Ex-post Evaluation Report

on

The SIC-Tool and Mold Technology Development Project in the Kingdom of Thailand

February 2008

JAPAN INTERNATIONAL COOPERATION AGENCY

No. 1

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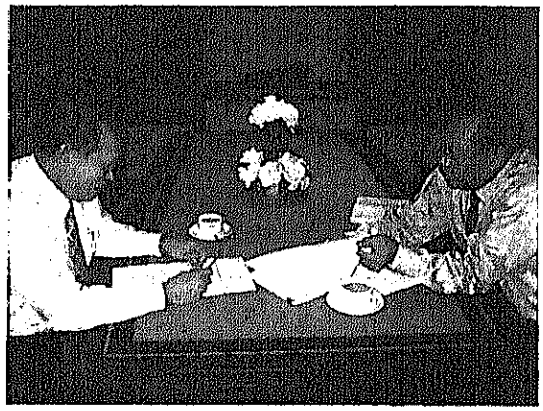

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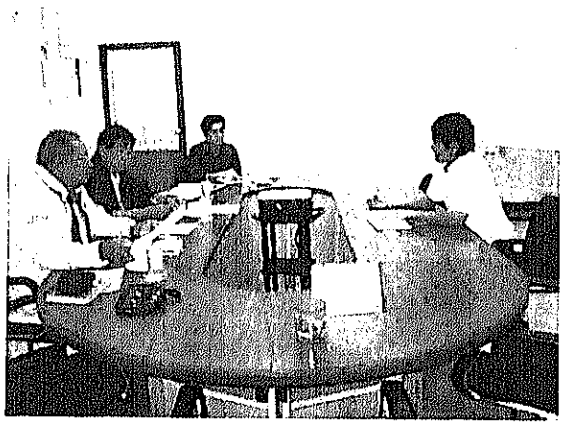

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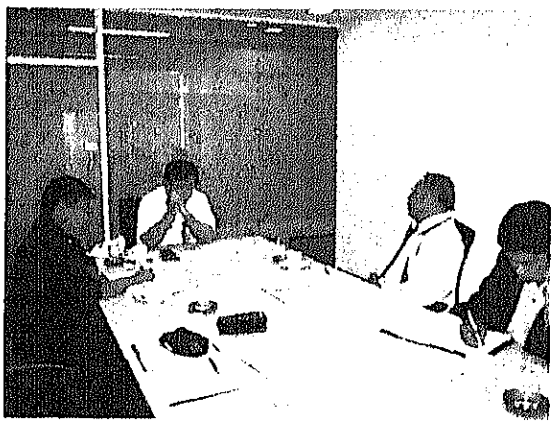

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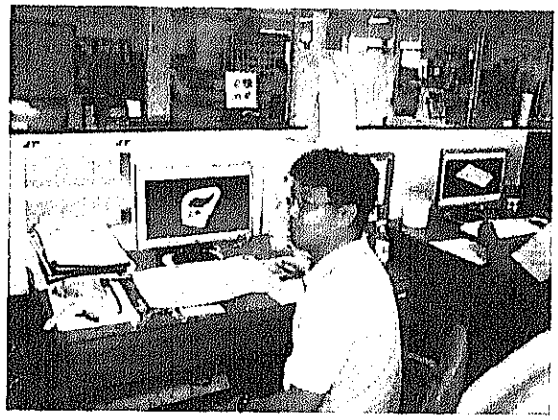

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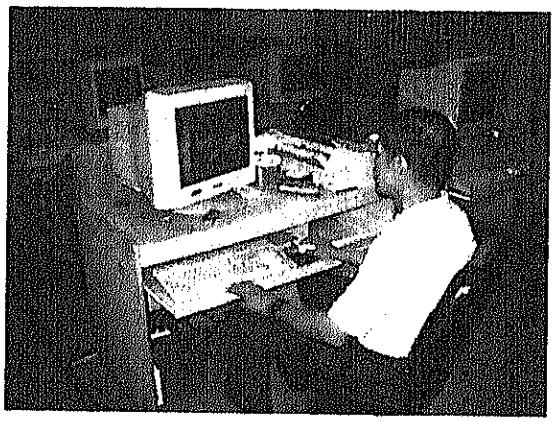

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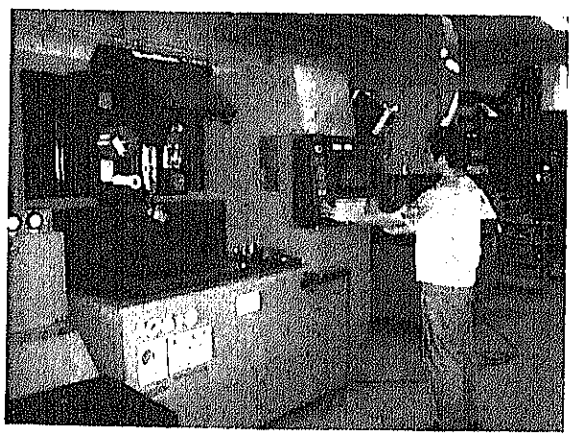

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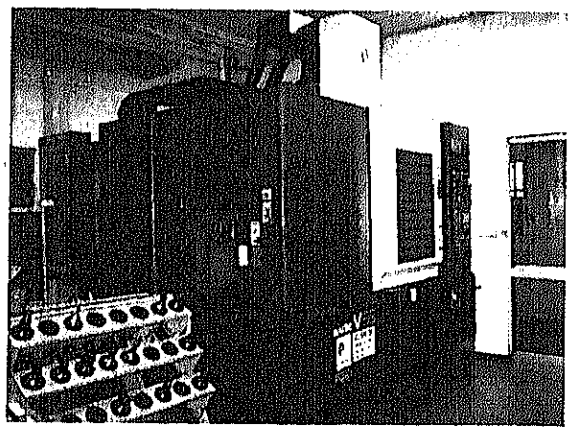
26 November 2007



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Abbreviations

BSID	Bureau of Supporting Industries Development
CAE	Computer Aided Engineering (name of software)
CAM	Computer Aided Machining (name of software)
CNC	Computer Numerical Controlled Machine
DIP	Department of Industrial Promotion
EDM	Electricity Discharge Machine
JICA	Japan International Cooperation Agency
MDIDC	Mold and Die Industry Development Committee
MDIDP	Mold and Die Industry Development Project
SIC	Supporting Industrial Cooperation
SME	Small and Medium Enterprise
TAI	Thai Automotive Institute
TDIA	Thai Tool and Die Industry Association
W-EDM	W-Electricity Discharge Machine

Summary of Ex-post Evaluation Study

Evaluation conducted by: JICA Thailand Office

1. Outline of the Project	
Country: Kingdom of Thailand	**Project title:** SIC-Tool and Mold Technology Development Project in the Kingdom of Thailand
Issue/Sector: Industrial Technology	**Cooperation scheme:** Technical Cooperation
Division in charge: Economic Dev. Dep't., Group 1, Small and Medium Enterprise Team	**Total cost:** Appr. 827 million yen
Period of Cooperation: 1 November 1999 - 31 October 2004	**Partner Country's Implementing Organization:** Bureau of Supporting Industries Development (BSID), Department of Industrial Promotion (DIP), Ministry of Industry
Supporting Organization in Japan: The Materials Process Technology Center	**Related Cooperation:** Machine Industry Development Project (Technical Cooperation Project) (Oct.1986 – Sep.1991) Development Study on Industry Sector Development (Supporting Industry) (Sep.1993 – Mar. 1995)

1-1. Background of the Project

The government of Japan has been supporting the development of Small and Medium Enterprises (SMEs) in Thailand since 1980s through the construction of Machine Industries Development Institute (MIDI), technical cooperation based on MIDI and development study on the development of supporting industries. As Thai assembling industries still relied on imported parts from overseas, the government of Thailand recognized the necessity to substitute the imported parts with domestic products. Under this circumstance, the government of Thailand requested the government of Japan to implement a technical cooperation project to enhance the international competitiveness of assembling industries through the development of supporting industries focusing on plastic and mold. Based on the request, 'SIC-Tool and Mold Technology Development Project in the Kingdom of Thailand' was launched in November 1999 for the project period of five years. In the Terminal Evaluation Study conducted in June 2004, the evaluation team clarified the achievement of the project purpose as an acceptable level with the satisfaction of the client on technical service provided by BSID, which was reorganized from MIDI, and expansion of technical services.

1-2. Project Overview

(1) Overall Goal

Thai plastic tool and mold industries will become internationally competitive to provide assembly industries in Thailand with high quality tools and molds.

(2) Project Purpose

Technical capacity of BSID will be upgraded to extend appropriate technical services to the Thai plastic tool and mold industries.

(3) Outputs

0. The project operation unit will be enhanced.
1. Necessary machinery and equipment will be provided, installed, operated and maintained properly.
2. Technical capability of the counterpart personnel will be upgraded in the fields of mold design, mold processing, mold assembling and trial shot.
3. Seminar and training courses in the above fields will be implemented systematically.

4. Technical information and advisory services in the above fields will be implemented systematically.
5. Trial prototyping services will be implemented systematically.

(4) Inputs

Japanese side (Total cost appr. 827 million yen):

Long-term Expert	9 persons	Equipment	316 million yen
Short-term Expert	27 persons	Local cost	14 million yen
Trainees received	14 persons		

Thai side:

Counterpart 43 persons	Local Cost 17,514,668 THB
Provision of Land and Facilities	

2. Evaluation Team

Evaluation Team:	Evaluation Analysis	Narong Rattana (Mr.) (Thai Auto-Parts Manufactures Association)
	Support for Evaluation Analysis	Takehiro Iwaki (Mr.) (IC Net Asia Co., Ltd.)
	Assistant Researcher	Dusita Krawanchid (Ms.) (IC Net Asia Co., Ltd.)

Period of Evaluation: 24 October 2007 – 29 February 2008 **Type of Evaluation:** Ex-post Evaluation

3.PROJECT PERFORMANCE

3-1. Performance of Project Purpose

Although BSID has been taking the role of a coordinator, in addition to the role of an implementation, of the training and replacement of resigned and retired ex-counterparts is considered insufficient, BSID has been consistently providing technical services to mold and die industries, especially for SMEs. Questionnaire survey conducted during the ex-post evaluation study shows the high satisfaction of ex-trainees on BSID's trainings in terms of trainer, training material, and equipment.

3-2. Achievement related to Overall Goal

Judging from the indirect indicators set by the evaluation team, i.e. 1) the improvement of trade balance of mold and die products; and 2) the improvement in the productivity and precision for the production of mold and die products, it can be said that the project overall goal has been achieved due to the growth of the mold and die industries and private sector.

3-3. Follow-up of the Recommendations by Terminal Evaluation Study

Following recommendations were made by the Terminal Evaluation Study.

1. BSID should strengthen its function as a coordinator
2. BSID should conduct need survey of industry
3. BSID should complete the database of its clients
4. BSID should consider the appointment of external trainers to conduct technical training
5. BSID should join private sector in training and utilize the project machine
6. BSID should continuously improve teaching material, evaluate all training courses and build capacity of trainers
7. BSID should make efforts to transfer the obtained skills and knowledge of C/P to other staff
8. BSID should re-examine its maintenance system of machinery and equipment

BSID has been following up all recommendations more or less. It has been strengthening the coordination and cooperation with concerned organizations including the private sector (recommendation 1, 4, 5). Training needs of the private sector have been identified by BSID trainers. However, it appears that BSID has not put high priority on needs

assessment in its policy (recommendation 2). The database has been developed and integrated with the database of DIP. The database is now shared with the Mold and Die Intelligence Unit of Mold and Die Industry development Project (MDIDP) and maintained well (recommendation 3). Although BSID has been taking an additional role of a coordinator in the industries, it still put importance on the training and has been continuously improving its training material and mechanism (recommendation 6, 7). BSID considers the appropriate maintenance and utilization of the project equipment. A committee was set up by BSID to outline criteria and monitor the utilization of the equipment by private companies which use the equipment (recommendation 8).

4. Results of Evaluation

4-1. Summary of Evaluation Results

(1) Impact

<Achievement of overall goal>

As there is no presetting of measurable indicators to evaluate the achievement of project overall goal, the evaluation study team used some implicated items relevant to measure the achievement of the overall goal. These items are 1) export and import values of mold and die, 2) lead time of production, and 3) quality in terms of precision. Judging from the achievement of these implicated indicators as summarised below, it can be said that the project overall goal has been achieved. Although it is difficult to pinpoint the contribution of the project to the achievement of the overall goal, it can be said that the project take a crucial role in building the awareness among stakeholders for urgent development of Thai mold and die industries.

1. The export-import ratio of mold and die products of Thailand increased from 0.09 in 2001 to 0.22 in 2006.
2. According to the survey conducted in 2007 on 110 Thai mold and die factories, the average lead time of the production was reduced to 45 days from about 60 days at 5 years ago.
3. According to the same survey, 45 of 110 factories were capable to produce the product with the precision of less than 10 micron meter. As the standard of precision on mold and die production was 20 micron meter at 5 year ago, it is fair to say that the mold and die quality in terms of precision has been rapidly improved.

<Other Impact>

1. MDIDP was launched by the effort of BSID management staff who gained knowledge and skills of tool and mold development from Japanese experts. The proposal of MDIDP was based on the recognition of BSID on the huge demand of quality mold and die products from the assembling industries and necessity to respond to the needs. It is also noted that BSID has sufficient capability to design a large-scale project like MDIDP to the cabinet through the Ministry of Industry.
2. Some of ex-counterparts of the project have been helping technical colleges to develop mold and die training curriculum and support Thai Tool and Die Industry Association (TDIA) for setting up skill standard. This kind of cooperation is also considered as an impact of the project.
3. The study team did not identify any negative impacts of the project.

(2) Sustainability

As the implementing agency of the project, BSID has been utilizing the knowledge and skills gained from the project to elevate the status of Thai mold and die industries by responding to the needs of the private sector for the human resource development continuously. Major findings are summarised below.

<Organizational and Human Resource Aspects>

1. BSID restructured its organization in 2007 to take the role of a coordinator, in addition to the role of an implementer, of technical services. This policy change was based on the recognition that 1) BSID has limitation

implementer, of technical services. This policy change was based on the recognition that 1) BSID has limitation in its capacity to provide wider needs of technical services from the growing mold and die industries; 2) there is a necessity to strengthen the role of the coordination agency to provide technical support to in the industries. This policy change has strengthened the role of BSID in making policies and in building a strong networking to provide technical services.

2. Among 18 key technical ex-counterparts, 14 still work for BSID and support mold and die production for SMEs. They utilized their knowledge and skills received from Japanese experts for the implementation of training courses and other activities. There is a concern that insufficient replacement of technical staff, resulted from the manpower control policy of the government of Thailand, may hamper the continuation of project activities in the future.

<Financial Aspects >

1. Although it is difficult to pinpoint the expense allocated for the project activities as BSID has integrated the related budget to other activities since 2006, project activities have been conducted with other activities of BSID.
2. MDIDP was a launched by the government of Thailand by the proposal from BSID for the project period of 5 years from 2005 with the total budget of 1.69 billion baht. MDIDP has a common objective with SIC-Tool Project to support the development of mold and die industries and can be considered as a succeeding project of the SIC-Tool Project.

<Technical Aspects>

1. In the questionnaire survey with 12 ex-counterparts, 8 persons responded the transferred technology during the project is highly valid. However, as BSID focuses more on the coordination in technical services, there is a concern that its technical expertise has been and will be weakened.
2. The major equipments have been maintained appropriately by BSID. BSID has been permitting private companies, who have a potential in conducting training, to utilize BSID's facility and equipment for training.
3. Regarding the needs assessment for the private sector on BSID's training courses, BSID has not put the priority in its policy. However, it is found from the interview with ex-counterparts that each trainer has been individually identifying the needs of client.

4-2. Factors that have promoted the project

(1) Impact

The impact of the project has been promoted by following two key factors.

1. The Thai government has been aware of the importance of mold and die industries and launched the MDIDP from 2004 till 2009 with the allocation of a sizable budget.
2. Networking among stakeholders in mold and die industries has been strengthened under the framework of MDIDP.

(2) Sustainability

The following factors have promoted project sustainability.

1. Growth of the thriving assembling industries in Thailand, especially motorcycle, automotive parts and accessories making, and electric and electronics production industries, has contributed to enhance the sustainability of the project.
2. Shortage of skilled manpower in mold and die industry has increased demand from the private sector in acquiring technical training and advisory service particularly in the advanced technology.

4-3. Factors that have inhibited the project

(1) Impact

1. The issue of the shortage of skilled manpower in mold and die industry also has a negative aspect on the impact and sustainability of the project. If the Thai government cannot efficiently respond to the private sector needs, the project effect will not be sustained in the long run.

(2) Sustainability

The following factors have inhibited the project sustainability

1. Opportunities for ex-counterparts to learn more advanced mold and die technology and practical skills have been limited. It may affect the quality of services provided by the BSID negatively. BSID intends to upgrade knowledge and skill of staff by the close cooperation with the private sector, particularly with Japanese companies.
2. The government of Thailand has a policy to encourage government offices to use the outsourcing service providers. This policy may strengthen the networking between BSID and concerned organizations/institutes through closer cooperation. However, there is a concern that this policy eventually may hamper the advance of technical capacity development at BSID.
3. The sustainability of the project effect may be weakened by; 1) unsteady allocation of annual budget, 2) slow response to the demand of the private sector. It can be said that the government personnel is not able to quickly respond to the private sector's demand due to the government regulation. BSID staff has difficulty in arranging training programs other than planned training programs under the annual budget.

