakarta, October 22, 1986.



*Hideo Endo*  
Hideo Endo  
Resident Representative,  
JICA Indonesia Office,  
Japan.



*Soebroto*  
Soebroto  
Chief,  
Industrial Skill and Vocational  
Training Development Center,  
Ministry of Industry,  
Republic of Indonesia.

The Attached Document

I. The objectives of the technical cooperation during the extended cooperation period is to improve the training method and thus achieve the self-reliance by the Indonesians through the following activities.

(a) Academy course

Continuation of the academy courses in chemical engineering and mechanical engineering.

(b) Short-term course

Operation technology course and repair maintenance course for engineers and others.

(c) Technical Service

Preparation of technical service system, namely the seminars, technical consultation, and execution of laboratory tests mainly in the field of water treatment and industrial wastewater treatment.

II. Responsibilities to be assumed by both sides as follows.

1. Indonesian side

- (1) To secure the necessary counterpart personnel.
- (2) To secure the necessary running budget.
- (3) To secure the prompt custom clearance of the machinery and equipment provided by the Government of Japan.
- (4) To secure the timely presentation of A Forms relevant to this project.

ltb.





## 2. Japanese side

### (1) Dispatch of experts

Long-term experts	- Leader	(1)
	- Chemical Engineering (A)	(1)
	- Chemical Engineering (B)	(1)
	- Organic Industrial Chemistry	(1)
	- Inorganic Industrial Chemistry	(1)
	- Mechanical Engineering (A)	(1)
	- Mechanical Engineering (B)	(1)
	- Instrument Engineering	(1)
	- Electrical Engineering	(1)
	- Coordination	(1)

Note: Short-term experts will be dispatched when necessity arises.

### (2) Supply of machinery and spare parts

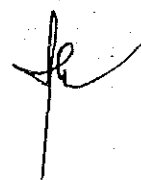
Note: As the main articles of machinery and equipment has been already provided, the supplementary equipment would be supplied.

### (3) Training of counterpart personnel in Japan

III. Technical Cooperation Programme of the Project and The Tentative Implementation Programme are shown in the Annex A and B.

IV. Measures to be taken by both sides to the above Cooperation will be treated in the same manner prescribed in the articles of the Attached Document in the Record of Discussions signed on November 19, 1981.

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TECHNICAL COOPERATION PROGRAMME

ANNEX A

ITEM	1986												1987												1988												1989											
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5																	
I. Target	<ul style="list-style-type: none"> <li>Improvement of training method and thus achieving self-reliance by Indonesians</li> </ul>																																															
II. Activity																																																
1. Academy course	<ul style="list-style-type: none"> <li>Improvement of curricurums</li> <li>Improvement of training techniques</li> <li>Acquirement of the practical knowledge and techniques of chemical plant operation and maintenance</li> </ul>																																															
2. Short-term Course	<ul style="list-style-type: none"> <li>Operation technology course and repair maintenance course for engineers and others.</li> </ul>																																															
3. Technical Service	<ul style="list-style-type: none"> <li>Preparation of technical service system, namely the seminars, technical consultation, and execution of laboratory tests mainly in the field of water treatment and industrial waste-water treatment.</li> </ul>																																															
	<p style="text-align: right;">Self-reliant operation by Indonesians</p>																																															
	<p style="text-align: right;">Self-reliant operation by Indonesians</p>																																															
	<p style="text-align: right;">Self-reliant operation by Indonesians</p>																																															

476.

ITEM	1986												1987												1988												1989												
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
I. General Schedule	1st Grade												2nd Grade												3rd Grade												3rd Grade												
II. Indonesian Side	2nd Grade												3rd Grade												1st Grade												2nd Grade												
1. To secure running fund																																																	
2. To secure counterpart personnel																																																	
3. To secure prompt custom clearance																																																	
4. To secure timely presentation of A FORMS																																																	
III. Japanese Side																																																	
1. Survey team													=																																				
2. Japanese expert																																																	
1) Long term																																																	
Leader																																																	
Chemical engineering (A)																																																	
Chemical engineering (B)																																																	
Industrial chemistry (organic)																																																	
Industrial chemistry (inorganic)																																																	
Mechanical engineering (A)																																																	
Mechanical engineering (B)																																																	
Instrument engineering																																																	
Electrical engineering																																																	
Coordination																																																	
2) Short term																																																	
3) Counterpart training in Japan																																																	
4) Provision of machinery																																																	

