

香港金型技術開發協力事業終了時評価調査団報告書

# 香港 金型技術開發協力事業 終了時評価調査団報告書

平成4年10月

平成四年十月

国際協力事業団



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香 港  
金型技術開発協力事業  
終了時評価調査団報告書

平成4年10月

国際協力事業団

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27172

## 序 文

1986年5月に東京で開催された日本・香港経済合同会議における討議から端を発し、1989年3月に討議議事録(R/D)に基づき「金型技術開発協力事業」を実施してきたが、来年3月22日をもって4年間の協力を終了するのに伴い、終了時評価調査団を派遣した。

同調査団の報告によれば、本プロジェクトは、香港側カウンターパートに対する当該分野の技術移転も順調に実施され、関係者から非常に高い評価を得ているとのことであり、前記R/Dに基づく技術協力は、予定どおり終了することとなった。

本プロジェクトのために日夜ご尽力いただいた専門家各位に対し、この機会を借りて心からのねぎらいと、感謝の意を表する次第である。

また、本プロジェクト遂行に多大のご協力をいただいた外務省、通商産業省及び国内支援委員会を形成いただいた各団体、個人の方々に対し、深甚なる謝意を表する次第である。

平成4年10月

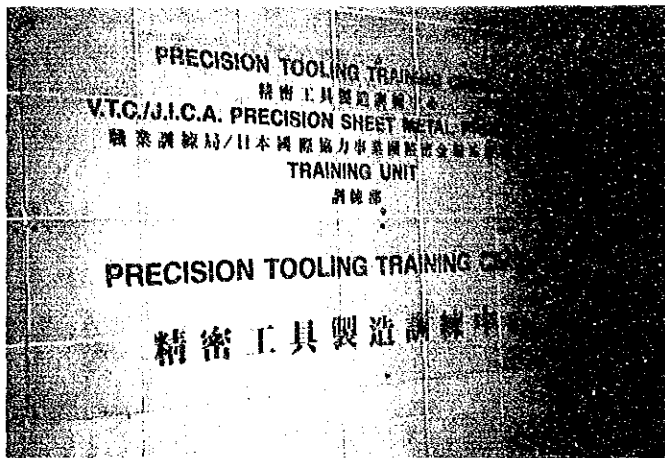
国際協力事業団

鋳工業開発協力部

部長 内 仲 康 夫







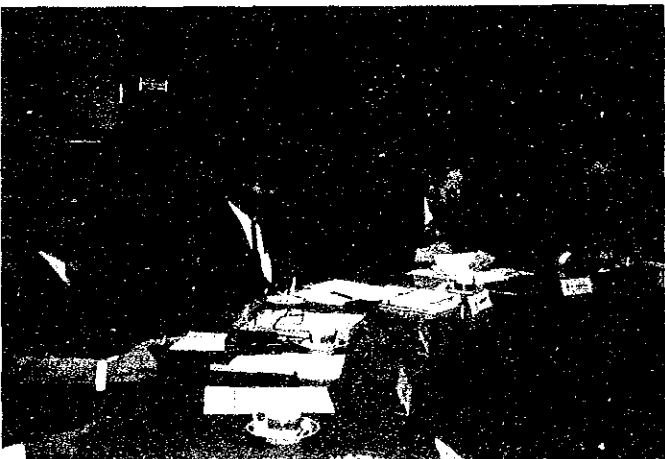
▲ PTTC 内観



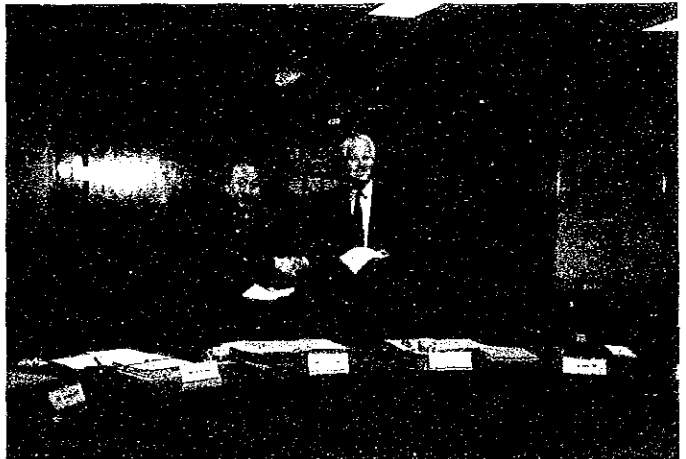
▲ 合同委員会



▲ 合同委員会



▲ ミニッツ署名



▲ ミニッツ署名  
 (左: 谷川 団長)  
 (右: ナイト 長官)







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## I. 終了時評価調査団の派遣

### 1. プロジェクト実施の経緯

香港は、伝統的に軽工業の生産が活発で、輸出額の大半も、これらの産品である。このため、貿易収支はほぼ均衡がとれているものの、特定国（特に日本）との貿易インバランスが最近問題となりつつあり、この問題解決のため、工業品の部品等の輸入を極力抑え、自国にて生産する方針を採用している。こうした背景の中で、

- (1) 1986年10月 この年5月東京で行われた日本・香港経済合同会議の討議を踏まえ、香港側は香港で最も不足している製造技術の人材養成を行うため、産業技術集中研修センターを設立することを計画し、我が国総領事館に対し、技術協力の要請書を提出してきた。
- (2) しかし、同センターの内容は多岐にわたり、金属加工、プラスチック加工、電子・電気技術、時計製造技術、工場自動化、繊維及びオフィス機器の製造技術に関するものまで入っていたため、総領事館はこの要請内容を絞って再度要請するよう香港工業庁に対し示唆した。
- (3) 1987年8月 その結果、香港側は香港にとり最もプライオリティーの高いものとして、工業製品部品の品質向上の基礎となる金型工業に着目し、我が国に対し、新たにプロジェクト方式技術協力の要請をしてきた。(62.8.18 公信 1502号)
- (4) 1988年2月 香港側の協力要請を受け、その内容を的確に把握するため、事前調査団を派遣。(1988.2.29 ~ 1988.3.6)
- (5) 1988年9月 プロジェクト方式技術協力の実施に必要な技術協力詳細計画の作成のため、長期調査チームが派遣された。(1989.9.18 ~ 1988.9.25)
- (6) 1989年3月 技術協力を開始するにあたって、先方とその実施のための協議を行い、R/Dを取り交わし、プロジェクトの暫定実施計画を策定した。(1989.3.20 ~ 1989.3.25)
- (7) 1990年3月 プロジェクトの開始後約1年を経過した段階で、計画打合せ調査団を派遣し、過去の進捗状況を確認するとともに、次期に係るプロジェクト実施計画の策定を行った。(1990.3.5 ~ 1990.3.13)
- (8) 1991年3月 R/D署名後約2年を経過した中、巡回指導調査団を派遣して、過去の1年間のプロジェクト活動状況を確認し、プロジェクト実施に係る年間活動計画の策定を行った。(1991.2.25 ~ 1990.3.2)
- (9) 1991年12月 R/D署名後3年近くを経過した中、計画打合せ調査団を派遣して、前回調査団からの過去の進捗状況を確認するとともに、次期に係るプロジェクト実行計画を策定し、加えて終了時評価調査に向けて、評価手法につき打合せを実施した。(1991.12.2 ~ 1991.12.7)

## 2. 終了時評価調査団派遣の経緯

香港において、「金型製造に必要な人材の養成」を目的として、R/Dにより1989年3月23日より4年間の計画で実施中の本プロジェクトは、現在、約3年半を計画し、終了時まで約半年を残すのみである。

協力実績として、延べ8名の長期専門家派遣（現在、5名派遣中）、18名の短期専門家派遣、6名の研修員受入れ、機材の供与が実施された。

また、プロジェクトの目的を達成するために、協力先機関である香港職業訓練局（VTC）に新規に三つの金型技術訓練コース（金型設計コース、金型製作コース、プレス加工コース）を開設し、日本人専門家の協力のもとに運営され、既に卒業生を輩出している。

本評価調査は、上記を踏まえ、日本側・香港側による合同評価調査を実施した。

## 3. 調査期間

コンサルタント：平成4年9月13日(日)より9月26日(土)まで(14日間)

官ベース：平成4年9月20日(日)より9月26日(土)まで(7日間)

## 4. 調査団員構成

- |          |            |                             |
|----------|------------|-----------------------------|
| 1. 谷川 和男 | 団 長        | 国際協力事業団鋳工業開発協力部計画課<br>課長    |
| 2. 田中耕太郎 | 技術協力計画     | 通産省機械情報産業局鑄鍛造品課<br>総括係長     |
| 3. 山田 忠昭 | プロジェクト実施管理 | (財)素形材センター企画室<br>次長         |
| 4. 落合 直之 | プロジェクト評価管理 | 国際協力事業団鋳工業開発協力部<br>鋳工業開発協力課 |
| 5. 吉田 弘美 | コンサルタント    | 吉田技術士研究所<br>所長              |
| 6. 濱田 一男 | コンサルタント    | 型研精工株式会社<br>社長              |



5. 調査日程

月 日	行 程	調 査 内 容
☆コンサルタント・チーム☆		
9 / 13 (日)	東 京 香 港	○移動 JAL 731 NRT 10:00 - HNK 13:20
/ 14 (月)		○在香港日本総領事館表敬 ○VTC表敬 ○日本人専門家と打合せ
/ 15 (火)		○現地評価調査 ・カウンターパート(C/P)へのインタビュー ・訓練コース卒業生就職先企業へのインタビュー ・地元金型業界代表へのインタビュー ・供与機材現況調査
/ 16 (水)		
/ 17 (木)		○(午前) 金型技術セミナー ○(午後) 現地評価調査
/ 18 (金)		○(午前) 金型技術セミナー ○評価調査資料整理
/ 19 (土)		○評価調査資料整理
☆官ベース調査団 + コンサルタント・チーム☆		
/ 20 (日)		○移動(官) JL 731 NRT 10:00 - HNK 13:20
/ 21 (月)		○在香港日本総領事館表敬 ○VTC表敬 ○日本人専門家と打合せ
/ 22 (火)		○PTTCと協議
/ 23 (水)		○PTTCと協議 ○合同評価レポート(案)作成
/ 24 (木)		○合同委員会
/ 25 (金)		○合同委員会・合同評価レポート署名 ○日本総領事館へ報告
/ 26 (土)	香 港 東 京	○移動 JL 002 HNK 11:25 - NRT 16:20

