

No.
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# **Ex-post Evaluation Report**

**on**

# **The Railway Training Center Project**

**February 2006**

**Japan International Cooperation Agency  
Thailand Office**

**Kaihatsu Management Consulting (Thailand) Ltd.**

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1. Meeting with RTC
2. Meeting with a former expert, Mr. Hideharu Igarashi (SRT - Head Office)
3. Mr. Prakrit Akeprinya explained the use of the troubleshooting software (SRT – Chiangmai)
4. Mr. Kittipong Utba demonstrated the use of the troubleshooting software (SRT – Chiangmai)
5. CAI system (Locomotive Control Circuit)
6. CAI system (Locomotive Control Circuit)
7. Driving Simulator for Train Operation
8. Control Panel inside the Driving Simulator for Train Operation
9. Rail Changer (Jack Type) for Maintenance of Permanent Way
10. Hole Edge Cutter for Maintenance of Permanent Way
11. Signal Relay Circuit Training for Signaling
12. Relay Interlocking Circuit for Signaling
13. Electric Fundamental Training Unit
14. Textbooks and Class Notes
15. Textbooks and Class Notes

## 事後評価調査結果要約表

評価実施部署： タイ事務所

<b>1. 案件の概要</b>	
国名：タイ王国	案件名：タイ鉄道研修センタープロジェクト
分野：運輸交通-陸上運輸交通	協力形態：プロジェクト方式技術協力
所轄部署：タイ国鉄訓練開発局 鉄道研修センター（Railway Training Center, RTC）	協力金額：5億8,000万円
協力期間	先方関係機関：タイ国鉄（State Railway of Thailand, SRT）
1992年7月1日～ 1997年5月31日 (プロジェクト協力)	
2001年4月1日～ 2002年3月31日 (アフターケア協力)	
他の関連協力：N/A	
<b>1-1 協力の背景と概要</b>	
<p>タイ国鉄は将来の組織拡大に備え、技術系職員のニーズに即した研修を効果的に実施できるよう方針を策定した。しかし既存の訓練機器は充分ではなく、その上老朽化が著しかった。そこでタイ国鉄は、先進的な研修設備とカリキュラムによって既存の鉄道研修センター(RTC)を近代化させることを目的に、1992年、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。</p> <p>プロジェクト期間中、日本政府は約4億円相当の機材を供与したほか、運転、車両、輸送、軌道保守、信号、通信の6分野において、計21コースの技術研修カリキュラムを作成した。期間中、日本から延べ10名の長期専門家と38名の短期専門家が派遣されたほか、タイからは26名のカウンターパートが本邦研修を受けた。</p> <p>アフターケア協力はプロジェクトが終了した4年後に実施され、ディーゼル電気機関車の「応急処置と回路緊急復旧のための研修ソフトウェア」が開発された。これによって国鉄職員の機関車運行技術を向上させることが目的であった。アフターケア協力では、日本から5名の短期専門家が派遣され、タイからは1名のカウンターパートが本邦研修を受けた。</p>	
<b>1-2 協力の内容</b>	
<p>本プロジェクトにおいて、日本政府は必要な研修機材を供与したほか、長・短期専門家を派遣した。また国鉄職員の本邦研修や、より役に立つ研修教材の開発に向けた支援をした。カウンターパートである国鉄職員の研修と実習場所はタイ国鉄が提供した。</p>	
<b>(1) 上位目標</b>	
近代設備や新技術に対応した教育・訓練をRTCにおいてタイ国鉄が独自で行えるようになる。	
<b>(2) プロジェクト目標</b>	
国鉄職員は以下にあげる6分野において、新技術と設備、機材の保守修理に関する知識を習得している。	
<ul style="list-style-type: none"> <li>a. 鉄道運転</li> <li>b. 車両</li> <li>c. 輸送</li> <li>d. 軌道保守</li> <li>e. 信号</li> <li>f. 通信</li> </ul>	
<b>(3) 成果</b>	
1) 国鉄職員に対し、研修コースの企画、調整、実施にかかわる知識に重点を置いた研修が	

実施される。

- 2) 研修設備と機材が適切に据付、保守管理される。
- 3) 国鉄職員が機材の保守にかかわる訓練を受ける。
- 4) 47 分野、21 の研修コースに使用される研修資料が準備される。

#### (4) 投入(プロジェクト終了時)

日本側：

長期専門家	10 名
短期専門家	38 名
機材供与	3 億 9,240 万円 (1 億 2,000 万パーツ)
ローカルコスト負担	4,240 万円 (1,300 万パーツ)

タイ側：

Project Director	1 名
Project Committees	11 名
Project Secretaries	3 名
カウンターパート	26 名
機材更新コスト負担	3,300 万パーツ (1 億 600 万円)
ローカルコスト負担	1,000 万パーツ (3,280 万円)

## 2. 評価調査団概要

調査者	(担当分野：氏名、所属先、職位) Dr. Sarawoot Watechagit Kaihatsu Management Consulting (Thailand) Ltd.	
調査期間	2005 年 10 月 3 日～2006 年 1 月 30 日	評価種類：事後評価

## 3. 評価結果の概要

### 3-1. 評価結果の要約

#### (1) インパクト

上位目標の達成度から、技術的なインパクトは大きいと評価される。RTC はプロジェクトで得た経験や知識を基に、プロジェクトが終了してからも新たな研修プログラムを開発し、プロジェクト期間中 21 プログラムだった研修が、現在は 28 プログラムに拡大している。その中で、プロジェクト期間中に開発された研修 9 コースすべてが今でも活用されている。プロジェクトで作成された 47 冊の研修教材は、その後新たに開発されたコースを含め、多くの関連研修コースで主要テキストとして改訂、活用されている。これまでの研修プログラムの効果が高いことから、研修は地方の各駅にまで広がり、OJT や現場研修として実施されている。地方の各駅で実施される研修コースやテーマは、各地方で直面する機関車運行上の問題の内容によって適宜実施されている。

#### (2) 自立発展性

組織面からの自立発展性は高いと評価される。国鉄及び RTC の主な組織体制は、RTC の位置づけを除いて変化していない。RTC の位置づけについては、RTC 全職員に対して研修プログラムが適切に実施されるよう、2002 年以来、RTC は人事部の管轄下に置かれるようになった。また、日本で研修を受けたカウンターパートが国鉄内で昇進しており、研修で得た知識は、組織の意思決定や政策策定という観点からも有益であると考えられる。

なお、国鉄の民営化はまだ始まっていないが、予算配分の問題を含め、現状の行政システムの欠陥の改善の必要性が一般的に認識されるようになれば、検討課題に上ってくるものと思われる。

技術面における自立発展性の評価は高い。120 の実験機材、47 冊のテキスト、修理対応ソフトウェアなど、プロジェクトの成果であるこれらの技術的な資産は、現在も良好な状態で活用されている。これらは、職員がそれぞれ関心ある分野の知識を得るための有益な資産となっている。さらに現在では、新たな研修プログラムも開発されている。

人材開発面においては、採用方針の変更が自立発展性にマイナスの影響を与えていることもあり、低いと評価される。人員不足により、新規採用職員用の研修プログラムはそのほと

んどが計画通りには実施されなかった。

財政面での自立発展性も低いと考えられる。国鉄は RTC に対して十分な財政支援をしていない。特に実験機材の維持にかかる予算はすべて削減されたほか、研修プログラムの運営予算も減少している。したがって、RTC にとっては、研修設備の維持や研修プログラムの運営に支障をきたしている。

### 3-2 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

長期専門家、短期専門家によって、研修プログラム開発に必要な基盤が築かれた。そのため、プロジェクト終了後、新たに開発されたカリキュラムも体系的に構成されているほか、現在の技術的ニーズに即したものとなっている。

#### (2) 自立発展性強化を促進した要因

RTC が人事部下に配置されたことは、RTC の役割の重要性を増したとともに、RTC にとっても職員のさまざまな知識ニーズに対応できる研修プログラムづくりをするインセンティブともなった。

RTC の職員と元のカウンターパートが高い能力を持っていることは、国鉄職員の中でも認知されている。例えば、あらゆるレベルの職員に対応できるような新しい研修プログラムを開発したり、財政的に困難な状況にありながらすべての機材を維持したりと、RTC を適切に運営かつ改善していくために、プロジェクトで得た知識や技術を活かしている。地方の職員もまた OJT 研修プログラムや、個人研修用・修理対応用ソフトウェアの活用を通じて、技術的な知識をしっかりと身につけている。

### 3-3 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

プロジェクトが終了して以来、採用方針が変更されたために、新規に採用された職員はいない。人員不足からくる、研修に参加する職員数の減少や研修期間の短縮といった問題のため、研修プログラムの適切な実施が阻害された。

#### (2) 自立発展性強化を阻害した要因

採用方針の変更は、上述の通り人員不足を招いた。もしこの状態が放置された場合、研修を受講する職員がいなくなり、ひいては RTC の将来が危ぶまれる。

予算の不足は、研修用備品や設備の改善にも支障を来たしている。毎年、こうした機材維持のために要求している予算額の約 50%あるいはそれ以下しか認められず、部品の交換や修理もごく限られた範囲しかできていない。

### 3-4. 結論

2002 年にプロジェクトが終了して以来、上位目標の達成度という点からプロジェクトのインパクトは大きいと評価された。これは、タイ国鉄の高い能力によって、プロジェクトの成果である研修施設が維持、改善されてきたことが大きい。プロジェクトを通じて得た経験や知識を活用して、プロジェクト終了後も、RTC によって新たな研修プログラムが開発されている。プロジェクト期間中に作成されたテキストも、今もすべて研修コースの中などで活用されている。研修プログラムの効果が高いことから、研修は地方の各駅にまで広がり、OJT や現場研修の形で実施されている。したがってこうしたことから、上位目標の達成度からみたプロジェクトの技術的なインパクトは高いといえる。

組織面、技術面におけるプロジェクトの自立発展性は高いと評価された。組織面では、RTC が人事部の管轄下に置かれたことによって RTC の役割が増し、新規採用職員や現行の職員に適切な研修を実施することが可能となった。技術面では、財政的に困難な状況にありながら、RTC が研修設備を維持していること、またプロジェクトで開発されたコースや供与さ

れた設備を活用して研修プログラムをさらに拡充していることがあげられる。

しかし、その一方で、人材開発面や財政面からの自立発展性は低い。その理由は、採用方針の変更や国鉄からの財政支援不足である。

プロジェクトの促進要因としては、日本人専門家が研修プログラム開発のための下地を築いたこと、RTCが人事部の管轄下に位置づけられたこと、RTC職員とカウンターパートの高い能力によって、新たな研修プログラムの開発や供与機材の適切な維持管理などRTCの運営がさらに改善されたことがあげられる。

インパクト、自立発展性の面からプロジェクトを阻害した要因として予算不足と新規採用に関する方針の変更があった。しかしこれらは政策的な変更から生じたものであり、プロジェクトが管理できない、つまり外部要因であった。

### 3-5. 提言(当該プロジェクトに関する具体的な措置、提案、助言)

#### JICA に対して：

JICA は、RTC の毎年の予算について国鉄と協議すべきである。今回の調査で JICA と国鉄との間でプロジェクト終了後の予算措置について合意がなされていることがわかった。それによると、国鉄はプロジェクトが供与したすべての機材を、プロジェクト終了後も良好な状態で維持、更新、改善するために必要な額を配分しなければならないことが明記されている。しかし現状では RTC の予算は上述の通り大きな懸念材料の一つとなっている。