8. オリジナル R/D

THE RECORD OF DISCUSSIONS BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF INDONESIA ON THE JAPANESE TECHNICAL COOPERATION FOR THE PROJECT ON THE CHEMICAL INDUSTRY TRAINING AND DEVELOPMENT CENTER

The Japanese Implementation Survey Team (hereinafter referred to as " the Team ") organized by the Japan International Cooperation Agency (hereinafter referred to as JICA) and headed by Dr. Ryuzo Naito, Senior Technical Advisor, JICA, visited the Republic of Indonesia from November 5 to 21, 1981 for the purpose of working out the details of the technical cooperation program concerning the Project on the Chemical Industry Training and Development Center.

During its stay in the Republic of Indonesia, the Team exchanged views and had a series of discussions with the Indonesian Authorities concerned in respect of the desirable measures to be taken by both Governments for the successful implementation of the above-mentioned Project.

As a result of the discussions, the Team and the Indonesian authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Jakarta, November 19, 1981



*Ryuzo Naito*

*Soebroto*

Dr. Ryuzo Naito  
Leader,  
Japanese Implementation Survey Team,  
Japan International Cooperation Agency,  
Japan

Ir. Soebroto  
Chief,  
Education & Training Center,  
Ministry of Industry,  
The Republic of Indonesia

## THE ATTACHED DOCUMENT

### I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of the Republic of Indonesia will cooperate with each other in implementing the Technical Cooperation Project on the Chemical Industry Training and Development Center (hereinafter referred to as " the Project ") for the purpose of training engineers and technicians in the fields of chemical engineering and preparing technical service system for the local chemical industries, thereby contributing to the development of chemical industries in the Republic of Indonesia.
2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

### II. DISPATCH OF JAPANESE EXPERTS

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense services of the Japanese experts as listed in Annex II through the normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. Privileges, exemptions and benefits to be granted by the Government of the Republic of Indonesia to the Japanese experts and their families in the Republic of Indonesia will be no less favourable than those granted to experts of third countries or of international organizations performing similar missions, and will include the followings:
  - (1) Exemption from income tax and charges of any kind imposed on or in connection with the living allowances remitted from abroad in relation with the implementation of the Project;

- (2) Exemption from import and export duties and any other charges imposed in respect of personal and household effects which may be brought into from abroad or taken out of the Republic of Indonesia;
- (3) Exemption from import tax, import sales tax, sales tax, and other taxes and charges of any kind imposed on or in connection with the purchase in the Republic of Indonesia by the Japanese experts of one motor vehicle per each expert;
- (4) Free local medical services and facilities to the Japanese experts and their families.

### III. PROVISION OF MACHINERY AND EQUIPMENT

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense such machinery, equipment and other materials necessary for the implementation of the Project as listed in Annex III, through the normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The articles referred to in 1 above will become the property of the Government of the Republic of Indonesia upon being delivered c.i.f. to the Indonesian authorities concerned at the ports and/or airports of disembarkation, and will be utilized exclusively for the implementation of the Project in consultation with the Japanese experts referred to in Annex II.

IV. TRAINING OF INDONESIAN PERSONNEL IN JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to receive at its own expense the Indonesian personnel connected with the Project for technical training in Japan through the normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The Government of the Republic of Indonesia will take necessary measures to ensure that the knowledge and experience acquired by the Indonesian personnel from technical training in Japan will be utilized effectively for the implementation of the Project.