4-4. Conclusions

Stakeholders in the private sector have appreciated the trainings and other services provided by project which has helped them upgrade their knowledge and skills in mold and die production. There has been significant improvement in mold and die industries in terms of quality, cost reduction and shorter lead time of production. Although the project cannot be claimed as a sole input for the achievement of its overall goal, it can be said that the project is a crucial drive in building the awareness among stakeholders for urgent development of Thai mold and die industries.

4-5. Recommendations

There are following recommendations to BSID.

(1) It is recommended for BSID to follow-up the progress of MDIDP since the output of MDIDP is consistent with the overall goal of the project.

(2) It is also recommended for BSID to discuss with DIP for the replacement of the resigned or retired technical counterpart personnel to strengthen its support for the mold and die industries.

(3) Arrangement of further trainings for ex-technical counterpart personnel is considered effective to update their knowledge and skills for ever-changing mold and die production technology.

(4) There is a concern for the shortage of skilled manpower due to the insufficient modern machines and equipment for the training. Therefore, it is recommended for BSID to facilitate its networks to identify potential customers who are interested in sharing project equipment for the training of their staff under the management of BSID.

(5) Based on the increasing role of BSID on coordination and policy making for the development of mold and die industries, it is recommended for BSID to put more emphasis on needs survey for strategic planning of competitiveness of Thai mold and die industries.

(6) The database and information system developed by the Mold and Die Intelligence Unit of MDIDP should be shared with concerned organizations to attract more cooperation.

(7) It is expected for BSID to play a more important role in transferring mold and die technology for medium and small automotive parts makers, which support the fast-growing automotive industries and need advanced mold and die technologies, such as CAD/CAM/CAE to produce very precision parts including suspension member, turbo charger, and manifold. For this matter, the transfer of Japanese technology, through a close cooperation with JICA, may be an effective approach.

4-6. Lessons Learned

(1) The measurable indicators to assess the achievement of the project should be defined and shared among stake holders in the process of project.

(2) In the case of the SIC-Tool Project, BSID has been enhancing the sustainability of the project effect by strengthening network with the related organizations, including the private sector in training. Form this experience, it can be implied that the sustainability of the project will be more secured with the involvement of other institutions working in the related field.

(3) For the technical cooperation project in the field of industrial development, the project can be implemented with fine coordination of four parties, namely the government of Japan, Japanese companies, the government of Thailand and Thai private sector.

4-7. Follow-up Situation

All the recommendations made by the Terminal Evaluation has been followed up by Thai side without Japanese follow-up cooperation.

事後評価調査結果要約表

評価実施部署：タイ事務所

1．案件の概要		
国名：　タイ王国		案件名：　金型技術向上計画プロジェクト
分野：　産業技術		協力形態：　技術協力プロジェクト
所轄部署：経済開発部第1グループ中小企業チーム		協力金額：　約8.27億円
協力期間	1999年11月1日 ～2004年10月31日	先方関係機関：工業省工業振興局裾野産業開発部（BSID）
		日本側協力機関：財団法人素形材センター
		他の関連協力： 金属加工機械工業開発振興プロジェクト（技術協力プロジェクト）（1986年10月～1991年9月） 工業分野開発振興計画（裾野産業）（開発調査） （1993年9月～1995年3月）

1-1　協力の背景と概要

日本政府は1980年代から無償資金協力による金属加工機械工業開発研究所（MIDI）の建設・整備と同研究所を利用したプロジェクト方式技術協力、裾野産業開発にかかる開発調査の実施などを通じてタイにおける中小企業育成を支援してきた。タイの組立部品産業が海外からの部品輸入に依存していることから、タイ政府は裾野産業の輸入依存体質の改善が不可欠であると考え、これまでの日本政府による協力を活かしながら金型分野の地場裾野産業を育成し、国際競争力を強化することを目的として、日本政府に対して技術協力プロジェクトの実施を要請した。要請に基づき、1999年11月から5年間のプロジェクト期間で「タイ金型技術向上計画プロジェクト」が実施された。2004年6月には終了時評価が行われ、BSIDから技術サービスを受ける民間企業の満足度の高さと技術サービスの拡大から、プロジェクトが満足できるレベルの成果を挙げていることが確認された。

1-2　協力内容

（1）上位目標

タイのプラスティック金型産業が国際競争力を持ち、タイの組み立て産業に高品質の金型を提供できるようになる

（2）プロジェクト目標

BSIDの技術力が、タイのプラスティック金型産業界に良質なサービスを提供できるように向上される

（3）アウトプット（成果）

0. プロジェクトの実施体制が強化される
1. 必要な機材が供与・設置され、適切に操作・管理がなされる
2. 設計、加工、組立・試打の各分野でC/Pの技術力が向上する
3. 研修コース・セミナーが体系的に実施されるようになる
4. アドバイザリーサービス・技術情報提供サービスが体系的に実施されるようになる
5. プロトタイピングサービスが体系的に実施されるようになる

（4）投入

日本側：（総額　約 8.27 億円）

長期専門家派遣	9 名	機材供与	約 3.16 億円
短期専門家派	27 名	現地業務費	約 0.14 億円
研修員受入	14 名		

相手国側：

カウンターパート配置　43 名

土地・施設提供

ローカルコスト負担　17,514,668 バーツ

2．評価調査団の概要

調査者	評価・分析	ナロン・ワッタナ（タイ自動車部品製造協会アドバイザー）
	評価・分析支援	岩城　岳央（アイ・シー・ネット・アジア株式会社）
	アシスタント調査員	ドゥシータ・グラワンチッド（アイ・シー・ネット・アジア株式会社）
調査期間	2007 年 10 月 24 日　～　2008 年 2 月 29 日	評価種類：事後評価

3．実績の確認

3-1　プロジェクト目標の状況

BSID は技術サービスの提供に加えて、金型産業全体のコーディネーターとしての役割を担うようになり、また離職したカウンターパートの補充が十分とはいえず人員面での制約があるが、プロジェクト終了後も、引き続き主に中小企業を対象に技術サービスを提供している。事後評価調査中に実施された質問表調査結果から、BSID 研修受講生の研修講師、教材、設備などに対する高い満足度が明らかになっている。

3-2　上位目標の達成状況

本プロジェクトの成果の間接的なインパクトとして、金型産業発展の必要性を認識した金型産業界および民間企業の自発的な発展によって、タイの組立部品産業で使用される金型製品の１）輸出入収支の改善、２）生産性および精度が向上していることから、上位目標は達成されているといえる。

3-3　終了時評価での提言の活用状況

終了時評価では BSID に対して以下の提言が挙げられた。

1. コーディネーターとしての機能を強化する
2. 金型産業のニーズ調査を行う
3. 顧客のデータベース作成を完成させる
4. 研修を行う際に外部講師の招聘を検討する
5. 民間部門と連携して研修を実施し、プロジェクト機材を有効活用する
6. 継続的に研修教材改善し、研修コースの評価を通じて研修講師の能力を向上させる
7. カウンターパートが習得した知識や技術を他のスタッフ移転できるようにする
8. プロジェクト機材の維持管理体制を見直す

程度に差があるが、BSID は終了時評価で挙げられたすべての提言を活用している。民間部門を含む関係者との連携・協力は強化されており（提言 1、4、5）、BSID としての取り組みは弱いが、研修ニーズは研修を行うスタッフにより把握されている（提言 2）。データベースは完成し、工業振興局のデータベースに統合された。また、現在では、このデータベースは金型産業振興プロジェクト（MDIDP）の金型情報ユニット

と共有され、活用されている。(提言 3)。BSID は技術サービスの提供自体に加えてコーディネーターという役割を担うようになっているが、引き続き研修実施にも重点を置いており、研修教材や研修システムの改善に努めている（提言 6、7)。BSID はプロジェクト機材の適切な維持管理と有効活用にも配慮しており、民間企業がプロジェクト機材を使って研修を行えるように委員会を設置して、共有方法の検討、使用状況のモニターを行っている。(提言 8)

4．評価結果の概要

4-1　評価結果の要約

（1）インパクト

<上位目標の達成>

1. 具体的な上位目標の指標が設定されていないが、本プロジェクトの成果に伴う間接的なインパクトとして、1）金型製品の輸出入収支の改善、2）　金型産業における生産性、3）金型製品の精度の向上、により上位目標達成について評価したところ、1）輸出対輸入比が 2001 年の 0.09 から 2006 年には 0.22 に向上し、2）従来は平均 60 日程度であった金型製作時間が、2007 年に 110 社を対象に実施された調査では 45 日に短縮されており、3）従来は金型製品の精度は平均 20 ミクロン程度であったが、上記調査では 10 ミクロン以下の精度が出せる企業が 110 社中 45 社も存在している。
2. 政策面、市場面などの外部要因があり、上位目標達成に対するプロジェクトの貢献を正確に抽出することは難しいが、プロジェクトは金型産業の急速な発展の必要性に対する関係者の意識の向上に重要な役割を果たしてきたといえる。

<その他のインパクト>

1. プロジェクトのカウンターパートが、組立部品産業からの質の高い金型製品に対する強い需要と需要に応える必要性を認識し、MDIDP を立案し、タイ政府の承認を受けて 2005 年に同プロジェクトが開始された。カウンターパートがプロジェクトを通じて、自ら後継プロジェクトを立案する十分な認識と能力を身につけていたといえる。
2. カウンターパートの中には、技術専門学校の金型教育カリキュラムの開発やタイ金型産業協会（TDIA）の技術基準作成を支援しているスタッフがいる。こうした関係機関への積極的な協力もプロジェクトのインパクトとして考えられる。
3. プロジェクトによる負のインパクトは確認されなかった。

（2）自立発展性

BSID は以下に要約されるように、プロジェクト実施機関として、プロジェクト終了後もプロジェクトを通じて習得した知識と技術を活用し、民間部門の人材育成ニーズに継続的に応えることにより、タイ金型産業の地位向上に努めている。

<組織・人材面>

1. BSID は 2007 年に組織改編を行い、金型産業における技術サービスの提供者としての役割に加えて金型産業発展のためのコーディネーターとしての役割を担うようになった。この組織改編は、1）BSID だけでは成長する金型産業での幅広い技術支援ニーズに応えていくことが難しい、2）金型産業において効果的に技術サービスを提供するために、調整機関の役割を強化することが重要になっている、という認識に基づいていた。この組織改編により、BSID の政策決定面での役割は高まり、また、民間部門とのネットワーク強化されている。

2. 18 人のプロジェクトカウンターパートのうち、14 人が BSID で勤務し、プロジェクトから得た知識・技術を活用して BSID で主に中小企業への支援に携わっている。離職したカウンターパートの補充が十分とはいえず、将来のプロジェクト活動の継続に対する懸念がある。

＜財政面＞

1. BSID は 2006 年以降、プロジェクトに関する活動の予算を他の活動予算に統合しているため、プロジェクト活動に配分された予算額を把握することは難しいが、プロジェクト活動への予算配分は行われており、活動が継続されている。
2. BSID の立案により、2005 年から 5 年間のプロジェクト期間にタイ政府から 16.9 億バーツの予算を受けて MDIDP が実施されている。MDIDP はタイの金型産業の成長を支援するという本プロジェクトと共通の目的を持っており、本プロジェクトの後継プロジェクトと考えられる。

＜技術面＞

1. プロジェクト期間中に移転された技術については、本評価調査の質問表に応えた 12 人のカウンターパートのうち 8 人が‘大変妥当’と回答している。一方で、BSID がコーディネーターとしての役割を担うようになっていることから、将来的に BSID の技術専門性が低下することが懸念されている。
2. プロジェクト機材は BSID により概して適切に維持管理されている。BSID は研修実施能力を持つ民間企業に施設や機材の使用を認めており、機材の効率的な活用につながっている。
3. BSID は民間部門を対象にした研修ニーズ調査を体系的に行っているとはいえない。一方で、カウンターパートからの聞き取り結果から、担当者レベルでは各企業のニーズの把握に努めていることが見て取れる。

4-2　プロジェクトの促進要因

（1）インパクト発現を促進した要因

インパクト発現の主な促進要因として以下が挙げられる。

1. タイ政府は金型産業振興の重要性を認識し、2004 年から 2009 年のプロジェクト期間で MDIDP を立ち上げ、大規模な予算を配分しており、インパクト発現に大きく貢献している。
2. MDIDP の枠組みの中で金型産業関係者のネットワークが強化され、金型産業の振興を支えている。

（2）自立発展性強化を促進した要因

プロジェクト自立発展性強化の主な促進要因として以下が挙げられる。

1. タイの組立部品産業の飛躍的な成長により金型製品への需要が高まっており、このことがプロジェクトの自立発展性強化につながっている。特に、自動車、自動車部品、電気・電子産業の成長が著しい。
2. 金型産業での熟練労働者の不足により、民間部門からの研修とアドバイザリーサービスに対するニーズが高まっており、このことが BSID の自立発展性の強化に寄与している。

4-3　プロジェクトの阻害要因

（1）インパクト発現を阻害した要因

金型産業での熟練労働者の不足は、BSID のサービスに対するニーズ向上につながる一方で、長期的には、産業振興の停滞を通じてプロジェクトのインパクト発現と自立発展性強化を阻害する恐れがある。

（2）自立発展性強化を阻害した要因

プロジェクト自立発展性強化の主な阻害要因として以下が挙げられる。

1. プロジェクトカウンターパートがさらに高度な技術を習得するための研修を受けたり、生産現場での実

践研修を受ける機会が少なく、BSID が提供する技術サービスの質の低下につながる懸念がある。BSID は日系企業を中心とした民間セクターとの緊密な協力により、職員の知識・技術の向上を意図している。

2. タイ政府は BSID を含む政府機関に対して外注サービスの活用を奨励している。この政策により BSID と関連機関の連携強化につながることが期待される一方で、BSID スタッフの技術力向上の妨げになる恐れがある。
3. プロジェクト効果の持続性は、1）不安定な政府予算の配分、2）民間部門のニーズへの対応の遅れ、によって低下する可能性がある。政府機関は政府規定などにより民間企業の需要に迅速に応えられないケースが多く、BSID は柔軟性の低い予算配分のもとで、計画外の研修プログラムの実施などの面で制約を受けている。

4-4　結論

タイの金型産業は品質改善、コストダウン、生産にかかる時間の短縮、などを通じて生産能力・生産性を大幅に改善している。プロジェクトによる投入がプロジェクト上位目標達成の唯一の要因とはいえないが、プロジェクトが金型産業振興が急務であることを関係者に認識させる原動力になったことは確かだといえる。

4-5　提言（当該プロジェクトに関する具体的な措置、提案、助言）

調査結果から以下の BSID への提言が挙げられる。

1. 本プロジェクトと MDIDP は一連の方向性を持っているため、BSID が MDIDP の進捗をモニタリングしていくことが提案される。
2. 金型産業発展への支援を強化するため、BSID が退職したプロジェクトカウンターパートの人員補充について産業振興局と協議することが望まれる。
3. 進歩の早い金型生産技術分野で新たな知識・技術を習得するために、プロジェクトカウンターパートに対する研修機会を提供することが必要だと考えられる。
4. 最新の研修機材が不足していることにより、将来、熟練技術者が不足するという懸念がある。BSID が金型産業分野でのネットワークを使い、スタッフ研修のためにプロジェクト機材を使用する企業・団体などを発掘していくことが重要である。
5. BSID が金型産業発展のための全体の調整や政策決定での役割を重視していることから、タイ金型産業の競争力強化を戦略的に計画できるように、ニーズ調査により重点を置くことが提案される。
6. MDIDP の金型情報ユニットが開発したデータベースと情報システムは、関係機関との協力を推進するために広く共有されるべきである。
7. BSID が急速に成長しているタイ自動車部品産業の中小メーカーへの金型技術の移転を行う上で重要な役割を担うことが期待される。ニーズの高い技術には、精度の高い部品を作るのに必要なコンピュータ支援デザイン／製造／エンジニアリングなどがある。JICA との協力による日本の技術の移転が、有効なアプローチのひとつとして考えられる。

4-6　教訓（当該プロジェクトから導き出された類似プロジェクトの発掘・形成、実施、運営管理に参考となる事柄）

1. プロジェクトの実施過程でプロジェクト上位目標の測定可能な指標が設定され、関係者間で十分に共有されるべきである。
2. 当該プロジェクトの場合は、カウンターパート機関は、研修を行う民間企業を含む関連機関とのネット

ワークを強化することによりプロジェクト効果の持続性を向上させている。この経験から、プロジェクトの自立発展性は、関連分野で活動する他の機関との連携により高まると考えられる。

3. 産業振興分野での技術協力プロジェクトは、日本政府、日系企業、受入国政府、受入国民間セクターの4者の連携により実施されることが望ましいと考えられる。

4-7　フォローアップ状況

プロジェクト終了時評価で挙げられたすべての提言を日本側のフォローアップ・プログラムなしにタイ側がフォローアップしている。

1. OUTLINE OF THE EX-POST EVALUATION STUDY

1.1.Background and Purpose of the Study

Japan International Cooperation Agency (JICA) implemented 'SIC-Tool and Mold Technology Development Project in the Kingdom of Thailand (SIC-Tool Project)' with the government of Thailand under the technical cooperation program for the period of five years from November 1999 to October 2004. The purpose of the project was to upgrade the technical capacity of Bureau of Supporting Industries Development (BSID) to extend appropriate technical services to Thai plastic tool and mold industries.

The project was identified as one of three target technical cooperation projects for 'Ex-post Evaluation Study on Three Project in the Kingdom of Thailand 2007', which was designed and funded by JICA Thailand Office, to evaluate the impact and sustainability of project effects three years after the completion of the projects. The ex-post evaluation study has following objectives.

