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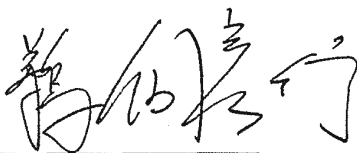
1. 合同評価報告書
2. 中間評価関連資料
(合同評価報告書／カウンターレポート)

**MINUTES OF MEETING
BETWEEN
THE JAPANESE FINAL EVALUATION MISSION
AND
THE AUTHORITIES CONCERNED OF
THE ROYAL GOVERNMENT OF CAMBODIA
ON
JAPANESE TECHNICAL COOPERATION PROJECT
ON PROMOTION OF MEDICAL EQUIPMENT MANAGEMENT SYSTEM**

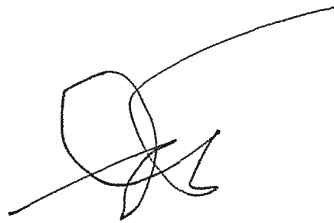
The Japanese Final Evaluation Mission, organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Cambodian counterparts of the authorities concerned formed a joint evaluation team to conduct a final evaluation on the Project on Promotion of Medical Equipment Management System from 19 August to 4 September 2008. The team has carried out a series of evaluation activities such as reviewing documents and interviewing relevant bodies and exchanged views about the findings and recommendations.

As a result of these exercises, both Cambodian and Japanese parties came to an agreement on the evaluation results and recommendation as described in the Joint Evaluation Report (hereinafter referred to as "JER") attached hereto.

Phnom Penh, Cambodia
September 4, 2008



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Leader
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**THE PROJECT ON PROMOTION OF
MEDICAL EQUIPMENT MANAGEMENT SYSTEM
IN THE KINGDOM OF CAMBODIA**

Joint Final Evaluation Report

September, 2008

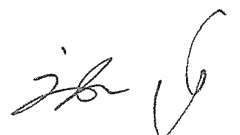
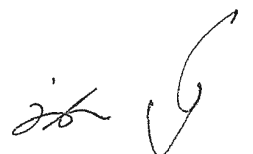
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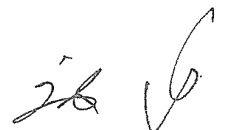
Table of Contents

1	Introduction	1
1-1	Outline of the Project.....	1
1-2	Background of the Evaluation Study	1
1-3	Objectives of the Evaluation Study.....	2
1-4	Members of Final Evaluation Mission	3
1-5	Schedule of the Evaluation Study	3
2	Methodology of Evaluation.....	4
2-1	Five Criteria of the Evaluation.....	4
2-2	Evaluation Questions and Indicators	4
2-3	Data Collection Methods	5
2-4	Limitations of the Evaluation Study	5
3	Achievements and Implementation Process	6
3-1	Inputs	6
3-2	Achievements of the Project.....	7
3-3	Implementation Process.....	18
4	Results of Evaluation with Five Criteria	19
4-1	Relevance	19
4-2	Effectiveness.....	20
4-3	Efficiency.....	22
4-4	Impact.....	22
4-5	Sustainability	23
4-6	Conclusion.....	25
5	Recommendations and Lessons Learned	26
5-1	Recommendations	26
5-2	Lessons Learned	29



Annexes

1. Project Design Matrix (PDM) and Plan of Operation (PO)
2. Study Schedule
3. Dispatch of Japanese Experts
4. Provision of Equipment
5. In-country Training by the Project
6. Names of Cambodian Counterparts Trained in Japan
7. Allocation of Cambodian Counterparts
8. Transition of Allocation of Cambodian Counterparts
9. Indirect Cambodian Counterparts at Target Hospitals
10. Cost Sharing by Cambodian Side
11. List of Participants of ME Technician Trainings
12. Score Criteria of Follow-up for Ex-trainees
13. Trend of Scores of MET Monitoring
14. List of Participants of ME Managers
15. Difference of Scores of Pre- and Post-tests by Group and Participant (ME Management)
16. ME management report evaluation criteria (ME Management Follow-up Check Sheet (In-house))
17. Result of Evaluation on ME Management Report
18. MEM-WG Follow up Criteria



Abbreviations and Acronyms

AOP	Annual Operation Plan
C/P	Counterpart
CPA	Complimentary Package of Activities
DAC	Development Assistance Committee
HSB	Hospital Service Bureau
HSD	Hospital Service Department
HSP	Health Sector Strategic Plan
HSSP	Health Sector Support Project
JICA	Japan International Cooperation Agency
MBPI	Merit Based Performance Incentive
ME	Medical Equipment
MEDEM	Promotion of Medical Equipment Management System
MEF	Ministry of Economy and Finance
MEM-WG	Medical Equipment Management Working Group
M/M	Man-month
MOH	Ministry of Health
MPA	Minimum Package of Activities
NH	National Hospital
NIPH	National Institute of Public Health
NMCHC	National Maternal and Child Health Center
NW	National Workshop
OD	Operational District
ODA	Official Development Assistance
OECD	Organization of Economic Cooperation and Development
PDM	Project Design Matrix
PO	Plan of Operation
PHD	Provincial Health Department
QI	Quality Improvement
RGC	Royal Government of Cambodia
RH	Referral Hospital
TOR	Terms of Reference
TWGH	Technical Working Group for Health
USD	US dollars

1 Introduction

1-1 Outline of the Project

The Royal Government of Cambodia (hereinafter referred to as RGC) has set out a strategy called Health Strategic Plan 2003-07 as national policy in the health sector (HSP, currently it is pursuing HSP2 2008-2015) and has been pursuing improvement of hospitals including medical equipment (ME) through construction and renovation as well as improvement of education for medical service providers. Maintenance and management of ME had been recognized as one of the most important concerns by the Ministry of Health (MOH) and development partners. However, the agency in charge, Hospital Service Department (HSD) of the Ministry had not been able to establish practical measures to manage ME in the whole country. Provincial public hospitals were facing many challenges such as insufficient number of ME at hand, and a large number of ME not in operation or prone to break down. These challenges are not only caused by technical capacity of ME technicians or operators but also by the way ME is managed. There was indeed a great need for establishing sound and comprehensive ME management system and improving capacity of HSD to give instructions to hospitals to follow the system.

JICA had been implementing Phase II of the Maternal and Child Health Project at National Maternal and Child Health Centre (NMCHC) since April 2000 for five years, which included activities to upgrade ME maintenance and management capacity of the Engineering Section. As a result, the Section started to receive requests from other hospitals for ME maintenance and training. Fee received through such services were used as ME maintenance, and ME management system inside the Centre started to function. Given the fact that this was the first successful case, MOH started to examine the way to spread out such system across the country.

Based on such background, did MOH request support to the Government of Japan to solve issues surrounding ME in this country. After a series of discussions and studies, it was decided to launch the Project on Promotion of Medical Equipment Management System (MEDEM Project) from January 2006 for three years, with an aim to introduce basic ME maintenance and management activities in hospitals as its main goal.

The contents of the Project are summarized in the Project Design Matrix (Annex 1).

1-2 Background of the Evaluation Study

1-2-1 Mid-term Evaluation

As confirmed in the Minutes of Meetings for the Mid-term Evaluation on the Project which was signed by both Cambodian and Japanese authorities on 4 October 2007, the Project had been making a good progress against its plan and toward the achievement of the Project Purpose. There are good signs that the capacity of project counterparts (C/P) is improving. However, there was a need to make more efforts for certain activities such as those under Output1, “administrative instruction of HSD of MOH on medical equipment management for target National Hospitals (NH) and Complementary Packages for Activity 3 Referral Hospitals (CPA3 RH) is strengthened with technical guidance of National Workshop (NW)”. In order to enhance the effectiveness and sustainability of the Project activities and its outputs, several recommendations were drawn, including those related to clarify and share the vision of ME management

in this country and roles of the organizations, mainly by holding more discussions among the Project Team, and by clarifying and agreeing the roles, responsibilities and relationship of Hospital Service Bureau (HSB) of HSD and NW/NMCHC.

1-2-2 Follow-up Activities of the Mid-term Evaluation

Thanks to the serious efforts made by both Cambodian and Japanese sides, the Project was able to submit its counterproposal to the recommendations from the Mid-term Evaluation. The proposal includes organization reforms such as creation of more integrated National Workshop Team with more clear responsibilities and relationship between each body as well as decision on clearer attainment level of each Output.

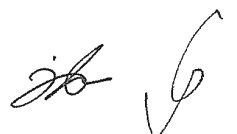
1-2-3 Final Evaluation

Following up the efforts made by the Project since Mid-term Evaluation and given the termination of the Project on 31 Dec 2008, JICA decided to conduct a joint final evaluation with Cambodian concerned authorities. An evaluation team, which is composed of a Japanese mission (as the member list in 1-4 below) including some members from Tokyo and a Cambodian team (*idem*) has been formulated in order to evaluate outcomes achieved and to discuss any issues to further enhance impact and sustainability of the Project from technical and managerial points of view.

1-3 Objectives of the Evaluation Study

Main objectives and outputs of the Final Evaluation are as follows:

- (1) To review outputs of the Project with the Cambodian counterparts based on relevant data and opinions identified through field surveys, meetings and interviews.
- (2) To evaluate the Project from the five evaluation criteria as designated by OECD/DAC: relevance, effectiveness, efficiency, impact and sustainability.
- (3) To make recommendations for measures that may need to be taken for the future by Cambodian and Japanese sides.
- (4) To produce an evaluation report based on the review and evaluation and to exchange the Minutes of Meetings, to which the evaluation report is attached, between Cambodian and Japanese authorities concerned.



1-4 Members of Final Evaluation Mission

(1) Japanese side

	Name	Mission	Job Title	Duration of stay
1	Mr. Hikoyuki UKAI	Leader	Deputy Resident Representative, JICA Cambodia Office	Resident
2	Mr. Yoichi SUGIURA	Medical Equipment Management	General Manager, Clinical Engineering Division, Tokyo Women's Medical University Yachiyo Medical Center	2008.8.27-9.5
3	Mr. Naoki TAKE	Evaluation and Analysis (Consultant)	Consultant/ Economist, Kaihatsu Management Consulting Inc.	2008.8.19-9.5
4	Ms. Masayo TERAKADO	Evaluation Planning	Assistant Resident Representative, JICA Cambodia Office	Resident

(2) Cambodian Side

	Name	Mission for MEDEM Project	Job Title
1	Prof. Eng Hout	Project Director	Secretary of State, Ministry of Health
2	Dr. Chi Mean Hea	Project Supervisor	Deputy Director General for Health, Ministry of Health
3	Dr. Sann Sary	Project Manager	Director, Hospital Service Department. Ministry of Health
4	Prof. Koum Kanal	Project Technical Advisor	Director, National Maternal and Child Health Center

1-5 Schedule of the Evaluation Study

See Annex 2.

2 Methodology of Evaluation

2-1 Five Criteria of the Evaluation

The Project is evaluated from the view of the following “five criteria”: relevance, effectiveness, efficiency, impact and sustainability.

(1) Relevance

Relevance of the Project is considered by compatibility of the Project with the Cambodian policy and programmes on the health sector and the policy and the programme of Japan to Cambodia, and appropriateness of the approach and design of the Project.

(2) Effectiveness

Effectiveness of the Project is evaluated through the analysis of the progress of the Outputs and the prospects of achievement of the Project Purpose.

(3) Efficiency

Efficiency of the Project is to analyze how efficiently the Inputs of the Project can be converted to the Outputs. Quantity, quality and timing of the Inputs are taken into consideration.

(4) Impact

Impact of the Project is to assess the longer-term effects of the Project: the prospects of achievement of the Overall Goal, and other unintended impacts regardless of positive or negative, direct or indirect.

(5) Sustainability

Sustainability of the Project is to examine the extent to which the achievements of the Project can sustain and expand even after the end of the Project, in terms of organizational, financial and technical aspects.

2-2 Evaluation Questions and Indicators

Based on the five evaluation criteria described in the previous section, evaluation questions are summarized in the evaluation grid. It also compiles the information on indicators used for evaluation, methods to collect, sources and criteria for analysis of the indicators define in PDM.

The basic questions are as follows:

(1) Relevance

- Is the direction of the Project compatible with Cambodian health policy and programs?
- Is the direction of the Project compatible with Japanese assistance policy and programs to Cambodia?
- Was the approach of the Project appropriately designed? Is it compatible with the needs of the target groups of the Project?

(2) Effectiveness

- Does the Project have the prospect to achieve the Purpose?
- To what extent the Project achieved Output 1?
- To what extent the Project achieved Output 2?
- To what extent the Project achieved Output 3?
- Are there any external factors that affect the achievement of the Project Purpose?

(3) Efficiency

- Were the number of Japanese experts dispatched, their expertise and timing of dispatch appropriate?
- Were the quantity and quality of inputs from Cambodian side appropriate?
- Were the activities of the Project properly implemented for achievement of the Outputs?
- Do medical equipment managers, deputy managers and technicians trained by the Project continue working at the same position?
- Do main counterparts of Cambodian side remain working for the Project?

(4) Impact

- Does the Project have the prospect to achieve the Overall Goal: basic maintenance of medical equipment is conducted at the target hospitals?
- Are there any positive or negative impacts through implementation of the Project?

(5) Sustainability

- Does the current Cambodian health policy continue to support medical equipment management even after the Project is finished?
- Can Bio-medical Engineering Unit continue to support medical equipment management after the end of the Project?
- Can the Cambodian side ensure the financial resources sufficiently to continue to support medical equipment management, including opportunities of cost sharing?
- Can the target hospitals have the prospect to continue medical equipment management system?

2-3 Data Collection Methods

Data are collected by document review, questionnaires to the counterparts and the target hospitals and interview with them and Japanese experts.

2-4 Limitations of the Evaluation Study

Due to constraints of the study period, the evaluation study team cannot visit all 22 target hospitals. Therefore, there is a limitation to cover the detail of the actual situation on medical equipment management.

3 Achievements and Implementation Process

3-1 Inputs

3-1-1 Japanese Side

(1) Dispatch of Experts

Since the commencement of the Project, three Japanese experts have been dispatched for the following five fields (Annex 3).