V. SERVICES FOR INDONESIAN COUNTERPART PERSONNEL AND ADMINISTRATIVE PERSONNEL

1. In accordance with the laws and regulations in force in the Republic of Indonesia, the Government of the Republic of Indonesia will take necessary measures to secure at its own expense necessary services for Indonesian counterpart personnel and administrative personnel as listed in Annex IV.
2. As to the Indonesian counterpart personnel, the Government of the Republic of Indonesia will endeavour to allocate the necessary number of suitably qualified personnel corresponding to each Japanese expert to be dispatched by the Government of Japan as specified in Annex II, for effective and successful implementation of the Project.

VI.

MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE  
REPUBLIC OF INDONESIA

1. In accordance with the laws and regulations in force in the Republic of Indonesia, the Government of the Republic of Indonesia will take necessary measures to provide at its own expense:
  - (1) Land, buildings and facilities as listed in Annex V;
  - (2) Supply or replacement of machinery, equipment, instrument, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than those provided through JICA under III above;
  - (3) Transportation facilities and travel allowance for the Japanese experts for the official travel within the Republic of Indonesia;
  - (4) Suitably furnished accommodations for the Japanese experts and their families.
  
2. In accordance with the laws and regulations in force in the Republic of Indonesia, the Government of the Republic of Indonesia will take necessary measures to meet:
  - (1) Expenses necessary for the transportation within the Republic of Indonesia of the articles referred to in III above as well as for the installation, operation and maintenance thereof;
  - (2) Customs duties, internal taxes and any other charges, imposed in the Republic of Indonesia on the articles referred to in III above;
  - (3) All running expenses necessary for the implementation of the Project.



VII. ADMINISTRATION OF THE PROJECT

1. The Chief of Education and Training Center will bear overall responsibility for the implementation of the Project and the Director of the Chemical Industry Training and Development Center will be responsible for the administrative and managerial matters of the implementation of the Project.
2. Japanese Chief Advisor and other experts will provide necessary recommendation and advice to the Chief of Education and Training Center and to the Director of the Chemical Industry Training and Development Center on the technical matters concerning the implementation of the Project.
3. For the effective and successful implementation of the Project, a Joint Committee (hereinafter referred to as " the Committee ") will be established as referred to in Annex VI.  
The Committee will have the functions to prepare the Annual Work Plan and consult any matters related to the implementation of the Project, and will be held when necessity arises.

VIII. CLAIMS AGAINST JAPANESE EXPERTS

The Government of the Republic of Indonesia undertakes to bear claims, if any arises, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Republic of Indonesia except for those arising from the wilful misconduct or gross negligence of the Japanese experts.

IX. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document .

X. TERMS OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be basically five (5) years from November 19, 1981. However, there will be a general review by the Committee on the progress of the implementation of the Project after three (3) years from the commencement of the cooperation taking account of measures to be taken by two Governments in order to decide if the cooperation should be continued for two (2) more years.