#### タイ国鉄に対して：

RTC の能力、開発された研修プログラム・コース、プロジェクトが供与した機材などが十分に活用されるよう、タイ国鉄や担当省が支援をして、RTC がアジア太平洋地域全体に認知されるようにすべきである。プロジェクトによって、RTC は現在、機関車運行に関わる研修、有能な職員、近代的な訓練機材などの面で強みを持っている。将来的に RTC が同地域内のあらゆる国のための研修センターとして位置付けることができる良いチャンスでもある。

国鉄は、採用方針を再検討すべきである。現在の方針では、知識を持った人材が RTC に不足してくることから、RTC にとっては技術面かつ組織運営面でより大きな問題につながる可能性がある。

現在の採用方針を変更できないならば、国鉄は、RTC が地方のためにより実践的かつ有益な研修プログラムを策定できるよう予算を認可すべきである。現在、地方では OJT によって能力向上を図るだけで、一時的に問題に対処しているに過ぎない。RTC が効果的に運営を行うためには、地方を含めた職員により徹底した研修を実施することが必要である。

### 3-6. 教訓(当該プロジェクトから導き出された他の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)

運転シミュレーター、修理対応ソフトウェアなどの供与機材は、特定の機関車、特に GEA 機関車用として開発された。自立発展性を高めるために、日立製など国鉄が保有するそれ以外の機関車にも対応できることが望ましい。将来的に異なるタイプにも対応できるようなガイドラインを作成しておくべきであった。

本プロジェクトのように研修プログラムの開発を含む場合、カリキュラムを策定する段階で、技術面ばかりではなく、研修プログラムの期間、講師数、研修員数、予算、ニーズ等の関連事項が将来どのように変化するか予測をしておくことも必要である。本プロジェクトでは、将来の職員数を考慮に入れた上でプログラムを策定しておけば、どんな状況になっても全職員が研修プログラムの恩恵を受けることができたと考えられる。実際、プロジェクトにおける研修プログラムの開発は、ほとんど技術的なニーズだけを考慮して作成されている。しかしながら、現状は、RTC にしっかりした技術的な知識があっても誰も出席しない研修プログラムがある。その理由は、研修プログラムが、研修参加者が減少しゼロになることを想

定した上で計画されなかったからである。

プロジェクト期間中 JICA によって供与されたハード・ソフト機材のほとんどは、日本から直接調達されたものである。それゆえ故障したり問題が発生したりすると、修理業者の確保やスペアパーツの入手は、大変困難である。したがって、必要最小限の機材だけを日本から調達していたならば、プロジェクト終了後の機材の保守問題を軽減することにもつながり、より良かったと思われる。

<b>1. Outline of the project</b>	
<b>Country:</b> Thailand	<b>Project title:</b> The Railway Training Center Project
<b>Issue/Sector:</b> Public Utilities (Railway)	<b>Cooperation scheme:</b> Project-type Technical Cooperation
<b>Section in charge:</b> Railway Training Center Training and Development Bureau	<b>Total cost:</b> 580 million yen
<b>Period of Cooperation:</b>	<b>Partner Country's Implementing Organization:</b>
June 1, 1992 - May 31, 1997 (Original Project)	State Railway of Thailand
April 1, 2001 - March 31, 2002 (Aftercare Program)	
<b>Related Cooperation:</b>	N/A
<p><b>1-1 Background of the Project</b></p> <p>The State Railway of Thailand (SRT) established a policy to develop an effective training system to meet the needs of proficient staffs due to the future expansion of the organization. However, the existing technical training equipments were inadequate and obsolete. Therefore, SRT, in 1992, submitted a request to Japanese Government to launch a technical cooperation project called "Railway Training Center Improvement Project", aiming to modernize the Railway Training Center (RTC) with up-to-date training facilities and curriculums.</p> <p>During the original Project, the Japanese Government contributed about 3 million US-dollars worth of equipments and developed 21 technical training curriculums for 6 fields which are Train Operation, Rolling Stock, Transportation, Maintenance of Permanent Way, Signaling and Telecommunication. There were total of 10 long-term and 38 short-term Japanese experts dispatched to Thailand, and 26 counterparts trained in Japan. The Aftercare Program was implemented 4 years after completion of the Project. The main outcome from this program was the development of the First Aid and Quick Recovery Circuit Training Software for the General Electric Articulated locomotive (GEA locomotive) in which SRT staff could use as a personal trainer to improve personal skill in GEA locomotive operation. This program involved 5 short-term Japanese experts visited Thailand, and 1 counterpart trained in Japan.</p> <p><b>1-2 Project Overview</b></p> <p>The Japanese Government provided necessary training equipment, short-term and long-term experts, training programs for SRT staffs to be trained in Japan, as well as assistance in developing more effective training curriculums for SRT. On the other hand, training and practicing locations along with staffs to work with Japanese experts were provided by SRT.</p> <p>(1) Overall Goal</p> <p>The State Railway of Thailand (SRT) is able to implement training, which copes with modern facilities and technologies at the Railway Training Center (RTC).</p> <p>(2) Project Purpose</p> <p>SRT staffs obtain knowledge with regard to new technologies and facilities, including the knowledge on equipment maintenance and troubleshooting in 6 fields as follows:</p> <ol style="list-style-type: none"> <li>a. Train Operation</li> <li>b. Rolling Stock</li> <li>c. Transportation</li> <li>d. Maintenance of Permanent Way</li> <li>e. Signaling</li> <li>f. Telecommunication</li> </ol> <p>(3) Outputs</p> <ol style="list-style-type: none"> <li>1) Training is provided to SRT staff emphasizing on knowledge for planning, coordinating and implementing training courses.</li> <li>2) Training facilities and equipment are installed and maintained properly.</li> <li>3) SRT staff are trained to maintain equipment.</li> <li>4) Training materials are prepared, including 47 titles for 21 training courses.</li> </ol>	



<b>(4) Inputs</b>		
Japanese side:		
Long-term Experts	10	
Short-term Experts	38	
Equipments	120 million baht (392.4 million yen)	
Local Cost	13 million baht (42.4 million yen)	
Thai Side:		
Project Director	1	
Project Committees	11	
Project Secretaries	3	
Counterparts	26	
Facilities Renovation Cost	33 million baht (106 million yen)	
Local Cost	10 million baht (32.8 million yen)	
<b>2. Evaluation Team</b>		
<b>Member of Evaluation Team</b>	Dr. Sarawoot Watechagit Kaihatsu Management Consulting (Thailand) Ltd.	
<b>Period of Evaluation</b>	3 October 2005 – 30 January 2006	Type of Evaluation: Ex-Post Evaluation
<b>3. Result of Ex-Post Evaluation</b>		
<b>3-1. Summary of Ex-Post Evaluation Result</b>		
(1) Impact		
<p>The impact in terms of the technical aspect attained by the overall goal is high. By using experiences and knowledge obtained from the Project, RTC has developed more new training programs by expanding the 21 programs at the time of the Project completion to currently 28 programs which incorporates all 9 courses developed during the Project with more courses. 47 textbooks developed during the Project have been improved and modified to be a main reference for many related courses including some courses in the newly developed training program. Due to the effectiveness of the developed training program, it has also expanded to the regional stations, but as an on-the-job or on-site training basis. Nonetheless, the courses or topics to be trained at the regional stations are arranged upon requested basis depending on the types of problems currently found from the locomotive operation at the regional stations.</p>		
(2) Sustainability		
<p>The organization aspect was evaluated and concluded as high. The major structures of the SRT and the RTC have not been changed, except the RTC position. Since 2002, the RTC has been controlled by Personnel Department under the Administrative sector so that the training programs could be properly arranged for all staffs. Counterparts who were trained in Japan have been promoted to a higher rank in the SRT organization, where the knowledge from the training programs could be beneficial for better decision making as well as better organization's policy development. The privatization of the SRT has not started and will be further discussed once any flaws regarding to the current administrative system including the budget allocation problems are considered to be resolved.</p> <p>The technical aspect is considered also as high. The technical resources from the outcomes of the Project have been well utilized and maintained including 120 laboratory equipments, 47 textbooks and the troubleshooting software are still in use and have been good resources for staff to gain personal knowledge for any particular area of interests. Moreover, more new training programs have been developed.</p> <p>The Personnel Development aspect is evaluated as low due to the change of the recruitment policy causing the sustainability in question. Due to the lacking of personnel, most of the training program for newly recruited staff could not be fully implemented. The Financial aspect is considered as low. Since the terminal of the Project, the SRT has not fully supported the RTC. The budget for maintaining lab equipment is totally cut, and the budget for operating training programs is decreased. Therefore, the RTC has been in a difficult time of trying to maintain training facilities and running the training programs.</p>		

### **3-2 Factors that have promoted project**

#### **(1) Impact**

Both short-terms and long-terms experts laid a good background on the development of the training programs such that the newly developed curriculum has been formulated in a systematical way, and ensured to fit the current technical needs.

#### **(2) Sustainability**

The inclusion of the RTC to the Personnel Department under the Administration sector amplifies the importance of the RTC' role and encourages the RTC to develop more thorough training programs to meet every knowledge need of the staffs.

The competencies of RTC's staffs and former counterparts were recognized among SRT's staffs. They have relied on their obtained knowledge and personal skills to manage and improve the RTC in a systematical way, such as the development of new training programs for every level of staffs or the maintenance of all equipment under the budget deficiency situation. Regional staffs are also well equipped with technical knowledge by the on-the-job training program and the use of the troubleshooting software for personal training and as a quick reference.

### **3-3 Factors that have inhibited project**

#### **(1) Impact**

The policy factor regards to the new recruitment policy produces zero newly recruited staff since the completion of the Project. The lacking of personnel prohibited the proper implementation of the training program due to the problems with the reduced number of attended trainees, and the shortened duration of the training program.

#### **(2) Sustainability**

The change for the recruitment policy caused the lacking of personnel as stated. If this problem persists, the future of the RTC will be in questioned, since there will be no trainees for any courses.

The financial factor mainly regards to the budget deficiency for maintaining the equipment. The budget deficiency prohibited improvement of training materials and facilities. Averagely about 50% or less of the requested budget for maintaining equipment is approved each year, which can be used for minor parts replacements or repairs.

### **3-4. Conclusion**

After the Project completion in 2002, The impact of the Project in terms of the attainment of the overall goal is high. This accounts for the ability of the RTC to maintain and improve the training facilities established during the Project. By using experiences and knowledge obtained from the Project, RTC has developed more new training programs by expanding the programs developed during the Project to more programs and more courses. All textbooks developed during the Project have been used for the related courses, and as a reference to develop new. Due to the effectiveness of the developed training program, it has also expanded to the regional stations, but as an on-the-job or on-site training basis. Therefore, the impact in terms of the technical aspect attained by the overall goal is high.

The sustainability of the Project in the areas of organizational and technical aspects is high. The current organization structure where the RTC is controlled by the Personnel Department amplifies the importance of the RTC in such a way that both newly recruited and existing staffs can be trained in a systematical way. For the technical aspect, the RTC is able to maintain training facilities regardless of the budget deficiency problem, also able to expand the training programs using courses and facilities provided by the Project. The sustainability in the area of personnel development and financial aspects is contrarily low due to the change of the recruitment policy, and the shortage of financial support from the SRT, respectively.

Factors promoting the Project include the Japanese experts who laid a good background on the development of the training programs, the inclusion of the RTC to the Personnel Department, and the competencies of RTC's staff and counterparts to further improve the RTC's operation by relying on their obtained knowledge and personal skills to manage and improve the RTC in a systematical way, such as the development of new training programs for every level of staffs or the maintenance of all equipment under the budget deficiency situation.