- Chief Advisor: 36 man-months (M/M)
- Maintenance of Medical Equipment: 7.43M/M
- Training Planning: 9.43 M/M
- Management System: 7.7 M/M
- Evaluation and Monitoring: 5.1 M/M

(2) Provision of Equipment

The following equipment has been procured (Annex 4). All of them function properly.

- 2 Project cars (53,000 US dollars (USD))
- 2 Photocopy machines (8,668 USD)
- Printer (2,190 USD)
- Computer (830 USD)

(3) Training Courses

The Project has organized the training courses for ME managers and technicians at the target hospitals and officers in charge of ME management at the Provincial Health Departments (PHD) (Annex 5). Costs are shared by the Cambodian side for some courses in 2006 and 2007.

It has also conducted training courses in Japan on the fields of administration of ME management and ME management system (Annex 6).

3-1-2 Cambodian Side

(1) Assignment of Counterparts

The counterparts of the Project have been assigned by the Cambodian side (Annex 7 and 8). Secretary of State for Health, Deputy Director General for Health, Director of NMCHC and Director of HSD have organized the management group for the Project. Four staff have been working for the Project at HSD after some were transferred. From NMCHC, five staff have been assigned.

At target hospitals, 18 CPA3 RHs and four NHs assigned the ME manager, the ME deputy manager and the ME technician to establish the Medical Equipment Management Working Group (MEM-WG) in the hospitals. They are regarded as the indirect counterparts for the Project (Annex 9).

(2) Local Cost for the Project

MOH provided accommodation for participants of the training courses for ME technicians. It could

also realize cost sharing of 8,853.15 USD for the ME management seminar from the MOH budget supported by Health Sector Support Project (HSSP) (Annex 10).

(3) Other Inputs

The Cambodian side has provided offices for the Project at MOH and NMCHC premises.

3-2 Achievements of the Project

3-2-1 Achievements of Output 1 and Activities

(1) Outline of Output 1: Administrative instruction of HSD of MOH on medical equipment management for target NHs and CPA3 RHs is strengthened, with technical guidance of NW.

Originally, HSD/HSB is responsible for management of medical equipment in public health facilities from the aspects of inventory management of equipment, facilitation of maintenance and repair and human resource development. However, prior to implementation of the Project, it could not fully implement its roles.

In order to facilitate ME management at the facility level properly, it is necessary to upgrade the capacity of HSD/HSB. Meanwhile, through the technical cooperation of JICA, the bio-medical engineering unit of NMCHC started to play a role of NW with providing preventive maintenance and minor repair of ME and conducting user trainings.

Therefore, designating 18 CPA3 RHs and 4 NHs as the target, the Project has sought strengthening administrative instruction of HSD on ME management with technical guidance of NW/NMCHC.

(2) Progress

Following five indicators are defined for evaluation of Output 1. Generally, compared to the situation of Mid-term Evaluation, a lot of improvements are identified and it is possible to conclude Output 1 has been achieved.

Indicator 1: Inventory is completed and regularly updated.

The database for management of ME inventory was developed and installed in September 2006 for the target hospitals. The master database for HSB was developed in January 2008 and the database for the hospitals was revised at the same time.

They are simply designed and NW/NMCHC was actively involved with their development. All target hospitals can manage update their inventories and send the data to HSB twice a year. HSB can also update the inventory regularly. Therefore, inventory management is functioning properly.

Indicator 2: Monitoring trip by HSD and maintenance service by NW are regularly conducted, and findings are fed back to their activity plans.

HSB and NW/NMCHC have jointly visited 73 times to the target hospitals for monitoring and follow-up of ME technicians since May 2007, while they have done 11 times for MEM-WG since July 2008. It was the first experience to conduct such a standardized monitoring visit for HSD and

NW/NMCHC, however they are now carrying out the visits, even in the absence of Japanese experts. According to the interview during the Evaluation Study, it is observed that the visiting team can now provide minor repair and instructions during the visit and forward major problems which cannot be solved on-site back to MOH for solution, which are useful for the hospitals. With the development of the ME technician monitoring criteria in July 2008, the instruction given by the visits have now clearer focus on the detail of ME activities.

Whenever they complete the visits, findings are reported at the meetings and reflected to the next monitoring schedule and the Annual Operation Plan (AOP) of HSD. Findings are also used to decide which hospitals to visit, and fed into contents of services for next visits.

Indicator 3: HSD prepares annual work plan by considering available human resources, financial resources and materials.

Under consultation of Japanese experts, HSB could properly prepare its AOP for 2009 with taking consideration of its human and financial resources, quarterly reports of activities, etc. The AOP firmly includes the activities being done by the Project such as supervision of ME management, follow-up of inventory registration of ME and brush-up seminars for the target hospitals as well as budgets required for such activities.

Indicator 4: HSB of HSD prepares quarterly report of their activities, and analyzes the progress.

The Cambodian side could realize huge improvement on regular reporting. After the Mid-term Evaluation in July-October 2007, some C/Ps were changed and their responsibilities were clearly assigned including compilation of the quarterly reports. Consequently, the reports have been submitted since 1st quarter of 2007. They were fully utilized and reflected to the preparation of AOP of HSD for 2009.

Indicator 5: HSD and NW are able to conduct training for medical equipment manager and technician.

With use of “To-do List” to clarify who should do what at when, and use of “Training Session Script Sheet” to note the name of instructors, the objectives of the training, time allocation, handouts/materials to be used, etc., now the Cambodian side are now able to conduct the trainings and seminars by themselves. Especially for training for ME technicians, C/Ps recently became able to make efforts to adjust the contents of trainings and seminars based on the curriculum vitae of participants. Furthermore, HSD has compiled the evaluation reports after each training, and they are reflected in the contents of next training session. According to participants’ responses to the post-training questionnaire, 80 to 90% of participants are satisfied with the arrangement of the training.

3-2-2 Achievements of Output 2 and Activities

(1) Outline of Output 2: Technical skills of medical equipment technicians in target NHs and CPA3 RHs is improved.

Prior to the Project, not all hospitals had ME technicians. Some technicians did not have proper

knowledge and skills to deal with ME problems, and many had not received trainings for ME management sufficiently. Furthermore, many did not have tool kits or workshops for ME maintenance and minor repair.

The Project is aimed at upgrading the knowledge and skill of ME technicians assigned at the target hospitals through activities to address the above-mentioned problems.

(2) Progress

It is also possible to conclude that Output 2 is achieved considering the progress of the following five indicators which are defined for evaluation of the Output.

Indicator 1: Number of trainees and instructors trained

The number of trainees and participants is as follows (Annex 11). The ME technician pre-training seminar and the technical training on ME maintenance covered all target hospitals based on PO. The ME technician brush-up training targeted the trainees participated in the courses in January and June 2007.

- ME technician pre-training seminar: 39
- Technical training on ME maintenance, theory course: 38
- Technical training on ME maintenance, practical course: 25
- ME technician brush-up training: 12

As for the training of instructors, two staff of HSB and five of NW/NMCHC were trained in the process of preparation for the training courses. A staff of NW/NMCHC was trained in Japan in October 2007.

Indicator 2: Number and types of training courses

The Project has implemented above-mentioned four types of training courses. The ME technician pre-training seminar in June 2006 was supplementarily conducted and was utilized for assessing the training needs of the technicians. The trainees of four-week technical training on ME maintenance practical course were divided into four groups to maximize effectiveness of the training.

Generally the training courses for ME technicians were implemented as scheduled. The Cambodian C/Ps could fully implement the technical training on ME maintenance practical course for the third and forth groups by themselves.

According to participants' responses to the post-training questionnaire, continuous improvements are observed in various aspects such as teaching attitude and skills. The participants also replied that basic knowledge of ME maintenance, preventive maintenance and roles of ME technician were useful subjects for their routine works and that they would start preventive maintenance and making ME inventories after the trainings.

Indicator 3: Number and types of developed manuals

Following needs assessment to ME technicians, manuals and checklists for ME maintenance and training curriculum were developed in both Khmer and English.

“Medical Equipment Maintenance Guide Book” is divided into two volumes. Part A includes basic

knowledge of ME management and maintenance. Part B consists of manuals and checklists for maintenance of selected equipment. Development of the manuals was slightly delayed, but this did not severely affect the implementation of the trainings. The manuals were revised three times so far, therefore the target hospitals are currently using the 4th edition.

Training curricula consist of one theory course on ME maintenance, four practical courses. They were also revised three times so far based on the evaluation of the previous trainings. The latest revision was done by C/Ps only. Most of the cases, distributed Guidebook is being utilized at the hospitals.

For most of the cases, it was observed that distributed Guidebook is being utilized at the hospitals.

The Project tried to improve the contents of these manuals and curricula by a series of revisions based on the feedback from training, reports and monitoring. This enhanced the understanding of instructors on training contents, and possibly the one of trainees as a result. (Same can be said to the ME management related manuals.)

Indicator 4: Difference in scores of pre-test and post-test conducted in the training courses makes constant progress.

In order to assess the improvement of knowledge and skills of trainees on ME maintenance, the Project conducted the pre-test and the post-test. Differences of scores between pre- and post-test are evaluated.

Table-1 shows the results by group. All participants could improve the scores. Especially, standard deviations¹ for all participants narrowed from 10.30 of pre-test to 7.21 of post-test, which means their knowledge on ME maintenance is standardized.

Table-1: Difference of Scores of Pre- and Post-tests by Group and Participant (ME Technicians)

	Pre-test			Post-test		
	Score	T-Score		Score	T-Score	
1	Kg.Cham	36	48.7	Kg.Cham	71	56.1
	Takeo	40	52.8	Takeo	70	54.7
	Kg.Thom	26	39.0	Kg.Thom	57	36.7
	Kg.Spue	42	54.6	Kg.Spue	59	39.5
	Battambang	25	38.1	Battambang	56	35.3
	Kossomak	39	51.7	Kossomak	74	60.3
Average (Group 1)		34.7		Average (Group 1)		64.6
S.D. (Group 1)		7.37		S.D. (Group 1)		8.02
2	Kandal	36	48.7	Kandal	60	40.9
	Siem Reap	45	57.5	Siem Reap	69	53.4
	Kampot	29	41.9	Kampot	63	45.0
	Kratie	39	51.7	Kratie	65	47.8
	Banteay Meanchey	48	60.4	Banteay Meanchey	64	46.4
	Pediatric	68	79.8	Pediatric	76	63.1
Average (Group 2)		44.2		Average (Group 2)		66.2
S.D. (Group 2)		13.47		S.D. (Group 2)		5.64
3	Prey veng HP	44	56.5	Prey veng HP	67	50.6
	Svay Rieng	41	53.6	Svay Rieng	64	46.4
	Koh Kong	40	52.6	Koh Kong	72	57.5
	Kg.Chhnang	29	41.9	Kg.Chhnang	60	40.9
	Pursat	35	47.8	Pursat	77	64.4
	Khmer Soviet	19	32.2	Khmer Soviet	55	33.9
Average (Group 3)		34.7		Average (Group 3)		65.8
S.D. (Group 3)		9.31		S.D. (Group 3)		7.99
4	Stung Treng	28	41.0	Stung Treng	75	61.7
	Ang Dourng	43	55.5	Ang Dourng	78	65.8
	Municipal	20	33.2	Municipal	56	35.3
	Sihanuk Ville	40	52.6	Sihanuk Ville	67	50.6
	Kg Cham2	42	54.6	Kg Cham2	73	58.9
	Mongkol Borey2	41	53.6	Mongkol Borey2	70	54.7
Average (Group 4)		35.7		Average (Group 4)		69.8
S.D. (Group 4)		9.44		S.D. (Group 4)		7.78
Average (All)		37.3		Average (All)		66.8
S.D. (All)		10.30		S.D. (All)		7.21

Source: MEDEM Project

¹ Standard deviation is to measure the gap of the test score among participants. The higher the number become, the bigger the gap of participants' understanding is.

Indicator 5: Project Team’s monitoring results for ex-participants make constant progress.

Performance of ME technicians at the target hospitals after trainings is most important. In order to facilitate the technical support from HSD and NW/NMCHC, the Project has carried out the monitoring and follow-up visits. During this activity, staff visiting the target hospitals have marked their performances on a scale of 100 with use of “ME technician monitoring criteria” (Annex 12) which was developed by the Project. The criteria comprises of the following parts: preventive maintenance, updating of ME inventory data, reporting work, actions taken for failure equipment, utilization of ME maintenance guidebook, cleanness and arrangement of maintenance workshop and management matter. The target score for the hospitals was also fixed at 70 after the Mid-term Evaluation.

Annex 13 shows the trend of scores. By August 2008, all target hospitals pass the target score of 70. 13 out of 22 hospitals achieved 90 or more.

3-2-3 Achievements of Output 3 and Activities

(1) Outline of Output 3: Management skill of medical equipment managers in target NHs and CPA3 RHs is improved.

Although MOH sets a guideline for ME management for RHs, most of them did not necessarily follow it due to the limited instructions from the Ministry. Prior to the Project, there was no clear organizational structure of ME management at many NHs and CPA3 RHs (which are now clear as defined as CPA3 Guideline). Thus, many of them did not know the role and responsibilities of ME managers and not sufficient amount of budget was allocated for ME management.

The Project has sought upgrade of the knowledge and skill of ME management at the target hospitals, as it has done in the field of ME technician.

(2) Progress

Following five indicators are defined for evaluation of Output 3. As far as the Evaluation Team can judge from the Indicators, it is possible to say that Outputs3 has been achieved. However, on-site observations on the progress might be required to capture the real progress of the Output.

Indicator 1: Number of trainees and instructors trained

The number of participants in ME management seminars is as follows (Annex 14). All seminars covered all target hospitals as planned in PO, and the pre-seminar (which is supplement to the original plan) and the seminar II also included PHD and Operational Districts (OD).

- ME management pre-seminar: 86
- ME management seminar I: 42
- ME management seminar II: 96
- ME management brush-up seminar: 64

As for the training of instructors, nine staff were trained for ME management. Eleven including non-C/P staff were trained on ME management reporting, and nine staff of HSD learned “5S”.