1) To evaluate and confirm the impact and sustainability of the projects after a certain period had passed since the completion of the projects
2) To derive lessons and recommendations for the improvement of JICA country programs and for the planning and implementation of more effective and efficient projects
3) To ensure accountability to tax payers through producing reports in both electronic and printed forms

1.2.Evaluation Team and Study Period

1.2.1. Evaluation Team

The evaluation team was comprised of following three members.

	Position	Name	Organization
1	Evaluation Analysis	Narong Rattana (Mr.)	Advisor Thai Auto-Parts Manufacturers Association
2	Support to evaluation analysis	Takehiro Iwaki (Mr.)	IC Net Asia Co., Ltd.
3	Assistant Researcher	Dusita Krawanchid (Ms.)	IC Net Asia Co., Ltd.

1.2.2. Study Period

The study was conducted from 24 October 2007 to 29 February 2008 as below.

Date	Activity	Output
24 Oct., 2007	• Kick-off Meeting with JICA Thailand Office	
till 12 Nov., 2007	• Collection of information/data • Document review • Development of Evaluation Grid and Questionnaires	• Evaluation Grid • Questionnaires
till 17 Dec., 2007	• Collection of information/data • Field visit • Development of Draft Evaluation Report	• Draft Evaluation Report
till 14 Jan., 2008	• Conducting supplemental study • Development of Draft Final Report and Draft Summary Sheets	• Draft Final Report • Draft Summary Sheets
till 29 Feb., 2008	• Conducting supplemental study • Development of Final Report and Summary Sheets	• Final Report • Summary Sheets

1.3.Outline of the Project

The outline of the project is summarized in the table below.

Project Title	SIC-Tool and Mold Technology Development Project in the Kingdom of Thailand (SIC-Tool Project)
Type of Cooperation	Technical Cooperation
Project Overall Goal	Thai plastic tool and mold industries will become internationally competitive to provide assembly industries in Thailand with high quality tools and molds
Project Purpose	Technical capability of BSID will be upgraded to extend appropriated technical service to Thai plastic tool and mold industries
Project Outputs	0. The project operation unit will be enhanced 1. Necessary machinery and equipment will be provided, installed, operated, and maintained properly 2. Technical capability of the counterpart personnel will be upgraded in the fields of mold design, mold processing, mold assembling, and trial shot 3. Seminars and training courses in the said fields will be implemented systematically 4. Technical information and advisory services in the said fields will be implemented systematically 5. Trial prototype services will be implemented systematically
Cooperation Period	1 November1999 - 30 October 2004
Implementing Agency in Thailand	Bureau of Supporting Industries Development (BSID), Department of Industrial Promotion (DIP), Ministry of Industry
Supporting organization in Japan	Materials Process Technology Center

2. STUDY METHOD

2.1.Stakeholders and Information/data collection

The evaluation study was designed to collect necessary information/ data to assess the project mainly in terms of impact and sustainability of project effects as well as contributing/disturbing factors based on the evaluation questions listed in the evaluation grid for the study (see the Attachment 1 'Evaluation Grid'). Following stakeholders were identified as targets for the collection of information/data.

1) Policy and decision makers of the Ministry of Industry, who were the project directors during the period
2) Project counterpart personnel who received technical transfer from Japanese experts
3) The managers of mold and die companies who received services from BSID during and after the project
4) The employees of mold and die companies who were trained by BSID during and after the project

2.2.Study Method

The ex-post evaluation study was conducted based on the evaluation grid, one interview form for policy and decision makers, and three questionnaire forms for ex-counterparts, company managers, and ex-trainees (see Attachment 2 'List of Interviewees' and Attachment 3 'Result of Questionnaires'). The received data and information were analyzed to assess the impact and sustainability of the project. To obtain more precise information and cross check the collected information, the study team also visited the Intelligence Unit of Mold and Die Industry Development Project (MDIDP), which was launched by the effort of BSID to enhance impact and sustainability of the project (see the outline of MDIDP in Attachment 4 'Mold and Die Industry Development Project ').

3. STUDY RESULTS

The ex-post evaluation study analyzes the circumstances of the project after three years of termination in terms of; 1) Impact of the Project, 2) Sustainability, 3) Analysis of Factors of Impact and Sustainability, 4) Issue and Problems, 5) Follow up Situation, and 6) Conclusion.

3.1. Impact of the Project

3.1.1. Achievement of Overall Goal

As there is no presetting of measurable indicators to evaluate the achievement of project overall goal, the evaluation study team used some implicated items relevant to measure the achievement of the overall goal. These items are export and import values of mold and die, lead time of production, and tool and mold quality in terms of precision. Judging from these implicated indicators, it can be said that the project overall goal has been achieved.

Study on import/export value of mold and die of Thailand from 2001 to 2006 shows that the export value of mold and die was approximately 2.03 thousand million baht in 2001 and 5.67 thousand million baht in 2006. It means the export value of mold and die became 2.79 times in five years. On the other hand, the import value of mold and die was 22.04 thousand million baht in 2001 and 25.32 thousand million baht in 2006. The increase of import value of mold and die was limited to 1.14 times in the same period. As can be seen in the table below, the export to import ratio on mold and die value has been steadily increased during 2001-2006.

<Export-Import Ratio on mold and die value of Thailand during 2001-2006>

Year	Export-Import Ratio
2001	0.09
2002	0.12
2003	0.16
2004	0.17
2005	0.18
2006	0.22

Source: Mold and Die Intelligent Unit, MDIDP

The other important indicators set by the evaluation team to assess the impact of overall goal are the lead time of production and the precision of mold and die production. According to the survey conducted in 2007 by the Mold and Die Intelligent Unit of MDIDP on 110 Thai mold and die factories, the average lead time of the production was 45 days. With the understanding that the lead time for the production was about 60 days at 5 years ago, the lead time for the production has been significantly reduced.

From the interview and questionnaire results, it can be said that stakeholders were highly satisfied with the shorter lead time of production. According to the information provided by some managers interviewed during the survey, they have been able to improve on time delivery management.

The same survey on 110 factories conducted by the Mold and Die Intelligent Unit of MDIDP also provides information for the precision of mold and die production as below. As the standard of precision on mold and die production was 20 micron meter at 5 year ago, it is fair to say that the mold and die quality in terms of precision has been rapidly improved. The managers of companies interviewed during the study are satisfied with the higher precision that Thai mold and die industries can provide to the assembling industries.

<Precision of mold and die production by factories>

Precision	Number of factory
Less than 5 micron meter	17
5-10 micron meter	28
More than 10 micron meter	65
Total	110

Source: Mold and Die Intelligent Unit, MDIDP

Judging from the data presented above, it can be said that the development of Thai mold and die industry is in the right track. These data also favors the achievement of overall goal of the project. According to the ex-counterparts, they gained both knowledge and skills, particularly in mold design and processing during the project. BSID has been utilizing the knowledge and skills to elevate the status of Thai mold and die industries by responding to the needs of the private sector, especially of small companies.

3.1.2. Unanticipated Impact at Project Completion

High level decision makers of the Ministry of Industry expressed their satisfactions to the impact of project to enhance the awareness on the mold and die development in the country through Thai Tool and Die Industry Association (TDIA) and the private sector. The increase in the awareness among TDIA and private companies reinforced the Ministry of Industry to propose MDIDP to Thai cabinet in June 2004. The cabinet approved the implementation of MDIDP on 12th September 2004 for the project period of 5 years from 2004 to 2009.

MDIDP was emerged by the effort of BSID management staff who gained knowledge and skills of tool and mold development from Japanese experts. The proposal of MDIDP was based on the recognition of BSID on the huge demand of quality mold and die from the assembling industry and necessity to respond to the needs. It is also noted that the BSID has sufficient capability to formulate and make attractive proposal for a complicated project like MDIDP to the cabinet through the Ministry of Industry. MDIDP, in turn, has been and continues to be a key factor which expand and sustain the project effect.

Some of ex-counterparts of the project have been helping technical colleges to develop mold and die training curriculum and support TDIA for setting up skill standard. This kind of cooperation is also considered as an impact of the project.

3.2. Sustainability

The sustainability of the project effect is analyzed in terms of five aspects: 1) current situation of counterpart personnel, 2) organizational aspect, 3) financial aspect, 4) technical aspect, and 5) sustainability of the project effect.

3.2.1. Current situation of counterpart personnel

During the implementation of the project, there were two groups of counterpart personnel, namely administrative counterparts and technical counterparts (see detail in the Attachment 5 'Current Situation of Counterpart Personnel').

Some of administrative counterparts of the project have been promoted to the key positions in the Ministry of Industry. These ex-counterparts are now in the positions to support projects or programs which may positively affect to the impact and sustainability of the project effect.

Four officers were appointed as project directors during the project. Out of four ex-project directors, three of them were retired from the Ministry of Industry and one is working actively in the field of mold and die development. The person is in the highly responsible position at MDIDP and also chairs the Mold and Die Industry Development Committee (MDIDC), which has been appointed by the Ministry of Industry. The committee is in charge of drafting policies and steering the MDIDP

direction to attain its objectives, which are compatible with the overall goal of the project.

There were four deputy project directors during the project and three of them are still working in the Ministry of Industry. These three persons have been promoted as the General Director of Department of Industrial Promotion, General Secretary of the Office of the Board of Investment, and General Inspector of Ministry of Industry, respectively. Four project mangers were appointed during the project. Out of 4 ex-managers, two are still working for the Ministry of Industry.

The technical counterparts were consisted of following five technical groups at the termination of the project.

1) Mold design (6 persons)
2) Mold processing (4 persons)
3) Assembling and trail short (8 persons)
4) Networking (2 persons)
5) Factory relationship (2 persons)

Among technical counterparts, 18 personnel at the groups of 1) Mold design, 2) Mold processing, 3) Assembling and trail short, were considered as key counterparts at the time of project termination. Currently, 14 out of these 18 counterparts still work for BSID and support mold and die production for small and medium enterprises.

Most of these 14 counterparts utilized their knowledge and skills received from Japanese experts for the implementation of training courses and other activities. They also support technical colleges to set up mold and die training curriculum and TDIA to build technical competency structure for mold and die.

There is a concern that insufficient replacement of technical staff, resulted from the manpower control policy of the government of Thailand, may hamper the continuation of project activities in the future.

3.2.2. Organizational aspect

Organizational structure of BSID has been changed after the termination of the project. During the project, BSID had following four divisions as well as one general

administrative section. Majority of technical staff of the project was appointed from the Metal Working and Machinery Industries Division.

- Plastic and Electronic Component Industries Division
- Subcontracting Promotion Division
- Packaging Promotion Division
- Metal Working and Machinery Industries Division

The General Director of Department of Industrial Promotion (DIP) had the order on 22 August 2007 to reorganize the DIP's structure. BSID was named as one of nine offices that have to be reorganized to comply with the DIP's order. According to the restructuring, BSID has following four technical divisions at present (see Attachment 6 'BSID Organization Chart').

- Fundamental Technology Division
- Advanced Technology Division
- Applied Technology Division
- Standard Technology Division

Among four divisions, project activities have been inherited to the Advanced Technology Division. In this division, ex-technical counterparts of the project form a core group to continue project activities.

With this organizational restructuring, BSID took the role of a coordinator, in addition to the role of an implementer, of technical services. This policy change was based on the recognition that 1) BSID has limitation in its capacity to provide wider needs of technical services from the growing mold and die industries; 2) there is a necessity to strengthen the role of the coordination agency to provide technical support to in the industries. This policy change has strengthened the role of BSID in making policies and in building a strong networking to provide technical services.

3.2.3. Financial aspect

Currently, BSID has following seven major programs to support Small and Medium Enterprises (SMEs) and industry community; 1) advisory service program for SMEs, 2) human resource development program for SMEs, 3) promotion of new entrepreneur, 4) advisory service for industry community, 5) training for industry community, 6) industrial information service program, 7) non-profit institutes support.

In 2004 and 2005, BSID allocated budgets for SIC-Tool Project activities, namely advisory service and training service under the 1) advisory service program for SMEs and 2) human resource development program for SMEs, respectively, as shown in the table below (see also detail of the BSID budget in the Attachment 7 'Summary of output and expense of BSID Program 2004-7').

<BSID's expense on SIC-Tool Project activities>

Service	2004	2005
Advisory Services	886,679 Baht	475,678 Baht
Training Services	338,481 Baht	731,333 Baht

Since 2006, BSID integrated the budgets for SIC-Tool Project activities to the other activities of BSID. Advisory services have been integrated to 'Promotion and development of efficiency of production for metal and machinery industry'. The training services of SIC project in 2006 was included in the expense of 'Technology transfer for efficiency improvement to intentional market'. In 2007, the training services of SIC project was combined with 'Metal and machinery industrial human resource development'.

Although it is difficult to pinpoint the expense allocated for project activities conducted in 2006 and 2007 due to this integration of expense items, project activities have been conducted with other activities of BSID.

MDIDP was a launched by the government of Thailand by the proposal from BSID for the project period of 5 years from 2005 with the total budget of 1.69 billion baht. As MDIDP can be considered as a succeeding project of the SIC-Tool Project with a common objective to support the development of mold and die industries, the sustainability of the project activities has been enhanced by the approval of the MDIDP.

BSID has allocated the budget to maintenance project equipment as below after the termination of the project. Appropriate care as well as less utilization of equipment is considered as reasons for less expense for the maintenance compared with the allocated budget.

<Allocation of budget and expense for the repair of project equipment>

Year	Allocated (Baht)	Spent (Baht)
2004	1,540,000	50,825
2005	275,000	142,790
2006	530,000	172,460
2007	360,000	140,300

Source: BSID

The list of machines and equipment, which were maintained and repaired since 2005, is listed below.

1. CAD/CAM Network station
2. Machining Center
3. Electricity Discharge Machine (EDM)
4. W-Electricity Discharge Machine (W-EDM)
5. Milling Machine
6. Injection Molding Machine
7. Vertical Milling Machine
8. Loathe (High speed)
9. Horizontal Boring Machine
10. Cutting grinder
11. Small Size Injection Machine
12. Flexible Mold Temperature Controller

3.2.4. Technical aspect

In the questionnaire survey with 12 ex-counterparts, 8 persons responded the transferred technology during the project is highly valid. However, as BSID focuses more on the coordination in technical services, there is a concern that its technical expertise has been and will be weakened.

BSID has an idea to fully utilize the facility within the budget allocation and try to find a chance for ex-technical counterparts to earn more competencies in mold and die technology.

In August 10, 2007, DIP signed the Memorandum of Understanding with a Japanese company to utilize the facility for training of mold and die technicians. BSID developed facility usage criteria to clarify the operating and utility costs that the company has to pay. The company also provides training to ex-technical counterparts for in-depth

practical knowledge and skills. It is expected that the company trains mold and die technicians so that they can gain more advanced technology and knowledge pertaining precision in mold and die production. BSID may also provide permission to utilize BSID's facility and equipment to other companies if the criteria are met.

BSID maintains the major equipment appropriately, although the utilization has been less. There is no software and equipment lost after the termination of the project (see the detail in the Attachment 8 'List of Machinery and Equipment'). BSID has been also trying to enhance utilization of their facilities. In September 3, 2007, DIP has set up a committee to outline criteria and to monitor the utilization of project equipment by the private sector to ensure full and fair application of equipment. Accordingly, BSID shares machines and equipment with the private sector by charging operation and utility costs.

Regarding the needs assessment for the private sector towards BSID's training courses, BSID has not put the needs survey as a main policy as indicated in the result of the questionnaire survey presented in the table below. However, it is found from the interview with ex-counterparts that each trainer individually has approaches to identify the needs of client.

<Response of ex-counterparts on the implementation of needs survey for the private sector>

No Survey	Survey		Total
	Once a year	Twice a year	
4	2	1	3

3.2.5. Sustainability of project effects

At present, 14 ex-counterparts of the project are the main human resource who implements project activities. The 14 personnel actively transfer mold and die technology to small mold and die companies. Result of training courses conducted for private companies by BSID during 2005-2007 is summarized in the table below.

<Summary of training courses conducted by BSID during 2005-2007>

Year	Number of training	Number of participants	Major course contents
2005	15	168	· Mold design · Fundamental forming injection mold · Fundamental mold polishing

			• Fundamental operation of injection machine • Experience in 3D mold design • Fundamental mold assembling and maintenance • Application of Autodesk Inventor Program and basic CNC
2006	7*[1]	85	• Application of Autodesk Inventor • 3D Mold Design (Caduceus which was supplied by SIC Project) • Mold Forming by CNC, EDM and Wire cut • Computer Analysis for Injection Mold • Application of Hyper Mill Program for Infection Mold Forming
2007	15	187	• Application of Autodesk Inventor • Computer Analysis for Injection Mold • Experience in 3D mold design • Fundamental mold assembling and maintenance

*[1]: The number of training courses in 2006 was less than numbers in 2005 and 2007 because of BSID's budget constraint

According to the evaluation conducted at the end of each training course, the satisfaction levels of participants were 70-85%. It is considered that the efforts of BSID, such as improvement of training documents according to the change in the needs of the private sector, are reflected in this high satisfaction of participants. From the information above, it can be interpreted that the project has been building knowledgeable and skilled counterparts who are successful in their career path and precious for BSID and development of Thai mold and die industries.

BSID has a plan to expand its activities to further transfer mold and die technology to the private sector. In fiscal year 2008, BSID plans to transfer mold and die technology to the factories in Northern and Northeastern regions, where demands for training have been gradually increasing and there are less number of training providers.