MASTER PLAN

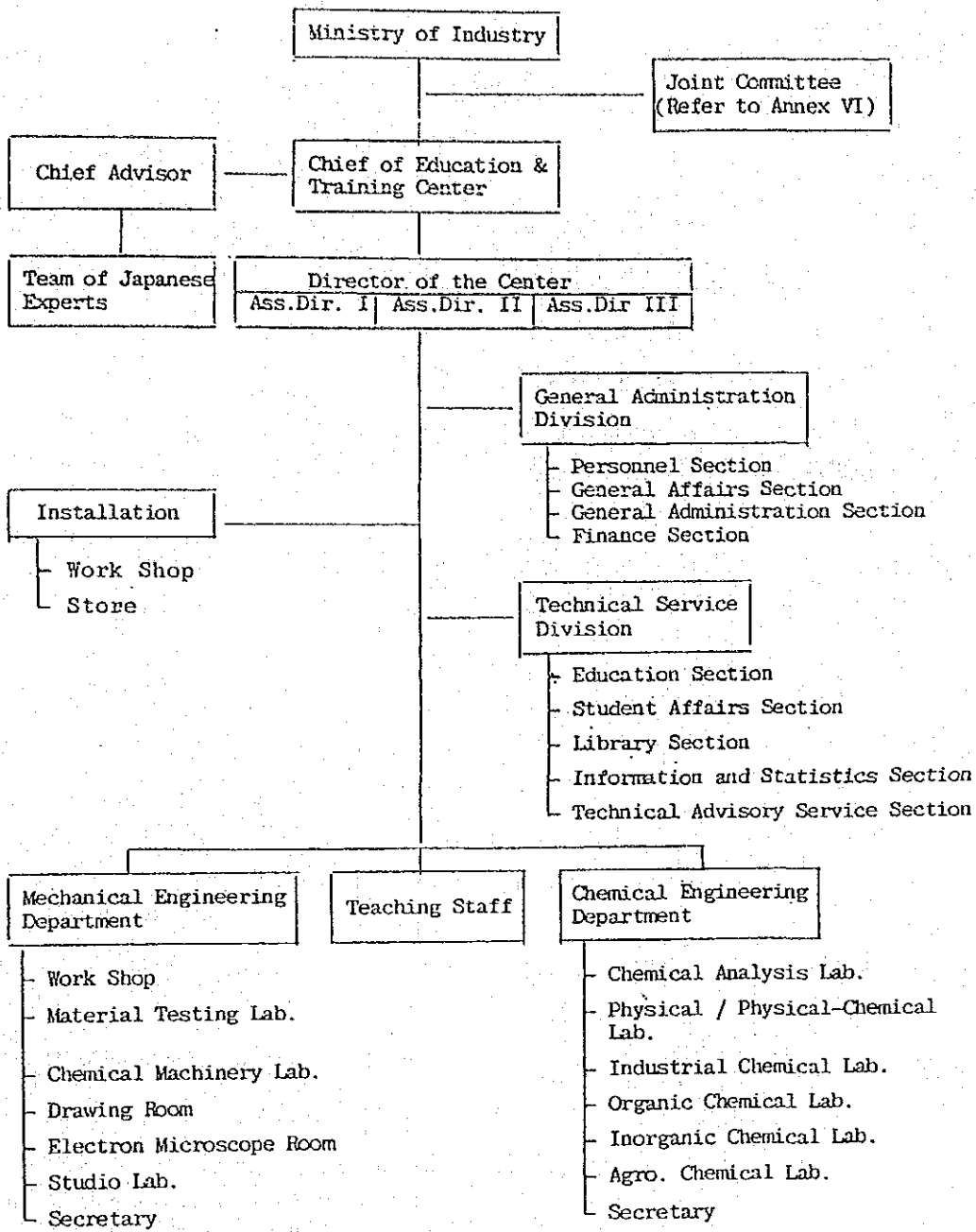
1. Main functions of the Center are;
  - (1) to establish Academy Courses to train middle class engineers in the fields of chemical engineering and mechanical engineering,
  - (2) to conduct Short-Term Courses for engineers and technicians from industries and others  
and
  - (3) to prepare technical service system to meet the technical requirements of the local chemical industries.
2. The training scheme of the Academy Courses is shown in the following table.

Note: Discussions on the actual planning of the Short-Term Courses are to be made between the Japanese and Indonesian authorities concerned in due course of time.

THE TRAINING SCHEME

Items Course	Period	Number of students and trainees to be enrolled	Qualification for entry	Training Target	Number of class
Academy Courses  Chemical Engineering Course Mechanical Engineering Course	3 years	Students :  150 (Maximum) 25 students x 2 classes x 3 grades	1. Graduates from senior high schools or technical high schools  2. Those who are equivalent to the graduates from senior high school	To supply middle class engineers in the fields of operation, maintenance and engineering necessary for chemical industries by means of providing basic technical knowledge and ability on chemical industries	6 classes (Maximum)  2 classes per enrollment

### 3. Organization for Implementation



Foot Note: - Assistant Director I : Academic Affairs  
 - Assistant Director II : Finance, Personnel and Administration Affairs  
 - Assistant Director III : Student Affairs.

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JAPANESE EXPERTS

Experts in the fields of:

1. Chemical Engineering (1)
2. Industrial Chemistry (2)
3. Mechanical Engineering (1)
4. Instrument Engineering (1)
5. Coordination (1)

Note: (1) One of the above-mentioned experts will be appointed as the Chief Advisor.