In addition, the number of C/Ps having on-the-job trainings is summarized below:

- ME management pre-seminar: 6
- ME management seminar I: 4
- ME management seminar II: 8
- ME management brush-up seminar: 7

The Project Supervisor and Manager were trained in Japan in July-August 2006, and a staff of HSD was trained in Japan in October 2007.

Indicator 2: Number and types of training courses

The Project has implemented above-mentioned three types of training courses. The ME management pre-seminar in April 2007 was conducted to assess the training needs of the managers. The ME management seminars were implemented twice in August and November 2007 and was followed by a brush-up seminar in June 2008.

Generally the training courses for ME managers were implemented as scheduled. According to the answers to the questionnaire to ME managers prepared by the Evaluation Team, they were satisfied with the courses since they could get knowledge on ME management, especially evaluation of the condition of ME and reporting to MOH. Some commented the courses enabled them to share the experiences of other hospitals.

Improvements in instructors, for example, increased capacity to respond to questions from participants are also recognized.

Indicator 3: Number and types of developed manuals

“The Manual of Medical Equipment Management” for National and CPA3 Referral Hospitals was developed as 1st version in November 2007, and the reporting forms of ME management were drafted at the same time. Following a revision of the manual and reporting forms, they were distributed at ME management brush-up seminar in June 2008. The manual was completed in Khmer and translated into English.

Indicator 4: Difference in scores of pre-test and post-test conducted in the training courses makes constant progress.

As for a result of the pre- and post-test in the ME management seminar in November 2007, participants could slightly improve the scores (Table-2 and Annex 15). However, according to the standard deviation for all participants, differences of knowledge among participants widened from 11.7 to 12.0 mainly due to the deterioration in the score of ME Managers and Deputy Managers.

Based on the feedback gained through the seminar, a brush-up seminar was provided in June 2008. No pre- and post-test were conducted at the seminar, but judging from the increase in the score for MEM report which raised from 72.5 to 84.7, it is possible to assume that understanding of participants on ME management is enhanced.

Table-2: Difference of Scores of Pre- and Post-tests by Group and Participant (ME Management)

	Pre-test	Post-Test
Average (PHD)	52.6	60.1
S.D. (PHD)	11.5	6.3
Average (RH Directors)	55.9	60.6
S.D. (RH Directors)	8.9	4.2
Average (ME Managers)	61.2	66.8
S.D. (ME Managers)	5.9	7.4
Average (ME Deputy Managers)	58.4	66.6
S.D. (ME Deputy Managers)	4.6	9.7
Average (ME Deputy Managers)	48.9	54.7
S.D. (ME Deputy Managers)	17.8	17.8
Average (All)	55.2	61.7
S.D. (All)	11.7	12.0

Source: MEDEM Project

Indicator 5: Project Team’s monitoring results for ex-participants make constant progress.

The target hospitals are responsible for submitting ME management reports to HSD in every June and December. HSD has marked the reports on a scale of 100 by using “ME management report evaluation criteria” (Annex 16). The criteria comprises of the following parts: punctuality of reporting, activities of members of MEM-WG, estimation of cost of repair and updating of ME condition. The target score of the hospitals was fixed for 70 after the Mid-term Evaluation.

Annex 17 shows the trend of scores. By June 2008, all target hospitals pass the target score of 70. 9 out of 22 hospitals achieved 90 or more.

In addition, in order to monitor and follow up the actual performance of ME management, the Project started to visit the target hospitals from July 2008 to complement the previous monitoring activities, using only MEM reports. Staff of HSD and NW/NMCHC has directly observed the performance and given advices, based on “MEM-WG Follow-up Criteria” (Annex 18). So far, they visited 11 hospitals and marked the score of more than 70.

3-2-4 Achievement of Project Purpose

The Project Purpose is that “basic maintenance and management activities for medical equipment are introduced at target NHs and CPA3 RHs, by following the instruction of MOH and by receiving technical guidance of NW”. The following three indicators are set for evaluation.

Indicator 1: Target NHs and CPA3 RHs submit annual activity report on medical equipment management to MOH through PHD.

Indicator 2: Based on the instruction manuals and checklist of medical equipment, periodical check and maintenance are conducted at target NHs and CPA3 RHs.

Indicator 3: Medical equipment management procedure is prepared and followed at target NHs and CPA3 RHs.

Judging from the designated three indicators, it can be said that the Project Purpose has been generally achieved although there are great varieties in the performance from hospital to hospital.

Indicator 1

It is confirmed that all target hospitals could manage to submit the ME management reports to MOH without delay. Based on the scores of evaluation of the reports with use of criteria described in Annex 16, all target hospitals pass the target.

Indicator 2

Indicator 2 can be evaluated by looking up the detailed scores of monitoring and follow-up for ME technicians. As for ME Maintenance Guidebook, the technicians of all target hospitals fully utilize it according to the ME technician monitoring criteria. Based on the interview by the Evaluation Team, some technician answered that they utilize it for reference at the time of preventive maintenance.

Concerning periodical preventive maintenance, all target hospitals started such activities, and some improved their performances. The number of preventive maintenance, minor repair and job records varies (Table-3).

Table-3: Preventive Maintenance, Minor Repair and Number of Job Records by Target Hospital
(January – 2 September 2008)

Hospital	Preventive maintenance	Preventive maintenance per ME	Repair	Total Job Records
Prey Veng RH	66	1.40	2	106
Siem Reap RH	95	0.68	25	278
K.g. Chhnang RH	44	0.47	19	67
Battambang RH	143	0.87	18	166
Stung Treng RH	1	0.01	6	9
K.g. Cham RH	14	0.08	15	97
Sampov Meas RH (Pursat)	267	2.45	9	316
Koh Kong RH	5	0.04	1	12
Chey Chumnas RH (Kandal)	6	0.07	7	31
Mongkul Borei RH (Banteay Meanchey)	82	0.51	3	167
Don Keo RH (Takeo)	90	0.57	35	279
Svay Rieng RH	52	0.53	5	102
Sihanouk Ville RH	97	1.01	1	103
K.g Thom RH	90	0.88	20	110
Kampot RH	65	1.00	15	88
K.g Speu RH	15	0.16	9	31
Kratie RH	0	0.00	0	0
Phnom Penh Municipal RH	50	0.59	0	50
Kossamak NH	116	0.61	53	171
Preah Ang Dung NH	75	0.83	4	114
Pediatric NH	46	0.23	22	68
Khmer-Soviet Friendship NH	8	0.02	0	8
Total	1,427	0.48	269	2,373

Source: MEDEM Project

Indicator 3

All target hospitals could manage to submit their annual action plan of ME management for 2009 without delay. Based on the results of monitoring and follow-up of 11 hospitals on ME management, all of them passed the score of 70 on a scale of 100.

3-2-5 Achievement of Project Overall Goal

The Overall Goal of the Project, which is expected to be achieved 3 to 5 years after the completion of

the Project, is that basic maintenance of medical equipment is conducted at NHs and CPA3 RHs, and the following four indicators are defined for evaluation.

Indicator 1: Operable rate of medical equipment is improved for all medical equipment at NHs and CPA3 RHs.

Indicator 2: Estimated equipment life is fulfilled for all medical equipment at NHs and CPA3 RHs.

Indicator 3: Number of preventive maintenance is increased, while repair cost is decreased during the estimated equipment life.

Indicator 4: Number of minor repair service by maintenance workshops at CPA3 RHs makes constant increase, while the one of the National Workshop (NW) decreases.

As for the prospect of achieving the Overall Goal, the Evaluation Team could confirm that the Project is actively pursuing goals beyond the Project Purpose and making a progress toward the achievement of the Goal. However it should be noted that the Team encountered the limitation of available data for indicators to actually measure the Overall Goal at the same time. Firstly some of the indicators became finally available through MEDEM Project activities. Therefore they should be used as baselines. Secondly availability and validity of the indicators to measure the Overall Goal are found to be questionable.

Indicator 1

Table 4 shows operable rates (as described “Condition of Equipment” in the table) and utilization rates of equipment. As of June 2008, 13 out of 22 target hospitals have over 80% for operable rates of ME, while 9 out 22 for utilization rates.

Table-4: Condition and Utilization of Equipment by Hospital in June 2008

No.	Name of Hospital	Condition of Equipment			Utilization of Equipment		
		Good and Fair (%)	Bad (%)	Unknown (%)	Daily and Sometimes (%)	Not Used (%)	Unknown (%)
1	Phnom Penh Municipal Hospital	95.3	4.0	1.2	92.9	5.9	1.2
2	Kandal Referral Hospital	75.6	15.9	8.5	74.4	18.3	7.3
3	Kampong Speu RH	87.0	13.0	0.0	87.0	13.0	0.0
4	Takeo RH	91.8	7.6	0.6	86.7	12.7	0.6
5	Prey Veng RH	61.7	36.2	2.1	59.6	40.4	0.0
6	Kampong Chhnang RH	83.9	9.7	6.5	81.7	15.1	3.2
7	Svay Rieng RH	76.8	20.2	3.0	72.7	25.3	2.0
8	Kampong Cham RH	88.3	8.2	3.5	86.6	9.9	3.5
9	Kampot RH	56.9	20.0	23.1	56.9	0.0	23.1
10	Kampong Thom RH	75.5	22.6	2.0	70.6	25.5	3.9
11	Pursat RH	85.3	12.8	1.8	79.8	18.4	1.8
12	Sihanouk Ville RH	87.5	12.5	0.0	79.2	20.8	0.0
13	Koh Kong RH	69.3	30.7	0.0	64.9	35.1	0.0
14	Battang Bang RH	89.0	1.8	9.2	87.8	3.1	9.2
15	Siem Reap RH	88.5	10.8	0.7	88.5	10.8	0.7
16	Kratie RH	72.1	27.0	0.9	64.0	36.0	0.0
17	Banteay Meanchay RH	73.9	24.2	1.9	70.9	27.2	1.9
18	Stung Treng RH	92.7	7.3	0.0	85.4	14.6	0.0
19	Ang Duong NH	88.9	11.1	0.0	84.4	15.6	0.0
20	Preah Kossamak NH	80.5	9.0	10.5	77.9	11.6	10.5
21	Khmer Soviet friendship NH	68.3	19.8	11.9	62.2	25.9	11.9
22	National Pediatric Hospital	89.7	10.3	0.0	79.8	20.2	0.0
	All NHs	77.0	14.9	8.1	73.3	18.9	7.8
	All CPA3 RHs	82.0	14.7	3.3	78.7	18.3	3.0
	All Target Hospitals	80.4	14.8	4.9	76.9	18.5	4.6

Source: MEDEM Project

However since the data with clear criteria became newly available as results of the Project, it is difficult to measure the year-to-year trend of the rates at the moment. Furthermore, it might be useful to examine the relevance of operable rates as an indicator for the Overall Goal.

The Manual of Medical Equipment Management for National and CPA3 Referral Hospitals, developed by the Project as a product and distributed in June 2008, clearly defines how the hospitals evaluate condition of the equipment and its utilization. This criterion enables the Cambodian side to get comparable indicators on current condition of medical equipment based on the standardized method.

Indicator 2

Currently it is difficult to measure this Indicator. According to the inventory of ME, dates of manufacturing and installation cannot be obtained for a lot of equipment. Furthermore, it is necessary to define the meaning of “estimated equipment life”.

Indicator 3

Table-5 shows the current situation on preventive maintenance and expenses on repairing ME at the target hospitals as of June 2008. Standardizing the number of preventive maintenance by the number of ME, hospitals like Prey Veng, Siem Reap, Battambang, Pursat, Banteay Meanchey, Takeo, Svay Rieng, Sihanoukville, Kampong Thom, Kampot, Phnom Penh Municipal, Kossamak and Preah Ang Doung are exceeding the average (0.48).

Table-5: Preventive Maintenance and Estimated Repair Cost by Hospital

Hospital	Preventive maintenance	Preventive maintenance per ME	Repair Cost in 2007 (Riel)
Prey Veng RH	66	1.40	N.A.
Siem Reap RH	95	0.68	N.A.
K.g. Chhnang RH	44	0.47	N.A.
Battambang RH	143	0.87	N.A.
Stung Treng RH	1	0.01	N.A.
K.g. Cham RH	14	0.08	347,950,039 *
Sampov Meas RH (Pursat)	267	2.45	N.A.
Koh Kong RH	5	0.04	N.A.
Chey Chumnas RH (Kandal)	6	0.07	42,000,000
Mongkul Borei RH (Banteay Meanchey)	82	0.51	4,000,000
Don Keo RH (Takeo)	90	0.57	12,893,818 *
Svay Rieng RH	52	0.53	7,472,000
Sihanouk Ville RH	97	1.01	3,000,000
K.g. Thom RH	90	0.88	265,700
Kampot RH	65	1.00	15,014,500
K.g. Speu RH	15	0.16	N.A.
Kratie RH	0	0.00	21,000,000
Phnom Penh Municipal RH	50	0.59	8,800,000
Kossamak NH	116	0.61	2,720,200
Preah Ang Dung NH	75	0.83	N.A.
Pediatric NH	46	0.23	28,400,000 **
Khmer-Soviet Friendship NH	8	0.02	N.A.
All Target Hospitals	1,427	0.48	

* including purchase of new ME and spare parts

** cost in 2006

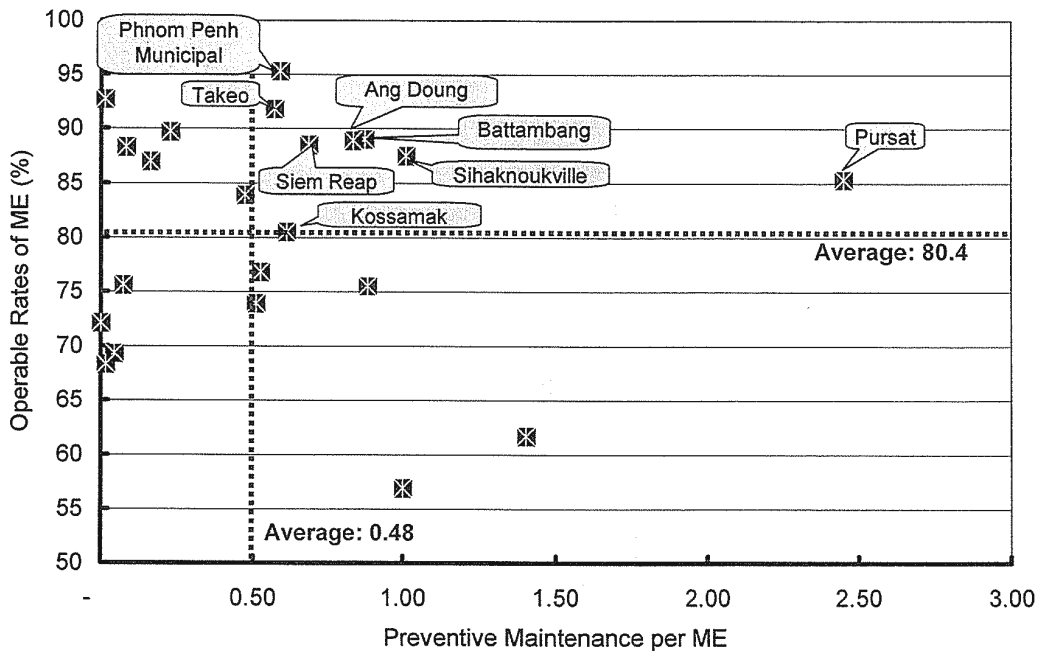
Source: 1. MEDEM Project for preventive maintenance. Data are as of June 2008.