From the interview with ex-counterparts and personnel at private companies, it was found that the marketing of training courses by BSID has not been sufficient. Although BSID has set up a database of training participants in 2005 for the total of 1,800 trainees, the database has not been utilized sufficiently. BSID does not have a public relations unit to take care of PR issues, including newsletter and brochure, and leaves the responsibility to the training unit.

The questionnaire survey revealed that BSID has not regularly kept contact with ex-trainees and little information about the development of mold and die technology has been provided to them. There are needs from ex-trainees for information on training

schedule, seminar schedule, and updated information of machines, equipment, information of software, and technology. The private companies and ex-trainees need more training from BSID for more advanced knowledge and skills, such as CAE for mold design and complicated mold and die assembling.

BSID has been providing advisory services on project/program basis. BSID provided advisory services to SMEs by joining a project with Rajamankala Technology Institute Nakorn Ratchasima and King Mongkut's University of Thonburi in 2001-2006 to strengthen SMEs' capacity. There were 31 SMEs participated in the project. Each company received 8-10 man-days of advisory services from BSID staff and academics from both institutes. In 2007, the technical ex-counterparts of the project conducted advisory program to SMEs in Lampoon Province. There were 11 companies joined the program. BSID plans to continue advisory service in 2008 in Lampoon Province conduct other trainings with a Japanese company.

3.3. Analysis of Impact and Sustainability Factors

Three contributing factors were identified for the impact and sustainability of the project; 1) growth of assembling industries in Thailand, 2) government policy to develop mold and die industries, and 3) strengthening of coordination in the field of mold and die industries

(1) Growth of Assembling Industries in Thailand

Thai motorcycle, automotive, electric and electronic industries are the foremost users of mold and die products for producing their parts. Since 2002, the export value of motorcycle, automotives, electric and electronic products from Thailand has been increased significantly as shown in the table below.

<Export Value of Motorcycle, Automotive, Electric and Electronic Products>

(Unit: million baths)

Export Item	2002	2003	2004	2005	2006	2007*1
Motorcycle, parts, accessories	14,013.69	17,587.89	29,574.16	34,926.27	39,140.48	31,004.98
Automotives, parts, accessories	107,729.72	138,161.39	202,079.90	294,243.90	342,979.82	340,130.33
Electric products	401,413.29	431,007.65	535,754.29	543,587.39	560,999.58	418,227.53
Electronic products	640,419.86	708,110.40	750,480.29	869,969.64	998,808.94	739,119.78

Remarks *1: January-September 2007

Source of data: 1. Mold and Die Intelligence Unit, MDIDP
2. Intelligence Unit, Thailand Electrical and Electronics Institute

The increase in the export value of assembling industries is considered as an important pull factor for the development of mold and die industries. It is expected the growth of assembling industries and mold and die industries go hand in hand since assembling industries need high quality products with reasonable costs and faster delivering time from mold and die industries.

In other words, the decrease in demand from assembling industries will hamper the development of mold and die industries as described in the project design as an important assumption to sustain the project effect.

(2) Thai Government Policy to Develop Mold and Die Industries

The approval of MDIDP, which pursues the direction of the SIC-Tool Project, by the government of Thailand highly contributed to the strengthening of international competitiveness of mold and die industries. MDIDP has reinforced government policy to develop Thailand as a center of automotive and parts production in Asia, or called as "Detroit of Asia". The government of Thailand has the budget of 1.69 billion baht for the implementation of MDIDP (see the detail in the Attachment 4).

(3) Strengthening of Coordination in the Field of Mold and Die Industries

Networking among stakeholders in the mold and die industries have been strengthened under the framework of MDIDP. There are more than twenty technical colleges which join MDIDP, together with the Labor Development Department, to provide pre-employment training, advanced training, and the training of trainers. Large Japanese manufacturing companies, such as Honda, Nissan, Toyota, and Denso also take part in MDIDP as technology providers. These companies provide training opportunities, such as on-site training for trainers and training in Japan.

BSID is a part of network of MDIDP and plays following two key roles.

- Involvement in the decision making of MDIDP
  BSID's director and staff are appointed as a member and assistant secretary of MDIDP committee and human resource development sub-committee, mold a die technology development sub-committee, and industrial relationship sub-committee.
- Provision of facilities/equipment
  BSID allows the private sector to utilize its facility to support MDIDP training.

3.4.Issues and Problems

Following issues and problems were identified by the evaluation team during the study.

(1) Insufficient allocation for technical manpower

At the termination of the project, there were 18 technical counterparts, who received technical transfer from Japanese experts. Among eighteen ex-counterparts, four, or 18%, of trained counterparts resigned/retired from BSID. Filling of vacant positions has not been sufficient.

(2) Lack of further training programs for ex-technical counterparts

Mold and die technology, especially software for design and analysis, changes rapidly. Government agencies may have difficulty to follow the change, while the private sector is more likely to catch up with the current of the change. There is a concern that government agencies are left behind of the trend without proper awareness and actions by concerned agencies, including BSID. There is a necessity for ex-counterparts to have further trainings to catch up with new technology and skill through the network of MDIDP.

(3) Lack of chances for ex-technical counterparts to increase practical skills

The daily work of ex-technical counterparts is to teach theories on mold and die technology. Their concentration on this routine work restrains them to work in real production lines as working in a factory. This is identified as a weakness to develop their competency. The problem may be solved by providing them opportunities to work in the actual business community, i.e., factory, for certain period of time to gain practical skills.

(4) Out sourcing policy

The government of Thailand has a policy to encourage government offices to use the outsourcing service providers. As the policy is also applied for industrial development activities, budget of DIP and BSID for their own training would be cut in consistent

with this policy. As a positive aspect, this policy may strengthen the networking between BSID and concerned organizations/institutes through closer cooperation. However, there is a concern that this policy eventually may hamper the advance of technical capacity development at BSID.

(5) Shortage of manpower in mold and die industries

There is a concern for Thai mold and die factories, especially small sized factories, to face the shortage of skilled technical manpower with following reasons.

- Preference of new generation to work at the office, and not at factories
- Incapability of small firms to provide in-house technical training and remuneration as high as that of bigger companies
- Preference of workers to be an engineer, who is engaged in the desk work such as designing, instead of a technician, who works in the production line such as assembling. Job-hunting for better opportunities is an irritated phenomenon to mold and die factory management

All interviewed managers of private companies agreed that the mold and die industries would face the threat of shortage for skilled manpower in the near future. Mold and die industries need more skilled engineers and technicians in various fields, such as CAD (3D)/CAM and CAE analysis for mold and die design, high speed machine program, assembling of high precision mold and die and the maintenance, and repair complicated mold and die.

(6) Constraints for sustainability

The sustainability of the project effect may be weakened by; 1) unsteady allocation of annual budget, 2) slow response to the demand of the private sector. It can be said that the government personnel is not able to quickly respond to the private sector's demand due to the government regulation. BSID staff has difficulty in arranging training programs other than planned training programs under the annual budget. From the interview with the decision makers, it is understood that DIP highly recognizes these issues.

3.5. Follow up situation

All the recommendations made by the Terminal Evaluation has been followed up by Thai side without Japanese follow-up cooperation.

3.6.Conclusion

SIC-Tool Project has built a good bridge of tripartite development relationship. The Japanese experts transferred technology to Thai counterpart personnel and to the private sector. Thai technical counterparts further transferred the technology, especially to micro and small enterprises. The trainings and other services provided by the project have been highly appreciated by the private sector to help them upgrading their knowledge and skills in mold and die production.

As presented in the Section 3.1.1, various data confirm the successful development of Thai plastic tool and mold industries. Stakeholders, who were contacted during the evaluation study, also agreed with the significant improvement in the industries in terms of quality, cost reduction, and shorter lead time of production. Although the study cannot claim that the project is a major input for the achievement of its overall goal, it is fair to say that the project contributed to the achievement of overall goal together with other factors mentioned in the Section 3.3.

For project sustainability in term of continuous development of Thai mold and die industries, the commitment by the government of Thailand has been ensured by the approval of MDIDP and allocation of budget to MDIDP as presented in the Section 3.3. SIC-Tool Project triggered the awareness of necessity to urgently develop Thai mold and die industries through the development of human resource and technology. The knowledge and experience gained from Japanese experts have provided BSID a clear picture to formulate MDIDP. MDIDP can be considered as a succeeding project of SIC-Tool Project for the development of mold and die industries in Thailand. MDIDP is expected to contribute greatly to maintain the project effect for the development of the industries.

4. RECOMMENDATION AND LESSONS LEARNED

Following recommendations and lessons learned are drawn from the result of the evaluation study.

4.1.Recommendation

(1) It will be good if BSID can follow-up the progress of MDIDP since the output of MDIDP is consistent with the overall goal of the SIC-Tool Project to strengthen international competitiveness of mold and die industries.

(2) It is recommended for BSID to discuss with DIP to submit a proposal to the Civil Service Commission Office for the replacement of the resigned or retired technical counterpart personnel to strengthen its support for the die and mold industries..

(3) Arrangement of further trainings for ex-technical counterpart personnel by BSID, or through the network of MDIDP, is considered effective to update their knowledge and skills for ever-changing mold and die production technology, especially in the field of 3D design and CAE.

(4) As there is a concern for the shortage of skilled manpower due to the insufficient modern machines and equipment for the training, it would be relevant for BSID to facilitate its networks to identify potential customers who are interested in sharing project equipment for the training of their staff under the management of BSID. This program will fit well to new foreign investors who want to invest in Thailand and are likely to face the shortage of the skilled manpower.

(5) Based on the increasing role of BSID on coordination and policy making for the development of mold and die industries, it is recommended for BSID to put more emphasis on needs survey for strategic planning of competitiveness of Thai mold and die industries. Technical support with international agencies may be considered.

(6) At present, the database and information system on mold and die industries are well organized under the responsibility of Mold and Die Intelligence Unit of MDIDP. The database and information system should be shared with concerned organizations, including JICA, to attract more cooperation.

(7) It is expected for BSID to play a more important role in transferring mold and die technology for medium and small automotive parts makers, which support the fast-growing automotive industries and need advanced mold and die technologies, such as CAD/CAM/CAE to produce very precision parts including suspension member, turbo charger, and manifold. For this matter, the transfer of Japanese technology, through a close cooperation with JICA, may be an effective approach. The result of the interview with factory managers shows that Thailand automotive parts producers need more advanced knowledge and skills to design and produce complicated mold and die to enhance their international competitiveness.

4.2.Lessons Learned

(1) The measurable indicators to assess the achievement of the project should be defined and shared among stakeholders in the process of project.

(2) In the case of the SIC-Tool Project, sustainability of project will be more secured with the involvement of other institutions established by the Ministry of Industry, such as Thai Automotive Institute (TAI)[1] is appropriate. Because of its management flexibility and its membership system, the institute is working closely with its customers and has good arms reaching to the demand in training and services of the automotive industry. Form this experience, it can be implied that the sustainability of the project will be more secured with the involvement of other institutions working in the related field.

(3) For the technical cooperation project in the field of industrial development, the project can be implemented by four parties, namely the government of Japan Japanese companies, the government of recipient country, and private sector of the recipient country. Japanese companies can take an important role to provide trainers for training. This model is working well under MDIDP with the cooperation of Honda Company.

[1] TAI concerns mainly about parts testing. However, TAI is also responsible for human resource development in the automotive industry of Thailand. TAI is expected to act as a coordinator for human resource development for mold and die industry by working with Thai-German Institute and universities/technical colleges to provide training courses to its members.

Attachment 1

Evaluation Grid

Evaluation Grid for Ex-post Evaluation Study on 'SIC-Tool and Mold Technology Development Project'

IMPACT

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
a) How far has the overall goal been achieved since the terminal evaluation?	1) Have the plastic tool and mold industries increased or decreased their exported and imported value since 2004?	Comparison of status during project period to after project	· Import value and export value of plastic tool and mold of Thailand	· Annual report of export/import from Customs Department · Current study on status of plastic tool and mold in Thailand	· Databases · Document review
	2) Have the plastic tool and mold industries decreased their lead time?	Comparison of status during project period to after project	· Lead time of production in day	· Companies that had received services from BSID	· Document review · Interview
	3) Have the plastic tool and mold industries increased their quality in terms of precision?	Comparison of status during project period to after project	· Precision of tool and mold that they can make in micron meter	· Companies that had received services from BSID	· Document review · Interview
	4) What are the product sizes that they be able to produce?	Comparison of status during project period to after project	· Plastic mold sizes in millimeter	· Companies that have received services from BSID	· Document review · Interview
	5) What is the rate of production of plastic molds by Thai industries?	Comparison of status during project period to after project	· Production sets of plastic mold by size in days	· Companies that have received services from BSID	· Document review · Interview

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
	6) Have the plastic tool and mold industries improved their on-time delivery since 2004?	Comparison of status during project period to after project	· Number of customers complain on delay delivery since 2004	· Companies that have received services from BSID	· Document review · Interview
b) What are major contributing/ disturbing factors for achieving overall goal?	7) How has the achievement of project purpose contributed to the achievement of overall goal?	Comparison of status before and after the project	· Views and information from BSID management and C/P	· BSID management and C/P	· Document review · Interview
	8) How important assumptions of the project affected for achieving the overall goal?	Comparison of status before and after the project	· Linkage with assembly industry	· BSID management and C/P	· Document review · Interview
	9) Are there any major changes on government policy that affected the project overall goal?	Comparison of status before and after the project	· Demand from assembly industry for plastic/ mold industry	· BSID management and C/P	· Document review · Interview
	10) Has Mold And Die Industry Development Project (MDIDP) which described by BSID been approved by the Ministry of Industry and the cabinet? If yes, how has it contributed for achieving overall goal?	Comparison of status during project period to after project	· Political and socio-economic condition	· BSID management and C/P	· Document review · Interview
	11) What are other contributing/ disturbing factors for achieving overall goal? How have they affected for achieving the overall goal?	Comparison of status before and after the project	· Status of MDIDP and impact on the project overall goal	· BSID management and C/P	· Document review · Interview
c) Are there any unintended positive and negative effects observed?	12) What are positive and/ or negative changes by the project?	Comparison of status before and after the project	· Past and current government policy	· Former project directors · BSID management level officials	· Interview with high level decision makers

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
	13) How the project has given impact on government policy on plastic and mold industry?	Comparison of status before and after the project	• Positive and negative impacts by the project	• Former project directors • BSID management level officials	• Interview with high level decision makers
	14) Are there any specific groups which have been affected by the project?	Comparison of status before and after the project	• Specific groups affected by the project	• Specific groups affected by the project	• Questionnaire and /or interview
d) What factors contributed to positive and negative impacts?	15) How has the project contributed to the unintended positive and negative impacts?	Comparison of status before and after the project	• Views and information from BSID and management ex-C/P	• MDIDP • BSID management and C/P • BSID networking organizations	• Document review • Interview and/or questionnaire
	16) What other factors contributed to unintended positive and negative impact of the project?	Comparison of status before and after the project	• Views and information from BSID and management ex-C/P	• MDIDP • BSID management and C/P • BSID networking organizations	• Document review • Interview and/or questionnaire

SUSTAINABILITY

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
a) How have the counterpart agencies been maintaining the project activities and services provided by the project?	17) Has BSID changed any policy and organizational structure on maintaining the project activities and services provided by project?	Comparison of status during project period to after project	• Current policy and operation of BSID from management and former project director	• MDIDP documents and related materials • BSID management and C/P • BSID networking organization	• Document review • Interview and/or questionnaire
	18) How many C/Ps are still actively working on project activities?	Comparison of status during project period to after project	• Current policy and operation of BSID from management and former project director	• MDIDP documents and related materials • BSID management and C/P • BSID networking organization	• Document review • Interview and/or questionnaire
	19) How technologies transferred during the project period have been utilized? Are technologies still in valid?	Comparison of status during project period to after project	• Current policy and operation of BSID from management and former project director	• MDIDP documents and related materials • BSID management and C/P • BSID networking organization	• Document review • Interview and/or questionnaire
b) What factors are contributing to or inhibiting the project effects or sustainability?	20) Do the clients still need BSID training courses and advisory services provided by C/P?	Comparison of status during project period to after project	• Views and information from C/P and clients • Views and information from high level decision makers of DIP	• Technical project C/P • High level decision makers • BSID's clients	• Document review • Interview and/or questionnaire

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
	21) Have the BSID received support and allocation of manpower and budget from Department of Industrial Promotion to maintain project activities and services?	Comparison of status during project period to after project	• Views and information from high level decision makers of DIP • Amount of budget allocated for BSID by DIP	• High level decision makers • Annual budget report since 2004	• Document review • Interview and/or questionnaire
	22) Are there other factors contributing to/ inhibiting the project effects or sustainability?	Comparison of status during project period to after project	• Views and information from C/P and clients • Views and information from high level decision makers of DIP	• Technical project C/P • High level decision makers • BSID's clients	• Document review • Interview and/or questionnaire

SPECIFIC QUESTIONS

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
a) What is the current situation and trend of plastic tool and mold industry in Thailand?	23) What are the present characteristics of mold and die industry in Thailand in terms of capital registration, number of employees and portion of assembly industries using plastic tools and mold?	Comparison of status during project period to after project	• No. and amount of capital registration • Average number of employees per factory	• MDIDP intelligent unit	• Review the latest report on mold and die situation and other documents
	24) How the situation of plastic tool and mold industry is changed after the completion of the project in terms of technology, R&D, technical skills, training institute?	Comparison of status during project period to after project	• No. of R&D and technical training institute in plastic tool and mold	• MDIDP intelligent unit	• Review the latest report on mold and die situation and other documents