## 6. 主要面談者

〈香港側〉

—Vocational Training Centre—

Mr. Horace R Knight	(The Executive Director)
Mr. T Y Chui	(Deputy Director)
Mr. Au-Yeung Man	(Assistant Director)
Mr. S K Chong	(Chief Industrial Training Officer)
Mr. Fu Si Pun	(Senior Industrial Training Officer)
Mr. Alec J Twitchett	(Centre Manager of PTTC)
Mr. Chak Tong Wong	(Trainer of PTTC)
Mr. Ka Ming Chang	(Trainer of PTTC)
Mr. Kwok Hing Chau	(Trainer of PTTC)
Mr. Wu Man Sing	(Trainer of PTTC)
Mr. Chi Fai Fung	(Trainer of PTTC)
Mr. Kwok Hung Leung	(Trainer of PTTC)

〈日本側〉

—在香港日本総領事館—

服部 勝己	領事 (経済部部長)
田中 広文	領事 (経済部)

—派遣専門家—

清水 誠司	チーフアドバイザー
中村 康夫	プレス加工
川村 和徳	金型設計
佐野 勝健	金型製作
加藤 健吾	金型製作

7. 対処方針及び結果

調査項目	現状及び問題点	対処方針	結果																
<p>1. 総合評価</p> <p>①目標達成度</p> <p>②案件の効果</p> <p>③自立発展の見通し</p>		<p>・「終了時評価調査内容」に基づき評価調査を実施して、その結果を定量的に「評価表」に記入し、本プロジェクトの終了時評価を導き出す。</p>	<p>合同評価調査の結果、平均点90.4を得た。本事業は順調に実施されており、ほぼ当初目標を達成していることを、日・香双方確認した。</p>																
<p>2. 終了後について</p> <p>—協力終了日—</p> <p>平成5年3月22日</p>	<p>1)技術移転</p> <p>①金型設計</p> <p>②金型製作</p> <p>③プレス加工</p> <p>—上記3分野において、当初計画どおり技術移転を実施している。</p> <p>また、本プロジェクト協力期間中、日本側は全分野に関し、各種手順書を作成し、これらに基づき香港側カウンターパートに技術移転を行っている。</p>	<p>—協力終了後、カウンターパートは各種手順書を使用して業務を遂行することができるかどうかを確認する。(インタビュー等により)</p>	<table border="0"> <thead> <tr> <th>○評価結果</th> <th>得点</th> </tr> </thead> <tbody> <tr> <td>・金型設計</td> <td></td> </tr> <tr> <td>    順送り</td> <td>82.0</td> </tr> <tr> <td>    トランスファ</td> <td>81.3</td> </tr> <tr> <td>・金型製作</td> <td></td> </tr> <tr> <td>    順送り</td> <td>80.9</td> </tr> <tr> <td>    トランスファ</td> <td>81.7</td> </tr> <tr> <td>・プレス加工</td> <td>84.0</td> </tr> </tbody> </table> <p>—評価調査の結果、各カウンターパートは、専門家から移転された技術を基に、そして各種技術手順書等を使用して、独自に業務を遂行できることが確認された。</p>	○評価結果	得点	・金型設計		順送り	82.0	トランスファ	81.3	・金型製作		順送り	80.9	トランスファ	81.7	・プレス加工	84.0
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順送り	80.9																		
トランスファ	81.7																		
・プレス加工	84.0																		

調査項目	現状及び問題点	対処方針	結果
	<p>2) 訓練コース運営</p> <ul style="list-style-type: none"> <li>金型設計コース、金型製作コースに関しては、支障無く計画どおりに進捗しており、定期的に卒業生を輩出している。</li> <li>しかし、プレス加工コースは応募者数が少ないという問題を抱え、コース期間の短縮等の内容変更を行ったが、結果は芳しくなく、91年11月より中断している。</li> <li>打開策として夜間コースを開設することとし、9月より毎週3晩(各2時間半)で11週にわたるコースを開設する予定。既に22名の応募者があり、6名の採用を決定した夜間コースの開設により、プレス加工コースの恒常的实施が見込まれる。</li> <li>協力期間中、カウンターパートが主体となり(専門家の助力を得て)各訓練コースに関する「指導マニュアル」を作成した。</li> </ul>	<p>一右推進するよう申し入れる。</p> <p>一協力終了後は、これを補助材料としてカウンターパートが、訓練コースを円滑に運営できるかどうかを確認する。</p>	<p>○評価結果 得点</p> <p>82</p> <ul style="list-style-type: none"> <li>製作コース 81</li> <li>プレス加工コース 84</li> </ul> <p>一懸案であったプレス加工コースも9月14日より、夜間コースとして再スタートした。</p> <p>今後の各訓練コースの恒常的運営に対し、香港側へ申し入れた。</p> <p>一各カウンターパートが独自で、訓練コースを運営できることを確認した。</p>

調査項目	現状及び問題点	対処方針	結果
	<p>3) 供与機材</p> <p>①保守管理        ー据付け後3年経過するCNCマシニングセンターは、保守点検の必要が生じている。</p> <p>②部品/消耗品補充        ー供与機材製作会社のうち、香港に代理店等を持たない会社が数社ある。</p> <p>4) カウンターパートの定着</p> <p>・カウンターパートは本プロジェクトのために雇用され、雇用契約期間は本協力終了までとなっている。        香港側の特殊事情もあり、その定着化が懸念されている。        現在、VTCにより引き留め策が講じられている。        6月初旬のカウンターパートへの契約更新意向調査によれば、全員更新を希望している。        しかし、最悪の事態を避けるためVTC側は昨年よりサブ・トレーナー（VTC内の他部署の職員）の養成に努めている。</p>	<p>ーCNCマシニングセンターの保守管理のため、短期専門家2名を本年度中に派遣する。        ー派遣予定        ①10月18日～10月24日        ②11月8日～11月14日</p> <p>ー香港側は日本から直接、スベアパーツ等を購入することが可能である旨、説明する。</p> <p>ー右推進するよう申し入れる。</p>	<p>ー右につき説明した。</p> <p>ー右につき説明した。</p> <p>ー6名のカウンターパート全員が、本プロジェクト終了後も契約を更新する意向であることを確認した。</p> <p>今後とも、サブ・トレーナーの養成を推進するよう、香港側に申し入れた。</p>



### 3. 今後への留意事項

#### 1) 本事業終了後の協力について

VTCより本事業終了後の円滑な各訓練コース運営のために、非公式要請としながら、下記3点につき、日本から何らかの協力を願いたい旨、表明があった。

- ① 供与機材の保守管理及び、CAD/CAMソフトバージョンアップ
- ② 先進精密金型加工のケーススタディーの提示
- ③ 非公式支援委員会の設立

—これらの要望に対し調査団より、香港のようにGDP高水準の国に対し、プロジェクト終了後の協力システムは無い旨を説明し、むしろ必要に応じ、香港側独自で民間ベースでの協力を求めるべきであると香港側に提言したところ、先方もこれを了解した。





(資料-1) 討議議事録 (ミニッツ)

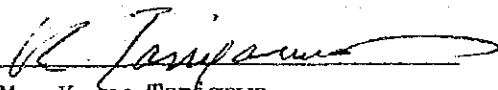
MINUTES OF MEETING  
BETWEEN THE JAPANESE EVALUATION TEAM AND  
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF HONG KONG  
ON THE JAPANESE TECHNICAL COOPERATION PROJECT  
FOR THE DEVELOPMENT OF  
PRECISION SHEET METAL PROCESSING TECHNOLOGY  
IN HONG KONG

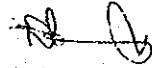
The Japan International Cooperation Agency (JICA) has dispatched the Evaluation Team headed by Mr. Kazuo Tanigawa, Director, Planning Division, Mining and Industrial Development Department, JICA (hereinafter referred to as "the Japanese Team") to Hong Kong from September 13, 1992 to September 26, 1992 in order to evaluate the Project for the Development of Precision Sheet Metal Processing Technology in Hong Kong (hereinafter referred to as "the Project").

The Japanese Team had a series of discussions and exchanged views with Hong Kong authorities concerned with respect to the matters for evaluation of the Project.

As a result of the discussions, both sides agreed to recommend to their respective Governments the matters referred to in the document attached herewith.

Hong Kong, September 25, 1992

  
Mr. Kazuo Tanigawa  
Leader,  
Japanese Evaluation Team,  
Japan International Cooperation  
Agency,  
Japan

  
Mr. H.R. Knight  
Executive Director,  
Vocational Training Council,  
Hong Kong

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The Attached Document

I. Progress of the Project

1. The Joint Committee meeting reviewed the progress of the Project in the period from December 1991 to September 1992 in respect of:

- (a) machinery and equipment installation and commissioning,
- (b) counterparts and JICA long-term experts,
- (c) JICA short-term experts,
- (d) courses run,
- (e) publicity for the Project,
- (f) training of substitute trainers, and
- (g) improvement of temperature and humidity control for the die manufacturing workshop.

2. Both sides were satisfied with the progress of the Project in the past 10 months. The details of the accomplishments made are shown in Appendix I.

II. Joint Evaluation Report on the Project

1. The meeting noted that a Joint Evaluation Team comprising members from JICA and VTC had carried out an evaluation on the overall progress of the Project. The items for evaluation included:

- (a) conformity to Project purpose,
- (b) inputs from the Japan side and Hong Kong side,
- (c) output in terms of technology transfer and operation of training courses,

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- (d) immediate and potential effects of the Project, and
  - (e) prospect of self-development of the Project.

2. The evaluation report endorsed by both sides is attached at Appendix II.

3. The meeting noted that excellent ratings had been achieved for all of the evaluation items and agreed that the Project was being successfully implemented and was meeting its objectives.