2. Answers to questionnaires to the target hospitals for repair cost

Relationship between the current performance of preventive maintenance and operable rates of ME is described in Figure-1². It shows little correlation between the two indicators. Pursat, Takeo, Battambang, Sihanoukville, Ang Doung, Siem Reap, Phnom Penh Municipal and Kossamak are beyond the average of both preventive maintenance and operable rates. There is a need to examine the validity of this indicator which tried to compare the number of preventive maintenance and repair cost. We can assume that there are many external factors affecting the operable rate apart from the number of preventive measures, for example, production date of ME, disposal of ME, users' behaviour, environment surrounding ME, donor support and availability of budget and spare parts.

Also, these data are regarded as the baselines, and MOH and the hospitals are encouraged to continuously improve accuracy of the information and monitor them to observe the progress in the future if relevant.

Figure-1: Preventive Maintenance and Operable Rates of ME as of June 2008



Source: Data from MEDEM Project

Indicator 4

As for the number of minor repair at NW/NMCHC, it is 22 in 2006 and 14 in 2007. As indicated in Table-3, the number of minor repair varies from hospital to hospital. Siem Reap, Kampong Chhnang, Battambang, Kampong Cham, Takeo, Kampong Thom, Kampot, Kossamak and National Pediatric perform more than 10 times of minor repair in 2008 (but no data available in 2006 and 2007). It is impossible to measure and compare the year-to-year trend of this Indicator.

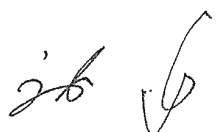
² Accuracy of “preventive maintenance per ME” used as an indicator to measure correlation with operable rates of ME should be carefully examined. It should take consideration of the fact that each ME requires different numbers of preventive maintenance, depending on type and date of production.

3-3 Implementation Process

The Project made a number of efforts to facilitate the implementation of the Project.

For example, the Project has regularly held the workshops for monitoring the progress of activities and revised PDM timely, with referring to PDM and PO.

Another example is its efforts to have as many opportunities for discussions among the Project as possible. Taking advantage of the opportunities like the Mid-term Evaluation and Joint Coordination Committees, the Project actively engaged in discussions to ensure the sustainability of the activities and organizations required for ME management, and ownership of the Cambodian side. It is plausible that these efforts resulted in the change of C/Ps and reorganization of the C/P organization into more integrated team of HSB and NW/NMCHC with clearer roles and responsibilities of HSB and NW/NMCHC. The Mid-term Evaluation also enabled the Project to set the concrete targets to some indicators for evaluation.



4 Results of the Evaluation with Five Criteria

4-1 Relevance

It is possible to conclude that relevance of the MEDEM Project is high for the following reasons.

(1) Relevance to the Cambodian Policy

The RGC's national policy in health sector, namely Health Strategic Plan (HSP) 2003-2007, at the time of the Project commencement, set improvement of health services as one of its important strategies. Appropriate maintenance and management of ME is necessary to improvement of health services, and therefore the Project fitted well to contribute to the implementation of the policy. The current policy, HSP 2008-2015, also clearly commits to increasing "investment in physical infrastructure and ME", as well as to improving management and maintenance for infrastructure and ME.

(2) Relevance to the Japanese Policy

The Project is in the line of the general direction of 'the Japan's Assistance Policy for Cambodia', considering the possibilities that, in the long run, the Project serves to improve the health services, which is included in the priority areas of the Policy. The Project also constitutes an important component of JICA 'Program for Strengthening Health Care Services' in a sense that the Project tries to address issues surrounding ME which is at foundation of health care services, and contributes to both human resources development and system development related to ME. Furthermore, considering that the expenses on equipment provision in JICA projects in health sector compared to other sectors, the focus of the Project can be considered as relevant.

(3) Relevance to the needs of MOH and target hospitals (Stakeholders of the Project)

Considering the situation at the target hospitals where the number ME is on increase from 2,340 in 2006 to 2,948 in 2008, the contribution of the Project cannot be neglected. Hospitals also recognize the importance of addressing the problems related to ME. While there is a clear need expressed, especially among ME technician, for knowledge and skills for repairing ME at hospitals, the Project was not designed to include components to meet such demands. This can be justified by the following:

- (1) The Project had to have clear focus on preventive maintenance so that ME would not get broken especially at the time of Project commencement when there is no ME management system and virtually no services from ME agents. This is because (a) the nature of ME repair which generally requires highly sophisticated techniques and which actually forces hospitals in the developed countries to outsource such functions to ME supplier or specialized agencies, and because (b) financial resources available in this country, and
- (2) The project term was only three years.

Demands for support to ME user training, infrastructure development, and spare parts procurement were also identified at the time of Project development. However, it is appropriate not to include activities to deal with these challenges in this Project because of the relatively short Project term and characteristic of technical cooperation project.

(4) Relevance of the Skills and Knowledge

The Evaluation team recognized the relevance and appropriateness of the skills and knowledge transferred by the Project. Curriculum and materials used for the training are carefully elaborated based on the textbooks used in Japanese educational institutes for clinical engineers, and the contents are appropriate for Cambodian ME technicians to learn basic knowledge on ME. Also, during the practical courses, actual ME and measurement devices are utilized, and this approach can be considered as practical and effective.

4-2 Effectiveness

Effectiveness of the Project can be confirmed as high. The following is the background to make this conclusion.

(1) Prospect to Achieve the Project Purpose

As described in “3-2-4 Achievement of the Project Purpose”, the Project Purpose has been generally achieved although there are varieties in the performance from hospital to hospital. Indicator 1 was fulfilled since all hospitals has submitted the ME management reports and exceeded the target score of 70. With regard to Indicators 2 and 3, it was observed that all hospitals started to plan and conduct “periodical check and maintenance”, and follow “ME management procedures”.

(2) Appropriateness of Outputs to Achieve the Project Purpose

Outputs (capacity building of three levels at central ministry, technicians at hospital, and its management) are appropriate for achieving the Project Purpose since these three outputs are all indispensable to introduce sound ME management system and the logic is in line with the principles for capacity development.

As mentioned in 3-2-1, 2, 3, it was confirmed that most of the Outputs are successfully achieved judging from the progress of each Indicator.

Qualitative data also confirm the steady achievement of the Outputs as well. For example, with regards to the Output1, the monitoring visits by HSD and NW/NMCHC is perceived by hospitals as a good opportunity to get encouragement to engage in ME management activities as well as fruitful advices and consultation on ME repair. Many hospitals eagerly request HSD and NW/NMCHC to continue the visits, at least twice a year.

These achievements contributed to fulfilling the Project Purpose.

(3) Factors Promoting Effectiveness

Other activities and efforts at hospitals inside as well as outside of the Project also affect the performance of ME management activities.

While almost all target hospitals conduct periodical check and maintenance, it is also found that there are differences of the number of preventive maintenance among them. Figure-2 shows the relationship between the number of preventive maintenance per ME and monitoring scores for ME technicians as an indicator to improve their skills, and Figure-3 draws the relationship between the number of preventive

maintenance per ME and the scores of ME management reports as an indicator to improve ME management. Pursat, Takeo, Sihanoukville and Kossamak perform both preventive maintenance and scores of ME technicians and ME monitoring reports.

Figure-2: Preventive Maintenance and Latest MET Monitoring Scores

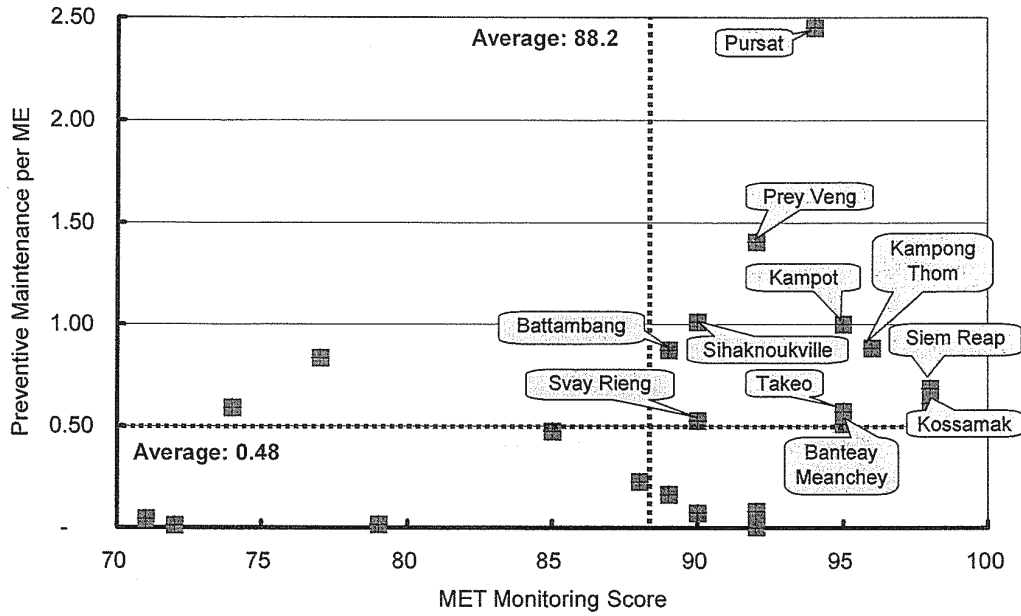
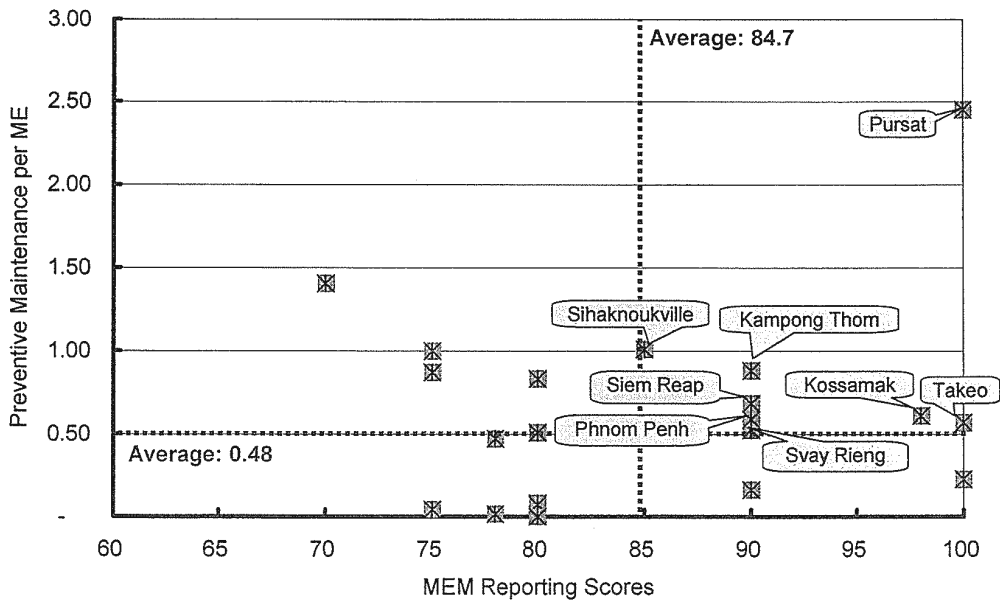


Figure-3: Preventive Maintenance and Latest ME Management Report Scores



Source: Data from MEDEM Project

Based on the observation of the Evaluation Team, these hospitals seem to have favorable environment

that enables MEM-WG to cooperate with other clinical departments smoothly. For example, Sihanoukville organizes a hospital management committee, which the director chairs and all heads of departments are members. Deputy Director (also ME manager) actively participates in the committee and shares knowledge of ME management and information on the current situation of ME. Such opportunities facilitate cooperation with other departments for smooth implementation of ME management activities like preventive maintenance. MEM-WG also can utilize reliable information on ME. In Kossamak National Hospital, MEM-WG closely communicates with other departments on ME management at regular meeting. All of them lay a foundation where problems related to ME are discussed for solution.

These hospitals also communicates with PHD well. Since reliability of information on ME increases, they can have a chance to get support from PHD more smoothly. PHD also can grasp the detail of ME condition and take necessary actions more easily, e.g. facilitating to request more budget from MOH and seeking support from development partners.

4-3 Efficiency

It is possible to affirm that efficiency of the Project is considerably high. Generally inputs for the Project can lead to the Outputs efficiently.

Quantity, quality and timing of the inputs from Japanese side can be evaluated as appropriate. Performance of Japanese experts is satisfied by Cambodian counterparts.