Factors inhibiting the Project in both impact and sustainability aspects are the financial deficiency, and the change of recruitment policy. They were however the effects from the policy change which are beyond the control of the Project, i.e., external factors of the Project.

### **3-5. Recommendations**

#### **For JICA:**

JICA may need to discuss with SRT regarding to the situation of the annual fund for RTC. The study found that there should be an agreement between JICA and SRT which indicated that SRT should provide necessary amount of fund such that all equipment provided by the Project would be well maintained, upgraded or improved after the Project completion. But currently the budget for RTC is one of major concerns as stated.

#### **For SRT:**

RTC needs to be supported and promoted by SRT or the Ministry of Transportation such that its potential is recognized throughout the Asia Pacific region, in order to fully utilize RTC's capability, developed training courses and programs, and other facilities provided by the Project. After all, the RTC has had strong background in locomotive training, knowledgeable staffs, and modern training equipment based on the help from the Project. This can open a chance of further developing RTC to be a regional training center for all countries in Asia Pacific area.

SRT needs to reconsider the recruitment policy. The current one may lead to more problems both in the technical aspect and the management system due to the lacking of knowledgeable staffs in RTC.

SRT needs to approve fund for RTC to set up a more concrete and useful training program for regional substations, if the current recruitment policy cannot be altered. Currently, the on-the-job training basis can only temporarily solve the problem. Thorough training for staffs still needs to be done for effective administration system of RTC.

### **3-6. Lesson Learned**

To promote sustainability, the Project should have provided guideline to modify the provided equipments such that they can be further utilized for some other related applications when applicable. Based on the study, some equipment such as the Driving Simulator and the troubleshooting software were developed only for a certain locomotive, specifically the GEA locomotive. The Project should have provided guideline to modify these equipments such that they can also be used for some other locomotives of the SRT's fleet such as HITACHI locomotive, etc.

For the Project or any other project which involves developing a training program, during the period of planning the related curriculum, factors such as the duration of training program, the number of instructors, the number of trainees, budget, etc., and the variation of these factors in the future, should as well be considered, besides the consideration of the technical aspects of the program. The programs should have been formulated by considering also the amount of staffs for the future situations such that it can ensure the benefit of the training program reaches all staffs under any circumstance. Based on the evaluated Project, the developed training programs were established by considering mainly the technical needs. However, under the current situation, the technical knowledge of the RTC is concrete, but there is no trainee attending the training program. This is because the training program was not planned for a zero trainee situation.

Most of hardware and software equipment provided by JICA during the Project were directly procured from Japan. Hence, it is very difficult to find an agent to repair or obtain any spare part when some of them are broken or malfunction. Therefore, it might be more convenient if only necessary and limited numbers of equipment acquired from Japan. This could reduce maintenance problems after the Project completion.

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## **List of Abbreviation**

GEA:	General Electric Articulated locomotive
JICA:	Japan International Cooperation Agency
PDMe:	Project Design Matrix for Evaluation
RTC:	Railway Training Center
SRT:	State Railway of Thailand

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## Chapter 1 Outline of the Ex-post Evaluation Study

### 1.1 Background and the Purpose of the Study

Japan International Cooperation Agency (JICA) Thailand Office has decided to conduct the ex-post evaluation of the Railway Training Center (RTC) Project for the State Railway of Thailand (SRT) (hereinafter referred to as “the Project”). This Project can be divided to two phases. The initial phase was started in June 1992 and completed in May 1997. The second phase was the Aftercare Program for the RTC Project conducted from April 2001 to March 2002. Main objectives of the ex-post evaluation study are as follows:

- 1) To derive lessons and recommendations for the improvement of JICA country programs and for the planning and implementation of more effective and efficient projects.
- 2) To ensure accountability to tax payers through producing reports in both electronic and printed forms.

Additionally, this study seeks to answer some specific concerns as the following:

- 1) How far the privatization of the SRT proceeded, and how the activities of the Project got influenced by this change?
- 2) Were training contents or program developed during the aftercare period practical for the usage in the regional stations?
- 3) How far the PDM is necessary for the Project focusing on “training” by analyzing through the characteristic of RTC Project?

The results of this study will contribute to better-informed decision making and be shared by the concerned agencies especially JICA and SRT.

### 1.2 Evaluation Team and the Study Period

The members of the Ex-post Evaluation Study Team are as follows:

Assignment	Name	Nationality
Researcher 1	Dr. Sarawoot Watechagit	Thai
Researcher 2	Mr. Pisit Tuntivivat	Thai

The study started on October 20, 2005 and ended January 2006. The work schedule is summarized below:

**1) Preparatory Work (October 20, 2005-December 15, 2005)**

- 1.1 Develop PDME;
- 1.2 Develop Evaluation Grid;
- 1.2 Consult with JICA Thailand Office to finalize the PDME and Evaluation Grid;
- 1.3 Prepare interview forms and questionnaire based on Evaluation Questions in the Evaluation Grid.

**2) Field Study (December 16-23, 2005)**

- 2.1 Conduct evaluation through interviews, field visits, and questionnaires;
- 2.2 Prepare Mid-term Report.

**3) Final Study (January – February, 2006)**

- 3.1 Submit Mid-term Report;
- 3.2 Review comments from JICA Thailand Office and SRT;
- 3.3 Conduct supplemental study (if necessary);
- 3.4 Prepare Draft Final Report and Draft Summary Sheets;
- 3.5 Submit Draft Final Report and Draft Summary Sheets;
- 3.6 Review comments from JICA Headquarters;
- 3.7 Submit Final Report and Summary Sheets.



## Chapter 2 Study Methods

### 2.1 Outline of the Project

Project Title:	The Railway Training Center Project
Project Site:	Bangkok, Thailand
Period of Cooperation:	Originally 5 years of technical cooperation (June 1, 1992 - May 31, 1997) The Aftercare Program (April 1, 2001 - March 31, 2002)
Counterpart Agency:	The State Railway of Thailand

#### 2.1.1 Background of the Project

The State Railway of Thailand (SRT) established a policy to develop an effective training system to meet the needs of proficient staffs due to the future expansion of the organization. There was, however, limitation to achieve this policy mainly due to the fact that the already existed training equipment were not enough and obsolete, especially technical training equipment. Therefore, SRT, in 1992, submitted a request to Japanese Government to launch a technical cooperation project called “Railway Training Center Improvement Project”, aiming to modernize the Railway Training Center (RTC) with up-to-date training facilities and curriculums. The agreement between SRT and Japanese Government was made in such a way that SRT would provide training and practicing locations along with staffs to work with Japanese experts. The Japanese Government, on the other hand, would provide necessary training equipment, short-term and long-term experts, training programs for SRT staffs to be trained in Japan, as well as assistance in developing more effective training curriculums for SRT.

The Project started from June 1992 and finished by May 1997. The Japanese Government contributed about 3 million US-dollars worth of equipment including Driving Simulator, Locomotive Control Circuit, Training Equipment for Signaling and Telecommunication, and developed 21 technical training curriculums for 6 fields which are Train Operation, Rolling Stock, Transportation, Maintenance of Permanent Way, Signaling and Telecommunication. There were total of 10 long-term and 36 short-term Japanese experts dispatched to Thailand, and 24 counterparts trained in Japan.

The Aftercare Program was implemented 4 years after completion of the Project, mainly to further improve the results from the original cooperation in order to promote the development and sustainability of the Project. This program involved 5 short-term Japanese experts visited Thailand, and 1 counterpart trained in Japan. The main outcome from this program was the development of the First Aid and Quick Recovery Circuit Training Software for the General Electric Articulated locomotive (GEA locomotive) in which SRT staff could use as a personal trainer to improve personal skill in GEA locomotive operation. This program started from April 2001, and ended by March 2002.

### **2.1.2 Framework of the Project**

Since the Project had no PDM, the Evaluation Study Team has prepared PDMe with the following contents:

#### **Overall Goal:**

The State Railway of Thailand (SRT) is able to solely implement training, which copes with modern facilities and technologies at the Railway Training Center (RTC).

#### **Project Purpose:**

SRT staffs obtain knowledge with regard to new technologies and facilities, including the knowledge on equipment maintenance and troubleshooting in 6 fields as follows:

- a. Train Operation
- b. Rolling Stock
- c. Transportation
- d. Maintenance of Permanent Way
- e. Signaling
- f. Telecommunication

#### **Project Outputs:**

- 1) Training is provided to SRT staff for planning, coordinating and implementing training courses.
- 2) Training facilities and equipment are installed and maintained properly.
- 3) Training materials are prepared.

## 2.2 Stakeholders and Study Methods

Based on the Terminal Evaluation Report of the Project prepared in February 1997, and the related Project documents, the evaluation plan as well as interview questions were developed and prepared to respective stakeholders as shown below:

Stakeholders	Study Method
<b>Implementing Agency:</b> The Railway Training Center - Chief of Training and Development Bureau	Interview
<b>Direct Target:</b> SRT-RTC Counterparts 1) RTC section's chiefs 2) Former counterparts 3) Former Japanese expert(s)	Interview and questionnaires
<b>Indirect Target:</b> Trained staffs	Interviews
<b>Administrative Personnel:</b> Project Coordinator	Interviews

## Chapter 3 Results of the Study

The results of the study will be presented in terms of sustainability as well as impacts. The sustainability study verifies if the SRT can and operate and maintain the outcomes of the Project for a long time. On the other hand, the impact study captures the long-term and expansion effects of the Project. Moreover, the analysis of impact and sustainability factors is also presented in this study.

### 3.1 Impact of the Project

The impact of the Project resulted from the Project completion in 2002 to present is expressed with the following three levels:

Level of Result	Explanation
<i>High</i>	The Project's products or outputs have high impacts on the RTC
<i>Moderate</i>	The Project outputs have moderate impacts on the RTC
<i>Low</i>	The Project failed to produce any impacts on the RTC

#### 3.1.1 Impact Attained by Overall Goal

Impact attained by the overall goal to SRT and RTC can be seen from many aspects. The first one is indicated by the expansion of the training program based on the foundation in terms of technical knowledge and training program development technique, which were provided by the Project. New training programs have been developed by expanding the 21 programs which already existed at the time of the Project completion to currently 28 programs which incorporates all 9 courses developed during the Project with more courses.

The second aspect can be seen from the improvement and modification of the training materials and textbooks to be a main reference for many related courses including some courses in the newly developed training program. The third aspect that obviously indicates the impact attained by the overall goal is the attempt on expanding the training program to the regional stations. Nevertheless, the training program implemented at the regional stations is in an on-the-job or on-site training basis due to the problem of the lacking of any newly recruited staffs. However, this has set a foundation of a regional training program which can be improved in the future if the staff shortage problem is resolved. Specifically, most of the training programs currently offered, which are mostly held at the

RTC in Bangkok, should be further modified and improved such that they can be taught regionally at the regional stations. Some courses those are currently trained regionally are developed upon requested basis depending on the types of problems currently found from the locomotive operation at the regional stations. Information about all topics being trained regionally can be used to formulate a more concrete training program for the regional stations in the future. The training locations have been adjusted such that the lecture rooms are at the laboratories where technical equipments are stored. This also enhances a hand-on experience as well as reducing the movement of equipment during the training programs.

Based on the results mentioned above, such as the expansion of training curriculum, or the utilization of the training materials, they lead to the conclusion that the impact of the Project attained by the overall goal is high.