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
b) What is the current situation and government policy on mold and die industry? Is there any change after termination of the project?	25) Has MDID been approved by the cabinet? If yes, 25.1) What are the strategic plans for development of mold and die industry? 25.2) Are there clear objectives for each strategic plan? 25.3) How much budget has the government committed to allocated for MDIDP? 25.4) How does Ministry of Industry organize the institutes and departments to implement the MDIDP? 25.5) What are the outputs of the MDIDP? 25.6) What are the effects of the project, positive or negative manners? 25.7) What is the role of BSID on the MDIDP?	Comparison of status during project period to after project	• The MDIDP's strategic plan • Objectives of MDIDP • Amount of committed budget and actual allocation • MDIDP's implementation organization • MDIDP's outputs	• MDIDP implementing agencies	• Review MDIDP documents • Interview
c) What kind of effort has BSID made to strengthen its function as a coordinator of various organizations in providing training courses and other services to Thai tool and mold industries after the termination of the project?	26) Does BSID have policy to strengthen its function as a coordinator in providing training courses and other services? If yes, 26.1) How does BSID organize itself? 26.2) How many training organizations be BSID network? 26.3) What activities have been conducted by BSID as a coordinating body?	Comparison of status during project period to after project	• Scale, types, design, and management of training course	• BSID management staff • BSID's organization chart	• Document review • Interview or questionnaire

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
d) By which mean the needs survey of private sector toward BSID's training courses and other services be conducted? How regular? To what extend BSID could respond to the needs?	27) How and how often does BSID conduct needs survey to identify the needs of the private sector after the completion of the project?	Comparison of status during project period to after project	· Means and frequency of needs survey	· BSID management staff	· Document review · Interview or questionnaire
	28) How does BSID respond to the needs of private sector?	Comparison of status during project period to after project	· BSID's response to the needs of the private sector	· BSID management staff · BSID's clients	· Document review · Interview or questionnaire
	29) How is the private sector satisfied with the response of BSID?	Comparison of status during project period to after project	· BSID's response to the needs of the private sector	· BSID management staff · BSID's clients	· Document review · Interview or questionnaire
e) Is the database of BSID's clients completed? Are there any networks between those who had been trained from BSID for further development or coordination in mold and die industry?	30) Has the database of BSID's client been completed? If yes, 30.1) How does BSID maintain the database? 30.2) How and what information does BSID provide to the persons in the database? 30.3) How does BSID use a channel to communicate with them?	Comparison of status during project period to after project	· Development, maintenance, and utilization of the database	· BSID management staff and C/P · BSID's ex-trainees	· Document review · Interview or questionnaire
	31) Are there activities for those who had been trained from BSID for further development or coordination in mold and die industry?	Comparison of status during project period to after project	· Scale and function of networking	· BSID management staff and C/P · BSID's ex-trainees	· Document review · Interview or questionnaire
f) How is the situation of the utilization of external human resources as trainers for training courses in the respond	32) How does BSID utilize the external human resources as trainers for training courses?	Comparison of status during project period to after project	· Status of maintenance and utilization of project equipment	· BSID management staff and C/P	· Document review · Interview and/or questionnaire

Evaluation Questions		Achievement Criteria/ Measures	Data needed	Data source	Data collection method
Main Questions	**Sub-questions**				
to the needs from private sector?	33) Are there any constrains for BSID to keep equipment and other in good condition?	Comparison of status during project period to after project	· Status of maintenance and utilization of project equipment	· BSID management staff and C/P	· Document review · Interview and/or questionnaire
g) Does BSID periodically update teaching materials and evaluate all training course?	34) How and how often does BSID update the teaching materials?	Comparison of status during project period to after project	· Situation of updating teaching material	· BSID management staff and C/P	· Document review · Interview and/or questionnaire · Observation
	35) How does BSID evaluate training course and feed back to the future training courses?	Comparison of status during project period to after project	· Evaluation mechanism of training course	· BSID management staff and C/P	· Document review · Interview and/or questionnaire · Observation
h) Does BSID regularly maintain project's equipment and machine in good condition and fully utilize?	36) How and how often does BSID keep maintaining and utilizing of project equipment and others?	Comparison of status during project period to after project	· Status of maintenance and utilization of project equipment	· BSID management staff and C/P	· Document review · Interview and/or questionnaire · Observation
	37) Are there any constrains for BSID to keep equipment and other in good condition?	Comparison of status during project period to after project	· Status of maintenance and utilization of project equipment	· BSID management staff and C/P	· Document review · Interview and/or questionnaire · Observation

Attachment 2

List of Interviewees

List of interviewees for
Ex-post Evaluation study of SIC-Tool and Mold Technology Development Project

No.	Date	Name and position
1	19 November 2007	**Dr. Pasu Loharjun** (Director) Bureau of Supporting Industries Development, Department of Industrial Promotion
2	26 November 2007	**Mr. Buntao Wongprachanukul** (Ex-counterpart) **Mr. Chairat Kaewdoung** (Ex-counterpart) **Mr. Paiboon Tekapan** (Ex-counterpart) **Mr. Chanon Suktayoo** (Ex-counterpart) **Mr. Sirisak Ritgham** (Ex-counterpart) **Mr. Dumlong Kratumkhetr** (Ex-counterpart) Bureau of Supporting Industries Development, Department of Industrial Promotion
3	27 November 2007	**Mr. Perapoj Wannabenjawat** (Manager) **Ms. Bajari Budthapiwat** (Ex-trainee) Porntanapath Co., Ltd.
4	28 November 2007	**Mr. Chavit Luanpijpong** (Vice President) Thai Griptech Co., Ltd.
5	28 November 2007	**Mr. Apaiyut Saetia** (Managing Director) Challenge Industry Co., Ltd.
6	30 November 2007	**Mr.Ruchira Srisamai** (General Manager) T.Krungthai Industries Public Co., Ltd.
7	30 November 2007	**Mr. Vichid Yoksuwan** (Factory Manager – Mold Factory) **Mr. Wachara Juntarasena** (Supervisor) **Mr. Prasertchai Thip-u-thai**(Ex-Trainee) **Mr. Supat Tengluddawong** (Ex-Trainee) **Mr. Anantachai Jongpho** (Ex-Trainee) Nippo Mechatronics (Thailand) Co., Ltd.
8	4 December 2007	**Dr. Damri Sukkhotanang** (Deputy Permanent Secretary) Ministry of Industry

Attachment 3

Result of Questionnaire

Result of Questionnaire for Ex-Counterparts BSID,
Department of Industrial Promotion, Ministry of Industry

A. Impact of the SIC Project

1. How much can Thai mold and die industry reduce average lead time of production comparing to the past?

Answer	Number	Percentage
Very much	2	17%
Fair	8	67%
No reduce	0	0%
Not sure	2	17%
Total	**12**	**100%**

2. How much can Thai mold and die industry produce more precise comparing to the past?

Answer	Number	Percentage
Much more precise	8	67%
Fair	2	17%
No improvement	0	0%
Not sure	2	17%
Total	**12**	**100%**

3. Can Thai mold and die industry produce larger mold comparing to the past?

Answer	Number	Percentage
Very much	4	33%
Fair	3	25%
No change	1	8%
Not sure	4	33%
Total	**12**	**100%**

4. How often has Thai mold and die industry improved on-time delivery of mold?

Answer	Number	Percentage
Always on time	2	17%
Often on time	5	42 %
Not change	1	8%
Not sure	4	33 %
Total	**12**	**100%**

5. How much can Thai mold and die industry reduce the cost of mold production after receiving services from SIC Project?

Answer	Number	Percentage
Very much	4	33%
Fair	5	42%
Not reduce	0	0%
Not sure	3	25%
Total	**12**	**100%**

6. How much can your company increase design ability comparing to the past?

Answer	Number	Percentage
Very much	3	25%
Fair	5	42%
Not reduce	0	0%
Not sure	4	33%
Total	**12**	**100%**

7. How much can your company increase the production ability comparing to the past?

Answer	Number	Percentage
Very much	3	25%
Fair	4	33%
Not increase	0	0%
Not sure	5	42%
Total	**12**	**100%**

8. Are there any unexpected factors which contributed to positive or negative competitiveness of Thai mold and die industry after termination of the project?

8.1 Positive factors are: BSID can provide consultancy service to small scale company.

8.2 Negative factors are: Budget for machine maintenance is limited.

9.Has the government changed any policy that affects SIC Project?

Answer	Number	Percentage
Yes	4	33%
No	3	25%
No sure	2	17%
No answer	3	25%
Total	**12**	**100%**

10.How much has BSID transferred technical knowledge and skills to C/P and other staff?

10.1 Mold knowledge:

Answer	Number	Percentage
Very much	2	16%
Much	6	50%
Fair	4	33%
Not increase	0	0%
Not sure	0	0%
Total	**12**	**100%**

10.2 Working Skills:

Answer	Number	Percentage
Very much	4	33%
Much	3	25%
Fair	5	42%
Not increase	0	0%
Not sure	0	0%
Total	**12**	**100%**

11. How much has BSID transferred technical knowledge and skill to private sector after termination of the SIC Project?

Answer	Number	Percentage
Very much	0	0%
Much	6	50%
Fair	6	50%
No increase	0	0%
Not sure	0	0%
Total	**12**	**100%**

B. Sustainability of SIC Project

Policy Sustainability

12. Has BSID changed policy for the development of Thai mold die industry?

Answer	Number	Percentage
Yes	3	25%
No	2	17%
Not sure	6	50%
No Answer	1	8%
Total	**12**	**100%**

13. Has BSID cooperated with other agencies and institutes for the development of Thai mold and die industry?

Answer	Number	Percentage
Yes	8	67%
No	0	0%
Not sure	4	33%
Total	**12**	**100%**

14. Are there any positive and negative factors affecting sustainability of the SIC Project after termination of the project?

14.1 Positive factor

Answer	Number	Percentage
Yes	4	33%
No	5	42%
Not sure	0	0%
No answer	3	25%
Total	**12**	**100%**

Positive factor: Spread of knowledge by ex-trainees to their colleagues

14.2 Negative factor

Answer	Number	Percentage
Yes	5	42%
No	4	33%
Not sure	0	0%
No answer	3	33%
Total	**12**	**100%**

Negative factor: Organization restructuring

15. How much does the mold and die industry need the following need of training/information/ services to BSID?

15.1 The need of mold design technology

Answer	Number	Percentage
Much	3	25%
Fair	7	58%
No	0	0%
Not sure	2	17%
	12	**100%**

15.2 The need of parts processing technology

Answer	Number	Percentage
Much	4	33%
Fair	6	50%
No	0	0%
Not sure	2	17%
Total	**12**	**100%**

15.3 The need of mold assembly technology

Answer	Number	Percentage
Much	2	17%
Fair	9	75%
No	0	0%
Not sure	1	8%
Total	**12**	**100%**

16. Is the technology, which has been transferred from Japanese experts to C/P, still valid and applicable?

Answer	Number	Percentage
Very much	3	25%
Much	5	42%
Fair	4	33%
Not sure	0	0%
Total	**12**	**100%**

17. What is the condition of equipment and machine supplied by Japanese side to the SIC Project?

Answer	Number	Percentage
Very good	2	17%
Good	7	58%
Fair	3	25%
Out of date	0	0%
Not sure	0	0%
Total	**12**	**100%**

18. What is the condition of software supplied by Japanese side to the SIC Project?

Answer	Number	Percentage
Very good	0	0%
Good	3	25%
Fair	5	42%
Out of date	2	17%
Not sure	1	8%
No answer	1	8%
Total	**12**	**100%**

Organization Sustainability

19. Are there any inhibiting factors in the development and extent of SIC Project structure?

Answer	Number	Percentage
Yes	4	33%
No	2	17%
Not sure	5	42%
No Answer	1	8%
Total	**12**	**100%**

20. How many new staff join the SIC project?

Answer	Number	Percentage
Many	0	0%
Some	0	0%
No	12	100%
Not sure	0	0%
Total	**12**	**100%**

21. How many new staffs are working in the following areas at present?

21.1 Mold design 1-4, persons
21.2 Part processing 2-4 persons
21.3 Mold assembly 1-2 persons
21.4 Information 6 persons
21.5 General support - persons

Note: C/Ps were confused with the number of new staff; since BSID restructure have made their staff move around.

22. Is budget allocated by government to BSID for sustainability of the SIC Project enough?

Answer	Number	Percentage
Enough	0	0%
Not increase	5	42%
Not enough	5	42%
Not sure	2	17%
Total	**12**	**100%**

23. How much has BSID training and services' income been increased after termination of the project?

Answer	Number	Percentage
Very much	0	0%
Much	0	0%
Not change	6	50%
Not sure	2	17%
No answer	4	33%
Total	**12**	**100%**

24. Does BSID conduct the needs survey on Thai mold and die industry since the termination of the SIC Project?

Answer	Number	Percentage
Yes	3	25%
No	7	58%
Not sure	2	17%
Total	**12**	**100%**

25. How has BSID responded to the needs of private sector?

Answer	Number	Percentage
Cooperate with its networks	7	58%
Work by itself	4	33%
No response	1	8%
Total	**12**	**100%**

25.1 Training networks include following persons: Software company, university, Thai-German Institute (TGI), Thai Tool and Die Industry Association (TDIA) and Ministry of Labor's Labor Skill Development Institute

25.2 Information services and consulting networks include following persons: Thai Tool and Die Industry Association (TDIA) and DIP's Regional Industrial Development Center

26. Has BSID conducted survey on customer satisfaction after the termination of SIC Project?

Answer	Number	Percentage
Yes	10	83%
No	0	0%
Not sure	0	0%
No answer	2	17%
Total	**12**	**100%**

If yes, does the customer satisfy with the services?

Answer	Number	Percentage
Very much (85-100%)	1	1%
Much (70-84%)	6	6%
Fair (55-69%)	1	1%
Not satisfied (30-54%)	0	0%
Not sure (30-54%)	2	2%
Total	**10**	**10%**

27. Has BSID completed its clients' database?

Answer	Number	Percentage
Yes	7	58%
No	2	17%
Not sure	2	17%
No answer	1	8%
Total	**12**	**100%**

27.1 If yes, how has the client database been utilized? (you can choose more than one answer)

Answer	Number of respondents	Percentage of respondents
To give the clients general information	6	86%
To support BSID as alumni members	5	71%
To expand network	0	0%
For training purpose	1	14%
To be asked for feedbacks and suggestions	1	14%

28. Has BSID produced brochure or newsletter of SIC Project regularly after the project termination?

Answer	Number	Percentage
Yes	3	25%
No	4	33%
Not sure	2	17%
No answer	3	25%
Total	**12**	**100%**

29. Have you transferred your technical knowledge and skills received from Japanese experts to your colleagues?

Answer	Number	Percentage
Yes	7	58%
No	5	42%
Total	**12**	**100%**

29.1 If yes, what is the your colleagues ability?

Answer	Number of respondents	Percentage of respondents
They can work with my assistance	2	29%
They can teach others	2	29%
They can work by themselves	3	43%
Total	**7**	**100%**

29.2 If no, what are the causes?

Answer	Number of respondents	Percentage of respondents
No new officials in my department/division, because of the government policy in manpower freezing	5	100%
No body is interested in technical subjects	0	0%
Due to my workload, I'm unavailable to teach others	0	0%
No policy from top management	0	0%
Total	**5**	**100%**

30. Has BSID employed outsourced technical trainers for mold and die to teach at project site?

Answer	Number	Percentage
Yes	9	75%
No	3	25%
Not sure	0	0%
Total	**12**	**100%**

30.1 If yes, what the subjects do they teach?
CAD/CAM Software, Polishing and Infection

31. Has BSID reviewed and improved teaching documents and materials?

Answer	Number	Percentage
Yes	11	92%
No	0	0%
No answer	1	8%
Total	**12**	**100%**

31.1 If yes, how often?

Answer	Number of respondents	Percentage of respondents
Once a year	3	27%
Once the information has changed	8	73%
Prior to each training	0	0%
Total	**11**	**100%**

32. Have you applied you gained knowledge and skills received from Japanese experts besides teaching?

Answer	Number	Percentage
Yes	6	50%
No	0	0%
No answer	6	50%
Total	**12**	**100%**

32.1 If yes, have you applied that knowledge and skills to the following activities?

Answer	Number of respondents from Q 32	Percentage of respondents
Contribute to new teaching courses for education/training institute	3	50%
Participate working group or sub-committee for mold and die human resource development	3	50%
Support other government agencies to set up level of skills	2	33%
Support Thai Mold and Die Industry Association (TMDIA) to build up competency of mold and die manpower	1	17%

33. What is the condition of machines and equipment of SIC Project?

Answer	Number	Percentage
Very good	3	25%
Good	6	50%
Fair	1	8%
Not good	2	17%
Not sure	0	0%
Total	**12**	**100%**

34. Does BSID allow other agencies or private sectors to utilize SIC Project machine/equipment?

Answer	Number	Percentage
Allow, but the users must fully pay for machine cost	0	0%
Allow, but the users partially pay for machine cost	12	100%
Allow to use free of charge	0	0%
Do not allow	0	0%
Other, specify	0	0%
Total	**12**	**100%**

Result of Questionnaire for Company Management Level Involved in "SIC-Tool and Mold Technology Development Project"

A. Impact of the SIC Project

1. How much can your company reduce lead time of production comparing to the past?

Answer	Number	Percentage
85-100%	1	17%
70-84%	2	33%
50-69%	2	33%
Less than 50%	1	17%
Not sure	0	0%
Total	**6**	**100%**

2. How much can your company produce more precise mold after joining the SIC project?

Answer	Number	Percentage
Much more precise	3	50%
Fair	2	33%
No improvement	1	17%
Not sure	0	0%
Total	**6**	**100%**

3. How much can your company produce larger mold comparing to the past?

Answer	Number	Percentage
Very much	1	17%
Fair	3	50%
No change	2	33%
Not sure	0	0%
Total	**6**	**100%**

4. How often has your company improved on time delivery of mold comparing to the past?

Answer	Number	Percentage
Always on time	1	17%
Often on time	4	67%
Not change	1	17%
Not sure	0	0 %
Total	**6**	**100%**

5. How much can your company reduce the cost of mold production after receiving services from SIC Project?

Answer	Number	Percentage
Very much	2	33%
Fair	2	33%
Not reduce	2	33%
Not sure	0	0%
Total	**6**	**100%**

6. How much can your company increase design ability comparing to the past?

Answer	Number	Percentage
Very much	4	67%
Fair	2	33%
Not reduce	0	0%
Not sure	0	0%
Total	**6**	**100%**

7. How much can your company increase the production ability comparing to the past?

Answer	Number	Percentage
Very much	5	83%
Fair	1	17%
Not increase	0	0%
Not sure	0	0%
Total	**6**	**100%**

8. How much can your company reduce the testing and trial time of a new mold comparing to the past?

Answer	Number	Percentage
Very much	3	50%
Fair	2	33%
Not reduce	1	17%
Not sure	0	0%
Total	**6**	**100%**

9. How much confidence do you have in competitiveness for mold or die production?

Answer	Number	Percentage
Very much	2	34%
Confidence	1	17%
No confidence	3	50%
Not sure	0	0%
Total	**6**	**100%**

B. Sustainability of SIC Project

10. Does your company still need BSID training and services from SIC Project?

Answer	Number	Percentage
Yes	6	100%
No	0	0%
Not sure	0	0%
Total	**6**	**100%**

Comment: 100% still need BSID training and service

10.1 If yes, what area/s of training do you need?

Answer	Number	Percentage
Mold design	4	67%
Mold part procession	4	67%
Mold trial	5	83%
Mold repair and maintenance	2	33%
Information services	2	33%
Consultancy	3	50%
Mold testing, performance, analysis and solution	2	33%

11. Has your company experienced any inconvenience while receiving training organized by BSID?

Answer	Number	Percentage
Yes	0	0%
No	5	83%
Not sure	1	17%
Total	**6**	**100%**

12. How much can your technicians/engineers, who had been trained by SIC Project, apply the gained knowledge and skills to their job?