Cambodian counterpart personnel of HSD, an input from Cambodian side, were frequently changed, however, it resulted in positive development to improve the management and operation of the Project.

One of the important and significant inputs from Cambodian side is cost-sharing. As described in Annex 10, from 2007, there was a remarkable increase in their financial contribution to the MEDEM training operation, mainly through the support to trainees' accommodation and operational cost (HSSP supported MOH's budget).

It is also important to note here that the Project design contributed to increase the efficiency by fully utilizing the outcome of the Phase II of the Maternal and Child Health Project at National Maternal and Child Health Centre (NMCHC).

4-4 Impact

Although it is too early to conclude the prospect to achieve Overall Goal, it is possible to say that the Project has some positive impacts.

(1) Prospect to achieve the Overall Goal

As described in 3-2-5, the Project is actively pursuing goals beyond the Project Purpose and making a progress toward the achievement of the Goal. However it should be noted that the Team encountered limitation of available data for Indicators to actually measure the Overall Goal at the same time. It is necessary to take appropriate measures recommended in the next chapter in order to achieve indicators like improvement of operable rate of ME.

(2) Positive Impacts of the Project

Project brought a number of impacts which were not foreseen at the time of the Project commencement.

One of the biggest was the reorganization of HSD and NW/NMCHC. Following the recommendation from the Mid-term Evaluation, the Project had a series of discussions to identify the way to clarify and share the vision of ME management and roles of HSD and NW/NMCHC. MOH reached a decision to reorganize the HSD and NW/NMCHC with clearer responsibilities and TORs, which resulted in the increased functioning of HSD. Another positive impact regarding the function of HSD is the introduction of a culture of making reports. After HSB started to make quarterly reports as a result of MEDEM Project efforts, the Director of HSD decided also to require other sections such reporting and now we can see such reporting system is functioning properly inside HSD.

Second positive impact of the Project is observed at some hospitals and PHDs. Those which are engaged in hospital management or quality improvement (QI) activities (some with support from development partners) increased their recognition on the importance of ME management. They are trying to ensure linkages between these activities. HSD also recognizes the synergies between the two and will start considering how to practically integrate ME management into hospital management. In addition, for some hospitals and PHDs, the Project provided them concrete information through the inventory system and database, to negotiate budget and support from MOH as well as development partners. Especially for the budget from MOH, there is now a tendency where hospitals and PHD recognize the importance of evidence-based development of AOP.

At policy level, Project brought important impacts, namely to the revision of CPA and MPA guidelines, which defines important standards of services and infrastructure at hospitals and health centers. The impact is significant considering that the Project could provide inputs based on its experiences at fields into the process so that the guidelines are able to meet the real situation and needs of the country.

Lastly, the Project also brought positive impacts to other Official Development Assistance (ODA) activities such as Japan's grant aid projects and all of the other on-going 3 Technical Cooperation projects. Counterparts of such projects received relevant information and technical inputs from the Project concerning ME. Another beneficiary is HSSP, one of the biggest support programs to the Cambodian health sector. The Project provided a number of technical inputs and advices to HSSP's hospital renovation and ME procurement activities, which was indispensable to advance their tasks.

4-5 Sustainability

Sustainability of the Project has significantly improved since the Mid-term Evaluation.

(1) Policy

The current national policy and assertion from the top management of MOH provide strong foundation for promotion of ME management.

(2) Organization

There are positive remarks from the counterparts that required tasks are carried out smoothly thanks to

the reform to clarify the responsibilities and Terms of References (TORs) of the NW team after the Mid-term Evaluation. Achievements of indicators in Output 1, such as development of sound AOP and reports, testify such improvements.

At the same time, there is a phenomenon which should not be overlooked. As capacity and performance of HSB are enhanced, and HSB staff is making a lot of efforts and upgrading its performances, requests from those who started to appreciate and realize the utility of their services increase at the same time. As a result, the workload of HSB has been intensified drastically and there is a danger that the unit would be overloaded.

The management of MOH is well aware of the phenomena and considering the way to encourage the staff such as introduction of Merit Based Performance Incentive (MBPI) which awaits the responses from the Department of Personnel of Ministry of Health. More tasks to different bodies including NW/NMCHC or possibly at hospital level can be delegated in the future.

With regard to NW/NMCHC, prospect of sustainability of the organization is fair with clear TOR and commitment from the management.

(3) Finance

Although the MOH budget spent on ME has been on decrease in these few years, there is a trend that MOH attaches the importance and allocates relatively higher budget to capital spending. There is also a good sign that both central and provincial level, the recognition for developing evidence-based-AOP is ever rising as demonstrated in those for HSD which included clearly activities introduced by the Project to be continuously carried out in 2009. This is the first important step to obtain national budgets including HSSP. However, it is necessary to have strong advocacy with related departments to actually secure the allocation.

(4) Sustainability at Hospital Level

Prospects are greatly improved. Strong ownership and commitment to ME management activities are observed in several hospitals. The sense that there is now support and monitoring from the central level contributes to raise their motivation to the great extent, and push up the need for continuation of the monitoring visits from MOH. Helped by the existing activities related to hospital management as well as donor coordination mechanism at provincial level (pro-TWGH), ME management activities started to take root at some hospitals, leading to make environment where hospital together with PHD and development partners as a whole to rigorously engage in ME management.

Financing ME management activities still pose a big challenge. As mentioned earlier, emerging culture for evidence-based-AOP development would pave the way for increased budget allocation from central MOH to ME management activities at hospitals. However, actual allocation of budget from MEF, MOH central and down to the governor to PHD and hospitals still requires a lot of efforts by the management staff at each level. They should understand the importance of such budget and there is a task for MOH management to increase further efforts to raise the awareness and mobilize the actions. Another possible budget for ME is user fee at hospitals. There is no case observed where user fee at provincial hospitals are systematically and effectively utilized for ME for the time of the Evaluation and MOH can usefully study

successful cases and could consider the way to spread such cases to others in future.

Similar to finance is the challenge of human resources. Some of the target hospitals have only 1 ME technicians. It is plausible that MOH had already made several efforts to recruit more ME technicians, but it is unfortunate that such efforts could not bear the fruit. MOH is currently thinking to take more active measures to recruit such technicians for next year and the effort should be encouraged.

4-6 Conclusion

It is concluded that the Project has generally achieved the Project Purpose to introduce basic ME maintenance and management activities at the target hospitals in spite of the great varieties in the performance from hospital to hospital.

One of the biggest attributions is the achievement of the Outputs. At the central level, HSD raised its capacity to give administrative instructions and the NW team started to play a leading and supportive role to promote ME management, through activities such as training, monitoring and follow-up visits. The ME database developed by the Project also enables HSD to have a concrete image of current ME conditions at hospitals.

At the hospital level, knowledge and skills of ME managers and technicians were upgraded, and on-site activities mainly through the newly organized MEM-WG are started, including preventive maintenance and minor repair.

Impacts of the Project are not negligible. It is now possible to assert that the Project is actively pursuing goals beyond the Project Purpose. Actually, it is making a steady progress toward the achievement of the Overall Goal where the target hospitals is supposed to actually conduct ME management with improvements around ME conditions such as increased operable rate. Example of the Project's impacts include; reorganization and enhanced function of HSB and NW/NMCHC (the NW team), enhanced culture of developing evidence-based-AOP both at central and provincial levels, and contributions to the development of national policies/guidelines and activities such as HSSP.

Sustainability of the Project was found to be improved significantly since the Mid-term Evaluation. However, there are several challenges in order to ensure the achievement of the Overall Goal. Firstly, there should be countermeasures to address ever-increasing workload of HSB as an organizational challenge. Option might include the delegation of the tasks to NW/NMCHC and in future to hospital levels. Secondly, ensuring sufficient budget as well as minimum level of human resources for ME management activities both at the central and provincial levels is an important task of MOH, although there is a significant improvement in AOP development process and remarkable efforts to increase the staff recruitment.

To improve conditions of ME (e.g. operable rate) at hospitals is an indicator to achieve the Overall Goal. How to ensure this achievement through the newly introduced ME management is a challenge. One of the important findings of the Project is that sound hospital management is a key to well-functioning MEM-WG. This enables the output of MEM-WG activities and information to be effectively utilized, which increases the possibility for ME-related problems to be actually addressed.

5 Recommendations and Lessons Learned

5-1 Recommendations

5-1-1 Recommendations to MOH as a Whole

(1) Ensure Favorable Working Environment for ME Technicians

As some of the target hospitals do not have proper workshops for ME maintenance, ME technicians have difficulties in implementing what they learned at the trainings. HSB and NW/NMCHC repeatedly advise the hospitals to establish the workshops at the time of monitoring and follow-up, it seems difficult for many reasons. It is recommended that MOH analyze the bottlenecks, elaborate the standard for workshops such as “Complementary Package of Activities Building Brief – Referral Hospitals” in December 2003 and ensure its own budget and other sources of funds so that hospitals can accelerate the establishment.

It is found that currently ME technicians can not execute the full time activities for ME management at five target hospitals as they are forced to spend a part of time for working for PHD and OD and for other administrative duties at the hospitals. It is recommended that MOH facilitates to seek solutions by enhanced talk with the management of hospitals and by increased recruitment of human resources.

(2) Take More Proactive Approach to Recruitment of ME Technicians

It is remarkable that MOH has attempted to recruit more ME technicians following the results of Mid-term Evaluation. It has not bore the expected result unfortunately, and HSD in collaboration with the Personnel Department, could usefully enhance the activity for recruitment by direct and more proactive contacts to technical colleges to disseminate recruitment information. It is recommended that MOH rigorously implement such active approaches.

(3) Ensure Enough Budget through Preparation of AOP, Enhanced Negotiation with Relevant Authorities and Identifying Good Practices for User Fee Utilization

The Project enabled the Cambodian side to access reliable information on current status of ME including estimated costs of repair and to expand the opportunity to plan the concrete actions and ensure the budgets based on the information. It was confirmed that the information was utilized at the time of mid-term review of AOP for 2009 and also for preparation of AOP for 2010. It is strongly recommended that MOH continues such practice.

As mentioned earlier, actual allocation of budget from Ministry of Economy and Finance (MEF), MOH central and down to the governor to PHD and hospitals still requires a lot of efforts. Each agency should understand the importance of the ME related budget and there is a task for MOH management to increase further efforts to raise the awareness and mobilize the actions.

Another important financial source for ME is user fee at some hospitals. MOH could usefully study on cases where user fee at provincial hospitals are systematically and effectively utilized for ME management in the framework of good hospital management, and consider the way to spread such cases to others in future.

(4) Share and Utilize the Information and Outputs Gained through the Project

In order to upgrade the quality of health services in Cambodia through the expansion of ME management activities, it is recommended that MOH takes measures to widely share the data and information on ME management obtained through the Project (e.g. operable rates of ME and repair cost at the hospitals) with the other relevant organizations such as the other departments and institutions of MOH, National Hospitals, development partners, etc.

MOH should also instruct and encourage the hospitals to share the information with PHD and development partners active in their provinces. Dissemination of the information and active discussion on ME management issues at pro-TWGH is a good option.

(5) Efforts to Achieve the Overall Goal

MOH is encouraged to continue and develop the on-going efforts to pursue the Overall Goal of the Project.

For example, some of the target hospitals face low operable and utilization rates of ME. There are a number of factors influencing these rates, including smooth disposal and replacement of inoperable equipment and capacity of ME users apart from proper preventive maintenance and minor repair. Therefore it is recommended that MOH analyzes these factors and continues to make efforts to improve utilization of ME from various aspects. For example, for short-term perspective, it is encouraged to continue encouraging the target hospitals to collect information on unknown ME and follow ME dispose procedures. For longer-term perspective, it is recommended that MOH analyze the situation and set concrete target and strategy to improve operable rate and utilization rate.

At the same time, we should not forget that the ultimate goal of the ME management beyond the Overall Goal of the Project is to improve the quality of hospital services. MOH is kindly invited to ensure the linkage of these two elements by integrating ME management into hospital management activities and to establish mutually-enforcing relationship between ME management and clinical services at hospitals.

(6) Explore Application of the Lessons Learned to Other Activities in Hospitals

MOH is kindly invited to explore possible application of the success of the MEDEM Project into other field. The Evaluation Team found that the Project successfully establish a management system for ME at hospitals, by introducing mechanism to functionalize three important elements for sound “management”: (1) upgrading of technique of individual and organizational level, (2) enhancing information and database, and (3) strengthening system (finance, human resources, and equipment and manuals). It also provided system which provide these three important elements are connected, namely MEM-WG MOH, for example, HSD could usefully analyze the background of such success and apply to other field of hospital management such as drug management and clinical services.

5-1-2 Recommendations to HSD

(1) Integrate ME Management with Hospital Management and QI

There are important activities related to ME management. National Institute of Public Health (NIPH) is

active in providing hospital management courses. HSD has been promoting the activities regarding QI at Quality Assurance Bureau as well as ME management at HSB simultaneously. Since ME management and QI activities are part of hospital management and interrelated, it is strongly recommended that HSD coordinate activities to integrate them. For example, the evaluation sheet for QI includes the condition of ME as a component, so criteria for ME monitoring by the Project can be applied.

(2) Human Resource Management of HSB

HSB could successfully upgrade its function through the implementation of the Project. However, the more capacity they have, the more workload they ought to deal with. In order to overcome the situation, the Director of Hospital Service is well aware of the situation and considering the way to encourage the staff such as introduction of MBPI which awaits the responses from Department of Personnel in MoH. It is recommended that HSD continues robust negotiation for increase its human resources, and at the same time, considering other measures to streamline the workload of its staff. Delegation of more tasks to different bodies including the NW/NMCHC or possibly at hospital level might be another option to be considered in the future

(3) Enforce the On-going Efforts to Support Hospitals

The enhancement of the NW team (HSB and NW/NMCHC) capacity to support hospitals was quite remarkable so far and should be continued. As mentioned earlier, monitoring visits are strongly welcomed by hospitals and therefore needs to be continued and expanded. The NW team should recognize the importance of checking the real situation of hospitals through such visits in addition to the monitoring through reporting. Secondly, instruction and advices that monitoring visits provide hospitals should be continuously improved and upgraded. Thirdly, the NW team is encouraged to enhance its efforts to share good practices from hospital to hospital. Lastly, it is also very important to give as much encouragement as possible to hospitals.