### III. Other Matters

#### Continued Support from JICA

1. The Hong Kong side expressed deep gratitude to the JICA and Government of Japan for their support for the Project. In order that the Precision Sheet Metal Processing Training Unit would continue to operate successfully after completion of the Project, the Hong Kong side requested for continued support from JICA as follows:

- (a) provision of maintenance and upgrade support to ADMS CAD/CAM softwares installed in the Training Unit,
- (b) provision of case examples on advanced sheet metal forming processes such as progressive stamping and transfer pressing to the Training Unit for training purpose, and
- (c) establishment of an informal committee through which further advice on precision sheet metal processing technology could be provided to the Training Unit and local industry.

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2. The Japanese Team advised that under the present scheme, JICA would not offer further assistance to those countries with a high per capita GDP after completion of the Project, and that Hong Kong side could seek technical assistance from commercial organisations if necessary. Nevertheless, the Team explained that it would convey the above matters to JICA Headquarters and the authorities concerned upon their return to Japan.

End of Project Ceremony

3. In response to an enquiry from the Hong Kong side, the Japanese Team explained that JICA had no intention to hold a ceremony to mark the conclusion of the Project.

IV. Attendance of the Meeting

The persons taking part in the discussions are listed in Appendix III.

Progress Report on the Joint Project  
December 1991 to September 1992

This report presents in the following paragraphs the progress of the VTC/JICA project since the third Joint Committee meeting in December 1991.

Machine and Equipment Installation and Commissioning

2. Two Hewlett Packard workstations and peripherals, procured by the VTC, were delivered and installed on 28 January 1992.
3. The two sets of ADMS software supplied by JICA were installed by a JICA short-term expert in February 1992.
4. VTC is in the process of procuring a single stroke power press which is expected to be installed on the G/F workshop by December 1992.
5. The upgrading of the ADMS software and the on-line linkage of the ADMS system to the machining centre was carried out by a JICA short-term expert in August 1992.
6. JICA also supplied additional tools for the machining centre in August 1992.

Local Counterparts and JICA Long-term Experts

7. There has been no change in personnel of the JICA team since December 1991.
8. The 6 local counterparts (Precision Tooling Trainers) continued to conduct the various training courses under the guidance of the JICA experts.

### JICA Short-term Experts

9. Another JICA short-term expert came to Hong Kong during the period 10.8.92 to 15.8.92 to supervise and instruct on the assembly of transfer and progressive dies.

### Courses

10. The third 44-week Progressive and Transfer Die Design Course commenced on 13.4.92 with 7 trainees enrolled. Two trainees had subsequently dropped out. As a number of applications had been received after commencement of the course, it was agreed to start another course on 14 September 1992 operating concurrently with the first course. To date 5 trainees have been enrolled.

11. The second 44-week CAD/CAM Die Manufacturing Course ended on 1.8.92 with 8 trainees completing training. One trainee dropped out early in July as he had found employment. The third course will commence on 28.9.92.

12. Because of the unsatisfactory enrolment situation, the full-time die setting and operation course had been restructured to operate as a 11-week part-time evening course. The new course is scheduled to commence on 15.9.92. Six trainees have been enrolled against a planned capacity of 5 and 12 trainees have been wait-listed.

### Publicity

13. Ample publicity has been given to the VTC/JICA Training Unit and its courses. Publicity activities included:

- (i) Trainee recruitment advertisements in leading local newspapers;
- (ii) Promotion letters to establishments in the machine shop and metal working industry, in particular the tool and die makers, and electrical and electronic firms with in-house tool making and sheet metal part production facilities;
- (iii) TV feature programmes;
- (iv) A feature article on the Asian Weekly Magazine; and
- (v) Guided tours for employers from relevant industries.

## Miscellaneous

### Seminar

14. A 2 half-days seminar on 'Transfer and Progressive Die Technology' has been scheduled for 17 and 18 September 1992 at the Precision Tooling Training Centre. The following lectures would be delivered by JICA experts and VTC staff:

- (i) Latest Technology in the Design and Manufacture of Progressive and Transfer Dies by Mr. Kazuo Hamada;
- (ii) Transfer Press and Peripheral Equipment by Mr. Tsuneo Nakamura;
- (iii) Rationalisation, Labour Saving and Automation in Stamping Operation. Response to High Accuracy and Quality. Transfer Press Technology and Practical Application by Mr. Hiromi Yoshida;
- (iv) Progressive Die or Transfer Die - the Deciding Factors by Mr. Rishi Bhatnagar.

A total of 120 persons, the majority of whom from the industry and tertiary educational institutions, would be attending the seminar.

### Training of Substitute Trainer

15. In order to create a larger pool of trainers to cater for unforeseen circumstances, five trainers from the Precision Tooling Training Centre had received a total of 8 weeks intensive training in the use of various machinery and equipment in the Precision Sheet Metal Processing Training Unit during the month of March 1992. The training was conducted by the counterparts and the Japanese experts. Similar arrangement has been planned for March 1993.

### Temperature and Humidity Control for the 6/F Workshop

16. To rectify the temperature and humidity problem, a two package air conditioning unit was installed on the 6/F and came into operation in March 1992.





JOINT EVALUATION REPORT

ON THE

JAPANESE TECHNICAL COOPERATION

FOR

THE DEVELOPMENT OF PRECISION SHEET

METAL PROCESSING TECHNOLOGY IN HONG KONG

25 SEPTEMBER 1992

HONG KONG

## I. Preface

The Japanese Evaluation Team organized by the Japan International Cooperation Agency (JICA), headed by Mr. Kazuo Tanigawa and Hong Kong Evaluation Team (VTC) headed by Mr. Horace R. Knight, the Executive Director of Vocational Training Council (VTC) jointly evaluated the Joint VTC/JICA Project on the Development of Precision Sheet Metal Processing Technology in Hong Kong. The Project has been implemented in accordance with the Record of Discussions (R/D) signed on 23 March 1989 and is scheduled for completion on 22 March 1993. The following paragraphs summarise the findings and observations of the evaluation.

### Objective of the Project

The objective of the Project is to establish a Precision Sheet Metal Processing Training Unit in VTC's Precision Tooling Training Centre at the Kowloon Bay Training Centre Complex with the aim of developing manpower in precision sheet metal processing technology, including die design, die manufacture and die setting and operation, thus contributing to the enhancement of precision sheet metal processing technology in Hong Kong.

## II. Evaluation Method

The Joint Evaluation Team is composed of members from JICA and VTC as shown in Annex I.

The evaluation process involves:

- (i) Discussions with the JICA experts.
- (ii) Interviewing the six Counterparts.
- (iii) Visits to two manufacturing companies which have employed graduates of the courses, namely NICS Engineering Limited and Kuk Je Mould and Dies (International) Limited, and interviewing the employers and trainees of these two companies.
- (iv) Discussion with a representative of the local die industry.

1. Items for Evaluation

The items for evaluation were determined based on the items of cooperation activities stipulated in the Master Plan of the Record of Discussions.

2. Criteria for Evaluation

Criteria for evaluation are:

- (i) Whether the targeted technology has been transferred.
- (ii) Whether the items for evaluation have been effectively carried out.

3. Assessment

Evaluation was carried out through qualitative and quantitative assessment according to the following scoring methods:

- 4 : 81 - 100 (excellent)
- 3 : 61 - 80 (good)
- 2 : 41 - 60 (fair)
- 1 : 0 - 40 (poor)

For each item, a specific rating was allocated so that the total rating becomes 100. Score for each item can be obtained by multiplying the evaluation point by the rating. The total score for the evaluation item is the sum of scores for individual items.

### III. Evaluation Results

#### Summary of Evaluation

Annex II is a summary of the results of evaluation.

#### 1. Conformity to the Purpose of the Project

##### 1-1. Conformity to the original plan

The technology on the design and manufacture of precision progressive die and transfer dies as outlined in the Record of Discussions, has been transferred to Hong Kong in accordance with the original plan without significant alteration to contents and level of technology.

After three and half years operation of the Project, the technology transferred has gained popularity among industrial employers and has become more important to the Hong Kong industry.

#### Remarks

- (1) As to the Die Setting and Press Operation Course, there has been no alteration in contents and level of the course. However this course has been restructured to attract more trainees to join the course.
- (2) During the JICA Survey Team's visit in December 1991, the request for JICA to provide additional training exercises was put forward for consideration. Accordingly the necessary support had been provided by JICA for this purpose. This has the effect of enlightening the technology to be transferred.

1-2. Evaluation of dies of which technology is transferred

The dies designed and manufactured independently by the counterparts had been successfully tried out on the press and parts produced conform to the required specifications. Hence the technology standard set initially has been achieved.

1-3. Degree of attainment of the technology and training received by counterparts

- (1) The counterparts were able to conduct the training course independently without further assistance from the Japanese experts.
- (2) The counterparts were able to actually design and manufacture the assigned dies. This means they have built up the capability to produce design drawing and manufacture the dies, and actually try out the dies on the press and produce the parts.

1-4. Conformity to the industry's requirements

The evaluation of the training courses by the industry is as follows:

- (1) Evaluation by a representative of local industry

The Evaluation Team interviewed Mr. C.C. Chan (Technical Manager of Sunnex Products Ltd.), a representative of the local industry, to collect the industry's views on the training courses. Mr. Chan was very satisfied with the

high standard of the training courses provided by Precision Sheet Metal Processing Training Unit (PSMPTU).

He said that as Hong Kong was facing a shortage of skilled precision tooling workers, the CAD/CAM courses offered by PSMPTU have helped to ensure a steady supply of well-trained tooling workers in meeting the needs of the industry.

(2) Evaluation by companies which employed graduate trainees of the courses

The evaluation team interviewed employers of two companies which had employed graduate trainees of the courses, namely NICS Engineering Ltd. and Kuk Je Mould & Dies (International) Ltd. Both employers were pleased with the capability of the graduate trainees and the high standard of training provided by PSMPTU. They indicated that they would continue to recruit graduate trainees in future. They also suggested PSMPTU to offer evening courses so that serving workers could join the training courses. With regard to comments from graduate trainees, most of them were satisfied with their employment and considered that the training they received at the PSMPTU was relevant to their present job.