Answer	Number	Percentage
Fully apply	4	66.5%
Partially apply	2	33.5%
Not at all	0	0%
Not sure	0	0%
Total	**6**	**100%**

13. Do you support your employees, who had been trained by SIC Project, to transfer their knowledge and skills to their colleagues?

Answer	Number	Percentage
Fully support	4	67%
Partially support	2	33%
Don't support	0	0%
Not sure	0	0%
Total	**6**	**100%**

General information on Mold and Die Industry

14. Among 5 Thai assembly industries below, could you rank these industries that will have demand of mold and die in the future from 1-5?

The industrial that most need mold and die	Number				
	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
Automotive parts maker industry	5				
Electricity and electronic industry		5		1	
Packaging industry (food and consumer goods)		1	3	1	
Fashion industry (shoes, leathers, jewelry, etc.)				1	2
Machinery and equipment industry			1	1	2

Note: 1.All six managers agree that automotive parts industry is the industry which need the development of mold die industry most.
2. Five mangers out of six agree that electricity and electronics industry is at the second rank

15. If the government wants to strengthen competitiveness for Thai mold and die industry, could you rank the priority abilities the industry may need from 1-5?

Needed ability	Number				
	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
The ability to design mold	3	1			
The ability to make prototyping mold	1	1			2
The ability to make very precision mold			2		
The ability to control quality	1	1	3		1
The ability to assembly and trail a complicated mold		1		2	1

Note: 1. Three out of six managers agree that the ability to design mold is the first priority

16. Does Thai mold and die industry still want technology transfer from Japan?

Answer	Number	Percentage
Yes	6	100%
No	0	0%
Not sure	0	0%
Total	**6**	**100%**

Comment: Thai mold and die industry 100% wants technology transfer from Japan

Technology for designing complicated mold and die	6
Technology for processing high precision mold and die parts	5
Technology for efficiency services of mold and die	4
Technology for extending services life of mold and die	4
Management of mold and die technology	3

17. What is the most appropriate approach of technology transfer from Japan to Thailand?

Government to government	0	0%
Japanese government to Thai government joining with private sector	1	16.5%
Japanese government & private sector to Thai government & private sector	4	67 %
Private sector to private sector	1	16.5%

18. Will Thai mold and die industry face the shortage of skillful manpower in the near future?

Answer	Number	Percentage
Yes	6	100%
No	0	0%
Not sure	0	0%
Total	**6**	**100%**

Note: All manager or 100% comment that Thai mold and Die industry will face the shortage of skill man power in near future

The fields of shortage	Number					
	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6
3D CAD design	2	2				2
CAE analysis for mold design	4			2		
High speed machine programmer		1	1	2		2
CMM for quality control		1	2		3	
Assembling of high precision mold and die	1	1	3		1	
Maintenance and repair complicated mold and die		1		1	2	2

Comment : - CAE analysis for mold design is rank no.1 in shortage of manpower. This is advanced technology
- 3D CAD design is also will face the high shortage

Result of Questionnaire for Ex-Trainees of BSID's "SIC-Tool and Mold Technology Development Project"

A. Impact of the SIC Project

1. How much can you reduce your finishing work time after receiving training by SIC Project?

Answer	Number	Percentage
85-100%	0	0%
70-84%	5	23%
50-69%	5	23%
Less than 50%	6	27%
Not sure	5	23%
No Answer	1	5%
Total	**22**	**100%**

2. How much can you produce more precise mold after receiving training by SIC Project?

Answer	Number	Percentage
Much more precise	8	36%
Fair	8	36%
No improvement	4	18%
Not sure	1	5%
No Answer	1	5%
Total	**22**	**100%**

3. How often can you deliver your work after receiving training by SIC Project?

Answer	Number	Percentage
Always on time	0	0%
Often on time	12	55%
No change	7	32%
Not sure	2	9%
No Answer	1	5%
Total	**22**	**100%**

4. How much can you help your company reducing the cost of mold production comparing to the past?

Answer	Number	Percentage
Very much	6	27%
Fair	5	23%
Not reduce	5	23%
Not sure	3	14%
No Answer	3	14%
Total	**22**	**100%**

5. How much can you help your company producing better quality mold or die comparing to the past?

Answer	Number	Percentage
Very much	6	27%
Fair	7	32%
Not better	3	14%
Not sure	1	5%
No Answer	5	23%
Total	**22**	**100%**

6. How much can you help your company reducing the testing and trial time for a new mold comparing to the past?

Answer	Number	Percentage
Very much	2	9%
Fair	9	41%
Not reduce	3	14%
Not sure	3	14%
No Answer	5	23%
Total	**22**	**100%**

7. How much confidence do you have in helping company increasing competitiveness?

Answer	Number	Percentage
Very much	8	36%
Confidence	8	36%
No confidence	1	5%
Not sure	3	14%
No Answer	2	9%
Total	**22**	**100%**

B. Sustainability of SIC Project

8. Do you want to receive more training from BSID?

Answer	Number	Percentage
Yes	16	73%
No	4	21%
Not sure	0	0%
No Answer	2	9
Total	**22**	**100%**

8.1 If yes: what subject/s do you want to learn? (multiple answer)

Subject	Number of total respondents	Percentage of total respondents
CAD design	9	56%
CAE for mold design	6	38%
CNC Machining	9	56%
CMM for quality control	1	5%
Complicated mold and die assembling	3	19%
Complicated mold and die maintenance and repair	5	31%

9. What is the condition of BSID training documents?

Answer	Number	Percentage
Updated	7	32%
Need improvement	10	45%
Not sure	3	14%
No Answer	2	9%
Total	**22**	**100%**

10. What is the condition of BSID training's machines and equipment?

Answer	Number	Percentage
Good for training	13	59%
Need improvement	5	23%
Not sure	3	14%
No Answer	1	5%
Total	**22**	**100%**

11. How often do you transfer your knowledge and skills received from SIC Project to your colleagues?

Answer	Number	Percentage
Very often	7	32%
Sometimes	12	55%
Not at all	1	5%
Not sure	1	5%
No Answer	1	5%
Total	**22**	**100%**

12. What kind of information do you want to receive from BSID? (multiple answer)

Information	Number of total respondents	Percentage of total respondents
Training schedule	12	55%
Seminar schedule	5	23%
Update of software technology	9	41%
Update of machines/equipment	11	50%

Comment: Problem solving skills for mold and die manufacturing are also needed.

13. Does BSID need outsourced trainers for rendering training in mold and die courses?

Answer	Number	Percentage
As a must	9	41%
Preferable	9	41%
Not necessary	2	9%
Not sure	2	9%
Total	**22**	**100%**

14. What did you think about the following BSID training aspects?

14.1 BSID trainers:

Answer	Number	Percentage
Appropriate	18	82%
Should improve	4	18%
Total	**22**	**100%**

14.2 Teaching materials:

Answer	Number	Percentage
Appropriate	18	82%
Should improve	4	18%
Total	**22**	**100%**

14.3 Machine/equipment:

Answer	Number	Percentage
Appropriate	16	73%
Should improve	6	27%
Total	**22**	**100%**

14.4 Classroom condition:

Answer	Number	Percentage
Appropriate	17	77%
Should improve	4	18%
No Answer	1	5%
Total	**22**	**100%**

14.5 Number of trainees per class:

Answer	Number	Percentage
Appropriate	14	64%
Too long	3	14%
Too Short	3	14%
No Answer	2	9%
Total	**22**	**100%**

14.6 Training period:

Answer	Number	Percentage
Appropriate	14	64%
Too long	5	23%
Too short	3	14%
Total	**22**	**100%**

14.7 Training information:

Answer	Number	Percentage
Appropriate	14	64%
Should improve	8	36%
Total	**22**	**100%**

14.8 Training registration:

Answer	Number	Percentage
Appropriate	20	91%
Should improve	2	9%
Total	**22**	**100%**

14.9 Skill training period:

Answer	Number	Percentage
Appropriate	12	55%
Too long	2	9%
Too short	8	36%
Total	**22**	**100%**

C. SIC Project

15. Will Thai mold and die industry face the shortage of skillful manpower in the near future?

Answer	Number	Percentage
Yes	18	82%
No	3	14%
Not sure	1	5%
Total	**22**	**100%**

15.1 If yes, could you rank the 6 fields of the shortage manpower in the near future?

Manpower shortage field	Number of Total Respondents						
	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	No Specification of Rank
3D CAD design	3	2	3	0	0	1	3
CAE analysis for mold design	5	3	1	0	0	1	5
High speed machine programmer	0	2	2	4	0	1	1
CMM for quality control	1	0	2	3	2	1	0
Assembling of high precision mold and die	1	2	0	1	5	2	4
Maintenance and repair complicated mold and die	0	0	1	1	2	6	3

16. Do you want career path development for mold and die technical persons created by Thai Mold and Die Industry Association?

Answer	Number	Percentage
Yes	20	91%
No	2	9%
Not sure	0	0%
Total	**22**	**100%**

16.1 If yes: are you willing to test your knowledge and skills for certification?

Answer	Number	Percentage
Yes	16	73%
No	1	5%
No Answer	5	23%
Total	**22**	**100%**

17. Do you think that at present, mold and die training providers are enough?

Answer	Number	Percentage
Enough	2	9%
Not enough	17	77%
Not sure	2	9%
No Answer	1	5%
Total	**22**	**100%**

18. How many days in a week can you leave your job for receiving training for your career path development?

Answer	Number	Percentage
3 days/week	11	50%
2 days/week	5	23%
1 days/week	4	19%
No Answer	2	9%
Total	**22**	**100%**

Attachment 4

Mold and Die Industrial Development Project (MDIDP)

Mold and Die Industrial Development Project (MDIDP)

1. Background

In April 2004, BSID proposed Ministry of Industry (MOI) to launch the Mold and Die Industrial Development Project (MDIDP). On May 10, 2004, MOI submitted MDIDP for Thai cabinet to endorse 1.63 billion baht budget support. The government approved the MDIDP proposal on August 10, 2004, with comments as follows:

- The cabinet agreed in principal to develop Mold and Die industry as MOI proposed.
- Addition budget of 60 million baht for year 2004 was approved for further implementation of the project from 2005-2009. Budget Bureaus could allocate the appropriate budget amount according to the situation and evaluation results of the project
- MOI and Board of Investment (BOI) should work with Ministry of Finance, and other agencies both government and private sector.

MOI has set up a committee to steer MDIDP and ask for Thai German Institute to implement the project under the committee guidance.

2. Project objectives

- To strengthen quality and precision of mode and die industry to be a solid foundation in supporting Thailand strategic industries which are automotive industry and electricity and electronics industry.
- To reduce mold and die import volume, but increase their export volume.
- To make Thai mold and die industry have high competitiveness in the international market
- To have high skilled personnel in mold and die to develop Thailand as a center of investment for production industries.

3. Project output (expected)

- 7,450 skilled technical personnel in mold and die and 250 well-trained supervisors and trainers (7700 personnel in total)
- 20 technical colleges having high ability in teaching mold and die technology
- 5 centers of mold and die technology for conducting research and development in specific practical technology; consulting service, transferring technology and preparing technical manual for industry
- 50 new technology created by above mentioned centers
- 3,750 man-day consulting service
- 45 technology transfer agreements with private sector
- 75 technical manuals for mold and die industry
- 250 established new entrepreneurs and investors in Mold and Die industry

4. Project strategies

There are 4 strategies in implementation of MDIDP.

Strategy 1: Development of personnel and educational institutions

Strategy 2: Mold and die technology development starting from establishing 5 centers of mold and die technology

Strategy 3: Cluster industrial development to cover investment and marketing in mold and die technology

Strategy 4: IT development for mold and die industry to acquire complete and updated information for analysis and development of local mold and die industry

5. Project Budget

The government of Thailand has allocated the budget of 1.69 billion baht for six 6-year implementation of MDIDP as seen in table.

<Budget approved for MDIDP and major activities>

MDIDP Activity	Unit	Year						
		2004	2005	2006	2007	2008	2009	Total
1. Technical Human Resource Development								
1.1 Technician Development	Person	605	1,180	1,300	1,465	1,550	1,600	7,700
	Budget (Million Baht)	60	120	129	149	148	156	762
1.2 Technical College Development	Institute		20	20	20	20	20	20
	Budget (Million Baht)		34	44	50	44	34	206
2. Establishment of Excellence Center for R&D and Transfer Technology	Center	-	5	5	5	5	5	5
	Budget (Million Baht)	-	62	102	102	104	104	474
3. Investment Promotion and Marketing Promotion	Company		50	50	50	50	50	250
	Budget (Million Baht)		34	50	55	55	55	248
Total	Budget (Million Baht)	60	250	325	356	351	349	1690

Source: MDIDP

6. Project impact (Expected)

- To decreasing mold and die import to 7,000 million baht/year stating from 2010
- To increasing mold and die export to 9,000 million baht/year starting from 2010
- To create 2,772 million baht/year by the trained personnel

7. Summary of Project output to 2007

Activity	Unit	Year			
		2005	2006	2007	Total
Training for skill technician	Person	1,614	484	1,190	3,288
Training for Trainers	Person	96	38	71	205
Established specialized Center	Center	7	Continuously support		7
New technology creation	Subject	18	19	10	47
Consulting service	Man-day	705	375	423	1,503
Technology transfer	Subject	8	13	16	41
Technical Manual	Subject	10	3	4	17
Establishment of new entrepreneur	Company	18	Continuously support		18
Technical colleges development	College	20	Continuously support		20

(as of 30 September 2007)