(4) Consider Establishment of a Mechanism to Spread ME Management across the Country

With more monitoring and follow-up activities are being carried out by the Project, differences in awareness and performances on ME management among hospitals are clearly observed. So far, the Project took a bottom-up approach, trying to standardize the level of all hospitals by focusing on the follow-up and support for poor performers. As one of options to spread out ME management across the country more effectively and efficiently, it might be useful to consider the way to establish a mechanism where better-performing hospitals enhance their capacity and support other hospitals.

5-1-3 Recommendations to NMCHC

NMCHC has already committed to continue both in-house and external services of ME management as a leader in the field. Furthermore, it is expected to make efforts to support and develop the capacity of the hospital that can play a leading role as a hub of specific areas.

5-1-4 Recommendations to JICA

JICA Projects do not provide financial incentives for local C/Ps. However, it should consider measures to address difficulties which MOH is facing, such as ever-increasing workload compared to the level of salaries. For example in this Project, Japanese experts tried to facilitate their initiatives and ownerships, and played a role of advisors to move toward the goals through development of their capacities. Whenever they realize the achievements, the experts encouraged them. Another option might be to explore the way to make efforts to increase the efficiency of the project activities and tasks.

In order to enhance the collaboration with other development partners in the related areas like hospital management, it is recommended to arrange the environment that enables to share the information and take concrete actions.

5-2 Lessons Learned

5-2-1 Project Design

(1) Effective Use of Existing Resources

Utilization of existing NW/NMCHC that upgraded the skills through the Phase II of the Maternal and Child Health Project at NMCHC efficiently contributed to development of the capacities of HSD and transfer of the skills to the target hospitals.

(2) System Approach

Establishment of ME management system through upgrading the capacities of central government (HSD), ME technicians and managers is in line with the concept of capacity development. Clarification of roles and responsibilities and establishment of network where they collaborate and monitor each other contribute to enhancement of the effects of the Project.

(3) Consider How to Respond to the Needs of “Repair”

Although it was not under the scope of the Project, there is a fact that hospitals are actually facing the failure equipment, and ME technicians are requested to deal with them. During the visits by the Evaluation Team, they expressed needs to get more knowledge and skills for repair. There is a task for MOH and JICA to discuss how to meet the needs as a next step.

5-2-2 Project Implementation

(1) Follow-up Activities After Training Is More Important

What is the most important at human resource development projects like the MEDEM Project is that participants of the trainings can fully apply knowledge and skills they learned at their workplaces. Therefore, the Project has emphasized the follow-up activities to monitor their actual performances and give advices if necessary. The follow-up activity is regarded as a direct approach beyond the Project Purpose, and it enabled MOH to grasp the achievements of the Project at the ground.

Such approach should be highly evaluated.

(2) Mid-term Evaluation and Follow-up Activities

The Mid-term Evaluation in 2007 can be regarded as a part of technical cooperation under collaboration with JICA HQs/Cambodia Office, and it was utilized as an opportunity to jointly identify the problems and seek solutions. Monitoring and follow-up of the actions to be taken are firmly reflected to the future activities of the Project. This mechanism enabled the Project to achieve the Purpose, and efforts by the Project to follow-up should be also highly evaluated.

(3) Impacts to the Health Administration and Program in Cambodia

The Project could reflect the actual situation of health service provision to a part of health administration like formulation of CPA and MPA guidelines and support projects such as HSSP.



ANNEX 1: Project Design Matrix (PDM)

Title: Promotion of Medical Equipment Management System

Target Area: Whole Cambodia

Target Group: Medical equipment managers and technicians at target NHs and CPA3 RHs

Indirect Beneficiary: Patients of NHs and CPA3 RHs

Super Goal: Basic maintenance of medical equipment is conducted at all RHs

Duration: January, 2006–December, 2008

Version: PDM4 (January 2008)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
<p>[Overall Goal] Basic maintenance of medical equipment is conducted at NHs and CPA3 RHs.</p>	<ul style="list-style-type: none"> * Operable rate of medical equipment is improved for all medical equipment at NHs and CPA3RHs. * Estimated equipment life is fulfilled for all medical equipment at NH and CPA3 RHs. * Number of preventive maintenance are increased while repair cost is decreased, during the estimated equipment life. * Number of minor repair service by maintenance workshops at CPA3RH makes constant increase, while the one of NW decreases. 	<ul style="list-style-type: none"> * Annual activity report of NHs and CPA3RHs * Inventory data at HSD * Accounting book of NH and CPA3RHs * Annual activity report of PHDs, HSD and NW 	<ul style="list-style-type: none"> * Medical equipment maintenance managers and technicians are assigned at OD, CPA1 and CPA2 RHs, and Project activities are extended to them.
<p>[Project Purpose] Basic maintenance and management activities for medical equipment are introduced at target NHs and CPA3 RHs, by following the instruction of MOH and by receiving technical guidance of NW.</p>	<ul style="list-style-type: none"> * Target NHs and CPA3 RHs submit annual activity report on medical equipment management to MOH through PHD. * Based on the instruction manuals and checklist of medical equipment, periodical check and maintenance are conducted at target NHs and CPA3 RHs. * Medical equipment management procedure are prepared and followed at target NH and CPA 3 RH. 	<ul style="list-style-type: none"> * Maintenance activity plan of NHs, CPA 3 RHs. * Reports from NHs, CPA 3 RHs. 	<ul style="list-style-type: none"> * Refresher training is provided to ex-participants * Training is provided to managers of PHDs. * Medical personnel at NHs and CPA3 RHs improve the knowledge on medical equipment usage.

<p>【Outputs】</p> <ol style="list-style-type: none"> Administrative instruction of HSD of MoH on medical equipment management for target NHs and CPA3 RHs is strengthened, with technical guidance of NW . Technical skill of medical equipment technicians in target NHs and CPA3 RHs is improved. Management skill of medical equipment managers in target NHs, CPA3 RHs is improved. 	<p>For Output 1</p> <ol style="list-style-type: none"> Inventory is completed and regularly updated. Monitoring trip by HSD and maintenance service by NW are regularly conducted, and findings are fed back to their activity plans. HSD prepares annual work plan by considering available human resources, financial resources, and materials. HSB of HSD prepares quarterly report of their activities, and analyzes the progress. HSD and NW are able to conduct training for medical equipment manager and technician. <p>For Output 2 and 3</p> <ol style="list-style-type: none"> Number of trainees and instructors trained. Number and types of training courses. Number and types of developed manuals, checklist, curriculum and training handouts. Difference in scores of pre-test and post-test conducted in the training course makes constant progress. Project team's monitoring results for ex-participants make constant progress. 	<p>* Project report of HSD and NW</p> <ul style="list-style-type: none"> Inventory data Annual report of HSD and NW Training report (i.e., test results, supervision results, and questionnaire survey results) 	
<p>【Activity】</p> <ol style="list-style-type: none"> Design and introduce the medical equipment inventory. Enhance knowledge of HSD staff on medical equipment management administration. Verify and give advices on existing policy guidelines (i.e. policy document, implementation plan & guideline, and basic maintenance) on medical equipment management, based on the experience from project activities, as needs arise. Provide on-site guidance to medical equipment managers and technicians at target NHs and CPA3 RHs. Conduct regular monitoring and evaluation on all above activities. Give advice to MOH and donors for appropriate supply of new medical equipment to hospitals. 		<p>【Input】</p> <p>Japanese Side <Personnel></p> <p>Long-term experts members (HSD and NW)</p> <p>Short-term experts</p> <p>2. NH and CPA 3 RH</p> <p><Equipment and Materials></p> <p>Basic maintenance tool</p> <p>1. Training facilities (at NMCHC)</p>	<p>* Majority of trained medical equipment maintenance managers and technicians continue working for the position.</p> <p>* Main counterpart members remain working for the Project</p>

<p>2-1. Develop the medical equipment maintenance manuals and checklist to target NHs and CPA3 RHs (i.e. medical equipment inventory, activity record, inspection standard, and reporting).</p> <p>2-2. Conduct needs assessment on medical equipment technicians at target NHs and CPA3 RHs.</p> <p>2-3. Provide technical training of trainers (TOT) for NW staff.</p> <p>2-4. Develop training curriculum (i.e. preventive maintenance, maintenance planning, inventory management, minor repair, and reporting) for medical equipment technicians of target NHs and CPA3 RHs.</p> <p>2-5. Prepare training handout for medical equipment technicians of target NHs and CPA3 RHs.</p> <p>2-6. Provide the technical training for medical equipment technicians at HSD, target NHs and CPA3 RHs.</p> <p>2-7. Evaluate the above (2-6.) technical training.</p> <p>2-8. Conduct follow-up supervision for the ex-trainees at their workplace.</p> <p>2-9. Hold blush-up meetings with medical equipment technicians of target NHs and CPA3 RHs at NW to promote usage of maintenance manuals and checklist.</p> <p>3-1. Provide TOT for HSD staff for medical equipment management training program.</p> <p>3-2. Develop the medical equipment management manual to target NHs and CPA3 RHs (i.e. inventory management, management of technicians, maintenance planning, and reporting protocol).</p> <p>3-3. Conduct training needs assessment of medical equipment managers at target NHs and CPA 3 RHs.</p> <p>3-4. Develop training curriculum for medical equipment managers of target NHs and CPA 3 RHs.</p> <p>3-5. Provide training for medical equipment managers of target NHs and CPA 3 RHs.</p> <p>3-6. Evaluate the above (3-5.) training.</p> <p>3-7. Provide follow-up supervision for the ex-trainees at their workplace.</p> <p>3-8. Hold blush-up meetings with medical equipment managers and directors of target NHs, and CPA3 RHs at HSD to promote usage of management manual.</p>	<p>Necessary equipment for Project Office</p> <p><Training in Japan></p> <p>2. Project offices (both at MOH and NMCHC)</p> <p><Budget> Local cost for government staff including salary and facilities. Water, electricity and gas supply for project offices.</p>	<p>[Pre-Condition]</p> <p>* Appropriate medical equipment managers and technicians are assigned at target NH and CPA 3 RH</p>
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Abbreviation: National workshop: NW; Hospital service department: HSD; Hospital service bureau: HSB; Provincial Health Department: PHD; Referral Hospital: RH; Training of Trainers: TOT; Ministry of Health: MOH; Operational District: OD; Complementary Package of Activities: CPA

2. Technical skills of medical equipment maintenance staff (target NHs and CPA3 RHs) is improved		NW&HSD S1,2
2-1	Develop the medical equipment maintenance manuals and checklist to target NHs and CPA3 RHs (i.e. medical equipment inventory, activity record, inspection standard, and reporting).	
2-2	Conduct needs assessment on medical equipment technicians at target NHs and CPA3 RHs.	NW&HSD S1
2-3	Provide technical training of trainers (TOT) for NW staff	NW S1,2
2-4	Develop training curriculum (i.e. preventive maintenance, maintenance planning, inventory management, minor repair, and reporting) for medical equipment technicians of target NHs and CPA3 RHs.	NW&HSD S1, 2, 4
2-5	Prepare training handout for medical equipment technicians of target NHs and CPA3 RHs.	NW&HSD S1,2,4
2-6	Provide the technical training for medical equipment technicians at FSD, target NHs and CPA3 RHs.	NW&HSD S2,4
2-7	Evaluate the above (2-6.) technical training.	NW&HSD S2,4
2-8	Conduct follow-up supervision for the ex-trainees at their workplace.	NW&HSD S2,4
2-9	Hold bluish-up meetings with medical equipment technicians of target NHs and CPA3 RHs at NW to promote usage of maintenance manuals and checklist.	NW&HSD

3- Management skills of medical equipment managers in target NH, CPA3 RH and PHDs is improved.		HSD	S3
3-1	Provide TOI for HSD staff for medical equipment management training program.	↑	
3-2	Develop the medical equipment management manual to PHDs, target NHs and CPA3 RHs (i.e. inventory management, management of technicians, maintenance planning, and reporting protocol).	↑	HSD S3
3-3	Conduct training needs assessment of medical equipment managers at PHD, NH and CPA 3 RH	↑	HSD S1
3-4	Develop training curriculum for medical equipment managers of PHDs, target NHs and CPA 3 RHs.	↑	HSD S3
3-5	Provide training for medical equipment managers of PHDs, target NHs and CPA 3 RHs.	↑	2-5 days /each HSD S3
3-6	Evaluate the above (3-5) training.	↑	HSD S3
3-7	Provide follow-up supervision for the ex-trainees at their workplace	↑	HSD S3,4
3-8	Hold bluish-up meetings with medical equipment managers and directors of PHDs, target NHs, and CPA3RHs at HSD to promote usage of management manual.	↑	HSD S4

CA: Chief Advisor, S1: Maintenance of medical equipment, S2: Training planning, S3: Management system, S4: Evaluation and monitoring
 ↑ CA ↑ S1 ↑ S2 ↑ S3 ↑ Cambodian C/P