2. Input

2-1. Input from Japanese side

In general, Japanese input is considered satisfactory (average score: Annex II-3). Details are given below.

2-1-1. Dispatch of experts

As of 31 August 1992, a total of 26 experts were dispatched to PSMP TU as shown in Annex III. Of these 26 experts, 8 are long-term experts whose assignment period last more than one year and the remaining are short-term experts. At present, 5 long-term experts are working with PSMP TU.

2-1-2. Provision of machinery and equipment

Since 1989, machinery and equipment to the value of more than 370 million Japanese Yen have been provided to PSMP TU. Details are shown in Annex IV.

2-1-3. Counterparts training in Japan

Six counterparts received 3-month initial training in Japan in mid 1989. Details are shown in Annex V.

2-2. Input from Hong Kong side

As shown in Annex II, the input from the Hong Kong side is also considered satisfactory (average score: Annex II-4.)

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The following is the details of the input from Hong Kong side.

2-2-1. Arrangement of counterparts according to plan

Counterparts were assigned to each course as required in the Record of Discussions. No vacancy has occurred during the Project period.

2-2-2. The provision of capital and recurrent funds

The provision of capital and recurrent funds and actual expenditure for the years 1988/89 to 1991/92 are shown in Annex VI.

2-2-3. Provision of equipment/machinery

The machinery/equipment have been provided by VTC in accordance with the Record of Discussions details of which are shown in Annex VII.

3. Output from the Project

Evaluation was made with regard to the transfer of technology and the accomplishment of the project. The average score for all evaluation subjects is at Annex II.

3-1. Transfer of technology

The results of evaluation for transfer of technology are shown in Annex II-5. Details are as follows.



3-1-1. Die design

- (1) Progressive Die Design
- (2) Transfer Die Design

The results of the evaluation are shown on the 'Basic Plan of Technology Transfer Evaluation' list shown at Annex II.

3-1-2. Die manufacturing

- (1) Progressive Die Manufacturing
- (2) Transfer Die Manufacturing

The results of the evaluation are shown on the 'Basic Plan of Technology Transfer Evaluation' list shown at Annex II.

3-1-3. Die setting and press operation

The results of the evaluation are shown on the 'Basic Plan of Technology Transfer Evaluation' list shown at Annex II.

3-2. Administration of training courses

The results of evaluation are shown in Annex II-11. Details are as follows.

3-2-1. Die design course

(i) Training of counterparts

Two counterparts assigned to the die design course received 3-month initial training in Japan. They secured a good basic understanding of the software to be used for the Project and at the same time were able to gain an insight into manufacturing techniques and methods.

(ii) Technology transfer from the Japanese experts

The Japanese experts transferred the targeted technology to the counterparts to the full extent. The counterparts were able to conduct the course to enable the trainees to design both progressive and transfer dies successfully.

(iii) Utilization of equipment/machinery

All the equipment and machinery supplied by both sides for die design were utilized as planned.

(iv) Utilization of training materials

Training materials, such as video tapes and exercises had been prepared by experts and counterparts and were fully utilized during training courses.

3-2-2. Die manufacturing course

(i) Training of counterparts

Three counterparts assigned to the die manufacturing course received 3-month initial training in Japan. They secured a good basic understanding of the CNC machines they were to be assigned to and at the same time were able to gain an insight into manufacturing techniques and methods.

(ii) Technology transfer from the Japanese experts

The Japanese experts transferred the targeted technology to the counterparts to the full extent. The counterparts were then able to conduct the course to the trainees to enable them to manufacture both progressive and transfer dies successfully.

(iii) Utilization of equipment/machinery

All the machinery and equipment supplied by both sides for die manufacturing were utilized as planned.

(iv) Utilization of training materials

Training materials, such as manuals, video tapes and exercises had been prepared by experts and counterparts and were fully utilized during training courses.

3-2-3. Die setting and operation course

(i) Training of counterpart

One counterpart assigned to die setting and operation course received 3-month initial training in Japan. He secured a good basic understanding of the transfer and high speed press to be used for the Project and at the same time was able to gain an insight into press working techniques and methods.

(ii) Technology transfer from the Japanese experts

The Japanese experts transferred the targeted technology to the counterpart to its full extent. The counterpart was able to conduct the courses to the trainees to enable them to carry out die setting and press operation independently.

(iii) Utilization of equipment/machinery

The machinery and equipment supplied for the training of die setting and operation were not fully utilized as planned.

Applications for this course were disappointing, resulting in a less number of courses being operated than initially planned. However it has been agreed to offer this course in a revised format i.e. as a 11-week part-time evening course. Six trainees have been enrolled for the first revised course commencing in September 1992. To-date 12 trainees are on the waiting-list.

(iv) Utilization of training materials

Training materials, such as manuals, video tapes and exercises had been prepared by experts and counterparts and were fully utilized during training courses.

3-2-4. Trainee statistics

Trainee statistics for the various courses offered during the Project period are at Annex VIII.

4. Effects of the Project

4-1. Immediate effects

4-1-1. Technological effects

- (i) The acquisition of the world leading technology to design and manufacture precision progressive and transfer dies domestically has enhanced Hong Kong's image internationally.
- (ii) The ability to design and manufacture precision dies and then to confirm that ability by testing the dies on the press not only proves the application of theoretical knowledge but also the practical skill. This has stimulated the interests of trainees and will in future attract more applications to the various courses.
- (iii) The Project has helped to build up technical expertise in Hong Kong in the

4-1-2. Financial effects

- (i) The standard of training received by the trainees is highly regarded by the industry. Employment rate of the graduate trainees of the courses is 100% and their remuneration has been increased by 167%. Their status has also been raised after completion of the course.
- (ii) Companies engaging trainees who have completed the courses have a high development potential in the field of precision die design and manufacture including the application and use of CAD/CAM and NC machines. Many employers have expressed their wish to employ more graduates in future.

4-2. Potential effects

4-2-1. Counterparts

The availability of manpower to train die designers, die makers, and press machine operators continuously on a national level will improve and develop Hong Kong's capability in this field.

4-2-2. The local industry

The majority of the trainees after completing their training courses in precision die design and manufacture will continue to join the manufacturing industry. Thus, CAD/CAM, precision machinery and equipment and High-speed Metal Stamping

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Systems, etc. which form the basis of the application of precision sheet metal processing technology will become more popular in the manufacturing industry and will no doubt continue to flourish in future.

5. Prospect of Self-development

5-1. Possibility of organizational self-development

The structure of the Precision Sheet Metal Processing Training Unit (PSMPTU) after the Project has been completed has been made clear by the organizational structure chart shown in Annex IX. The VIC has a well established Precision Tooling Training Centre to support the future development of the PSMPTU set up under the joint JICA/VIC Project.

5-2. Possibility of financial self-development

Based on the operation of the Project since its implementation in March 1989 and the successful running of other training courses by the Precision Tooling Training Centre, it is envisaged that sufficient funds will be provided by the VIC to support the continuing operation and future development of the PSMPTU when the Project ends in March 1993.

5-3. Possibility of technological self-development

The technology transferred to Hong Kong is a leading technology which is unlikely to become obsolete in the foreseeable future. During the Project period, the JICA experts also have been assisting the counterparts to design and manufacture new dies to improve their capability.

#### IV. Conclusion

The objective of this Project was to provide technology transfer of precision die design and manufacture which is essential if local engineering-based manufacturers are to upgrade the quality of their products and improve the productivity not only for the present but also in the future.

According to the results of the joint evaluation, both Hong Kong and Japanese sides confirmed that this Project is being successfully implemented and is meeting its objectives. The effect of training manpower in precision sheet metal processing technology may not be immediately apparent, but it will certainly have a great impact on the development of the manufacturing industry in future.

In spite of difficulties encountered, the Project has made significant progress and conformed to the original plan and the counterparts and trainees have attained the targeted technology level. This is mainly due to the devotion and co-operation of the persons involved.

As a characteristic of this Project, not only the necessary machinery/equipment were installed but text books, manuals, technical data and other educational articles were also prepared to enable training to be maintained and further developed. A complete list of manuals is shown in Annex X.



V. Recommendation from the Joint Evaluation Team

1. Recommendation to JICA

As a result of evaluation on all factors pertaining to its operation, the Joint Evaluation Team concluded and recommended to JICA that the Project would be completed as scheduled and that the Training Unit set up under the JICA/VIC joint Project would continue to operate independently and effectively after the Project ends in March 1993.

2. Recommendation to VIC

The Joint Evaluation Team recommended that VIC should convey to relevant departments of the Hong Kong Government to take necessary measures to promote the application of precision die design and manufacture technology to the industry.

VI. Dispatch of Survey Teams

To date, JICA has dispatched a total of 7 Survey Teams to plan, monitor and evaluate the Project. Details are shown in Annex XI.