### **3.1.2 Unanticipated Impact after Project Completion**

#### **(1) Negative Impact on the use of Troubleshooting Software**

One minor negative impact from the troubleshooting software provided by the Project during the Aftercare Program is the requirement of a computer suitable for installing the software. Specifically, the software requires a little higher performance computer than those where the software was initially installed. Currently this problem has been resolved by the distribution of the software for each staff upon request such that the software could be installed onto the staff's personal computer. Since there was no indicated requirement of a suitable computer for the software, based on the discussion of current software user, the software runs well with the CPU of Pentium II class or higher, at least 32 MB RAM for the graphic card, and at least with the 256 MB RAM for the system memory.

### 3.2 Sustainability

The sustainability of the Project, which takes into account the results from the Aftercare Program, is expressed with the following three levels:

Level of Result	Explanation
<i>High</i>	It is expected high that the Project benefits are likely to sustain after the discontinuation of JICA's assistance, based on the analysis on the retention of the Project outcomes in terms of technical, organizational and financial aspects.
<i>Maintained</i>	It is expected high but not higher than the above that the Project benefits are likely to sustain after the discontinuation of JICA's assistance, based on the analysis on the retention of the Project outcomes in terms of technical, organizational and financial aspects.
<i>Low</i>	It is expected low that the Project benefits are likely to sustain after the discontinuation of JICA's assistance, based on the analysis on the retention of the Project outcomes in terms of technical, organizational and financial aspects.

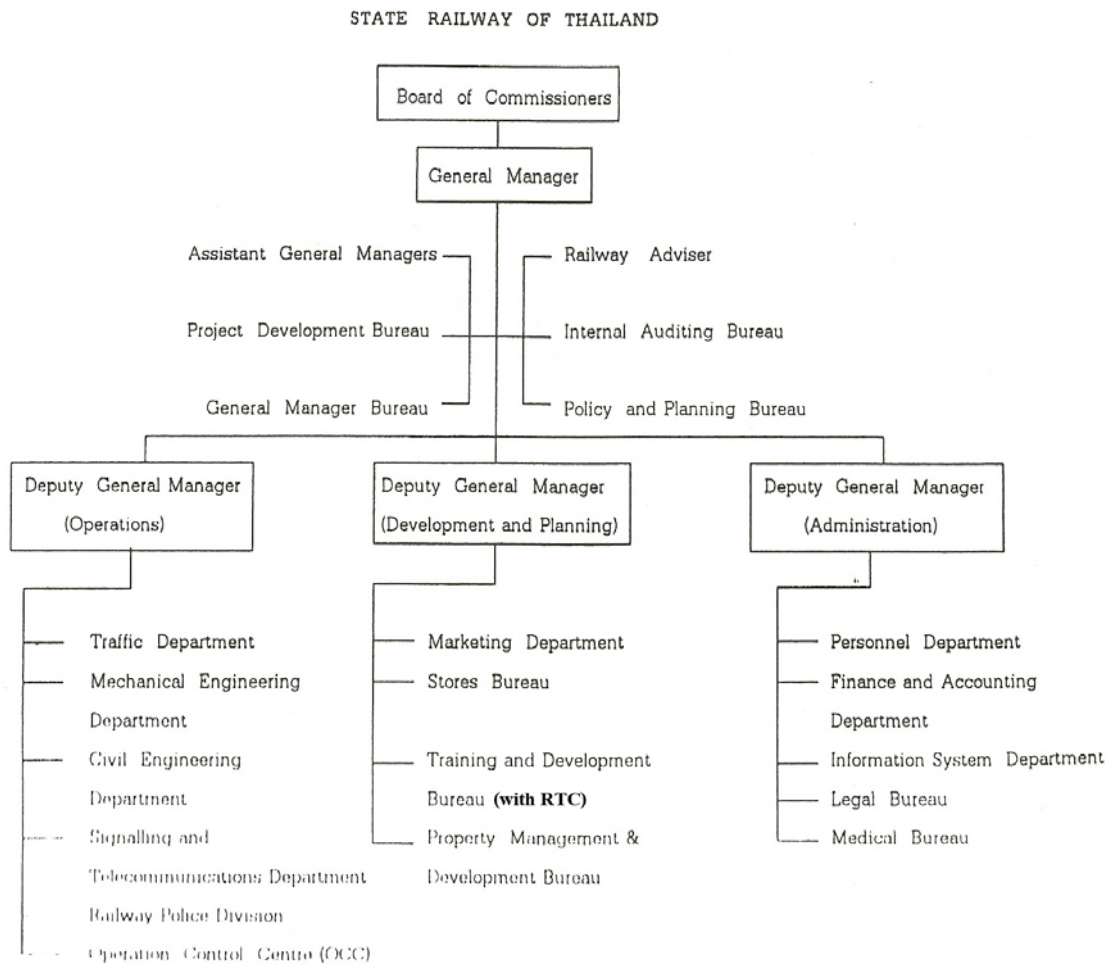
#### 3.2.1 Organizational Aspects

The organizational structure of the RTC has not been changed since the completion of the Project. Counterparts who were trained in Japan during the period of the Project have been promoted to a higher rank in the SRT organization. The benefit of the promotion is such that the former counterparts are currently at the administrative level. The training program provided to counterparts by the Project emphasized not only the technical knowledge for locomotive operation, to be obtained from Train Operation, Rolling Stock, Signaling, and Telecommunication trainings, but also the knowledge of locomotive fleet management, to be obtained from Transportation, and Maintenance of Permanent Way trainings. Therefore, the knowledge from the training programs could be beneficial to the former counterparts for better decision making as well as better organization's policy development.

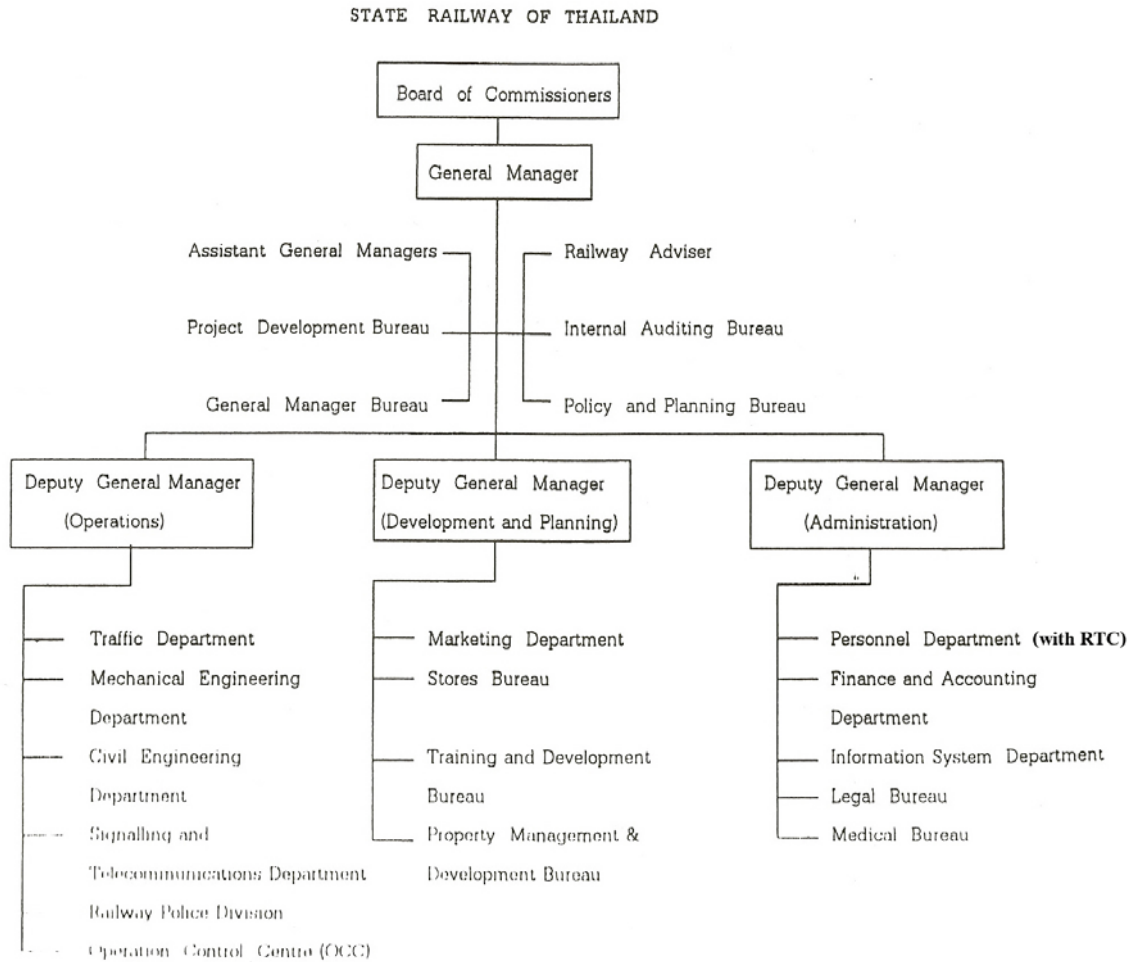
The major structure of the SRT has also not been changed, except the RTC position. During the Project duration, the RTC was run by the Training and Development Bureau under the Development and Planning sector (see Figure 1). However, since 2002, the RTC has been reassigned to be controlled by the Personnel Department under the Administration sector (see Figure 2). The reasons for this change is that, since the Personnel Department has the records of all staff, it would be easy for this department to be assigned proper training

courses for different group of staff, including arranging all necessary substituting staff when one is being trained. Moreover, this change has prepared the RTC to comply with the future policy of which every newly recruited staff must be systematically trained or pass the RTC training program.

In terms of the privatization of the SRT, there has not been any concrete policy. Though, there were a few meetings among staffs but mainly to resolve any flaws regarding to the current administrative system including the budget allocation problems. Once these problems are resolved, then the privatization for the SRT will be further discussed. As of now, there has not been any change in the RTC position for function regarding to the privatization issue. These all contribute to the conclusion of higher in the organizational aspect, since the control by the Personnel Department not only eases the arrangement of the training programs, but also ensures a proper program is being offered.



**Figure 1:** The organization chart for State Railway of Thailand (SRT) before the year 2002



**Figure 2:** The organization chart for State Railway of Thailand (SRT) after the year 2002

### 3.2.2 Technical Aspects

There are several issues indicating the further development in technical aspects, based on the results from the Project, and it leads to the conclusion of high in this area.

- 1) During the period of the Project, 12 new training courses in 6 fields were developed, and 21 training programs were established. These courses and training programs were implemented. However, after the Project completion, they have been further adjusted and modified to suite the current needs. The main difference between the new curriculum as compared to the original one is the integration between the Signaling and the Telecommunication fields. Also, the new curriculum has been developed in such a way that a staff in any field will be trained in a systematical way starting from the basic level and proceeds to the intermediate or advanced level within designated time period. Except the



field of Transportation in which the new curriculum is under development, there are currently 28 programs in 5 fields which are the Train Operation, the Rolling Stock, the Maintenance of Permanent Way, and the Signaling and Telecommunication. The details with the developed courses during the Project and the newly developed training program are shown in Table 1 below.