Attachment 5

Current Situation of Counterpart Personnel

Current Situation of Counterpart Personnel

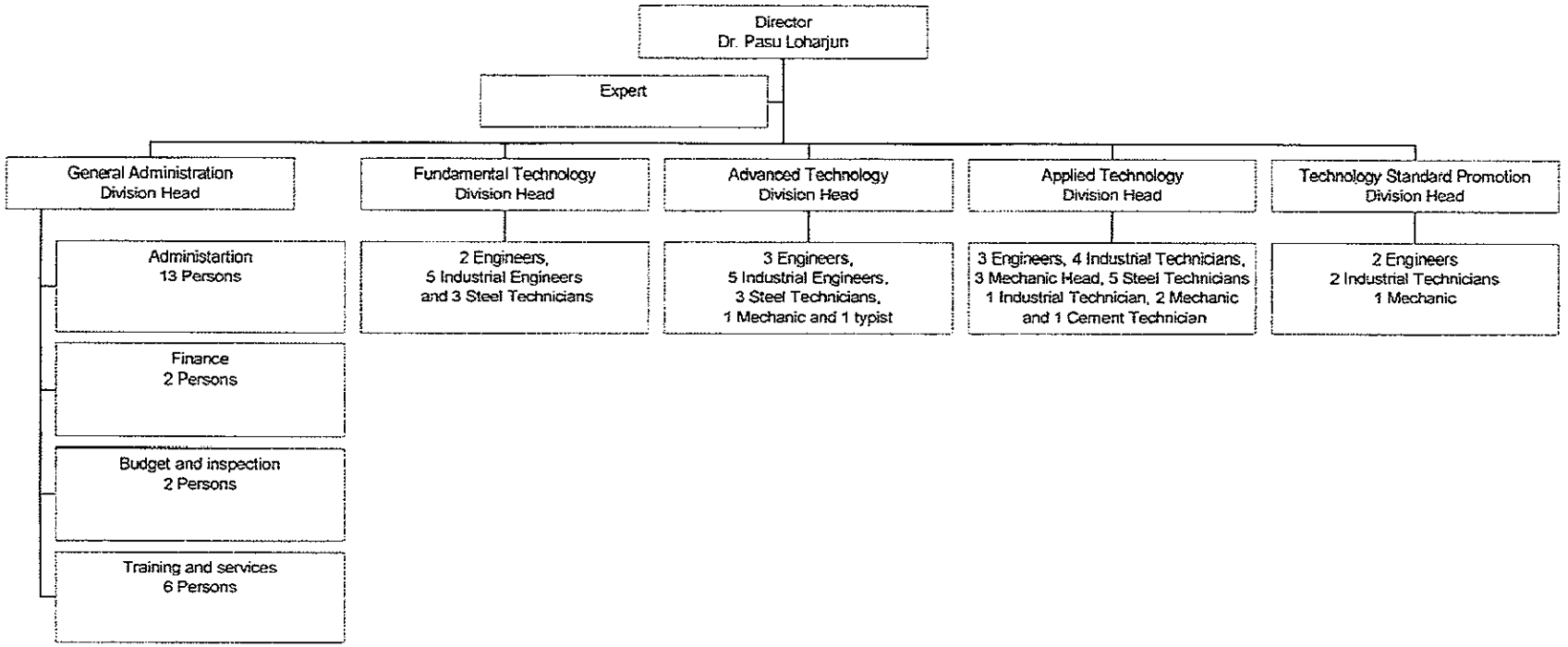
Name of C/P	Responsibility Period	Present Responsibility (as of Dec 2007)
1. Administrative C/P		
1.1 Project Director		
Dr. Damri Sukhotanong	10/99-10/00	- Deputy Permanent secretary of Ministry of Industry (MOI) - Chairman of MDIDP committee
Mr. Thamnu Vasinonta	10/00-10/02	Retired
Mrs. Sumonman Kalayasiri	10/02-10/03	Retired
Mr. Supat Limpaporn	10/03-7/04	Retired
1.2 Deputy Project Director		
Mr. Satit Sirirangkamanont (Surname was changed to Chalchankul)	10/99-10/00	General Secretary of the Office of the Board of Investment, MOI
Mr. Pramode Vidtayasuk	10/00-10/01	General Director of Department of Industrial Promotion, MOI
Mr. Virat Tandaechanuat	10/01-10/03	Resigned from BSID (Director of Textile Institute)
Mr. Prapat Vanapataksa	10/03-10/04	General Inspector, MOI
1.3 Project Manager		
Mr. Nuntapit Nakasarn	11/99-09/00	Retired
Mr. Prapat Vanapataksa	11/00-12/03	General Inspector, MOI
Mr. Sirichai Pothitapana	11/01-10/03	Retired
Mr. Saneh Niyomthai	10/03-10/04	Director General of Natural Resources Department, MOI
1.4 Project Coordinator		
Dr. Pasu Loharjun	11/99-10/04	Director of BSID
Mr. Kittipat Panitaporn	11/99-10/04	Director of Industrial Sciences
Mr. Panuwat Triyangkulsri	11/99-10/04	Head of Division of Promotion of Technology Standard for Supporting Industry
Mr. Prakob Janma	10/03-10/04	Head of Energy and Environmental Division
1.5 Technical Coordinator		
Mr. Paiboon Tekapan	11/99-10/03	Advanced Technology Division, BSID
Mr. Prakob Janma	11/99-10/03	Advanced Technology Division, BSID
Mr. Worapong Chinchoksakulchai	10/03-10/04	Applied Technology Division, BSID
Mr. Satta Denpradith	10/03	Advanced Technology Division, BSID
Mr. Sahas Chumsoongnoen	10/03	Technical College, Surin Province

Name of C/P	Responsibility Period	Present Responsibility (as of Dec 2007)
2. Technical C/P		
2.1 Mold Design		
Mr. Sompong Teeracanont	3D Mold Designer, 10/99-10/04	Fundamental Technology Division, BSID
Mr. Chanon Suktayu	3D Mold Designer, 10/99-10/04	Advanced Technology Division, BSID
Mr. Chairat Keawdoung	3D Mold Designer, 10/99-10/04	Technology Standard Promotion Division, BSID
Mr. Paiboon Tekapan	CAD/CAM Operator, 10/99-10/04	Advanced Technology Division, BSID
Mr. Worapong Chinchoksakulchai	CAD/CAM Operator, 10/99-10/04	Applied Technology Division, BSID
Mr. Paisan Lhokaew	CAD/CAM Operator, 10/99-10/04	Industrial Innovation Section
2.2 Mold Processing		
Mr. Satta Denpradith	10/99-10/04	Advanced Technology Division, BSID
Mr. Bantao Wongprachanukul	10/99-10/04	Advanced Technology Division, BSID
Mr. Damlong Kratumkhetr	10/99-10/04	Advanced Technology Division, BSID
Mr. Sirisak Ritngam	10/99-10/04	Advanced Technology Division, BSID
2.3 Assembling and Trail Shot		
Mr. Prakob Janma	10/99-10/04	Energy and Environmental Division
Mr. Sahas Chumsoongnoen	10/99-10/04	Retired
Mr. Preecha Jamtath	10/99-10/04	Advanced Technology Division, BSID
Mr. Tikumporn Chinnarong	10/99-10/04	Fundamental Technology Division, BSID
Mr. Pornsak Vonggrasametoeng	10/99-10/04	Applied Technology Division, BSID
Mr. Virit Viseshsindh	10/99-10/04	Applied Technology Division, BSID
Mr. Piboon Chaengsanon	10/99-10/04	Transferred to Chonburi
Mr. Taweesit Buamee	10/99-10/04	Advanced Technology Division, BSID
2.4 Networking		
Mr. Kijja Chongkwanyaen	10/99-04/00	Resigned
Mr. Worapong Chinchoksakulchai	04/00-04/04	Resigned
2.5 Factory Relation		
Mr. Umnart Teerapongpipat	06/00-09/03	DIP
Mr. Chanchai Ungpinitpong	09/03-10/04	Resigned

Attachment 6

BSID Organization Chart

BSID Organization Chart



Source: BSID

Attachment 7

Summary of output and expense of BSID Program 2004-7

Summary of output and expense of BSID program 2004 - 2007

	Activity/Program	Code	2004		2005		2006		2007	
		output	output	Expense	output	Expense	output	Expense	output	Expense
	(A) Advisory service Program for SMEs	1.1	842	31,872,749.14	1,015	30,445,491.65	291	9,569,209.69	399	20,772,435.97
	(1) Supporting industry (Counter part Fund)									
1	Promotion and development of production efficiency for metal and machinery industry		313	4,149,621.34	169	3,654,395.92	40	2,483,248.65	33	1,701,785.91
2	Air-condition Technology Transfer center				61	2,156,847.44	30	2,010,470.98		
3	Consultancy Fee for Airconditon industry and metal and machinary industry								40	3,445,777.67
4	(2) Packaging (SMEs)		205	10,056,878.49	479	8,155,112.23	206	3,078,351.09	207	5,408,828.47
5	(3) Logistics and Supply chain management Promotion		40	4,963,687.90	45	5,628,073.98	15	1,497,225.34	15	1,497,082.80
6	(4) Packaging Product and Photo type promotion								104	5,317,961.12
7	(5) Model Study									2,400,000.00
8	(5) Industrial cluster		129	6,175,214.43	114	5,018,270.42		499,913.63		
9	(7) Study for the potential to apply solar energy for production of air condition system									
10	(8) Development for mental and machinary industry in Thai border				60	2,402,651.87				
11	(9) SIC-Tool Project		53	886,578.62	27	475,678.29				
12	(10) Competitive development for Plastic Industry				60	2,954,461.50				
13	(11) Technology center for Industry		32	845,164.20						
14	(12) Injection Technology and engineering plastic testing development		29	393,602.35						
15	(13) Foundry Industrial development to international standard by ISO		20	999,684.80						
16	(14) Quality and efficiency development for mold and die industry		20	3,392,217.00						
	(B) Human Rasource Development for SMEs	1.2	2,131	7,172,121.36	682	12,186,641.23	1,115	3,479,189.10	2,254	57,445,675.25
	(1) Shot/Long term training for supporting industry									
17	Electronics and refrigeration industry development								164	710,000.00
18	Metal and machinary industrial human resource development								1,100	2,658,949.11
19	(2) Aircondition and refrigeration industry development		163	2,827,689.96	100	522,000.00	358	1,164,987.92	435	3,199,795.24
20	(3) Pre-employment development to industry								224	9,923,101.38
21	(4) Human resource Development (HRD) for Logistics								111	3,001,232.16
22	(5) HRD for product and packaging development								100	3,001,386.60
23	(6) Innovation for Thai Automotive								120	34,951,210.76
24	(7) SIC - Tool Project		280	338,481.02	240	731,332.49				
25	(8) Technology transfer for efficiency improvement to international market		489	465,671.26	262	460,744.03	757	2,314,201.18		
26	(9) Competitive development for plastic industry				80	543,237.11				
27	(10) Technology Center for Industry		258	390,000.00		9,929,327.60				
28	(11) Industrial cluster		296	200,000.00						
29	(12) Quality Production management Promotion for SMEs in Supporting industry		111	591,295.89						
30	(13) CAD for SMEs		152	734,788.33						
31	(14) Injection Technology and engineering plastic testing development		135	81,142.30						
32	(15) Factory teaches Factory		80	526,939.80						

	Activity/Program	Code	2004		2005		2006		2007	
		output	output	Expense	output	Expense	output	Expense	output	Expense
33	(16) Packaging development		134	475,212.80						
34	(17) Logistics and supply chain management promotion		53	559,900.00						
	(C) Establishment & New entrepreneur	2.1	-	-	-	-	300	5,049,962.80	263	4,249,968.98
35	(1) Advisory for New entrepreneur						300	5,049,962.80	263	4,249,968.98
	(D) Advisory for Community industry	3.1	394	9,128,370.25	547	9,273,135.31	392	9,525,763.94	392	6,702,168.67
36	(1) Packaging development		394	9,128,370.25	547	9,273,135.31	392	9,525,763.94	392	6,702,168.67
	(E) Training for Community industry	3.2	1,531	2,104,991.95	1,082	1,529,625.50	-	-	-	-
37	(1) Packaging development		1,531	2,104,991.95	1,082	1,529,625.50				
	(F) Industrial information Service Program	4	2,819	7,024,895.54	651	1,462,958.00	1,935	1,999,598.00	720	369,873.36
38	(1) Industrial information Service		234	156,577.00					569	219,950.00
39	(2) Mobile Unit BOC								151	149,923.36
40	(3) Logistics and supply chain management		1,696	1,993,025.74			1,935	1,999,598.00		
41	(4) Industrial cluster		789	752,824.94	151	512,958.00				
42	(5) Competitive development for plastic industry				500	950,000.00				
43	(6) Supporting World Mold & die Association		100	550,267.86						
44	(7) Packaging			3,552,200.00						
	Total other expense		7,817	57,303,128.24	3,987	54,897,851.69	4,033	29,623,723.53	4,028	89,540,122.23
	(G) Supporting Non Profit institutes under MOI									
45	(1) Training for Automotive personnel industry	1.2					100	35,000,000.00	75	23,750,000.00
46	(2) R & D for information system for SMEs	1.1								8,000,000.00
	Total for Non profit institutes		-	-	-	-	100	35,000,000.00	75	31,750,000.00
	Total		7,817	57,303,128.24	3,987	54,897,851.69	4,133	64,623,723.53	4,103	121,290,122.23
	Advisory Program	1.1	842	31,872,749.14	1,015	30,445,491.65	291	9,569,209.69	399	26,772,435.97
	Training Program	1.2	2,131	7,172,121.36	682	12,186,841.23	1,215	38,479,189.10	2,329	81,195,675.25
	New entrepreneur	2.1	-	-	-	-	300	5,049,962.80	263	4,249,968.98
	Advisory for Community industry	3.1	394	9,128,370.25	547	9,273,135.31	392	9,525,763.94	392	6,702,168.67
	Training for Community industry	3.2	1,531	2,104,991.95	1,082	1,529,625.50	-	-	-	-
	Non Profit institutes	4	2,819	7,024,895.54	661	1,462,958.00	1,935	1,999,598.00	720	369,873.36
	Total		7,817	57,303,128.24	3,987	54,897,851.69	4,133	64,623,723.53	4,103	121,290,122.23

Note : Expense in Thai Baht

output for Advisory Program is the number of companies

output for Training Program is the number of persons

Attachment 8

List of Machinery and Equipment

List of Machinery and Equipment Provided by Japanese Side

No.	Equipment Name	Manufacturer/Model	Unit	Usage frequency	Maintenance condition	Delivery time
1	Photocopy Machine	Xerox MF 400CP	1	A	A	Feb, 00
2	FAX	Brother MFC-6650MC	1	A	A	Feb, 00
3	CAD/CAM Network station (Software)	IK Tool International	1	C	A	Mar, 00
	(1) CADCEUS Software					
	(2) CAD/CAM Application					
4	CAD/CAM Network station (Hardware)		1	B	A	Mar, 00
	(1) PC for 3D	COMPAQ SP750 SERIES				
	(2) PC for 2D	COMPAQ A2750 SERIES				
	(3) Server	COMPAQ PROLIANT 800 SERIES				
	(4) Printer	FUJITSU 20W				
	(5) Plotter	HP C4716A/HP Design Jet 450				
	(6) Others					
5	Test Mold Set	IK Tool International	1	C	A	Mar, 00
6	Machining Center	MAKINO V-55	1	B	A	Mar, 00
7	Tool presetter and Tools	VDM-3040-3	1	C	A	Mar, 00
	(1) Tool presetter					
	(2) Optional Accessories					
	(3) Tool & Holder					
	(4) Tool & Jigs					
8	EDM	Sodick AQ600+MARK30+AVT	1	C	A	Mar, 00
9	W-EDM	Sodick AN55L+LN1+ATC	1	B	A	Mar, 00
10	Small Hole Drilling Machine	Sodick KIC	1	B	A	Mar, 00
11	Surface Grinder	KURODA GS-515PFL	1	C	A	Mar, 00
12	Injection Machine	Nissei Plastic FN7000	1	C	A	Mar, 00
13	Waterless Cooler	MATSUI MCN-60H	1	C	A	Mar, 00
14	Mold Temperature Controller	KANNETU WL-15	1	C	A	Mar, 00
15	Welding Machine and others	Yozo Welding Machine Type Series4	1	C	A	Mar, 00
16	White Board (1) Large	Panasonic KX-B630G Copyboard	2	B	A	Mar, 00
17	White Board (2) Small	Panasonic KX-B530G Copyboard	2	B	A	Mar, 00
18	TV	JVC AV-S33MS6	1	C	A	Mar, 00
19	VTR	Sony SLV-GF99K Hi-Fi	1	C	A	Mar, 00
20	Projector	3M 2770	1	B	A	Mar, 00
21	LCD Projector	Epson LCD Projector EMP-7250	1	B	A	Mar, 00
22	Screen for Projector	Sopar Tripod Screen 70"x70"	1	B	A	Mar, 00
23	Printer	Epson Color 880	1	A	A	Oct, 00
24	Tool Wagon with Vice	Harn & Kolb	2	A	A	Dec, 01
25	Air Blow for MAKINO V-55	For 55 SNR 825	1	B	A	Dec, 01
26	Holder Set for Sodick AM 55L	EROWA EJ	1	C	A	Dec, 01
27	Caliper	MITSUTOYO 500-154	5	C	A	Dec, 01
28	Caliper	MITSUTOYO 500-156	5	C	A	Dec, 01
29	Caliper	MITSUTOYO 530-122	2	C	A	Dec, 01
30	Caliper	MITSUTOYO 530-124	2	C	A	Dec, 01
31	Caliper	MITSUTOYO 500-10	2	C	A	Dec, 01
32	Depth Gauge	MITSUTOYO 571-201-10	3	C	A	Dec, 01
33	Depth Gauge	MITSUTOYO 7221	2	C	A	Dec, 01
34	Depth Gauge	MITSUTOYO 7213	2	C	A	Dec, 01
35	Depth Gauge	MITSUTOYO 7210	2	C	A	Dec, 01
36	Depth Gauge	MITSUTOYO 7223	2	C	A	Dec, 01
37	Dial Tester	MITSUTOYO 523-426-E	3	C	A	Dec, 01
38	Floating Holder for Sodick AM 55L	EROWA EJ-1403	1	C	A	Feb, 02
39	Magnet Block Base	PFSPL-L105*W45*H45*	4	B	A	Mar, 02
40	Handy Forklift	Hyduric SK-500/1.6M	1	A	A	Apr, 02
41	Milling Machine	Shizipla	2	B	A	Jul, 02
42	Printer	Canon MPC 400	1	A	A	Jun, 03
43	Injection Molding Machine	JSW	1	C	A	Nov, 03
44	Stereo Zoom Microscopes W/Stand	Gessweinsiam	1	C	A	Apr, 04

Usage Frequency: A=use daily, B=use often (1-3 times/week), C=use only specific period,
D=use rarely (3-11 time/year), E=not useable with specific reason

Maintenance condition: A=maintained well, B=maintained good, C=need maintenance to use, D=not useable condition