(2) Short-term experts may be dispatched, if necessary, for the installation of the equipment and machinery provided by the Government of Japan and for other purposes.

LIST OF MAIN ARTICLES

1. Chemical Analysis Lab.

- (1) Potentiometer
- (2) Centrifuge
- (3) Magnetic Stirrer
- (4) Drying Oven
- (5) Rough Balance
- (6) Glasswares and Chemicals for Chemical experiments

2. Physical/Physical Chemical Lab.

- (1) Technical Balance weight set.
- (2) Specific heat specimen set
- (3) Optical benches with accessories
- (4) Hook's law apparatus
- (5) Wheatestone bridge
- (6) Thermostat
- (7) Equilibrium distillation still
- (8) Victor Meyer apparatus
- (9) Glasswares and Chemicals for Chemical experiments

3. Industrial Chemical Lab.

- (1) Electrolysis apparatus
- (2) Electro plating apparatus
- (3) Pressure/Vacuum Pump
- (4) Variable transformer
- (5) Absorption apparatus
- (6) Glasswares and Chemicals for Chemical testing

4. Material Testing Lab.

- (1) Ultrasonic Flaw detector
- (2) Metallurgical microscope
- (3) Montring (mixer)

ANNEX - III

(cont'd)

5. Chemical Machinery Lab.

- (1) Analytical balance
- (2) Wet tester
- (3) Heat exchanger
- (4) Abbe refractometer
- (5) Drying Oven

6. Drawing Room

- (1) Drawing Instrument with accessories;  
- triangles, scales, ruling pens, dividers,  
compass, adjustable curves, lettering sets,  
electric eraser, templates.

7. Inorganic Chemical Lab.

- (1) Furnace (muffle)
- (2) Thermal gravimetric analyser
- (3) Glasswares and Chemicals for Chemical testing

8. Organic Chemical Lab.

- (1) Distillation apparatus with accessories
- (2) Ultra filtration apparatus with accessories.
- (3) Rotary viscosimeter
- (4) Surface tensiometer
- (5) Refractometer
- (6) Glasswares and Chemicals for Chemical testing.

9. Agro Chemical Lab.

- (1) Incubator
- (2) Autoclave
- (3) Fermentator
- (4) Refrigerator
- (5) Titrimeter
- (6) Glasswares and Chemicals for Chemical testing.



ANNEX - III

(cont'd)

10. Electron Microscope Room

- (1) Developer (film) with accessories
- (2) Glasswares and Chemicals for chemical experiments

11. Workshop

- (1) Frash machine
- (2) Lathe
- (3) Drill press
- (4) Milling machine
- (5) Power Hack Saw

12. Vehicles

13. Other Necessary Equipment

AAJ

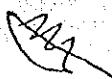
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LIST OF INDONESIAN STAFF

1. Director of the Center
2. Counterpart personnel to the Japanese experts
  - (1) At least ten (10) engineers corresponding to the fields of the experts as listed in Annex II.
    - (i) Chemical Engineering (2)
    - (ii) Industrial Chemistry (4)
    - (iii) Mechanical Engineering (2)
    - (iv) Instrument Engineering (2)
  - (2) Necessary number of technicians mutually agreed upon.
3. Administrative Staff
  - (1) Administration
  - (2) Accounting
  - (3) Clerical work
4. Other personnel mutually agreed upon as necessary.

LIST OF LAND, BUILDINGS AND FACILITIES

1. Space of land and buildings when necessity arises
2. Office rooms for the experts
3. Conference rooms
4. Library
5. Others



MEMBERS OF THE JOINT COMMITTEE

1. Chairman: Director General of Basic Chemicals Industry,  
Ministry of Industry
  
2. Indonesian Side
  - (1) Chief of Education and Training Center
  - (2) Director of the Center
  - (3) Officials of the Ministry of Finance
  - (4) Officials of BAPPENAS
  - (5) Officials of SET/KAB
  - (6) The other personnel concerned
  
3. Japanese Side
  - (1) Chief Advisor
  - (2) The other experts and personnel concerned to be  
dispatched by JICA, if necessary
  - (3) Resident Representative of Jakarta Office, JICA.