**Table 1: Courses developed during the Project and the newly developed training program**

<b>Courses developed during the Project</b>		<b>New Training Program</b>	
<b>Fields of Study</b>	<b>Courses</b>	<b>Fields of Study</b>	<b>Programs</b>
<b>Train Operation</b>	Driver Assistant Driver Driving Simulator	<b>Train Operation</b>	Basic Assistant Driver Assistant Driver (Enhanced) Advance Assistant Driver Driver (Enhanced) Assistant Chief of Section Chief of Section
<b>Rolling Stock</b>	Inspector for Diesel Fleet Inspector for Carriage and Wagon	<b>Rolling Stock</b>	Basic Technician Technician (Enhanced) Advance Technician Inspector (Enhanced) Assistant Chief of Section Chief of Section
<b>Maintenance of Permanent Way</b>	Ganger Technician Inspector Chief Inspector Operation of Multiple Tie Tamper	<b>Maintenance of Permanent Way</b>	Basic Technician Technician (Enhanced) Advance Technician Inspector (Enhanced) Assistant Chief of Section Chief of Section
<b>Signaling</b>	Basic Signaling	<b>Signaling and Telecommunication</b>	Basic Assistant Technician Assistant Technician (Enhanced) Basic Technician Advance Technician Basic Inspector Inspector (Enhanced) Assistant Chief Assistant Chief (Enhanced) Chief of Section Chief of Section (Enhanced)
<b>Telecommunication</b>	Basic Telecommunication		
<b>Transportation</b>	Train Dispatcher	<b>Transportation</b>	<b><i>Under development</i></b>

- 2) In terms of teaching materials or textbooks, there has not been any new publication since the Project completion. However, all 47 textbooks for 6 fields which were prepared as a part of the Project have been used intensively, not only as a textbook for classes, but also as a reference for personal research. In some cases, however, the details from the textbooks were already obsolete especially in the area of Signaling, such as Basic Signaling and Aspect of Railway Signals. For these two cases, the major change was about the signaling techniques which had to be adjusted to comply with the current signaling methods used in Thailand. Additional materials have always been provided by instructors to ensure that the up-to-date information and technologies were given to the trainees.
  
- 3) All 120 items of laboratory equipment (see ANNEX 3) are still used and in good working conditions. Only the Multiple Tie Temper that is not currently at the RTC, but has been used at the regional station and moved from one station to another upon requested. The utilization of the training buildings has also been adjusted such that the training areas are at the places where all related laboratory equipments are located.
  
- 4) The troubleshooting software for GEA locomotive operation which was developed by Japanese experts and distributed to SRT during the Aftercare Program has also been used intensively. It is noted that this software was distributed mostly to local stations. Specifically, there were 13 local stations, from 4 regions all over the country, which received the software package. These 13 stations are at Chiangmai, Lumpang, Pisanulok, Payao for Northern region, Bangsue (Bangkok), and Makasan (Bangkok) for Central region, Khonkan, Nakhon Ratchasima, Ubonrachathani, and Sarabury for North-East region, Hat Yai, Songkla, and Prajuabkirikhun for Southern region. The main reason for choosing these stations out of many other stations is because these stations are a local hub which is not only a transit station for a passenger, but also a dispatching station for the commercial, and cargo locomotive. Normal duties for staffs at these stations are to ensure a smooth operation of the local, regional and overall railway system, and to check and/or repair all locomotives and railway tracks such that they are in good working conditions. Therefore, staffs at these stations are required to be knowledgeable. The troubleshooting software can help them to improve their technical skill for prompted response to any incident.

Since the distribution, the software has been utilized in two ways. Firstly, staffs have installed the software on a personal computer at home, or personal office, such that the software could be used for study on staff's private time. Secondly, the software has been used as a mobile resource at the regional stations such that the locomotive driver or technician can call back and ask for any assistant or recommendation once any problem occurs. The software has been recognized as a necessary resource and well prepared to fit the needs for all staffs.

Based on these results, it can be seen that all technical resources from the outcomes of the Project have been well utilized. Training courses developed from the Project have laid a foundation for the newly developed curriculum which emphasis in more systematical way of training. All equipments have been well utilized and maintained in good working conditions. Both teaching materials which include textbooks and software are still in use and have been good resources for staff to gain personal knowledge for any particular area of interests. These show the high side of the sustainability in terms of technical aspect.

### **3.2.3 Personnel Development Aspects**

During the Project period, there were both long-term and short-term experts from Japan to RTC. Also, SRT staffs were given the chances to be trained in Japan. Specifically, there were 23 counterparts who were trained in Japan. After the Project completion, out of 23 counterparts, there were 4 persons who retired and 1 who resigned from the SRT. The rest of them were promoted to higher ranks in SRT organization. Due to the SRT recruitment policy stating that the number of new staffs must not be higher than 5% of retired personnel, there has not been any recruitment for a new full-time staff since the completion of the Project. This contributes several problems in terms of the personnel development aspect as follows.

The lacking of the newly recruited personnel means that the chance of offering training programs by the RTC is decreased. As stated earlier, there were 21 training program during the Project period. After the completion of the Project, at least 8 out of 21 training programs which are basic programs for the new staff have not been offered. For some other intermediate or advanced training programs, there were problems with the number of attended trainees, and the duration of the training program. The lacking of personnel has led to the problem of staff rotation or substitution. Most of the situations fall to the case that staffs could not leave their duties to attend the training program, or the training session must

be within a very short period of time. For the past few years, only 12 programs out of 21 training programs have been continuously offered. However, the numbers of attended trainees have been about 50% less than what RTC could accept, and only about 60% of all trainees attended all training sessions.

The current solution to resolve these problems is the arrangement of on-site or on-the-job training. This method normally takes longer time as compared to attending full training courses. However, it can keep all staffs to remain at their working sites where some other duties can be taken care of at the same time training being provided. Since the training activities and the numbers of trained personnel by the RTC are decreased, it can be concluded that the level of sustainability is low in terms of personnel development aspect.

### **3.2.4 Financial Aspects**

Financial supports for maintenance of laboratory equipment have not been adequate especially for the repairs and maintenance of heavy equipment. After the completion of the Project, averagely, the budget needed for arranging training courses and maintaining laboratory equipment is about 1.2 million Baht per year or about \$30,000 per year, and, within this amount, about 30% is for maintaining laboratory equipment. However, averagely, the RTC receives the support by the SRT only about 70% of the requested budget. With this amount of budget, averagely, only 20% is designated for the equipment or about half of the originally requested amount is cut. Therefore, the RTC has been in a difficult time of trying to maintain all training facilities and running the training programs. The current solutions are to rely on staff's personal commitments to ensure that all laboratory equipment are in working conditions, i.e. by using equipment with care, and also staff's personal budgets repair some minor problems. Based on this study, the level of sustainability can be concluded as low in terms of the financial aspect.

## **3.3 Analysis of Factors of Impact and Sustainability**

### **3.3.1 Promoting Factors to Sustainability**

Promoting factors to sustainability involve the SRT organization structure and the competencies of academic staffs as mentioned below.

#### **Organization Factors:**

The inclusion of the RTC to the Personnel Department under the Administration sector since 2002 not only eases the arrangement of the training programs, but also

ensures a proper program is being offered. Moreover, this amplifies the importance of the RTC in such a way that every newly recruited or the existing staffs must be systematically trained or pass the RTC training program before being hired by the SRT or getting promoted to a higher rank, respectively. These encourage the RTC to develop more thorough training programs to fit every knowledge level of staffs.

**Competencies Factors:**

The competencies of RTC's staffs as well as former counterparts were recognized among SRT's staffs. The current administrative team lead by Mr. Boonsom Wiengchai, one of the former counterparts with the current position being the Deputy Chief of RTC, with other staffs and former counterparts have relied on their obtained knowledge and personal skills to manage and improve the RTC in a systematical way, such as the development of new training programs for every level of staffs or the maintenance of all equipment under the budget deficiency situation. Regional staffs are also well equipped with technical knowledge by the on-the-job training program and the use of the troubleshooting software for personal training and as a quick reference.

**3.3.2 Promoting Factors to Impact**

Both short-terms and long-terms experts laid a good background on the development of the training programs. RTC staffs have been working in more systematical way in terms of setting up any new or modified from already existed training programs. This includes the existence of preliminary discussion among staffs to define specific needs in order to develop any new course or training program. Based on this preliminary discussion, the newly developed curriculum was systematically formulated, and well fit the current technical needs.

**3.3.3 Inhibiting Factors**

Inhibiting factors are related to the policy and the financial factors as follows:

**Financial Factors:**

One major inhibit factor affecting the operation of RTC mainly regards to the budget deficiency for maintaining the equipment. This includes the budget for replacement and repair of laboratories equipment, as well as the budget for personal development. As stated earlier, averagely about 50% or less of the requested budget for

maintaining equipment is approved each year. With this amount of money, it can be used only to do minor parts replacements or repairs. There have been plans to improve the capability of some equipment such as the Driving Simulator which could be modified to simulate the operation of other locomotives, or the troubleshooting software which could also be modified to capture more technical problems or developed for other locomotives as well. All these plans could be done by the RTC staffs themselves, however the shortage of the budget has prevented to get them started.

**Policies Factors:**

One of the inhibiting factors is related to the change of the recruitment policy. As mentioned earlier that the current policy allows the acceptance of new staff by not more than 5% of retired personnel. Therefore, each year, in order to recruit one new staff, there must be at least 20 staffs retire. Under the current situation, there are averagely only 2 retired staffs each year. Therefore, there has not been any newly recruited staff since the completion of the Project. As the study results showed, due to the lacking of personnel, most of the training program developed for newly recruited staff could not be implemented. For some other intermediate or advanced training programs, there were problems with the number of attended trainees, and the duration of the training program.

**3.4 Conclusion**

Based on the results of the study, after the Project completion in 2002, it is found that the sustainability of the Project in the areas of organizational and technical aspects is high. The current organization structure where the RTC is controlled by the Personnel Department amplifies the importance of the RTC in such a way that both newly recruited and existing staffs can be trained in a systematical way. For the technical aspect, the study shows that the RTC is able to maintain training facilities regardless of the budget deficiency problem. The RTC is also able to improve and expand the former 21 training programs to the current 28 training programs using courses and facilities provided the Project.

The sustainability in the area of personnel development and financial aspects is contrarily low. The problem regarding to the personnel development aspect arises from the change of the recruitment policy. The training program is ready, but there is no trainees attending the program. The shortage of financial support from the SRT after the Project

completion has led to the difficulty to maintain the equipment as well as to modify or improve the equipment to fit the current technical needs.

The impact of the Project in terms of the attainment of the overall goal is high. The achievement accounts for the ability of the RTC to maintain and improve the training facilities established during the Project. After the Project completion, there was an unanticipated impacts related the use of the given troubleshooting software. This impact is considered to be negative. However, this was not a result from any flaw in the software. Solutions have also been found such that the software could be used effectively.

There are also some promoting factors to both sustainability and impact. For the sustainability, the promoting factors include the organization factor and the competencies factor. For the impact, the promoting factors came from the Japanese experts. Besides the promoting factor, the study shows several inhibiting factors due to the financial deficiency and the change of recruitment policy. Therefore, it can be concluded that there are both positive and negative impacts of the Project, and the Project has been influenced rather by the inhibiting factors that are beyond the control of the Project.

## Chapter 4 Recommendations and Lesson Learned

### 4.1 Recommendations

#### **For JICA:**

JICA may need to discuss with SRT regarding to the situation of the annual fund for RTC. The study found that there should be an agreement between JICA and SRT which indicated that SRT should provide necessary amount of fund such that all equipment provided by the Project would be well maintained, upgraded or improved after the Project completion. However, results from this study showed that the annual budget for RTC seemed not up to the level to further improve anything. Only maintaining equipment in working conditions may not be enough in the near future due to locomotive technology change. And this may cause the sustainability to be in question.