List of Machinery and Equipment Provided by Thai Side

No.	Equipment Name	Manufacturer/Model	Unit	Usage frequency	Maintenance condition	Obtained year
1	Working Desk and Chair	Desk/PSP (0011384) Chair/GL35A1(000112214)	15 set	B	B	2000
2	Desk for printer	PSP VCD 1202 (00113835)	1	B	B	2000
3	Desk for Server		1	B	B	2000
4	Vertical Milling Machine	Makino/BVII J-70	1	C	B	1987
5	Surface Grinder	Okamoto/PSS	1	C	B	1987
6	Tool Grinder	Ito/DP-250 No.1322	1	C	B	1987
7	Grinder (Floor)	Showa/5EA-516	1	B	B	1987
8	Band Saw (Hack saw)	Economy/PSB 280 U	1	B	B	1987
9	Lathe (High Speed)	Daimichi/DLG-SH	1	B	B	1987
10	Cutting Grinder	Bosch/GWS 6-100	1	C	C	1987
11	11.1 Working Desk 11.2 Surface Plate	Size 900 x 1800x 750 mm. Size 1200 x 2400 x 320 mm.	1 1	C C	A A	1987 1987
12	Middle Size Injection Machine	Japan Steel Works (JSW) J150EII-P (150Ton)	1	C	C	NEDO 1997 1998
13	Small Size Injection Machine	Sodick/TR 80 S2 (80 Tons)	1	C	B	NEDO 1997
14	Flexible Mold Temperature Controller	Kanetsu/TM-05A = 2 set TM-03A = 1 Set	3	C	B	NEDO 1998
15	Temperature Controller	Matsui/MCN 30H = 1 set MCN-135/31AX = 1 set				NEDO 1997
16	Plastic Material Drier	Matsu/PO-120	1	C	B	NEDO 1998
17	Three Coordinate Measuring Machine	Mitutoyo FJ-805/No.871153	1	E	D	Dec, 1987
18	Steel Hardness Tester 1. Rockwell Hardness Tester 2. Brinell Hardness Tester 3. Vickers Hardness Tester 4. Shor Hardness Tester	 Shimasu/Type HR No. 8222 Shimasu/Type HR No. 8536 Matsuzawa Seiki Co., Ltd./ SER No. V5964 Shimadzu Seisakusho Ltd. SER No. 17424	 1 1 1 1	 E B B B	 D B B B	 Aug, 1986 Aug, 1986 Oct, 1986 Oct, 1986
19	Tool Makers Microscope 1. Microscope and IT's Accessories 2. Microscope and IT's Accessories 3. Microscope and IT's Accessories 4. Measuring Microscope and IT's Accessories	 Ver samet-2 No. 7611 Olympus No. 7611 Olympus No. 7612 Nikon No. 12172	 1 1 1 1	 C E B B	 B D B B	 Oct, 1986 Oct, 1986 Oct, 1986 Dec, 1987
20	Gauge Unit 1. Block Gauges and IT's Accessories 2. Block Gauges and IT's Accessories 3. Block Gauges and IT's Accessories 4. Block Gauges and IT's Accessories 5. Optical Gauges and IT's Accessories 6. Optical Gauges and IT's Accessories 7. Optical Gauges and IT's Accessories 8. Cylinder Gauges and IT's Accessories 9. Cylinder Gauges and IT's Accessories 10. Cylinder Gauges and IT's Accessories 11. Cylinder Gauges and IT's Accessories 12. Cylinder Gauges and IT's Accessories	 Mitutoyo/No. 114358 Mitutoyo/No. 209541 Mitutoyo/No.143584 Mitutoyo/No. 200103 Nikon No. 3443 Nikon No. 4839 Nikon No. 10548 No. 740791 No. 511-172 No. 511-173 No. 511-174 No. 511-175	1 set	 C C C C C C C C C C C C	 B B B B B B B B B B B B	 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987 Dec, 1987

Usage Frequency: A=use daily, B=use often (1-3 times/week), C=use only specific period, D=use rarely (3-11 time/year), E=not useable with specific reason

Maintenance condition: A=maintained well, B=maintained good, C=need maintenance to use, D=not useable condition

Attachment 9

Project Design Matrix (PDM)

Annex 10 Project Design Matrix (PDM)

Project Name: SIC-Tool and Mold Technology Development Project in the Kingdom of Thailand
Duration: November 1, 1999 - October 31, 2004
Thai Side Implementing Agency: Bureau of Supporting Industries Development (BSID), Department of Industrial Promotion, Ministry of Industry
Japanese Side Implementing Agency: Japan International Cooperation Agency (JICA)
Target Group: Thai Plastic Tool and Mold Industries

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumption
(Overall Goal) Thai plastic tool and mold industries will become internationally competitive to provide assembly industries in Thailand with high quality tools and molds.	1 The plastic tool and mold industries benefited from BSID services improve the quality of their products. 2 The above industries improve their productivity and efficiency through BSID services. 3 The number of products of the above industries delivered to assembly industries increases.	1 Survey report of respective institutes, questionnaire to and interview with industries concerned 2 Survey report of respective institutes, questionnaire to and interview with industries concerned 3 Survey report of respective institutes, questionnaire to and interview with industries concerned	a There is no drastic change in political and economic situation in the Kingdom of Thailand. b Supporting industries development policy continues to be stable. c Demand form assembly industries for plastic tool and mold industry continues to be stable.
(Project Purpose) Technical capability of BSID will be upgraded to extend appropriate technical services to the Thai plastic tool and mold industries.	1 The plastic tool and mold industries show the high level of satisfaction on the technical services of BSID. 2 The number of technical services, clients increases and there are repeater clients.	1 Questionnaire to and interview with related industries 2 Records of Technical Trainings, Seminars, Technical Information / Advisory Services and Prototyping Services	a Thai plastic tool and mold industries utilize the technology obtained from BSID. b Linkage between assembly industry and plastic tool and mold industry is established.
(Outputs) 0 The Project operation unit will be enhanced.	0-1 C/Ps are allocated as planned. 0-2 Budet is adequately allocated to the local cost of the Project. 0-3 Committees and the Project management meetings are held periodically. 0-4 The number of publicity of the Project increases.	0-1 Organization Chart, Allocation of C/Ps and Staffs for the Project 0-2 Budget Allocation for the Project 0-3 Number of Committees and Meetings 0-4 Number of Publicity	a Trained C/Ps remain at BSID. b The private sector of Thai plastic tool and mold industries is cooperative to the Project.
1 Necessary machinery and equipment will be provided, installed, operated and maintained properly.	1-1 The type and quantity of machinery and equipment provided are appropriate. 1-2 Provided machinery and equipment are inspected and operated appropriately. 1-3 Spare parts are appropriately procured through local supplier.	1-1 List of Machinery and Equipment, Maintenance Record of Machinery and Equipment 1-2 Maintenance Record of Machinery and Equipment 1-3 List of Spare Parts and Local Suppliers	
2 Technical capability of the counterpart personnel (hereinafter referred to as "C/P") will be upgraded in the fields of mold design, mold processing, mold assembling and trial shot.	2-1 Each C/P improves his knowledge and skill of respective technology-transfer items. 2-2 The number of achieved target products increases. 2-3 Original manuals, textbooks and training materials are developed.	2-1 Evaluation Sheet (Assessment of Technical Capability by Japanese Experts) 2-2 Progress Record of Completed Target Products 2-3 List of Manuals, Textbooks and Materials Developed by C/Ps	
3 Seminars and training courses in the said fields will be implemented systematically.	3-1 The number of implemented seminars, training courses and its participants increases.	3-1 Record of Technical Trainings and Seminars	
4 Technical information and advisory services in the said fields will be implemented systematically.	4-1 The number of implemented advisory services increases. 4-2 Related technical data including client information is accumulated. 4-3 The quantity and quality of technical information and advisory services satisfy the clients' needs.	4-1 Record of Advisory Services 4-2 Record of Technical Information, Survey Report 4-3 Questionnaire to and interview with related industries	
5 Trial prototyping services will be implemented systematically.	5-1 The number of implemented trial prototyping services increases. 5-2 The quality of trial prototyping services satisfies the clients' needs.	5-1 Record of Prototyping Services 5-2 Questionnaire to and interview with related industries	

(Activities)	Inputs		
	The Thai side	The Japanese side	a C/P remain at BSID b Machinery and equipment provided will pass customs smoothly.
0-1 Allocate necessary personnel as planed. 0-2 Formulate plans of activities. 0-3 Make budget plan and execute properly. 0-4 Establish and operate management system. 1-1 Make facility refurbishment plan and implement as planned. 1-2 Provide and install necessary machinery and equipment. 1-3 Operate and maintain the machinery and equipment properly. 2-1 Make Technical Cooperation Program. 2-2 Implement technology transfer to the C/P. 2-3 Monitor and evaluate the result of technology transfer to the C/P. 3-1 Make plan of technical training and semi 3-2 Implement technical training and seminar 3-3 Monitor and evaluate technical training and seminars. 4-1 Make plan of trial technical information and advisory services. 4-2 Collect and compile technical information and material. 4-3 Implement trial technical information and advisory services. 4-4 Monitor and evaluate trial technical information and advisory services. 5-1 Make plan of trial prototyping services. 5-2 Implement trial prototyping service. 5-3 Monitor and evaluate trial prototyping service.	1 Provision and Maintenance of Building and Facilities 2 Allocation of C/P and Administrative personnel (1) Administrative C/P 4 (2) Technical C/P 14 at the commencement (3) Administrative Staff Necessary number (4) Supporting Staff a Secretary 2 b Driver 1 c Other necessary staff upon request by the Japanese experts 3 Provision of Machinery & Equipment and their Maintenance 4 Local Cost Necessary budget for the implementation of the Project	1 Dispatch of Japanese Experts (1) Long-term Experts a Chief advisor b Coordinator c Plastic Tool and mold (2) Short-term Experts Appropriate number of short-term experts will be dispatched as necessity arises. 2 Thai C/P Training in Japan A certain number (about 2 persons) of the C/P yearly 3 Provision of Machinery and Equipment 4 Supporting Local Cost	(Preconditions) a Construction of SIC building completed as scheduled.

Attachment 10

Third Party Review by External Expert

Third Party Review by External Experts

Ex-Post Evaluation on
SIC-Tool and Mold Technology Development Project in the Kingdom of Thailand

1 Evaluation Framework

B	(1) Time Frame of Evaluation Study	
Viewpoint	Necessary field survey activities such as data collection and discussion with counterparts are appropriately set within the time frame of the evaluation study. Time frame also contains preparations such as distribution of questionnaires, and is appropriate in terms of timing, length and schedule of the evaluation study.	
B	(2) Study Team	
Viewpoint	Team members are assigned on a impartial basis, and are with balanced specialty.	
Comment	The initial plan seems to be set up appropriately, starting from the make of the evaluation grid, the initial interviews, the supplementary research, through the preparation of the report. Based on the analysis results shown, there are reasons leading to the belief that some supplementary work were done. Moreover, the structure and competency of the study team fit well with the objectives and scopes of the project. Therefore, the evaluation results in these criterions are given as good.	

2 Date Collection and Analysis

B	(1) Evaluation Questions	51
Viewpoint	Evaluation questions are in line with evaluation purposes and set properly in the evaluation grid. General questions as to the five evaluation criteria are narrowed down to more specific sub questions to identify necessary information/data to be collected.	
A	(2) Data Collection	72
Viewpoint	Data collection is conducted based on the evaluation grid, and is sufficient for obtaining answers for evaluation questions. Additional information are collected for unexpected and newly confronted questions during the process.	
B	(3) Measurement of Results	61
Viewpoint	Achievement level of overall goal is examined on the basis of appropriate indicators, being compared with targets.	
C	(4) Examination of Causal Relationship	62
Viewpoint	The causal relationships whether the effects for the beneficiaries resulted from the project is examined either in a qualitative or quantitative manner (i.e. Are the effects at the overall goal level caused by the project intervention?)	

Comment	For all issues in terms of the Evaluation Questions, the Data Collection, and the Measurement of Results, the reviewing results indicate that they were well developed. In terms of the Examination of Casual Relationship, even though the report shows that it was well analyzed using credible supporting data, it also shows some room for improvement. Specifically, the macro level statistical data was used to show that the SIC-Tool project's overall goal was excellently achieved. However, more specific details could be given to show how the achievement was related to the output of the SIC-Tool project. The increasing of the export-to-import ratio is another good choice of index to indicating the achievement of the project. However, separated detailed data for both export and import should be shown to give more insightful information.

3 Evaluation Results

B	(1) Impact	57, 85-86
Viewpoint	Perspectives for evaluation of 'Impact' (e.g. achievement level of the overall goal, causal relationships between the outcome of the project and overall goal, ripple effects) are substantially covered. Grounds for judgment are clearly stated in a convincing manner.	
B	(2) Sustainability	58, 85-86
Viewpoint	Perspective for evaluation of 'Sustainability' (e.g. probability of activities to be continued and outcomes to be produced in terms of 1)policies and systems, 2) organizational and financial aspects, 3) technical aspects, 4) Society, Culture and environment and) are substantially covered. Grounds for judgment are clearly stated in a convincing manner.	
A	(3) Factors Promoting Sustainability and Impact	85-86
Viewpoint	Promoting factors on 'Impact' and 'Sustainability' are analyzed properly based on the information obtained through evaluation process.	
C	(4) Factors Inhibiting Sustainability and Impact	85-86
Viewpoint	Inhibiting factors on 'Impact' and 'Sustainability' are analyzed properly based on the information obtained through evaluation process.	
B	(5) Recommendations	87-88
Viewpoint	Recommendations are made thoroughly based on the information obtained through the process of data analysis and interpretation. Recommendations are specific and useful for feedbacks and follow-ups, preferably being prioritized with a time frame.	
C	(6) Lessons Learned	87-88
Viewpoint	Lessons learned are derived thoroughly based on the information obtained through the process of data analysis and interpretation. Lessons learned are convincing and useful for feedbacks, being generalized for wider applicability.	

Comment	(1) **Evaluation Results in terms of Impact:** Impressive and well selected choices of statistical data were used to examine the impact of the SIC-Tool project. (2) **Evaluation Results in terms of Sustainability:** The results of the sustainability analysis are good. The study team clearly evaluated the issue by looking into 5 aspects affecting the sustainability. Detailed analysis for each aspect show clearly if the particular aspect would or would not promote the sustainability of the project. (3) **Factor Promoting Sustainability:** The analysis result for this issue was well presented. The statistical data was used to show that the assembling industrials in Thailand and the demand of skillful personnel have been growing. And to support these growths, the BSID as a result of the SIC-Tool project is now capable of producing well trained personnel, and/or offering consulting services, etc. (4) **Factor Inhibiting Sustainability:** More elaboration, in terms of any advanced technology that is needed for ex-counterparts, should be given. Based on the SIC-Tool project details, it is believed that the ex-counterparts should be able to update themselves as the technology is changes or improved. Moreover, in terms of the lacking of the so called "real-world" experiences for the ex-counterparts, the connections or networking between the BSID and industrials as indicated in the report lead to believe that this issue may not be a problem. Therefore, more detailed data should be present to confirm these conclusions in order to perfectionalize the report.

4 Structure of Report

B	(1) Writing Manner	89,103
Viewpoint	Logical structure and major points are clearly described in an easily understandable manner.	
B	(2) Presentation of Primary Data and Utilization of Figures	89,103
Viewpoint	Sufficient primary data such as on the target, contents and results of interviews and questionnaires are presented properly in the report. Figures and tables are utilized effectively to present statistics and analysis results.	
Comment	(1) **Writing Manner:** The study team should be more careful in terms of the synchronization between the detailed report and the summary sheet. Especially the number of sub-items for each main item should be the same. The flow of the summary sheet is understandable as compared to the full report. In order to help making the full report more readable, a short paragraph at the beginning of each main item to summarize the materials being presented should be written. The writer should be very careful with grammars, the choice of words, and use more quantitative evidences.	

(2) **Presentation of Primary Data and Utilization of Figures:** There are much of useful data referred in the report. However, many occasions that data should be presented to clarify sentences and more sentences should be used to discuss more about the data presented. Moreover, more discussion about the results from the questionnaires should be given.

5 Overall Review based on 'Criteria for Good Evaluation'

A	(1) Usefulness	13-14
Viewpoint	In light of the effective feedback to the decision-making of the organization, clear and useful evaluation results are obtained.	
B	(2) Impartiality and Independence	13-14
Viewpoint	Evaluation is impartially conducted in a neutral setting	
C	(3) Credibility	13-14
Viewpoint	In light of the specialties of evaluators, transparency of the evaluation process and appropriateness of the criterion of judgment, evaluation information are credible.	
B	(4) Participation of Partner Countries	13-14
Viewpoint	Partner countries' stakeholders participate actively in the process of evaluation, not just provide information.	
Comment	Based on the data and the analysis presented, it is believed that the study team carefully developed the evaluation process. The JICA evaluation guideline was strictly followed such that useful conclusions and convincing analysis results were obtained. Much of useful information came from the field work where notable choices of interviewee were selected. More work could be done to gain more insightful information using the obtained interviewing results. Though, this can be left for the future work or for the deeper level of evaluation if needed. Much of credible and impressive data were presented making this report to be useful and convincing.	

5 Overall Comment

The evaluation project as a whole seems to be well planned and prepared. Credits could be given to both the study team and JICA personals who conducted the project. Based on the data and the analysis presented, it is believed that the study team carefully developed the evaluation process. The JICA evaluation guideline was strictly followed such that useful conclusions and convincing analysis results were obtained. Though there are some rooms for improvement to perfectionalize the report. These can be left for deeper analysis in the future which may requires more time and budget. Regardless of convincing analysis results, the study team should be more careful when preparing the report. Synchronization between the summary sheet and the full report should be checked. It is obvious that the study team composed of experienced personnel in the field under studied such that many good conclusions were depicted even with such limited data. Overall, the reviewing result

indicates that the ex-pot evaluation project for the SIC-Tool project is good.

Date

8/03/2008

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