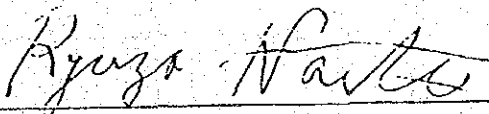
Note: Officer-in-charge of the Embassy of Japan will be able to attend the Joint Committee meetings as an observer.

TENTATIVE SCHEDULE OF IMPLEMENTATION AND TECHNICAL COOPERATION  
PROGRAM OF THE TECHNICAL COOPERATION FOR THE PROJECT ON THE  
CHEMICAL INDUSTRY TRAINING AND DEVELOPMENT CENTER

The Japanese Implementation Survey Team and the representatives of the Education and Training Center have jointly formulated the Tentative Schedule of Implementation and the Technical Cooperation Program of the Project as annexed hereto.

These have been formulated in connection with 1-2 of the Attached Document of the Record of Discussions signed between the Japanese Implementation Survey Team and the Education and Training Center for the Technical Cooperation Project of the Chemical Industry Training and Development Center in the Republic of Indonesia on the conditions that necessary budget will be allocated for the implementation of the Project, and are subject to change within the framework of the Record of Discussions when necessity arises in the course of implementation of the Project.

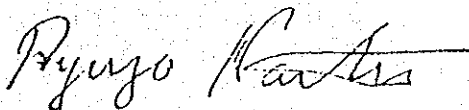
Jakarta, November 19, 1981



DR. RYUZO NAITO  
Leader,  
Japanese Implementation Survey Team,  
Japan International Cooperation Agency,  
Japan



IR. SOEBROTO  
Chief  
Education and Training Center,  
Ministry of Industry,  
The Republic of Indonesia



ANNEX 4-1 TENTATIVE FRAMEWORK OF IMPLEMENTATION

Calendar Year	'79	'80	'81	'82	'83	'84	'85	'86	'87
Final Year	'79	'80	'81	'82	'83	'84	'85	'86	'87
Phase	Preparation		Preparation		Preparation		Preparation		Self-Balance
Building Construction			Implementation Survey Team	Consultation Team	Operating	Equipment Installation Team	Evaluation Team		
Dispatch of Missions			N/D Signing						
Academy Course									
General Schedule									
Long-Term Experts									
Chemical Eng.									
Industry: Dyeing (Organic)									
Industry: Chem. (Inorganic)									
Mechanical Eng.									
Instrument Eng.									
Coordination									
Short-Term Experts									
Curriculum									
Training Materials									
Project Promotion									
Installation and Maintenance									
Training of Indonesian Personnel in Japan									
Precision of Equipment and Machinery									