MEMBERS OF JOINT EVALUATION TEAM

The Joint Evaluation Team is composed of members from  
JICA and VTC as follows:

Members (Japan side)

Mr. Kazuo TANIGAWA  
Mr. Kotaro TANAKA  
Mr. Tadaaki YAMADA  
Mr. Naoyuki OCHIAI  
Mr. Hiromi YOSHIDA  
Mr. Kazuo HAMADA  
Mr. Seiji SHIMIZU

Members (Hong Kong side)

Mr. Horace R. KNIGHT  
Mr. S.K. CHONG  
Mr. Alec J. TWITCHETT  
Mr. S.P. FU  
Mr. C.Y. MAN

Summary of Project End Evaluation Results

Annex II - 1

Evaluation Item		Average Score
Degree of purpose achievement	Conformity to Project purpose	90
	Input ( Japan side )	92
	Input ( Hong Kong side )	97
	Technology transfer	81.8
	Output Operation of training courses	82
Effects of Project	Immediate effects	92
	Potential effects	
Prospect of self development	Possibility of self-development as an organization	98
	Possibility of financial self-development	
	Possibility of technological self-development	

*[Handwritten mark]*

Conformity to Project Purpose

Annex II - 2

Project purpose	Present Condition	Evaluation point	RATE	Score
<p>To promote the training of manpower on die manufacturing in order to pursue the increase in the production of industrial products in Hong Kong and subsequently to reduce the trade imbalance with certain nations.</p>	<p>It is effective for the industry in Hong Kong to be able to train manpower in precision die design and manufacturing which are crucial in improving quality and productivity of industrial products.</p>	<p>90</p>	<p>100</p>	<p>90</p>
<p>Average Score</p>		<p>90</p>		

*[Handwritten mark]*

Item	Evaluation point	RATE	Score
<p><u>Dispatch of Experts</u> Dispatch of long-term and short-term experts necessary for the operation of Project has been implemented as scheduled. In October &amp; November 1992, the last short-term experts are scheduled to be dispatched. See to Annex III-1, Annex III-2.</p>	100	40	40
<p><u>Training of Counterparts</u> The initial training of Counterparts in Japan was implemented as scheduled. See Annex V.</p>	100	20	20
<p><u>Provision of machinery / equipment</u> Although the first batch of machinery/equipment was introduced behind schedule due to the problem in allocating fund, the provision of machinery/equipment by Japan side has been completed.</p>	80	40	32
Average Score			92

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Item	Degree of achievement	Score (RATE)
<u>Arrangement of counterparts</u> Counterparts (6) are allocated to each of the three courses, Die Design Course (2), Die Manufacturing Course (3), and Die Setting and Press Operation Course (1) as scheduled.	40	40
<u>Allocation of funds</u> There has been adequate expenditure by VTC side for the procurement of the machinery/ equipment, consumable tools, etc. required for the operation of Project.	30	30
<u>Training premises and machinery/equipment installation</u> Size of the workshop, installation of machinery/equipment, and training environment are generally acceptable. Condition of vibration effects could be improved (by strengthening the floor).	30	27
Average Score	97	

Technology Transfer

Annex II - 5

Item	Evaluation point	RATE	Score
Die design	Progressive die design	22	18.0
	Transfer die design	22	17.9
Die manufacturing	Progressive die manufacturing	22	17.8
	Transfer die manufacturing	22	18.0
Die Setting and Press Operation	84.0	12	10.1
Average Score	81.8		

Item	Comment	Evaluation point	RAFE	Score
Press working method		83	4	3.3
Countermeasures against troubles	No troubles occurred. There are not enough cases to be considered.	60	4	2.4
Material		90	4	3.6
Press machine and equipment		77	4	3.1
Tooling die design		70	4	2.8
Drawing		90	4	3.6
CAD / CAM		90	4	3.6
Die manufacturing and trial run		70	4	2.8
Drawing		90	10	9.0
Precision die design		83	24	20.0
Be able to design precision progressive dies by using CAD/CAM		90	20	18.0
Be able to understand the nature of problems and their countermeasures while attending the trial run of dies		70	14	9.8
Average Score				8.2



Item	Comment	Evaluation point	RATE	Score
Press working method		83	4	3.3
Countermeasures against troubles		70	4	2.8
Material		90	4	3.6
Press machine and equipment		70	4	2.8
Tooling die design		80	4	3.2
Drawing		90	4	3.6
CAD / CAM		90	4	3.6
Die manufacturing and trial run	Not enough practical training.	50	4	2.0
Drawing		90	10	9.0
Transfer die drawing		90	24	21.6
Be able to design transfer die by using CAD/CAM		80	20	16.0
Be able to understand the nature of problems and their countermeasures while attending the trial run of dies		70	14	9.8
Course contents				
Practical skills				
Average Score				81.3

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Item	Comment	Evaluation point	RATE	Score
Press working method		70	4	2.8
Countermeasures against troubles on press working		50	4	2.0
Material		90	4	3.6
Press machine and equipment		63	4	2.5
Tooling die		63	4	2.5
Die manufacturing method		80	4	3.2
Possessing general knowledge on heat treatment for die parts	No practical training conducted.	70	4	2.8
Die finishing and assembly		77	4	3.1
Reading and understanding of die drawings		90	10	9.0
Processing of parts using machines for die machining		90	30	27.0
Die finishing and assembly		80	18	14.4
Trial run and sample making		80	10	8.0
Average Score				80.9

Technology Transfer - Die Manufacturing / Transfer Die Manufacturing Annex II - 9

Item	Comment	Evaluation point	RATE	Score
Press working method		70	4	2.8
Countermeasures against troubles on press working		70	4	2.8
Material		80	4	3.2
Press machine and equipment		77	4	3.1
Tooling die		80	4	3.2
Die manufacturing method		78	4	3.1
Possessing general knowledge on heat treatment for die parts		70	4	2.8
Die finishing and assembly		57	4	2.3
Reading and understanding of die drawings		90	10	9.0
Processing of parts using machines for die machining		90	30	27.0
Die finishing and assembly		80	18	14.4
Trial run and sample making		80	10	8.0
Average Score				81.7

Item	Comment	Evaluation point	RATE	Score
Press working method		80	4	3.2
Countermeasures against troubles	There are not enough cases to be considered.	60	4	2.4
Material		60	4	2.4
Press machine and equipment		80	4	3.2
Tooling dies		90	4	3.6
Drawing		90	4	3.6
Die manufacturing		90	4	3.6
Trial run		70	4	2.8
Inspection of machinery and its equipment		90	10	9.0
Set-up and adjustment		90	24	21.6
Trial run and production		80	20	16.0
Maintenance of dies		90	14	12.6
Average Score				84.0

Training Courses

Annex II - 11

Item	Comment	Evaluation point	RATE	Score
<u>Die design course</u>	<p>Technology transfer from Japanese Experts to Counterparts, and from Counterparts to trainees has been well implemented.</p> <p>Running condition of machinery is also good. Manuals are well-prepared and well-utilized.</p>	82	40	32.8
<u>Die manufacturing course</u>	<p>Technology transfer from Japanese Experts to Counterparts, and from Counterparts to trainees has been well implemented.</p> <p>Still inexperienced in conducting trial run and tackling troubles in pressworking.</p>	81	40	32.4
<u>Die setting and press operation course</u>	<p>Technology transfer from Japanese Experts to Counterparts has been well implemented. Not enough technology transfer from Counterparts to trainees.</p>	84	20	16.8
Average Score 82.0				

Effects of Project

Annex II - 12

Item		Comment	Evaluation point	RATE	Score
Immediate effects	Technological effect	Basic elements required for design and manufacture of precision dies had been transferred with the possibility of developing further.	100	60	60
	Financial effect	The income and job contents of former trainees seem to be good. It may take a little longer to see more visible results and effects.	80	40	32
Potential effects	Counterpart	Counterparts are preparing a new product on their own. They have strong potential ability.	90	50	45
	Local die industry	The biggest obstacle preventing the introduction of NC machines has now been removed and NC machines are becoming more popular in the industry.	90	30	27
	Country	Now possesses the most advanced technology on precision dies in Asia.	100	20	20
Average Score				92 / 92	

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Item	Comment	Evaluation point	RATE	Score
<u>Possibility of self-development as an organization</u>	Judging from the organization chart of PPTC and past performance, self-development can be well expected. See Annex IX.	100	40	40
<u>Possibility of financial self-development</u>	Judging from past performance and current situation, there seems to be adequate capacity for financial self-development.	100	40	40
<u>Possibility of physical and technological self-development</u>	For the present, the contents of technology transferred are not expected to become obsolete. Counterparts have high ability to apply their technology.	90	20	18
Average Score 98				

List of Japanese Experts  
(1) Long Term Experts

Annex III-1

Field	Name	Period	1989		1990	1991	1992
			Apr	Mar			
Leader	Yoshiro KOHATA Seiji SHIMIZU	20, 10, 1989~25, 12, 1990 28, 2, 1991~27, 2, 1993	←	←	←		
Tool Design	Kazunori KAWAMURA	20, 10, 1989~22, 3, 1993	←				
Die Manufacturing	Shoken SANO Masayoshi NAKAJIMA Kengo KATO	20, 10, 1989~22, 3, 1993 14, 11, 1989~13, 11, 1991 2, 12, 1991~22, 3, 1993	←	←	←		
Die Setting and Press Operation	Harumi SATO Tsuneo NAKAMURA	20, 10, 1989~19, 10, 1991 14, 10, 1991~22, 3, 1993	←		←		



## (2) Short-Term Experts

	Field	Name	Period
89	Seminar	Makoto KIYOHARA	26. 3.1990 ~ 29. 3.1990
	Seminar	Keizou MITANI	26. 3.1990 ~ 29. 3.1990
	Seminar	Kenji IWAI	26. 3.1990 ~ 29. 3.1990
	Seminar	Mitsuo OYAMA	26. 3.1990 ~ 29. 3.1990
90	CAD/CAM	Tatsuya MASANARI	6. 6.1990 ~ 19. 6.1990
	Transfer Die Set	Kunimi KOSHO	19. 6.1990 ~ 26. 6.1990
	Profile Grinder	Shigeyuki MATSUBA	19. 6.1990 ~ 27. 6.1990
	Profile Grinder	Kazuyuki KOMATSU	26. 6.1990 ~ 3. 7.1990
	Machining Centre	Masahiko SHIBATA	29. 6.1990 ~ 6. 7.1990
	EDM Operation	Yoshihiko HISANO	8. 7.1990 ~ 14. 7.1990
	Machining Centre EDM Operation	Kazuyoshi TAKEDA Hiromi YOSHIDA	21. 7.1990 ~ 27. 7.1990 6. 8.1990 ~ 12. 8.1990
91	Profile Grinder	Shigeyuki MATSUBA	22. 4.1991 ~ 26. 4.1991
	Jig Grinder	Toshio YOKOYAMA	5. 5.1991 ~ 11. 5.1991
	EDM Operation	Kunimi KOSHO	21. 7.1991 ~ 3. 8.1991
	CAD/CAM	Tatsuya MASANARI	23. 2.1992 ~ 1. 3.1992
92	Die Assembly	Akira KURAMOCHI	9. 8.1992 ~ 15. 8.1992
	CAD/CAM	Tatsuya MASANARI	23. 8.1992 ~ 28. 8.1992
	CNC Machines		~
	CNC Machines		~