Schedule for the Final Evaluation on the JICA/MOH MEDEM Project

#	Date	Schedule for Mission Members (Note: Arrival of Mr. Sugiura on 27 Aug)
1	19 Aug (Tue)	18:45 Arrival of Mr Take at PP (TG698)
2	20 Aug (Wed)	8:00 Meeting with JICA Office 10:30 Meeting with Japanese Expert (JE)
3	21 Aug (Thu)	9:00 – 10:00 Manager of HSD/MOH 10:00 – 11:00 Interview with DDG of health 11:00 – 12:00 Director of NMCHC 14:00 – 16:00 Staff of HSD C/P
4	22 Aug (Fri)	9:00 – 11:00 Interview with NW C/P (NMCHC) 14:00-15:30 Interview with JE (Mr Suzuki & Ms Kawaguchi)
5	23 Aug (Sat)	Drafting Joint Evaluation Report (JER)
6	24 Aug (Sun)	12:00 Leave PP for Koh Kong
7	25 Aug (Mon)	8:00 Interview with Koh Kong CPA3 hospital (Hos Dir., ME Manager, Deputy Manager, ME technician) 10:30 Interview with PHD PM Move to SHV
8	26 Aug (Tue)	8:00 Interview with SHV CPA3 hospital (Hos Dir., ME Manager, Deputy Manager, ME technician) 10:30 Interview with PHD Move to Kampot 14:30 Interview with Kampot CPA3 hospital
9	27 Aug (Wed)	8:00 Interview with PHD 8:00 Interview with GTZ (Based in Kampot PHD) Move to PP 14:30 Interview with Soviet-Khmer Hospital 18:45 Arrival of Mr Sugiura at PP from Tokyo (TG698) 20:00 Internal Meeting at the hotel
10	28 Aug (Thu)	8:00 Internal Meeting at the hotel 9:00 Meeting with JICA Office and Meeting with JE 14:30 Courtesy call and interview with Secretary of State/ MOH (all Member) 16:00 Interview with Kossomak Hospital
11	29 Aug (Fri)	8:00 – 9:00 HSD and NW staff 9:00 – 10:20 Manager of HSD 10:30 – 11:10 Interview with DDG 14:30 Interview with Budget/ Finance Dept. 15:30-16:30 Report and discussion (For Mr Sugiura, Ms Sato, Mr Veasna, Mr Matsuo, Mr Brine: 12:00 departure from PP and visit Pursat CPA3 hospital (Hos Dir., ME Manager, Deputy Manager, ME technician)

12	30 Aug (Sat)	Drafting and internal discussion on M/M & JER Preparing M/M & JER
13	31 Aug (Sun)	Preparing M/M & JER 13:30 Internal Discussion on M/M & JER
14	1 Sep (Mon)	8:30 PP Municipality Hospital AM Submission of draft M/M & JER to MOH 10:00 Interview with GTZ (NIPH) 11:00 Interview with Mr Suzuki at MEDEM Office, Meeting with JICA Office & JE 14:30 Discussion with DDG, Manager of HSD and other relevant staff on M/M & JER
15	2 Sep (Tue)	8:30 Discussion with DDG, Manager of HSD and other relevant staff on M/M & JER (3h) 14:00 Interview with WB Phnom Penh 14:30 Interview with HSSP Unit in MOH PM Preparation of M/M & JER
16	3 Sep (Wed)	8:30 Discussion with DDG, Manager of HSD and other relevant staff on M/M & JER 11:00 Submission of the M/M & JER to International Coop. Dept/ MOH 14:30 Discussion on activities until the end of the Project and brain-storming on the next cooperation with DDG, Manager of HSD and other relevant staff 17:30 Report to JICA Office
17	4 Sep (Thu)	10:00 De-briefing and signing Ceremony with the MoH (Secretary of State) 12:00 Lunch Reception hosted by JICA 14:30 Report to the Embassy of Japan 19:45 Departure for Tokyo (TG699)
18	5 Sep (Fri)	Arrival at Tokyo

END

Annex 3: Dispatch of Japanese Experts

Name of Expert	Specialty	Period
Mr. Matsuo Takeshi	Chief Advisor	2006/01/01- 2008/12/31
Mr. Suzuki Kazushiro	Maintenance of ME	2006/04/18- 2006/11/20
Mr. Suzuki Kazushiro	Training Planning	2007/01/04- 2007/03/19 2007/04/17- 2007/11/02
Mr. Ajiki Kazuhiro	Management System	2007/04/17- 2007/11/27
Mr. Suzuki Kazushiro	Evaluation and monitoring	2008/04/20- 2008/09/13

Annex 4: Provision of equipment

Year	Total amount	
FY 2005 (1 st January 2006- 31 st March 2006)	\$6,120	Copy Machine
FY2006 (1 st April 2006- 31 st March 2007)	\$56,020	Project car \$53,000 Printer \$2,190 PC \$830
FY2007 (1 st April 2007- 31 st March 2008)	\$2,548	Copy Machine
FY2008 (1 st April 2008- 31 st December 2008)	\$0	
Grand Total	\$64,688	

Annex 5: In-country Training by the Project

	Name of training	Date	# of participants
1	ME technician pre-training seminar	13 Jun '06 (1 day)	39
2	Technical training on ME maintenance, Theory course	22 Jan -26 Jan '07 (5 days)	38
3	Technical training on ME maintenance Practical course (Group 1)	29 Jan-23 Feb '07 (4 weeks)	7
4	Technical training on ME maintenance Practical course (Group 2)	04 Jun-29 Jun '07 (4 weeks)	6
5	ME technician brush-up training (Group 1 and 2)	25 Sep-28 Sep '07 (4 days)	12
6	Technical training on ME maintenance Practical course (Group 3)	27 Nov-21 Dec'07 (4 weeks)	6
7	Technical training on ME maintenance Practical course (Group 4)	29 Jan-23 Feb '07 (4 weeks)	6
8	ME Management Pre-Seminar	25Apr -26 Apr '07 (2 days)	86
9	ME Management Seminar I	21 Aug-24 Aug'07 (4 days)	42
10	ME Management Seminar II	05 Nov-07 Nov'07 (3 days)	96
11	ME Management brush-up training	19 June-20 Jun'08 (2 days)	64

Annex 6: Name of Cambodian Counterparts Trained in Japan

	Name of trainees	Post	Field	Period	Institute
1	Dr. Chi Mean Hea	DDG for Health	Administration of ME management	2006/7/14-2006/8/7	IMCJ, St. Mary's Hospital,
2	Dr. Sann Sary	Director of HSD	Administration of ME management	2006/7/14-2006/8/7	IMCJ, St. Mary's Hospital,
3	Dr. Cheu Sivuty	Chief of HSB, HSD	ME management system	2007/10/15-2007/10/25	St. Mary's Hospital
4	Mr. Ngeth Titya	Staff of Bio-Engineering unit	ME management system	2007/10/15-2007/10/25	St. Mary's Hospital



Annex 7: Allocation of Cambodian Counterparts

Management Group

Name of Cambodian Counterpart	Post	Assignment in project	Assignment period	Name of Japanese Counterparts
Prof. Eng Huot	Secretary of State for Health	Project Director	2006/01/01-	Mr. Matsuo
Dr.Chi Mean Hea	DDG for Health	Project supervisor	2006/01/01-	Mr. Matsuo
Prof.Koum Kanal	Director of NMCHC	Technical Advisor	2006/01/01-	Mr. Matsuo
Dr.Sann Sary	Director of HSD	Project Manager	2006/01/01-	Mr. Matsuo, Mr. Ajiki

HSD/MoH

Dr.Kuy Sivotha	Deputy Director of HSD	(Transferred)	2006/01/01-2006/5	Mr. Matsuo
Dr.Sok Srun	Deputy Director of HSD	Deputy PM	2006/12-	Mr. Matsuo, Mr. Ajiki
Dr.Cheu Sivuthy	Chief of HSB	Responsible of NW team ME management	2007/05-	Mr. Matsuo, Mr.Suzuki, Mr. Ajiki
Dr.Phy Radian	Vice-chief of HSB	(Transferred)	2006/01/01- 2007/06	Mr. Matsuo, Mr. Suzuki
Ph.Sok Chan	Vice-chief of HSB	(Transferred)	2006/01/01- 2006/11	Mr. Matsuo, Mr. Suzuki
Mr.Long Borin	Staff of HSB/BEU	Logistic, ME management	2006/01/01-	Mr. Matsuo, Mr. Suzuki, Mr. Ajiki
Ms.Chhay Sok Heng	Staff of HSB/BEU	(Transferred)	2006/01/01 - 2006/11	
Dr.Chan Sohka	Staff of HSB/BEU	(Transferred)	2006/05 - 2007/10	Mr. Suzuki
Ph.Sam Sopheap	Staff of HSB/Labo	(Transferred)	2006/12 -2007/12	Mr. Ajiki
Ph.Uch Monipheap	Staff of HSB/Labo	(Transferred)	2006/12 -2007/12	Mr. Ajiki
Ph.Chea Tavan	Staff of HSB/BEU	Staff	2007/12-	

NMCHC

Mr.Huot Khom	Chief of Administration Bureau	Responsible of NW team ME management	2006/01/01-	Mr. Matsuo, Mr. Suzuki, Mr. Ajiki
Mr.Hab Sok Samnag	Chief of Bio-Engineering unit	ME management ME maintenance	2006/01/01-	Mr. Suzuki

Mr.Chum Toma	Chief of Bio-Engineering unit and facility unit	ME maintenance	2006/01/01-	Mr. Suzuki
Mr.Ngeth Titya	Staff of Bio-Engineering unit	ME management ME maintenance	2006/01/01-	Mr. Suzuki, Mr. Ajiki
Mr.Bau Sau Sophon	Staff of Bio-Engineering unit and Facility unit	ME maintenance	2006/01/01-	Mr. Suzuki

Annex 8: Transition of Allocation of Cambodian Counterparts

	2006												2007												2008											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Prof. Eng Huot																																				
Secretary of State for Health																																				
Dr. Chi Mean Hea																																				
DDG for Health																																				
Dr. Sann Sary																																				
Director of HSD																																				
Dr. Kuy Sivotha																																				
D. Director of HSD																																				
Dr. Sok Strun																																				
D. Director of HSD																																				
Dr. Cheu Sivuthy																																				
Chief of HSB																																				
Vice-Chief of HSB unit, HSD																																				
Dr. Phy Radian																																				
Vice-Chief of HSB unit, HSD																																				
Ph. Sok Chann																																				
Vice-Chief of HSB unit, HSD																																				
Dr. Chan Sohka																																				
Staff of HSB unit, HSD																																				
Mr. Long Borin																																				
Staff of HSB unit, HSD																																				
Ms. Chhay Sok Heng																																				
Staff of HSB unit, HSD																																				
Ph. Sam Sopheap																																				
Staff of Labo unit, HSD																																				
Ph. Uch Monipheap																																				
Staff of Labo unit, HSD																																				
Ph. Chea Tavan																																				
Staff of HSB unit, HSD																																				
Prof. Koum Kanal																																				
Director of NMCHC																																				
Director of Administration																																				
Chief of Bio-Engineering unit																																				
Mr. Hab Sok Samnang																																				
Engineering unit																																				
Mr. Chum Toma																																				
Chief of Facility unit																																				
Staff of Bio-Engineering unit																																				
Mr. Ngeth Titya																																				
Staff of Bio-Engineering unit																																				
Mr. Ban Sau Sophor																																				
Staff of Facility unit																																				

Management group HSD NMCHC

Annex 9: Indirect Cambodian Counterparts at Target Hospitals

	Name	Hospital name	Position	Assignment in the project
1	Dr. Ly Bun Thoeun	Prey Veng Referral Hospital	Hospital Deputy Director	ME Manager
2	Ms. Em Sitha	Prey Veng Referral Hospital	Chief of Administration Bureau	ME Deputy Manager
3	Mr. Mak Van	Prey Veng Referral Hospital	ME Maintenance Staff	ME Technician
4	MA. Mol Neng	Siem Reap Referral Hospital	Hospital Deputy Director	ME Manager
5	Ph. Sam Silavichet	Siem Reap Referral Hospital	Chief of Pharmacy Department	ME Deputy Manager
6	Mr. Muth Samay	Siem Reap Referral Hospital	ME Maintenance Technician	ME Technician
7	Dr. Ngoung Khosok	Kampong Chhnang Referral Hospital	Hospital Deputy Director	ME Manager
8	Mr. Sar Savath	Kampong Chhnang Referral Hospital	Chief of Administration Bureau	Deputy ME Manager
9	Mr. Kong Houen	Kampong Chhnang Referral Hospital	Facility Maintenance and Repair	ME Technician
10	Dr. Oung Many	Battambang Referral Hospital	Hospital Deputy Director	ME Manager
11	Mr. Phy Chantlayoung	Battambang Referral Hospital	Chief of Administration Bureau	Deputy ME Manager
12	Mr. Thuy Samith	Battambang Referral Hospital	Facility Maintenance	ME Technician
13	Dr. Dor Sothy	Stung Treng Referral Hospital	Hospital Deputy Director	ME Manager
14	Mr. Mom Sivun	Stung Treng Referral Hospital	Chief of Accounting Bureau	Deputy ME Manager
15	Mr. Dor Dara	Stung Treng Referral Hospital	ME Maintenance Technician	ME Technician
16	Dr. Mey Moniborin	Kampong Cham Referral Hospital	Hospital Deputy Director	ME Manager
17	Mr. Song Meng	Kampong Cham Referral Hospital	Vice-chief of Administration Bureau	Deputy ME Manager
18	Mr. Sam Sophan	Kampong Cham Referral Hospital	In-charge of ME+ Facility	ME Technician
19	Mr. Mean Sopheak	Kampong Cham Referral Hospital	In-charge of Facility Section	ME Technician
20	Dr. Chan Sokha	Sampov Meas Referral Hospital	Hospital Deputy Director	ME Manager