#### **For SRT:**

- 1) RTC needs to be supported and promoted by SRT or the Ministry of Transportation such that its potential is recognized throughout the Asia Pacific region, in order to fully utilize RTC's capability, developed training courses and programs, and other facilities provided by the Project. After all, the RTC has had strong background in locomotive training, knowledgeable staffs, and modern training equipment based on the help from the Project. This can open a chance of further developing RTC to be a regional training center for all countries in Asia Pacific area.
- 2) SRT needs to reconsider the recruitment policy. The policy of recruiting only five percentages out of retirement person in each year causes the lacking of personnel currently. This may lead to more problems not only in the technical aspect, but also the management system. Specifically, there are currently limited number of staffs who have been trained properly. Due to the personnel shortage situation, chance is less for a staff that needs training to attend the training program because there is not enough staff to make any substitution. As a result, the number of skillful staffs cannot be increased. The lacking of knowledgeable staffs can lead to the difficulty or delay in resolving any problem during the locomotive operation, which is the artery of SRT. If this is the case, the SRT may not be able to manage the system since while the main business is in trouble, but there is not enough knowledgeable staff to help fixing the system. Moreover, there is also a chance that some of the policy makers by



that time might not pass the training programs. Therefore, the policy or the management system may be in question.

- 3) SRT needs to approve fund for RTC to set up a more concrete training program for regional substations, if the current recruitment policy cannot be altered. Currently, the on-the-job training basis can only temporarily solve the problem. Thorough training for staffs still needs to be done for effective administration system.

#### **4.2 Lessons Learned**

- 1) To promote sustainability, the Project should have provided guideline to modify the provided equipments such that they can be further utilized for some other related applications when applicable. Based on the study, some equipment such as the Driving Simulator and the troubleshooting software were developed only for a certain locomotive, specifically the GEA locomotive. The Project should have provided guideline to modify these equipments such that they can also be used for some other locomotives of the SRT's fleet such as HITACHI locomotive, etc.
- 2) For the Project or any other project which involves developing a training program, during the period of planning the related curriculum, factors such as the duration of training program, the number of instructors, the number of trainees, budget, etc., and the variation of these factors in the future, should as well be considered, besides the consideration of the technical aspects of the program. The programs should have been formulated by considering also the amount of staffs for the future situations such that it can ensure the benefit of the training program reaches all staffs under any circumstance. Based on the evaluated Project, the developed training programs were established by considering mainly the technical needs. However, under the current situation, the technical knowledge of the RTC is concrete, but there is no trainee attending the training program. This is because the training program was not planned for a zero trainee situation.
- 3) Most of hardware and software equipment provided by JICA during the Project were directly procured from Japan. Hence, it is very difficult to find an agent to repair or obtain any spare part when some of them are broken or malfunction. Therefore, it might be more convenient if only necessary and limited numbers of equipment acquired from Japan. This could reduce maintenance problems after the Project completion.

# ANNEX 1 PDMc

Project Design matrix for Evaluation						
Project Name	Technical Cooperation for Railway Training Center Project					
Project Period	June 1, 1992 - May 31, 1997					
Thai Implementing agency	State Railway of Thailand					
Japanese Implementing agency	Japan International Cooperation Agency					
Target Area	Railway Training Center					
Target Group	Staffs and Technicians of State Railway of Thailand					
Narrative Summary		Objectively Verifiable Indicators	Mean of Verification	Important Assumptions		
Overall Goals	The State Railway of Thailand (SRT) is able to solely implement training, which copes with modern facilities and new technologies at the Railway Training Center (RTC).					
Projects Purpose	<ul style="list-style-type: none"> <li>- Staffs are able to maintain the facility and equipment as well as cope with major troubles.</li> <li>- All facilities and equipment is properly functional.</li> <li>- Reduction of the number of trains getting trouble when in operation.</li> </ul>					
Outputs	<ol style="list-style-type: none"> <li>1 Training is provided to SRT staff for planning, coordinating and implementing training courses.</li> <li>2 Training facilities and equipment are installed and maintained properly.</li> </ol>	<ol style="list-style-type: none"> <li>1 945 staff are trained to be trainers on basic knowledge in 6 fields*.</li> <li>2-1 A training center, including a training building, a practice building and training lines is built or improved and maintained properly.</li> <li>2-2 The training equipments*** are installed and maintained properly.</li> <li>2-3 Staffs are trained for maintenance of equipment.</li> <li>2-4 Staffs are designated to be responsible for maintenance of equipment.</li> <li>2-5 The maintenance book of equipment is prepared and used properly.</li> </ol>	<ol style="list-style-type: none"> <li>1 Project Report of RTC</li> <li>2-1 Annual Report of SRT</li> <li>2-2 Project Report of RTC</li> <li>2-3 Annual Report of SRT</li> <li>2-4 Annual Report of SRT</li> <li>2-5 Project Report of RTC</li> </ol>	<ul style="list-style-type: none"> <li>- Project and Annual report from RTC and SRT/ List of Publications</li> <li>- Questionair</li> </ul>	<ul style="list-style-type: none"> <li>- The training program is a mandatory for all staffs</li> <li>- The plan to established the training program at regional stations is exist</li> </ul>	
Activities	<ol style="list-style-type: none"> <li>3 Training materials are prepared.</li> </ol>	<ol style="list-style-type: none"> <li>3-1 Textbooks of 47 titles for 21 training courses are prepared.</li> <li>3-2 19 cut models are prepared and used in the training courses.</li> </ol>	<ol style="list-style-type: none"> <li>3-1 Project Report of RTC</li> <li>3-2 Project Report of RTC</li> </ol>			
Input		Preconditions				
1-1 Develop training plans and curriculum						
1-2 Prepare and implement the training courses in each field*						
1-3 Provide instructions through experts on modern equipment and new technologies in each field*						
1-4 Implement training courses in Japan in each field**						
2-1 Build a training center by RTC						
2-2 Improve a training center by RTC						
2-3 Install training equipment						
2-4 Provide SRT staff with training on maintenance of equipment						
3-1 Prepare a plan to develop textbooks						
3-2 Develop textbooks in 6 fields*						
3-3 Develop a cut model						
RTC Railway Training Center						
SRT State Railway of Thailand						
* Technical Fields		*** Equipments (See ANNEX 3)				
- Train Operation						
- Rolling Stock						
- Transportation						
- Maintenance of Permanent Way						
- Signalling						
- Telecommunication						
- Operational Management						

## ANNEX 2 Evaluation Grid

Criteria	Evaluation Questions		Achievement Criteria/Measures	Data Needed	Data Sources	Data Collection		
	Main Questions	Sub-questions				Methods		
IMPACT	1.	How far is the Railway training Center improved?	<ul style="list-style-type: none"> <li>1 How many training courses and categories are developed and provided to RTC technical staff after terminal evaluation?</li> <li>2 Do the training courses meet RTC technical need?</li> <li>3 Are the traubaug facilities improved base on the technical need?</li> <li>4 Are the training materials manual and railway program available and useful?</li> <li>5 How many RTC technical experts are developed during the project?</li> </ul>	<ul style="list-style-type: none"> <li>- Name and categories of training courses.</li> <li>- Types and number of training facilities where are improved.</li> <li>- List of available training materials manual and the usage.</li> <li>- Number of local technical expert.</li> </ul>	<ul style="list-style-type: none"> <li>Project report</li> <li>Interview SRT in Bangkok</li> <li>Nakhon Ratchasima</li> <li>to be named</li> </ul>	<ul style="list-style-type: none"> <li>Interviews</li> <li>Document review</li> <li>Questionnaire</li> </ul>		
	2.	Are there any positive or negative changes resulted from the project interventions?	<ul style="list-style-type: none"> <li>- How much the function of the RTC improved?</li> <li>- What are the positive and negative effects of the project?</li> <li>- What are the gains from the project?</li> <li>- How the rate of incidents, causing a train to miss its schedule or stop, changes?</li> </ul>	<ul style="list-style-type: none"> <li>- Level of satisfaction of agencies concerned</li> <li>- Number of incidents</li> </ul>	<ul style="list-style-type: none"> <li>Agencies which sent trainees</li> <li>RTC, SRT</li> </ul>	<ul style="list-style-type: none"> <li>Interview</li> <li>Questionnaire survey</li> </ul>		
	3.	Are there any external factors affected the achievement of the project overall goal?	<ul style="list-style-type: none"> <li>- Are there any change in the government policy that affect the project's goal?</li> <li>- Is there any technology changed?</li> <li>- What events after the project termination did influence this project goals?</li> <li>- How far the privatization of the SRT proceed?</li> <li>- How the privatization of the SRT affects the RTC activities?</li> </ul>	<ul style="list-style-type: none"> <li>Compare the rate of incidents (past and present) information</li> <li>Describe the result of discussion with RTC and SRT</li> </ul>	<ul style="list-style-type: none"> <li>- Budget allocation</li> <li>- Government's policy</li> <li>- RTC function's descriptions</li> </ul>	<ul style="list-style-type: none"> <li>RTC, SRT</li> <li>RTC, SRT</li> </ul>	<ul style="list-style-type: none"> <li>interview</li> <li>Literature/Document search</li> </ul>	

SUSTAINABILITY									
1. How has the counterpart agency been maintaining the project activities and services provided by the project?	<ul style="list-style-type: none"> <li>- Does the developed training system being fully run?</li> <li>- Are equipments fully utilized at present time?</li> <li>- What is the current organization structure of the counterpart agency?</li> <li>- Are trained staff sufficient for RTC?</li> <li>- Is there additional recruitment of the staff for the RTC?</li> </ul>	Compare the newly obtained information with the Terminal Evaluation Report	<ul style="list-style-type: none"> <li>- Number of personnel</li> <li>- Number of equipments and their status</li> <li>- Number of training courses</li> <li>- Policy and structural changes</li> <li>- New function of RTC and related office(s)</li> <li>- Organization structure</li> </ul>	RTC, SRT	Interview Literature/Document search				
2. How likely are the project outputs to be maintained?	<ul style="list-style-type: none"> <li>- Do the project technical details still valid?</li> <li>- Can RTC keep up with the technology changes?</li> <li>- Is the training program practical for the usage in the regional station?</li> <li>- What are the obstacles of the work?</li> </ul>	Acceptance of the agencies sent trainees	<ul style="list-style-type: none"> <li>- Number of clients</li> <li>- Number of training courses</li> <li>- Number of new training courses</li> </ul>	RTC, SRT, Agencies which sent trainees	Interview Literature/Document search				
3. What are the factors that have contributed or inhibited the sustainability of the project outcomes		Describe the significant changes and enquire its reasons	<ul style="list-style-type: none"> <li>- Policy and structural changes</li> <li>- New function of RTC and related office(s)</li> <li>- Organization structure</li> </ul>	RTC, SRT	Interview Literature/Document search				
4. Is there adequate budget from the Thai government to maintain works of the project?	<ul style="list-style-type: none"> <li>- How much as the last year budget allocation after the project termination?</li> </ul>	Compare the newly obtained information with the Terminal Evaluation	<ul style="list-style-type: none"> <li>- Annual budget</li> </ul>	RTC, SRT	Interview Literature/Document search				
Note:	RTC								
	SRT								
	: Railway Training Center								
	: State Railway of Thailand								