## List of Machinery Provided by Japan

Annex IV

Japanese Fiscal Year/Price(Yen)	Description	Quantity
1989 227,000,000	Horizontal CNC Machining Center Tool Grinder ADMS DIE MASTER for CAD/CAM System CNC Optical Profile Grinder Progressive Die and Transfer Die CNC Electrical Discharge Machine Surface Grinder	1 set 1 set 5 sets 1 set 1 set 1 set 5 sets
1990 127,000,000	Tooling Set Precision Surface Grinding Machine CNC Jig Grinding Machine CNC Optical Profile Grinder Profile Projector Contracer	1 set 1 set 1 set 1 set 1 set 1 set
1991 10,000,000	ADMS DIE MASTER for CAD/CAM System	2 sets
1992 6,300,000	ADMS DIE MASTER for CAD/CAM System Jig for CNC Machining center	5 sets 16 sets

## List of Counterparts Trained in Japan

Annex V

Field	Name	Period
Tool Design	FUNG Chi-Fai	27, 6, 1989~27, 9, 1989
	SING Wu-Man	"
Die Manufacture	WONG Chak-Tong	"
	CHAN Ka-Ming	"
	CHAU Kwok-Hing	"
Die Setting and Press Operation	LEUNG Kwok-Hung	"

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ANNEX VI

ALLOCATION OF CAPITAL AND RE-CURRENT EXPENDITURE  
FOR PRECISION SHEET METAL PROCESSING TRAINING UNIT  
\*\*\*\*\*

Expenses Date	Trainee Allowance	STAFF EXPENSES	ADM. OVERHEAD	TRAINING FACILITIES	REPAIRS & MAINTENANCE	CONSUMABLE MATERIALS & TOOLS
APRIL 88 / MARCH 89		77,904.00	30,382.56			
APRIL 89 / MARCH 90		1,380,033.60	538,213.10	5,424,878.12	230,179.67	1,029,696.24
APRIL 90 / MARCH 91	339,098.00	2,571,012.00	1,002,694.68	4,732,365.76	206,911.49	1,898,628.32
APRIL 91 / MARCH 92	434,512.00	3,355,300.80	1,308,567.31	1,284,150.24	200,578.07	1,417,459.10
APRIL 92 / MARCH 93	665,000.00	3,556,950.00	1,387,210.50	32,360.90	297,000.00	1,477,000.00
Total:	1,438,610.00	10,941,200.40	4,267,068.16	11,473,755.02	934,669.23	5,822,783.66

TOTAL EXPENDITURE FOR THE PROJECT : \$34,878,086.47

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*[Handwritten mark]*

Machinery and Equipment Provided by VTC for the  
VTC/JICA Precision Sheet Metal Processing Training Unit.

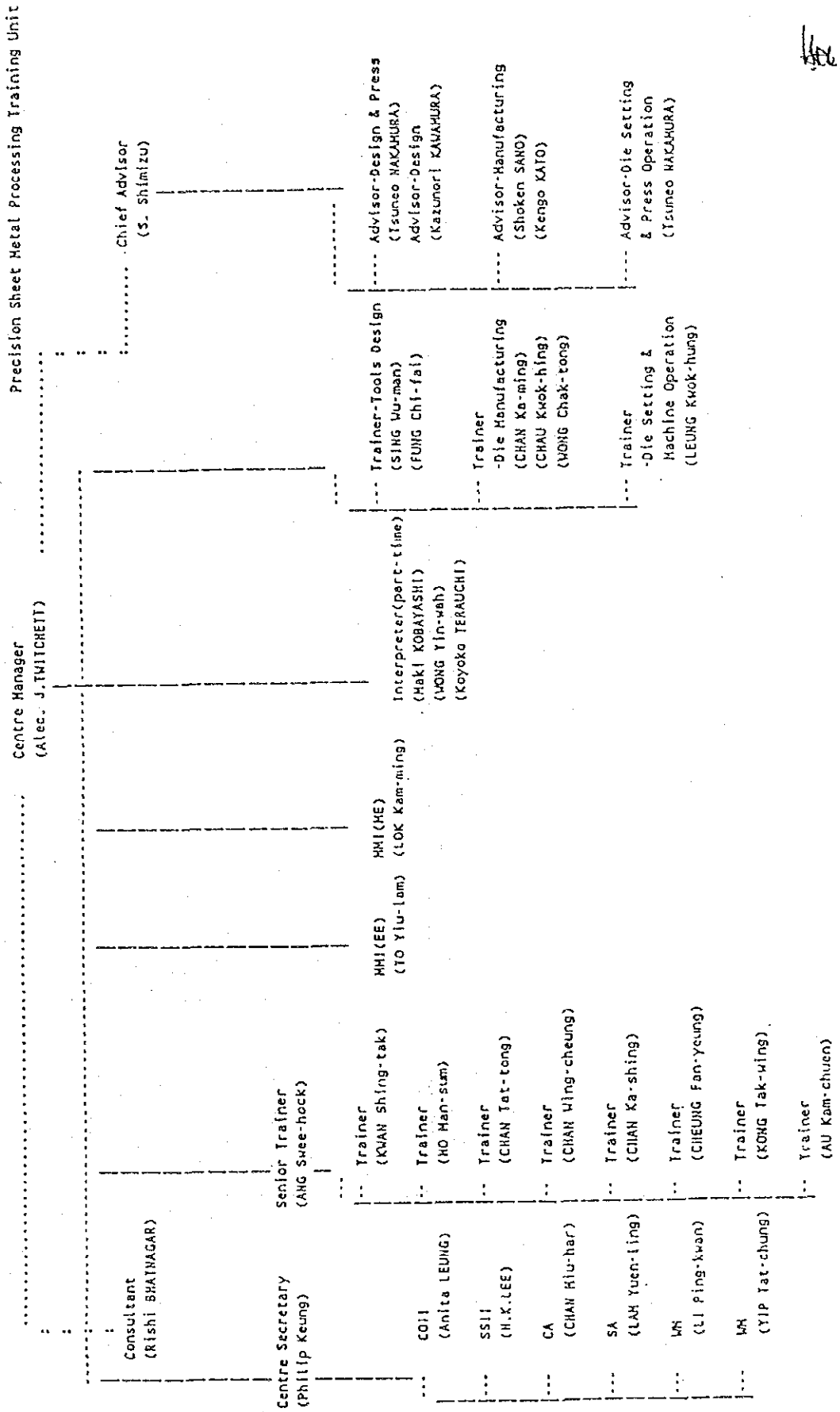
<u>Item</u>	<u>Quantity.</u>
1) Hewlett Packard/Apollo workstations complete with accessories.	7 sets.
2) Vernier Caliper	1 set
3) Rockwell Hardness Tester	1 set
4) Pin gauges, bore gauges and 113-piece gauge blocks.	1 set each
5) Deckel vertical milling machine.	2 sets
6) Vertical bandsaw.	1 set
7) Harrison lathes.	2 sets
8) Workbench (wood).	5 sets
9) Workbench (steel).	1 set
10) Aida high speed press.	1 set
11) Aida transfer press.	1 set
12) Drawing boards and drafting equipment.	5 sets
13) CNC wire-cut electrical discharge machine.	2 sets
14) Komatsu press.	1 set
15) Single crank press for transfer die testing (under procurement processing)	1 set
16) Optical profile projector.	1 set
17) Toolmakers measuring microscope.	1 set
18) Hydrovane air compressor and accessories.	2 sets
19) 486 personal computer. (under procurement processing)	4 sets