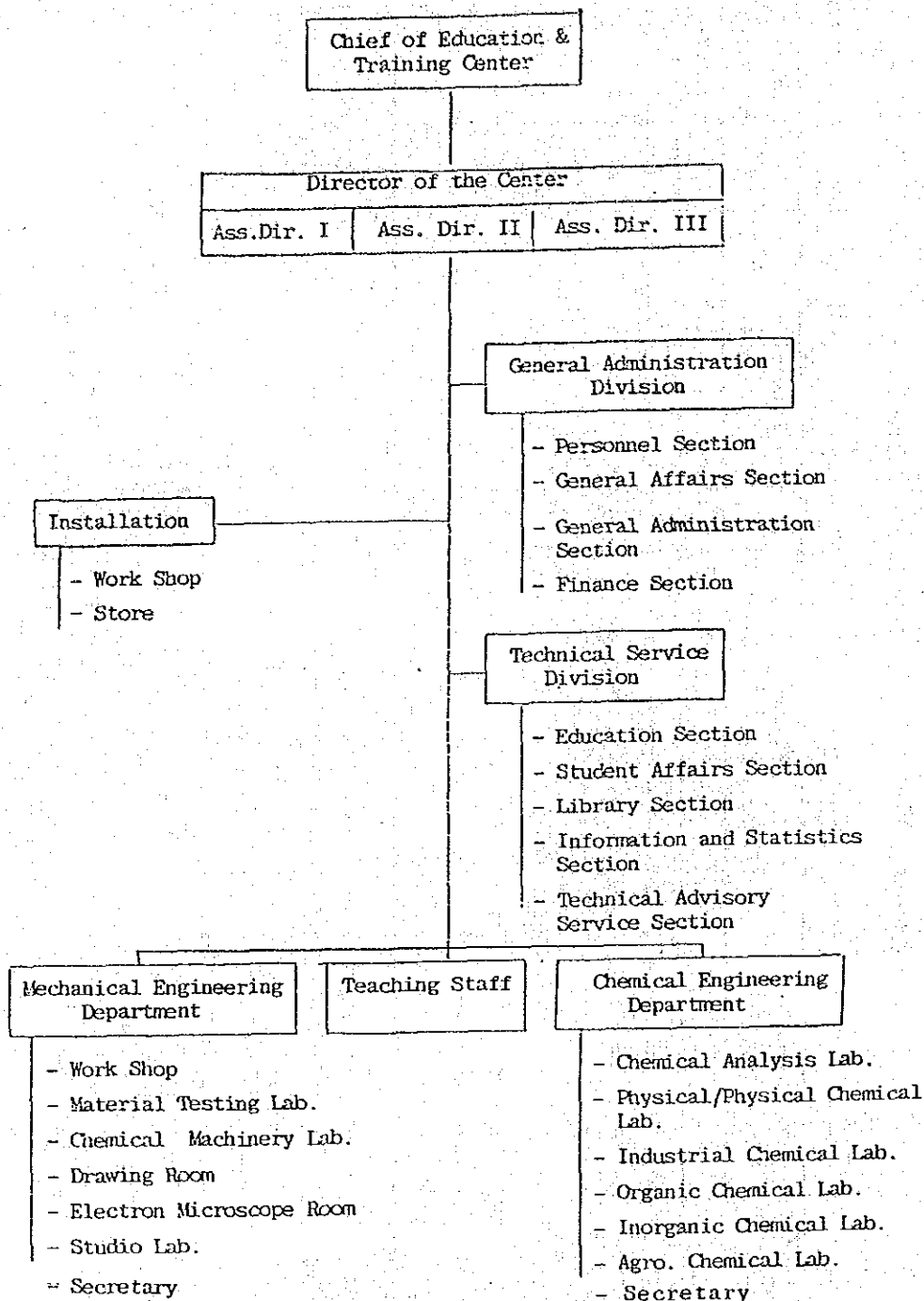
Foot Note: 1. This Schedule is subject to admission that necessary budget will be supplied for the implementation of the first part.  
 2. This scope of Technical Cooperation is subject to change within the scope of the provision given in the Board of Disposition.

## Technical Cooperation Program of the Project

Phase fiscal year Item	Phase 0 Preparation		Phase 1 Basic Establishment		Phase 2 Development		Phase 3 Self-Reliance
	1981	1982	1983	1984	1985	1986	1987
A. Target	* Planning and preparation of the center operation policy * Arrangement of personnel * Preparation of training curriculums and materials	* Planning and preparation of the center operation policy * Recruitment of staff and establishment of organization * Recruitment of staff and establishment of organization * Preparation of curriculums * Planning and procurement of training facilities * Preparation of training materials	* Establishment of the center operation policy * Mastering of training methodology	* Establishment of the center operation policy * Mastering of training techniques by practical training facilities * Mastering of operation & maintenance techniques of training facilities * Master of the basic concept of chemical plant operation and maintenance	* Improvement of training method * Improvement of training curriculums * Improvement of training techniques * Acquisition of the practical knowledge and techniques of chemical plant operation and maintenance	* Further development of activities of the center	* Further development of activities of the academy course
B. Technical Fields Academy Course							

ANNEX - III

1. Organization



Foot Note: - Assistant Director I : Academic Affairs  
 - Assistant Director II : Finance, personnel and Administration Affairs  
 - Assistant Director III : Student Affairs



## 2. Staffing Plan

Director of the center		(1)
Assistant Directors		(3)
General Administration Division	Head	(1)
Personnel Section		(3)
General Affair Section		(3)
General Administration Section		(3)
Finance Section		(3)
Technical Service Division	Head	(1)
Education Section		(3)
Student Affair Section		(3)
Library Section		(2)
Information and Statistic Section		(3)
Technical Advisory Service Section		(3)
Installation	Head	(1)
Work Shop		(3)
Store		(1)
	<hr/>	
	Total	(37) =====

Staffing for the chemical engineering, mechanical engineering, and development department, and teaching group.