### ANNEX 3 List of Equipment provided to RTC by Project

Field	Equipment	Detailed List	Status	Note
Train Operation	Driving Simulator	Simulated Car BFA-36C	Fine	
		Image Displayer	Fine	Cable Adaptor Changed
		Instructor Console	Fine	
		Computing and Control Device A8930000	Fine	
		Cables	Fine	Renewed
		Current Stabilizer	Fine	
		Spares Accessories (5 items)	Fine	Not use
Rolling Stock	Locomotive Control Unit	CAI system	Fine	
		Spares Equipment (9 items)	Fine	Not use
	Brake Circuit Simulator	Operation Panel for HITACHI 45 Locomotive	Fine	
		Brake Simulation for HITACHI 45	Fine	
		Simulation Software for HITACHI 45	Fine	
		Preparation Unit for HITACHI 45	Fine	
		STR45 Brake Circuit	Fine	
		STR45 CAI System	Fine	
		STR45 Machine for Student	Fine	
		STR45 Power Unit	Fine	
		STR45 Software	Fine	
		Measuring Equipment	Function Generator	Fine
	Vibration Meter		Fine	
	Insulator Tester		Fine	
	Digital Thermometer		Fine	
	Phase Rotation Tester		Fine	
	Multimeter Kyoritsu		Fine	
	Multimeter SANWA		Fine	
	Multimeter Yogogawa		Fine	
	Clamp Meter		Fine	
	Flaw Tester		Fine	
	Hydraulic Tester		Fine	
	Compression Loss Tester		Fine	
	Smoke Meter		Fine	
	Car Collar Service Kit		Fine	
	Battery Tester		Fine	
	Micrometer M820-100		Fine	
Micrometer M-10	Fine			
Venire Caliper	Fine			
Pitch Gage	Fine			

Rolling Stock (continued)	Workshop Equipment	Lifting Crane	Fine	
		Arc Welder	Fine	
		Gas Cutting Tool	Fine	
		Hand Truck	Fine	
		Disk Grinder	Fine	
		Hand Grinder	Fine	
		Speed Cutting Machine	Fine	
		Lathe Ishino	Fine	
		Air Compressor	Fine	
		Duster Gun Set	Fine	
		Drilling Machine	Fine	
Maintenance of Permanent Way	Multiple Tie Temper		Fine	Relocated
	Maintenance Equipments	Rail Cutter	Fine	
		Rail Drilling	Fine	
		Hole Edge Cutter	Fine	Not use
		Rail Changer	Fine	
		Rail Depression Gage	Fine	Not use
		Rail Stress Measurement	Fine	Not use
		Accelerometer for Rolling Stock	Fine	Not use
		Curve Teleputter	Fine	Not use
		Rail Flaw Detector	Fine	
		Level with Tripod	Fine	
		Standard Gage	Fine	
		Thermometer	Fine	
		Rail Running Surface	Fine	
		Rail Bender	Fine	Not use
		Hydraulic Rail Gap Adjustment	Fine	
		Nozzle Tester	Fine	
		Battery Charger	Fine	
		Insulator Tester	Fine	
		Battery Tester	Fine	
		Battery Hydrometer Set	Fine	
Shovel	Fine			
Scoop	Fine			
Signaling	Signal Relay Circuit Training		Fine	
	Signal Relay Circuit Testing		Fine	
	Relay Interlocking Circuit		Fine	
	Electric Fundamental Training	Electric Fundamental Training Unit	Fine	
		Resistance Experiment Unit	Fine	
		Capacitance Experiment Unit	Fine	
		Inductance Experiment Unit	Fine	
		Wheatstone Bridge Unit	Fine	
AC-DC Power Experiment	Fine			

Signaling (continued)		Regulated DC Power Experiment	Fine	
		AC Ammeter	Fine	
		DC Ammeter	Fine	
		Power Factor Meter	Fine	
		Frequency Meter	Fine	
		Shut Resister	Fine	
		Multiplex	Fine	
		Single Core Slide Resister	Fine	
		Double Core Slide Resister	Fine	
		Volt Slider	Fine	
		Decade Resister	Fine	
		Synchro Scope	Fine	
		Analogue Multimeter	Fine	
		Digital Multimeter	Fine	
		Facsimile	Fine	Not use
		Transformer	Fine	
		MODEM	Fine	Not use
Ditto Drive	Fine	Not use		
Vibration Recorder	Fine	Not use		
Telecommunication	Electronics Fundamental Training Kit	Model IWATSU:ITF01	Fine	
	Measurement Instrument	Oscilloscope	Fine	
		Signal Generator	Fine	
		Universal Counter	Fine	
		Attenuator	Fine	
		Tracking Generator	Fine	
		Oscillator	Fine	
		Voltmeter	Fine	
		Distortion Meter	Fine	
		Precision Wheatstone Bridge	Fine	
	LCR Meter	Fine		
Digital Telephone Exchange System	Model NEX240SDS-SP	Fine		
Transportation	Computer Presentation Equipments		Fine	Not use
	VDO Player		Fine	Not use
Others	AV Equipments	Outdoor Recording Set	Fine	Not use
		VDO Editing Set	Fine	Not use
		Camera	Fine	
		Enlarging Machine	Fine	Not use
		Slide Projector	Fine	
		Overhead Projector	Fine	
Machine Tool Sets	Fine			

#### **ANNEX 4 Interview Form for RTC**

The following are all questions used for the interview with RTC's personnel to evaluate the post-project impact and sustainability of JICA-supported RTC Project.

1. Please describe the current status of the curriculum (Specify clearly the number of study fields, courses, and curriculum).
2. Please describe any difference of the curriculum between the period of the Project and present. (Specify clearly the number of study fields, courses, and curriculum).
3. Please describe the future status of the current curriculum (if there is any plan for further development of the training program or courses)
4. Are those textbooks developed during the Project being used? In case of any or some of them are not being used, explain the reason.
5. Please describe the future status of the textbooks (if there is any plan for further development of the textbooks)
6. Please describe the number of the training courses or curriculums have been offered each year?
7. For all courses offered each year, how many trainees were expected, and how many trainees attended?
8. Please describe the status of all equipments provided by JICA (a list of equipments is given to the informer to specify equipment's status)
9. How have all equipments been maintained? (Explain clearly in terms of technical issue, manpower and budget)
10. Please describe the future status of the equipments
11. Explain the training program at the local or regional stations?



12. Explain the status of the troubleshooting software provided by JICA during the Aftercare Project.
13. Explain the utilization and beneficial of the software to the RTC and the local or regional stations?
14. Describe the status of counterparts? (a list containing the name of counterparts and their status is requested from the informer)
15. Is there any change in the organization's structure since the completion of the Project? (If so, explain clearly the new structure and the reason of the change)
16. Please describe the situation about the privatization of the SRT
17. Please describe any incident, problem, or situation affecting the sustainability of the Project results (Explain in terms of the organization, the budget allocation, and else)
18. How many incidents those cause the interruption of the locomotive operation? (Estimated figure, and comparing the current situation to the past before the implementation of the Project)
19. Explain the positive impact and/or impression of the Project to the organization
20. Explain the negative impact and/or impression of the Project to the organization
21. Describe the budget allocation each year after the Project completion and the use of the budget.
22. How is the PDM necessary to this project?
23. What would be your recommendation to SRT and JICA regarding to the Project?

## **ANNEX 5 Interview Form for Local Station**

The following are all questions used for the interview with personnel at local or regional station to evaluate the post-project impact and sustainability of JICA-supported RTC Project.

1. Please describe the current status of the training program or method (Specify clearly the number of study fields, courses, and curriculum).
2. Please describe any difference of the training program or method between the period of the Project and present. (Specify clearly the number of study fields, courses, and curriculum).
3. Please describe the future status of the current training program or method (if there is any plan for further development of the training program or courses)
4. Are those textbooks developed during the Project being used? In case of any or some of them are not being used, explain the reason.
5. Please describe the future status of the textbooks (if there is any plan for further development of the textbooks)
6. Please describe the number of the training program or curriculums have been offered each year?
7. For all courses offered each year, how many trainees were expected, and how many trainees attended?
8. Please describe the status of all equipments provided by JICA, if there is any.
9. Explain the status of the troubleshooting software provided by JICA during the Aftercare Project.
10. Explain the utilization and beneficial of the software to the training program at the local or regional stations?

11. Describe the pro and con of the given software?
12. Please describe the situation about the privatization of the SRT
13. How many incidents those cause the interruption of the locomotive operation?  
(Estimated figure, and comparing the current situation to the past before the implementation of the Project)
14. Explain the positive impact and/or impression of the Project to the local station
15. Explain the negative impact and/or impression of the Project to the local station
16. Describe the budget allocation each year after the Project completion and the use of the budget.
17. What would be your recommendation to SRT, RTC, and JICA regarding to the Project?

## **ANNEX 6 Interview Form for Former Experts**

The following are all questions used for the interview with a former expert to evaluate the post-project impact and sustainability of JICA-supported RTC Project.

1. Please describe the current job description
2. Please describe the job description during the period of the Project
3. Please describe any positive and/or negative impression during the implementation of the Project
4. If you were involved with the Aftercare Project as well, please describe your job description
5. Is there any communication between you and SRT or RTC regarding to the result of the Project both officially and unofficially? If so, please explain
6. How is the PDMe necessary to the Project? Why wasn't it there during the period of the Project?
7. Is there any comment about the PDMe developed for this post-evaluation project? (If the answer is yes, please explain)
8. Describe any comment regarding to the training program, courses, equipments and all other training materials (if any)?
9. Describe the pro and con of the troubleshooting software provided by JICA?
10. Do you know about the privatization of SRT? What do you think about the impact to the RTC after the privatization?
11. What would be your recommendation to SRT, RTC, and JICA regarding to the Project?

**ANNEX 7 Study Plan****RTC Project Study Schedule****Subject :** RTC Project Ex-Post Evaluation Study**Date :** December 14, December 19-26, 2005

**Place :** (1) Training and Development Bureau (Bangkok, Jatujak)  
 (2) State Railway Thailand (Head Office)  
 (3) State Railway Thailand (Nakon Ratchasima Office)  
 (4) State Railway Thailand (Chiangmai Office)  
 (5) State Railway Thailand (Bangkok, Bangsue)

Date	List of Key Informants	Position	Place
14/12/05	Mr. Boonsom Wiengchai Mr. Boonna Intaratul	Chief of the Bureau (Counterpart) Chief of the Train Operation Division (Counterpart)	(1)
19/12/05	Mr. Anupong Arjsooglert Mr. Vicheunyooth Weangjuntuk Mr. Bunpoj Peawsoognern	Assistant Chief, Locomotive Inspector Locomotive Driver Locomotive Driver	(3)
20/12/05	Mr. Prakit Akeprinya Mr. Kumkong Summasup Mr. Kittipong Utba	Chief, Locomotive Inspector Locomotive Inspector Assistant Driver	(4)
22/12/05	Mr. Hideharu Igarashi	Technical Advisor for SRT (Former Long Term Expert)	(2)
23/12/05	Mr. Boonsom Wiengchai Mr. Boonna Intaratul	Chief of the Bureau (Counterpart) Chief of the Train Operation Division (Counterpart)	(1)
26/12/05	Mr. Thanorm Ornkun	Chief, Locomotive Inspector (Counterpart)	(5)