Trainee Statistics

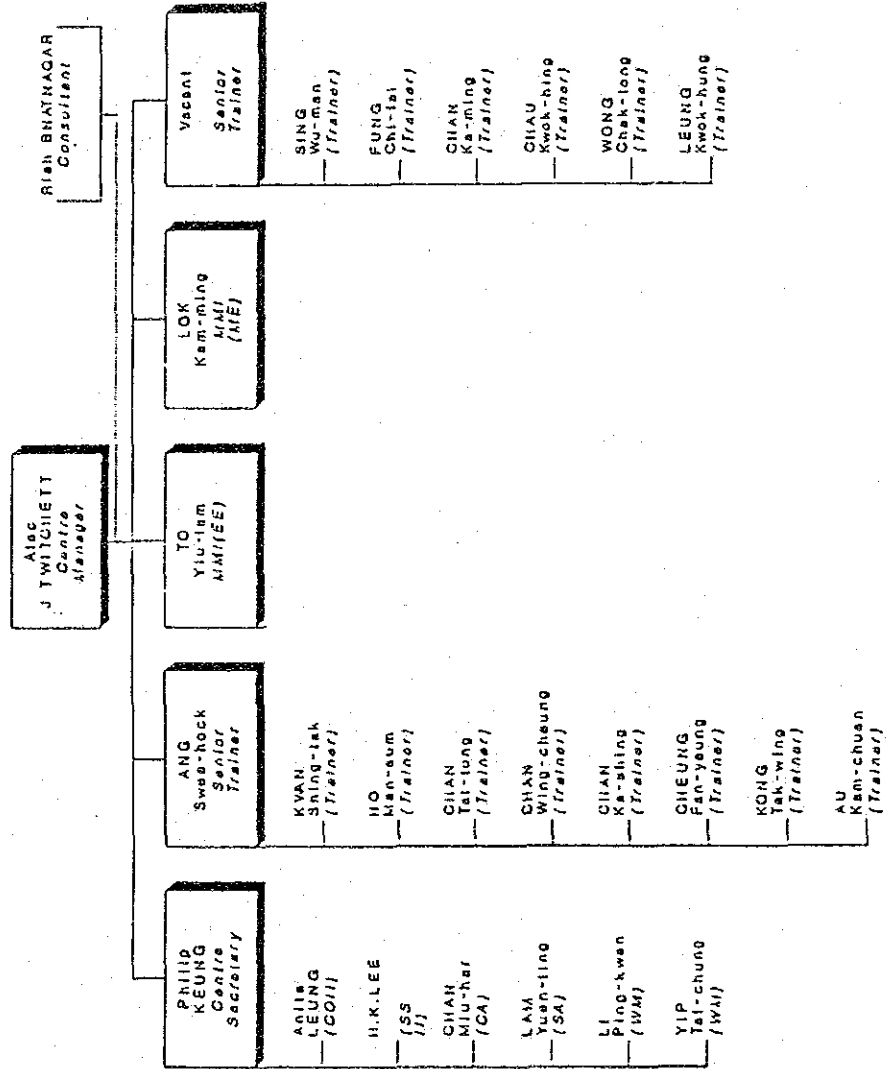
Annex VIII

Name of Course	Period	Graduate
<b>Tool Design Course</b> First Course Second Course Third Course Fourth Course	17, 4, 1990 ~ 16, 2, 1991 15, 4, 1991 ~ 15, 2, 1992 13, 4, 1992 ~ 13, 2, 1993 14, 9, 1992 ~ 17, 7, 1993	9 8 (6) (5)
<b>Die Manufacturing Course</b> First Course Second Course Third Course	1, 10, 1990 ~ 3, 8, 1991 30, 9, 1991 ~ 1, 8, 1992 28, 9, 1992 ~ 31, 7, 1993	10 8 (11)
<b>Die Setting and Press Operation</b> First Course Second Course Third Course Fourth Course Fifth Course	1, 10, 1990 ~ 24, 11, 1990 28, 2, 1991 ~ 20, 4, 1991 3, 6, 1991 ~ 27, 7, 1991 11, 11, 1991 ~ 23, 11, 1991 14, 9, 1992 ~ 27, 11, 1992	5 1 2 4 (5)

Precision Tooling Training Centre  
Organisation Chart



# Precision Tooling Training Centre Future Organisation Chart





LIST OF THE MANUALS PREPARED FOR THE PROJECT

1. Manufacturing process of precision die
2. Design manual for progressive die
3. Design manual for transfer die
4. Processing procedure manual for progressive die
5. Processing procedure manual for transfer die
6. Press work and die setting manual No.1
7. Press work and die setting manual No.2
8. JICA/VTC progressive die design standard
9. JICA/VTC transfer die design standard
10. Die design data sheet
11. Manuals of ADMS (CAD/CAM) operation training
12. Video tapes for technology transfer
13. Manuals of machine operation training
14. Data and manuals for die manufacturing
15. Technical books

## List of Survey Teams

Annex XI

	Name	Duration and Field
1	Preliminary Survey Team Shigeo IWATANI Toshio OKAZAKI Toshio SANO Hiroyuki OCHIAI Shunta HAYASHI Iwao MATSUMOTO	29,2,1988 ~ 6,3,1988 Leader Co-ordinator Policy of Technical Co-operation Machines for Precision Tooling Technics of Precision Tooling Technics of Precision Tooling
2	Experts Survey Team Toshio OKAZAKI Yoshiro KOHATA Kazuo HAMADA Hiromi YOSHIDA	18,9,1988 ~ 25,9,1988 Policy of Technical Co-operation Planning of Technical Co-operation Planning of Machinerics Planning of Technical Training
3	Implementation Survey Team Toshihiko KOGA Yutaka KITAZAWA Yoshiro KOHATA Kazuo HAMADA Hiromi YOSHIDA Kazunori OSHIYAMA	20,3,1989 ~ 25,3,1989 Leader Policy of Technical Co-operation Planning of Technical Training Planning of Machinerics Texts for Technical training Co-ordinator
4	Japanese Consultation Team Yukitoshi NAGASAWA Yasushi AKABOSHI Masahiro CHIJI Kazuo HAMADA Tsutomu NAGAE	5,3,1990~11,3,1990 Leader Policy of technical Co-operation Planning of Technical Training Precision tooling Technics Co-ordinator
5	Japanese Technical Guidance Te Kazuo TANIGAWA Kenzo SUZUKI Kazuo HAMADA Toshio YAMAKI Masahiro CHIJI Tsutomu NAGAE	25,2,1991 ~2,3,1991 Leader Policy of Technical Co-operation Planning of Technical Co-operation Precision Tooling Technics Planning of Technical Training Co-ordinator
6	Japanese Consultation Team Hiromi YOSHIDA Mitsuo MIYABAYASHI Kazuo HAMADA Masahiro CHIJI Masayoshi JURO	2,12,1991 ~ 7,12,1991 Leader Policy of Technical Co-operation Precision Tooling Technics Planning of Technical Training Planning of Project Management
7	Evaluation Survey Team Kazuo TANIGAWA Kotaro TANAKA Hiromi YOSHIDA Kazuo HAMADA Tadaaki YAMADA Naoyuki OCHIAI	13,9,1992 ~ 26,9,1992 Leader Policy of Technical Co-operation Tool Design Die Manufacturing Project Operation Project Planning Evaluation

Japanese SideEvaluation TeamLeader

Mr. Kazuo Tanigawa	Director, Planning Division, Mining and Industrial Development Cooperation Department, JICA
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Members

Mr. Kotaro Tanaka	Cast and Wrought Products Division, Machinery and Information Industries Bureau, MITI
Mr. Tadaaki Yamada	Deputy General Manager, Technical Planning Division, The Materials Process Technology Center
Mr. Naoyuki Ochiai	Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA
Mr. Hiroshi Yoshida	President, Yoshida Technical Consulting Laboratory
Mr. Kazuo Hamada	President, Katakun Seiko Co. Ltd.

Japanese Experts

Mr. Seiji Shimizu	Chief Adviser
Mr. Tsuneo Nakamura	Expert on Die Setting and Machine Operation
Mr. Kazunori Kawamura	Expert on Tool Design
Mr. Shoken Sano	Expert on Die Manufacturing
Mr. Kengo Kato	Expert on Die Manufacturing

In Attendance

Mr. Hirofumi Tanaka	Consul, Consulate-General of Japan
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Hong Kong Side

Leader and Chairman of Joint Committee

Mr. H.R. Knight                      Executive Director  
Vocational Training Council

Members

Dr. S.W. Lui                            Principal Consultant  
(Representative from the Hong Kong  
Productivity Council)

Mrs. Patricia K.M. Keung            Trade Officer  
(Representative of the Director-  
General of Industry)

Mr. S.K. Chong                        Chief Industrial Training Officer  
(Representative of the Executive  
Director of Vocational Training  
Council)

Mr. A.J. Twitchett                    Centre Manager  
Precision Tooling Training Centre  
of Vocational Training Council

Secretary

Mr. S.P. Fu                            Vocational Training Council

Absent with Apologies

Dr. Henry T.C. Yu                    Managing Director  
Sunnex Products Ltd.  
(Chairman, Committee on Precision  
Tooling Training of Vocational  
Training Council)

In Attendance

Mr. M.T. Au-Yeung                   Assistant Executive Director  
Vocational Training Council

Mr. C.Y. Man                         Vocational Training Council

## (資料一 2) 香港金型技術開発協力事業終了時評価評価項目及び評価内容

本評価調査は、「評価ガイドライン」に基づき、日本側・香港側による合同評価調査により「終了時評価結果集約表」を作成し、最終的評価を下すものとする。その評価結果は「評価報告書」に纏められ、本協力事業合同委員会に上程される。

なお、終了時評価結果集約表におけるレベル1の各評価項目は、下記の内容にて評価を行う。

### 終了時評価の各評価項目における評価内容

#### 1) 案件目的との整合性

##### 1-1 当初の計画内容との整合性

R/Dで取り決められた、精密順送り型及び精密トランスファ金型の設計及び製作に、内容及びレベル等の変更が無く実施できたか。

変更が合った場合は、どの部分を、どの程度修正したか。変更した結果は目標達成にどのように影響したか。(プラスに作用したか否か)

##### 1-2 技術移転した金型の評価

C/Pが実際に作成した図面及び金型は、予定した技術水準にあるか。(プレス機械に取り付けて製品の加工ができたか)

##### 1-3 C/Pの習得した技術と訓練内容の完成度

① C/Pが日本人専門家を必要とせず、訓練生を指導できるか。できない部分がある場合、その内容とはどのようなものか。

② 訓練生は実際に課題の金型の設計・製作ができたか。できない部分がある場合、その内容とはどのようなものか。

##### 1-4 産業界との整合性

精密プレス加工及び精密金型製作関連の業界での当訓練コースに対する評価。(移転した技術は当該業種の生産性向上、品質向上等に役立つか)

訓練コース卒業生に対する業界及び企業の評価。

#### 2) インプットー日本側 (計画に対する実績)

##### 2-1 専門家派遣

① 技術移転に必要な専門家の派遣情報。

② 予定人員に対する実際の派遣人員と業務内容。

2-2 研修員の受入れ

C/Pの日本研修が計画どおり実施されたか。

2-3 機材供与

- ① 技術移転に必要な機材のうち、日本側機材供与の実績。
- ② 技術移転に必要なテキスト、マニュアル、データ、見本等の提供（現在何が充足し、何が不足しているか）

2-4 その他

R/Dで合意した事項以外の事項。

3) インプットー香港側（計画に対する実績）

3-1 C/Pの計画どおりの配置。

- ① 金型設計コース（順送り型及びトランスファ型）
- ② 金型製作コース（順送り型及びトランスファ型）
- ③ プレス加工コース
  - ・上記各コースに予定した人数のC/Pを配置できたか。
  - ・欠員は無かったか。その場合の補充はできたか。

3-2 予算措置（年度ごとの実績）

- ① 消耗工具、材料購入費  
訓練を繰り返し継続するための消耗工具、材料（金型材料、標準部品、被加工材等）の補充購入実績。
- ② 運営費  
機材保守整備費。
- ③ 管理費  
人件費及び水光熱費