I. Department of Chemical Engineering

1.	Head of Department	Professor/Engineer	(1)
1.1.	Chemical Analysis Lab.		
	a.	Chief Lab.	(1)
	b.	Assistant Chief	(2)
	c.	Staff	(2)
1.2	Physical/Physical Chemical Lab.		
	a.	Chief Lab.	(1)
	b.	Assistant Chief	(2)
	c.	Staff	(2)
1.3	Industrial Chemical Lab.		
	a.	Chief Lab.	(1)
	b.	Assistant Chief	(2)
	c.	Staff	(2)
1.4	Organic Chemical Lab.		
	a.	Chief Lab.	(1)
	b.	Assistant Chief	(2)
	c.	Staff	(2)
1.5	Inorganic Chemical Lab.		(1)
	a.	Chief Lab.	(1)
	b.	Assistant Chief	(2)
	c.	Staff	(2)
1.6	Agro. Chemical Lab.		
	a.	Chief Lab.	(1)
	b.	Assistant Chief	(2)
	c.	Staff	(2)
1.7	Secretary		(2)
		<hr/>	
		Total	(33)
			=====

## II. Department of Mechanical Engineering

1.	Head of Department	Professional/Engineer	(1)
1.1	Work Shop		
	a. Chief Lab.		(1)
	b. Assistant Chief		(2)
	c. Staff		(2)
1.2	Material Testing Lab.		
	a. Chief Lab.		(1)
	b. Assistant Chief		(2)
	c. Staff		(2)
1.3	Chemical Machinery Lab.		
	a. Chief Lab.		(1)
	b. Assistant Chief		(2)
	c. Staff		(2)
1.4	Drawing Room		
	a. Chief Lab.		(1)
	b. Assistant Chief		(2)
	c. Staff		(2)
1.5	Electron Microscope Lab.		
	a. Chief Lab.		(1)
	b. Assistant Chief		(2)
	c. Staff		(2)
1.6	Studio Lab.		
	a. Chief Lab.		(1)
	b. Assistant Lab.		(2)
	c. Staff		(2)
1.7	Secretary		(2)
		Total	(33)
			=====
		Grand Total	(103)
			=====

ANNEX - IV ANNUAL WORK PLAN FROM NOVEMBER 1981 to MARCH 1983

Calendar Year Fiscal Year	1981			1982			1983		
	Apr. 1/4	2/4	3/4	Jan. 4/4	Apr. 1/4	2/4	3/4	Jan. 4/4	
Scope of Technical Cooperation			Signing of R/D		(Preparation of A-1 Form, etc.)	(Preparation of A-2 and A-3 Form, etc.)		(Preparation of A-4 Form, etc.)	
1. Indonesian Side									
(1) Receiving of Japanese Experts									
(2) Training of counterpart persn. in Japan									
(3) Acceptance of mach. and equipment									
(4) Staff recruitment									
(5) Organizational set-up									
(6) Preparation of text book									
2. Japanese Side									
(1) Dispatch of Japanese experts									
a) Survey on curricula									
b) Survey on training materials									
c) Project promotion									
d) Chemical Eng.									
e) Industrial Chemistry (organic)									
d) Industrial Chemistry (inorganic)									
(2) Training of counterpart personnel in Japan									
(3) Provision of machinery and equipment									
a) Procurement & shipping									
b) Installation									

Foot Note : 1. This schedule is subject to conditions that necessary budget will be acquired for the implementation of the Project.  
 2. This Scope of Technical Cooperation is subject to change within the scope of provisions given in the Record of Discussions



JICA