## ANNEX 8 Interview Results

### IMPACT OF RTC PROJECT

	Questions	Results
1	Please describe the current status of the curriculum (Specify clearly the number of study fields, courses, and curriculum).	There are currently 28 programs in 5 fields as the following. <ul style="list-style-type: none"> <li>- Train Operation</li> <li>- Rolling Stock</li> <li>- Transportation</li> <li>- Maintenance of Permanent Way</li> <li>- Signaling and Telecommunication.</li> </ul>
2	Are those textbooks developed during the Project being used? In case of any or some of them are not being used, explain the reason.	<ul style="list-style-type: none"> <li>- All 47 textbooks for 6 fields have been used intensively, as a textbook for classes, and as a reference for personal research.</li> <li>- Additional materials have always been provided by instructors to give the up-to-date information and technologies</li> </ul>
3	Explain the training program at the local or regional stations?	There is no specific training program at the regional or local stations. Some courses opening are developed upon requested basis depending on the types of problems currently found from the locomotive operation at the regional stations. And the usual way of teaching is on-the-job type of training.
4	Explain the status of the troubleshooting software provided by JICA during the Aftercare Project.	The troubleshooting software for GEA locomotive operation has been used intensively at RTC and 13 local stations or locomotive hubs as the following. <b>Northern region</b> <ul style="list-style-type: none"> <li>- Chiangmai</li> <li>- Lumpang</li> <li>- Pisanulok, Payao</li> </ul> <b>Central region</b> <ul style="list-style-type: none"> <li>- Bangsue (Bangkok)</li> <li>- Makasan (Bangkok)</li> </ul> <b>North-East region</b> <ul style="list-style-type: none"> <li>- Khonkan</li> <li>- Nakon Ratchasima</li> <li>- Ubonrachathani</li> <li>- Sarabury</li> </ul> <b>Southern region</b> <ul style="list-style-type: none"> <li>- Hat Yai</li> <li>- Songkla</li> <li>- Prajuabkikhun</li> </ul>

5	Describe the status of counterparts? (a list containing the name of counterparts and their status is requested from the informer)	Counterparts who were trained in Japan during the period of the Project have been promoted to a higher rank in the SRT organization.
6	Is there any change in the organization's structure since the completion of the Project? (If so, explain clearly the new structure and the reason of the change)	<p>(1) Since 2002, the RTC has been reassigned to be controlled by the Personnel Department under the Administration sector, instead of the Training and Development Bureau under the Development and Planning sector as during the period of the Project.</p> <p>(2) The organizational structure of the RTC has not been changed since the completion of the Project</p>
7	Please describe the situation about the privatization of the SRT	The privatization for the SRT has not started. The plan will be further discussed after any flaws regarding to the current administrative system including the budget allocation problems is resolved.
8	How many incidents those cause the interruption of the locomotive operation? (Estimated figure, and comparing the current situation to the past before the implementation of the Project)	The number of incidents is averagely about 1000-1200 cases annually. This number is about the same for both during and after the Project.
9	Explain the positive impact and/or impression of the Project to the organization	Short-terms and long-terms experts provided a good background on the development of the training programs. RTC staffs have been working in more systematical way.
10	Explain the negative impact and/or impression of the Project to the organization	<p><b>(1) Negative Impact from the Recruitment Policy Change</b></p> <p>The new recruitment policy is that only 5% of retired personal each year can be recruited. Hence, there has not been any recruitment for a new full-time staff since the completion of the Project. As a result, there have been some problems with the number of attended trainees, and the duration of the training program. In general,</p>

		<p>staffs could not leave their duties to attend the training program, or the training session must be within a very short period of time.</p> <p><b>(2) Negative Impact by the Budget Deficiency</b></p> <p>The financial support from the SRT to RTC for maintaining lab equipment is totally cut, and the budget for operating training programs is decreased. Therefore, the RTC has been in a difficult time of trying to maintain training facilities and running the training programs.</p> <p><b>(3) Negative Impact on the use of Troubleshooting Software</b></p> <p>Since, the software requires a little higher performance computer than those where the software was initially installed.</p>
11	<p>Please describe any difference of the curriculum between the period of the Project and present. (Specify clearly the number of study fields, courses, and curriculum).</p>	<p><b>During the Project</b>  There are currently 28 programs in 5 fields as the following.</p> <ul style="list-style-type: none"> <li>- Train Operation</li> <li>- Rolling Stock</li> <li>- Transportation</li> <li>- Maintenance of Permanent Way</li> <li>- Signaling</li> <li>- Telecommunication.</li> </ul> <p><b>Current Situation</b>  There are currently 28 programs in 5 fields as the following.</p> <ul style="list-style-type: none"> <li>- Train Operation</li> <li>- Rolling Stock</li> <li>- Transportation</li> <li>- Maintenance of Permanent Way</li> <li>- Signaling and Telecommunication.</li> </ul>
12	<p>Please describe the future status of the current curriculum (if there is any plan for further development of the training program or courses)</p>	<p>The new curriculum has been developed so that a staff in any field will be trained in a systematical way starting from the basic level and proceeds to the intermediate or advanced level within designated time period.</p>



## SUSTAINABILITY OF RTC PROJECT

	Questions	Results
1	Please describe any difference of the curriculum between the period of the Project and present. (Specify clearly the number of study fields, courses, and curriculum).	<p><b>During the Project</b> There are currently 28 programs in 5 fields as the following.</p> <ul style="list-style-type: none"> <li>- Train Operation</li> <li>- Rolling Stock</li> <li>- Transportation</li> <li>- Maintenance of Permanent Way</li> <li>- Signaling</li> <li>- Telecommunication.</li> </ul> <p><b>Current Situation</b> There are currently 28 programs in 5 fields as the following.</p> <ul style="list-style-type: none"> <li>- Train Operation</li> <li>- Rolling Stock</li> <li>- Transportation</li> <li>- Maintenance of Permanent Way</li> <li>- Signaling and Telecommunication.</li> </ul>
2	Please describe the future status of the current curriculum (if there is any plan for further development of the training program or courses)	The new curriculum has been developed so that a staff in any field will be trained in a systematical way starting from the basic level and proceeds to the intermediate or advanced level within designated time period.
3	Please describe the future status of the textbooks (if there is any plan for further development of the textbooks)	There is no plan to develop more textbooks in the future.
4	Please describe the number of the training courses or curriculums have been offered each year?	Currently, there is no specific number of courses offering. However, all courses being offered now are on-requested or if there is any new technology that staffs may need to know. Averagely now there are about 2-3 training programs which involve around 12-15 courses.
5	For all courses offered each year, how many trainees were expected, and how many trainees attended?	Currently, there is no specific number of courses offering. However, all courses being offered now are on-requested or if there is any new technology that staffs may need to know. Averagely now there are about 2-3 training programs which should be around 70-90 trainees, but there are averagely 50-60% less.

6	Please describe the status of all equipments provided by JICA (a list of equipments is given to the informer to specify equipment's status)	<ul style="list-style-type: none"> <li>- All 120 items of laboratory equipments are still used and in good working conditions.</li> <li>- Only the Multiple Tie Temper that is not at the RTC. It has been used at the regional station and moved from one station to another upon requested.</li> </ul>
7	How have all equipments been maintained? (Explain clearly in terms of technical issue, manpower and budget)	Staffs have enough required knowledge to look after all equipments. But the budget from SRT to maintain equipments has always been cut. The maintenance of all equipments rely on staff's personal commitments to ensure that all laboratory equipment are in working conditions, i.e. by using equipment with care, and also staff's personal budgets repair some minor problems.
8	Please describe the future status of the equipments	There is no official or specific plan about the equipments but try to maintain them to be in good working condition. However, there have been staff's personal researches to improve technical capability of equipments such as modifying the Driving Simulator to account for other locomotive on SRT's fleet.
9	Explain the utilization and beneficial of the software to the RTC and the local or regional stations?	<ul style="list-style-type: none"> <li>- Installed the software on a personal computer at home, or personal office, such that the software could be used for study on staff's private time</li> <li>- The software has been used as a mobile resource at the regional stations such that the locomotive driver or technician can call back and ask for any assistant or recommendation once any problem occurs.</li> </ul>
10	Please describe any incident, problem, or situation affecting the sustainability of the Project results (Explain in terms of the organization, the budget allocation, and else)	<p><b>(1) Negative Impact from the Recruitment Policy Change</b></p> <p>The new recruitment policy is that only 5% of retired personal each year can be recruited. Hence, there has not been any recruitment for a new full-time staff since the</p>

		<p>completion of the Project. As a result, there have been some problems with the number of attended trainees, and the duration of the training program. In general, staffs could not leave their duties to attend the training program, or the training session must be within a very short period of time.</p> <p><b>(2) Negative Impact by the Budget Deficiency</b></p> <p>The financial support from the SRT to RTC for maintaining lab equipment is totally cut, and the budget for operating training programs is decreased. Therefore, the RTC has been in a difficult time of trying to maintain training facilities and running the training programs.</p>
11	Describe the budget allocation each year after the Project completion and the use of the budget.	<p>RTC averagely requests 1.2 million Baht per year (\$30,000) where 30% of this amount goes for maintaining laboratory equipment. However, averagely, the RTC receives the support by the SRT only about 70% of the requested budget. With this amount of budget, averagely, only 20% is designated for the equipment or about half of the originally requested amount is cut.</p>

### How is the PDMe necessary to this project?

The PDMe is necessary for this project. The Project has many little details, such as the development of 47 textbooks, training and giving advise RTC's staffs, the development of curriculum, etc., involved during the course of the Project. Therefore, PDMe could help ensuring all activities comply with Project's goal, purposes, and objectives. Moreover, PDMe gives an overall picture of the Project and its results. This is useful if the Project would be further improved and implemented.

## **Recommendations**

### **For JICA:**

JICA may need to discuss with SRT regarding to the situation of the annual fund for RTC. The study found that there should be an agreement between JICA and SRT which indicated that SRT should provide necessary amount of fund such that all equipment provided by the Project would be well maintained, upgraded or improved after the Project completion. However, results from this study showed that the annual budget for RTC seemed not up to the level to further improve anything. Only maintaining equipment in working conditions may not be enough in the near future due to locomotive technology change. And this may cause the sustainability to be in question.

### **For SRT:**

- 1) RTC needs to be supported and promoted by SRT or the Ministry of Transportation such that its potential is recognized throughout the Asia Pacific region, in order to fully utilize RTC's capability, developed training courses and programs, and other facilities provided by the Project. After all, the RTC has had strong background in locomotive training, knowledgeable staffs, and modern training equipment based on the help from the Project. This can open a chance of further developing RTC to be a regional training center for all countries in Asia Pacific area.
- 2) SRT needs to reconsider the recruitment policy. The policy of recruiting only five percentages out of retirement person in each year causes the lacking of personnel currently. This may lead to more problems not only in the technical aspect, but also the management system. Specifically, there are currently limited number of staffs who have been trained properly. Due to the personnel shortage situation, chance is less for a staff that needs training to attend the training program because there is not enough staff to make any substitution. As a result, the number of skillful staffs cannot be increased. The lacking of knowledgeable staffs can lead to the difficulty or delay in resolving any problem during the locomotive operation, which is the artery of SRT. If this is the case, the SRT may not be able to manage the system since while the main business is in trouble, but there is not enough knowledgeable staff to help fixing the system. Moreover, there is also a chance that some of the policy makers by that time might not pass the training programs. Therefore, the policy or the management system may be in question.
- 3) SRT needs to approve fund for RTC to set up a more concrete training program for regional substations, if the current recruitment policy cannot be altered. Currently, the on-the-job training basis can only temporarily solve the problem. Thorough training for staffs still needs to be done for effective administration system.