3-3 機材配置

技術移転に必要な機材のうち、香港側で購入し設置すべき機材の導入実績。

4) アウトプットー技術移転

4-1 金型設計

- ① 順送り型設計 ———— 別紙「技術移転の評価基案」（チェックリスト）による
- ② トランスファ設計 ———— 〃

4-2 金型製作コース

- ① 順送り型製作 ———— 〃

- ② トランスファ型製作 ————— //
- 4-3 プレス加工 ————— //

## 5) アウトプットー訓練コース運営

### 5-1 金型設計コース

#### ① 専門家の技術移転

派遣された日本人専門家は、目標とする技術移転（課題の金型の設計）に必要な業務を遂行できたか。できなかった部分がある場合、その内容と程度はどうか。

#### ② 研修員の受入れ

課題の金型の設計を担当する研修員（C/P）を日本で受け入れ、必要な教育訓練ができたか。

不十分と思われる部分がある場合、どのような内容で、どのような影響があるか、それを補う必要性と方法について。

#### ③ 機材の活用状況

日本側及び香港側で供与した機材（主としてCAD/CAM）の活用状況（予定どおり活用されているか）。

もし活用されていない機材があれば、その機種と活用されない理由は。

#### ④ 教材の活用状況

作成した教科書、マニュアル、データ、サンプル等は、所期の目標どおり活用されているか。

利用されない物がある場合、その原因と全体に対する比率、当プロジェクト遂行への影響はどうか。

### 5-2 金型製作コース

#### ① 専門家の技術移転

派遣された日本人専門家は、目標とする技術移転（課題の金型の製作）に必要な業務を遂行できたか。できなかった部分がある場合、その内容と程度はどうか。

#### ② 研修員の受入れ

課題の金型の製作を担当する研修員（C/P）を日本で受け入れ、必要な教育訓練ができたか。

不十分と思われる部分がある場合、どのような内容で、どのような影響があるか。それを補う必要性と方法について。

#### ③ 機材の活用状況

日本側及び香港側で供与した機材（主として工作機械及びプレス機械）の活用状況

(予定どおり活用されているか)。

もし活用されていない機材があれば、その機種と活用されない理由は。

④ 教材の活用状況

作成した教科書、マニュアル、データ、サンプル等は、初期の目標どおり活用されているか。

利用されない物がある場合、その原因と全体に対する比率、当プロジェクト遂行への影響はどうか。

5-3 プレス加工コース

① 専門家の技術移転

派遣された日本人専門家は、目標とする技術移転に必要な業務を遂行できたか。できなかった部分がある場合、その内容と程度はどうか。

② 研修員の受入れ

課題のプレス加工を担当する研修員(C/P)を日本で受け入れ、必要な教育訓練ができたか。

不十分と思われる部分がある場合、どのような内容で、どのような影響があるか。それを補う必要性と方法について。

③ 機材の活用状況

日本側及び香港側で供与した機材(主としてプレス機械及び金型)の活用状況(予定どおり活用されているか)。

もし活用されていない機材があれば、その機種と活用されない理由は。

④ 教材の活用状況

作成した教科書、マニュアル、データ、サンプル等は、所期の目標どおり活用されているか。

利用されない物がある場合、その原因と全体に対する比率、当プロジェクト遂行への影響はどうか。

6) 効果の内容

終了時評価時点で、当プロジェクト実施の効果が既に現れている部分について、対象となる業界にどのようなプラスまたはマイナスの効果が生じているか。また、今後の可能性につき評価する。

6-1 技術的效果

① 世界的に見て先端技術と評価できる精密順送り型及び精密トランスファ型を、設計し製作技術を国内に持った意味と評価。



- ② 実際に精密金型の設計と製作ができた（知識のみでなく実物を確認できた）意味と評価。
- ③ 精密金型設計及び製作のできる人材の確保が、香港で可能になったことの意味と評価。

#### 6-2 経済的効果

- ① 卒業した訓練生の就職状況と処遇（収入その他）の変化。
- ② 卒業した訓練生を雇用した企業の業績と今後の発展性。

### 7) 効果の広がり

#### 7-1 カウンターパート

- ① 香港が精密金型の設計者及び製作者、プレス加工技術者を国レベルで育成できる人材を持った意味と評価。
- ② 精密金型設計及び製作に関する訓練システムを作成し、継続的に人材を育て、業界に供給できる意味と評価。（今後の可能性含む）
- ③ 精密金型について、新しい課題に対処できる可能性の評価。（潜在能力の評価）

#### 7-2 地元金型業界

- ① 技術を習得した卒業性が、毎年、必要とする企業に雇用される効果。
- ② 精密金型設計及び製作、精密プレス加工等に対する理解と関心。
- ③ 高精度、高速自動加工に対する理解及び関心。
- ④ CAD/CAMへの理解と関心。
- ⑤ 精密金型に関する技術を身近に感じ、導入できる技術的環境。
- ⑥ 精密金型製作を考えている企業での、設備及び人材確保に対する情報提供。

### 8) 自立発展の見通し

#### 8-1 組織的自立発展性

- ① プロジェクトの運営組織について、組織上の位置付けは明確になされているか。
- ② プロジェクトの運営組織は十分な行政能力、及びプロジェクトの管理運営費の予算化と必要額の確保を含めた財政能力を持つか。

#### 8-2 財務的自立発展性

- ① プロジェクトが香港に移管された後、その自立発展を確保できるだけの経費調達の見通しがあるか。

#### 8-3 物的・技術的自立発展性

- ① 移転された技術の内容は、香港の技術レベルに比べて適正であったか。

- ② C/Pの技術レベルはプロジェクトの自主的運営に十分といえるか。
- ③ 技術移転を受けたC/Pが組織に定着しているか。

終了時評価結果集約表

評価項目		平均得点
目標達成度	案件目的との整合性	
	インプット（日本側）	
	インプット（香港側）	
	アウト	技術移転
	プット	訓練コース運営
案件の効果	効果の内容 効果の広がり	
	組織的自立発展性 財務的自立発展性 物的・技術的自立発展性	
自立発展の見通し		

案件目的との整合性

案件目的	現 状	評 点	R A T E	得 点
<p>内国における工業製品部品の生産増加を                      追求し、もって特定国との貿易インバラン                      スを解消するため、金型製造に必要な人                      材の促進を図る。</p>			100	
<p>平 均 得 点</p>				

インプット（日本側）

項目	評点	RATE	得点
<u>専門家派遣</u>		40	
<u>研修員受入れ</u>		20	
<u>機材供与</u>		40	
平均得点			

インプット (香港側)

項 目	評 点	R A T E	得 点
<u>カウンターパート配置</u>		40	
<u>予算措置</u>		30	
<u>機材配置</u>		30	
平均得点			

2-4 技 術 移 転

項 目	評 点	RATE	得 点
金 型 設 計	順送り型設計	22	
	トランスファ型設計	22	
金 型 制 作	順送り型製作	22	
	トランスファ型製作	22	
プレス加工		12	
平 均 得 点			

2-4-1 技術移転—プレス加工

項	目	コ	メ	ン	ト	評	点	R	A	T	E	得	点
学	プレス加工法							4					
	トラブル対策							4					
	材 料							4					
	プレス機械及び装置							4					
	プレス金型							4					
	製 図							4					
	金型製作							4					
	トライ							4					
	金型機械及び装置の点検							10					
	段取りと調整							24					
実	試し加工（トライ）と生産							20					
	金型の保守整備							14					
	平 均 得 点												



2-4-2 技術移転—金型設計/順送り型設計

項	目	コ	メ	ン	ト	評	点	R	A	T	E	得	点
学	プレス加工法							4					
	トラアル対策							4					
	材							4					
	プレス機械及び装置							4					
	プレス金型設計							4					
	製							4					
	図							4					
	CAD/CAM							4					
	金型製作及びトライ							4					
	製							10					
実	精密金型設計							24					
	CAD/CAMを使用して精密順送り型設計ができること							20					
	金型のトライに立会い、不具合の原因と対策案が分かること							14					
	平均得点												

2-4-3 技術移転—金型設計/トランスファ型設計

項	目	コ	メ	ン	ト	評	点	R	A	T	E	得	点
学	プレス加工法							4					
	トラブル対策							4					
	材 料							4					
	プレス機械及び装置							4					
	プレス金型設計							4					
	製 図							4					
	CAD/CAM							4					
	金型製作及びトライ							4					
	製 図							10					
	トランスファ金型設計							30					
実	CAD/CAMを使用してトランスファ 金型の設計ができること							18					
	金型のトライに立会い、不具合の原 因と対策案が分かること							10					
	平均得点												

2-4-4 技術移転—金型製作／順送り型製作

項	目	コ	メ	ン	ト	評	点	R	A	T	E	得	点
学	プレス加工法							4					
	トラブル対策							4					
	材							4					
	プレス機械及び装置							4					
	プレス金型							4					
	金型製作法							4					
	金型部品の熱処理について概略の知識を持っていること							4					
	金型の仕上げ及び組立て							4					
	金型図面の読図と理解							10					
	金型加工用工作機械での部品加工							30					
実	金型の仕上げ及び組立て							18					
	トライの実施とサンプルの作成							10					
	技												
平均得点													

2-4-5 技術移転-金型製作/トランスファ型製作

項	目	コ	メ	ン	ト	評	点	R	A	T	E	得	点
学	プレス加工法							4					
	トランプル対策							4					
	材 料							4					
	プレス機械及び装置							4					
	プレス金型							4					
	金型製作法							4					
	金型部品の熱処理について概略の知識を持っていること							4					
科	金型の仕上げ及び組立て							4					
	金型図面の読図と理解							10					
	金型加工用工作機械での部品加工							30					
	金型の仕上げ及び組立て							18					
	トライの実施とサンプルの作成							10					
平 均 得 点													

2-5 訓練コース運営

項 目	コ メ ン ト	評 点	R A T E	得 点
金型設計コース			40	
金型製作コース			40	
プレス加工コース			20	
平 均 得 点				

3-1 案件の効果

項	目	コメント	評点	RATE	得点
効果の内容	技術的効果			60	
	経済的効果			40	
効果の広がり	カウンターパート			50	
	地元金型業界			30	
	国家			20	
平均得点					

4-1 自立発展の見通し

項 目	コ メ ン ト	評 点	R A T E	得 点
組織的自立発展性			40	
財務的自立発展性			30	
物的・技術的自立発展性			30	
平均得点				