21	Mr. Sim Hun	Sampov Meas Referral Hospital	Chief of Accounting Bureau	Deputy ME Manager
22	Mr. Soeung Samy	Sampov Meas Referral Hospital	Staff	ME Technician
23	Dr. Soun Samith	Koh Kong Referral Hospital	Hospital Deputy Director	ME Manager
24	Nu. Men Samet	Koh Kong Referral Hospital	Chief of Administration Bureau	Deputy ME Manager
25	Mr. Oun Danin	Koh Kong Referral Hospital	ME Maintenance Technician	ME Technician
26	Dr. Em Sokchea	Chhey Chum Nas Referral Hospital	Hospital Deputy Director	ME Manager
27	Ms. Hem Chanthen	Chhey Chum Nas Referral Hospital	Vice-chief of Administration Bureau	Deputy ME Manager
28	Mr. Chum Panha	Chhey Chum Nas Referral Hospital	Chief of Workshop	ME Technician
29	Dr. Srey Chanry	Cambodian-Japan Monglul Borey Friendship Referral Hospital	Hospital Deputy Director	ME Manager
30	Mr. Or Kanal	Cambodian-Japan Monglul Borey Friendship Referral Hospital	Chief of Administration Bureau	Deputy ME Manager
31	Mr. Im Thy	Cambodian-Japan Monglul Borey Friendship Referral Hospital	Electrician	ME Technician
32	Mr. Chou Praseu	Cambodian-Japan Monglul Borey Friendship Referral Hospital	Electrician	ME Technician
33	Dr. Chhouv Chhuon	Don Keo Referral Hospital	Hospital Deputy Director	ME Manager
34	Mr. Tao Ro	Don Keo Referral Hospital	Administrator	Deputy ME Manager
35	Mr. Mom Chenda	Don Keo Referral Hospital	Chief of Workshop	ME Technician
36	Dr. Tean Sabon	Svay Rieng Referral Hospital	Hospital Deputy Director	ME Manager
37	Dr. Ou Sophal	Svay Rieng Referral Hospital	Chief of Administration Bureau	Deputy ME Manager
38	Mr. Mok Sokrath	Svay Rieng Referral Hospital	Staff	ME Technician
39	Nu. Keo Saroeun	Sihanouk Ville Referral Hospital	Hospital Deputy Director	ME Manager

40	Nu. Tuy Sareth	Sihanouk Ville Referral Hospital	Staff In-charge of Inventory List	Deputy ME Manager
41	Mr. Phem Touch	Sihanouk Ville Referral Hospital	Office Staff	ME Technician
42	Dr. Nget Bochum	Kampong Thom Referral Hospital	Hospital Deputy Director	ME Manager
43	Ms. Kong Sophalna	Kampong Thom Referral Hospital	Chief of Admin & Accounting Bureau	Deputy ME Manager
44	Mr. Chim Sam An	Kampong Thom Referral Hospital	Maintenance Staff	ME Technician
45	MA. Ngoun Chanbora	Kampot Referral Hospital	Hospital Deputy Director	ME Manager
46	Mr. Chheang Krisna	Kampot Referral Hospital	Chief of Accounting Bureau	Deputy ME Manager
47	Mr. Ang Chhin	Kampot Referral Hospital	Maintenance Staff	ME Technician
48	Ph. Ngoy Song	Kampong Speu Referral Hospital	Hospital Deputy Director	ME Manager
49	Nu. Sorn Thach	Kampong Speu Referral Hospital	Chief of Administration Bureau	Deputy ME Manager
50	Mr. Sim Song	Kampong Speu Referral Hospital	Maintenance & Repair Technician	ME Technician
51	Dr. Keang Hong	Kratie Referral Hospital	Hospital Deputy Director	ME Manager
52	Mr. Boeuy Mach	Kratie Referral Hospital	Chief of Administration Bureau	Deputy ME Manager
53	Mr. Top Sophanna	Kratie Referral Hospital	Maintenance & Repair Technician	ME Technician
54	Dr. Long Ky	Phnom Penh Municipal Referral Hospital	Hospital Deputy Director	ME Manager
55	Ms. Sam Chantha	Phnom Penh Municipal Referral Hospital	Administrator	Deputy ME Manager
56	Mr. Chea Narin	Phnom Penh Municipal Referral Hospital	Electrician	ME Technician
57	Dr. Sek Sokoeun	Preas Kossamak National Hospital	Hospital Deputy Director	ME Manager
58	Mr. Ek Sonsatha	Preas Kossamak National Hospital	Chief of Administration Bureau	Deputy ME Manager
59	Mr. Kao Pheavith	Preas Kossamak National Hospital	Chief of engineering	ME Technician
60	Dr. Lim Pengsieng	Preas Ang Doung National Hospital	Hospital Deputy Director	ME Manager
61	Mr. Chou Rady	Preas Ang Doung National Hospital	Chief of Technical Bureau	Deputy ME Manager

62	Mr. Ung Leak tola	Preas Ang Doung National Hospital	Chief of Operation Theater Ward	ME Technician
63	Dr. Kdan Yuvatha	National Pediatric Hospital	Hospital Deputy Director	ME Manager
64	Dr. Ket Vansith	National Pediatric Hospital	Chief of Laboratory Department	Deputy ME Manager
65	Mr. Net Vichea	National Pediatric Hospital	Electrician	ME Technician
66	Dr. Tan Phally	Khmer-Soviet Friendship Hospital	Hospital Deputy Director	ME Manager
67	Mr. Chieu Chin Banau	Khmer-Soviet Friendship Hospital	Vice-chief of Administration Bureau	Deputy ME Manager
68	Mr. Suos Kimteng	Khmer-Soviet Friendship Hospital	Staff	ME Technician

Annex 10: Cost Sharing by Cambodian Side

Item	FY2005	FY2006	FY2007	FY2008	Note
Project office (including lighting and water expenses)	Provided	Provided	Provided	Provided	MOH
Accommodation for technical training on ME maintenance (1 st group)		Provided (the amount is equivalent to \$1,300)			NMCHC
Accommodation for technical training on ME maintenance (2 nd group)			Provided (the amount is equivalent to \$1,300)		NMCHC
Accommodation for technical training on ME maintenance (3 rd group)			Provided (the amount is equivalent to \$1,300)		NMCHC
Accommodation for technical training on ME maintenance (4 th group)			Provided (the amount is equivalent to \$1,300)		NMCHC
ME management seminar			\$8,853.15		HSSP/MOH
TOTAL		(\$1,300)	\$8,853.15 (\$3,900)	GRAND TOTAL	\$8,853.15 (\$5,200)

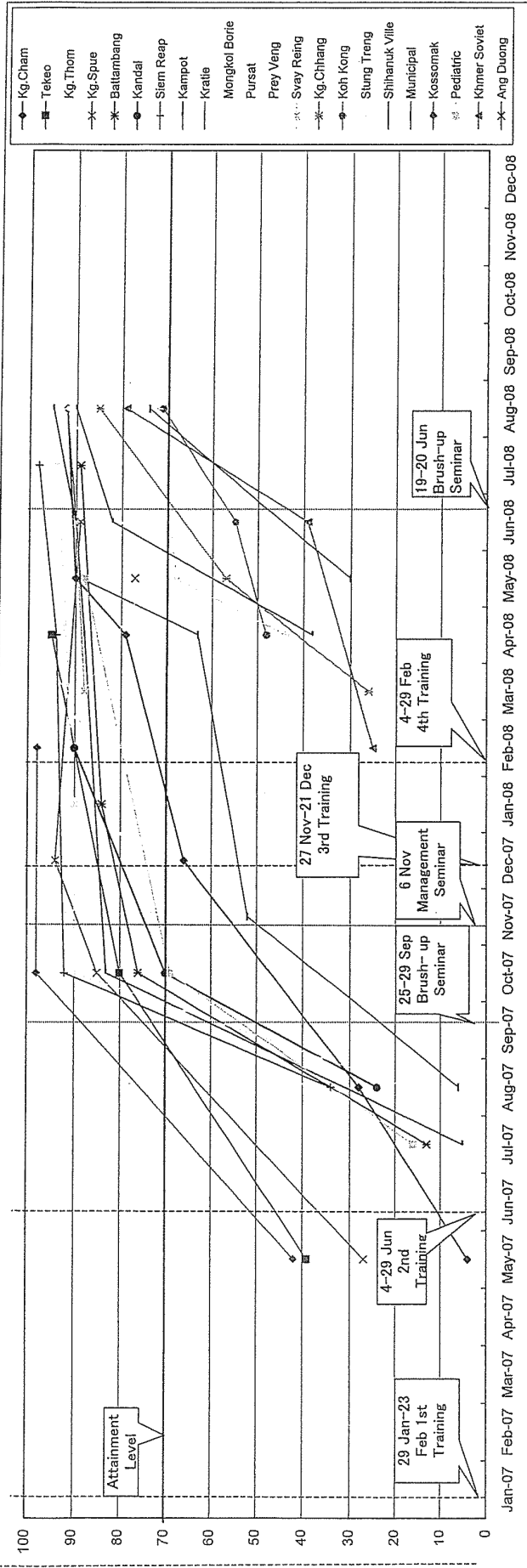
Annex 11: List of Participants of ME Technician Trainings

No.	Municipality/Province	ME technician Pre-training seminar <Jun 2006>	Technician Training (Theory) <Jan 2007>	Technician Training (Practice) <Jan 2007-Feb 2008>	Technical Training Brush up <Sep 2007>
1	Prey Veng	Mr. Mak Van,	Mr. Mak Van	Mr. Mak Van	Group 3
2		Mr. Him Kim Sear	Mr. Him Kim Sear		
3	Siem Reap	Mr. Muth Samay	Mr. Muth Samay	Mr. Muth Samay	Group 2
4		Ms. Son Bunna			
5	Kampong Chhnang	Mr. Kong Hoeun,	Mr. Kong Houn	Mr. Kong Hoeun	Group 3
6		Mr. Nhem Choeun	Mr. Nhem Choeun		
7	Battam Bang	Mr. Thuy Samith	Mr. Thuy Samith	Mr. Thuy Samith	Group 1
8			Mr. Sok Vibol		
9	Stung Treng	Mr. Sim Siratha	Mr. Sim Siratha	Mr. Dor Dara	Group 4
10					
11	Kampong Cham	Mr. Sam Sophan,	Mr. Sam Sophan	Mr. Sam Sophan	Group 1
12		Mr. Mean Sophak	Mr. Mean Sopheak	Mr. Mean Sopheak	Group 4
13	Pursat	Mr. Tit Sim	Mr. Tit Sim		
14		Mr. Song Samy	Mr. Song Samy	Mr. Soeng Samy	Group 3
15	Koh Kong	Mr. Chum Sophan	Mr. Chum Siphon	Mr. Oun Danin	Group 3
16		Mr. Men Samet	Mr. Suorn Samith		
17	Kandal	Mr. Chum Panha	Mr. Chum Panha	Mr. Chum Panha	Group 2
18		Mr. Men Ya	Mr. Meng Ya		
19	Banteay Meanchey	Mr. Chou Prasour		Mr. Cheu Praseu	Group 4
20		Mr. Im Thy	Mr. Im Thy	Mr. Im Thy	Group 2
21	Takeo	Mr. Mam Chenda	Mr. Mam Chenda	Mr. Mam Chenda	Group 1
22		Mr. Sarun Sambath	Mr. Chen Buntha		
23	Svay Rieng	Mr. Muk Sokroth	Mr. Muk Sok Rath	Mr. Mok Sokrath	Group 3
24		Mr. An Sa Hoeun			
25	Sihanouk Vile	Mr. Tuy Sareth	Mr. Tuy Sareth		
26		Mr. Phen Touch	Mr. Phem Touch	Mr. Phem Touch	Group 4
27	Kampong Thom	Mr. Chim Sam An	Mr. Chim Sam An	Mr. Chim Sam An	Group 1
28					
29	Kampot	Mr. Ang Chhin	Mr. Ang Chhin	Mr. Ang Chhin	Group 2
30		Mr. Chhieng Krisna	Mr. Chheang Krisna		
31	Kampong Speu	Mr. Sim Song	Mr. Sim Song	Mr. Sim Song	Group 1
32		Mr. Miech Vanna	Mr. Heang Huy		
33	Kratie	Mr. Tob Sophana	Mr. Top Sophanna	Mr. Top Sophanna	Group 2
34		Mr. Boeuy Mach	Mr. Bery Mach		
35	Municipal Hospital	Mr. Kao Nei	Mr. Kao Nei	Mr. Chea Narin	Group 4
36					
37	Preah Kossamak Hospital	Mr. So Vun	Mr. So Vun		
38		Mr. Kao Pheavith	Mr. Kao Pheavith	Mr. Kao Pheavith	Group 1
39	Preah Ang Duong Hospital	Mr. Ung Leak Tola		Mr. Ung Leak tola	Group 4
40					
41	National Pediatric Hospital	Mr. Klok Sola	Mr. Khlok Sola		
42		Mr. Net Vichea	Mr. Neth Vichea	Mr. Net Vichea	Group 2
43	Khmer-Soviet Friendship Hospital	Mr. Noun Eng	Mr. Nuon Eng	Mr. Suos Kimteng	Group 3
44		Mr. Chiv Chinbanaul	Mr. Chou Chin Banaul		

Annex 12: Score Criteria of Follow-up for Ex-trainees

No	Description	How to make a Score	Full Score
I. Planned Preventive Maintenance			
1	Develop Preventive Maintenance Schedule	No start: 0, <25%: 1, 25-50%: 2, 50-75%: 3, 75-99%: 4, Perfect : 5	5
2	Perform Preventive Maintenance following the schedule	No start: 0, <25%: 1, 25-50%: 2, 50-75%: 3, 75-99%: 4, Perfect : 5	5
3	Utilizing the Maintenance Check List	No start: 0, <25%: 1, 25-50%: 2, 50-75%: 3, 75-99%: 4, Perfect : 5	5
4	Keep & File Maintenance Check List	Yes: 4, No: 0	4
5	Utilizing of the Maintenance Job record	No start: 0, <25%: 1, 25-50%: 2, 50-75%: 3, 75-99%: 4, Perfect : 5	5
6	Keep & File the maintenance Job record	Yes: 4, No: 0	4
7	Submit Maintenance Job record to ME manager	Yes: 4, No: 0	4
II. Up dating of the ME inventory data			
1	Sticking ID number for each ME	No start: 0, <25%: 1, 25-50%: 2, 50-75%: 3, 75-99%: 4, Perfect : 5	5
2	Perform up-date about condition of ME	Yes: 4, No: 0	4
3	Submit Up-date data to ME manager every 6 months	Yes: 4, No: 0	4
III. Report work			
1	Make the Annual action plan (Form 3-1) about ME technician	Yes: 4, No: 0	4
2	Submit the Annual action plan (Form 3-1) to ME manager	Yes: 4, No: 0	4
3	Make the Semi-annual report (Form 3-2 & 3-3) about ME technician	Yes: 4, No: 0	4
4	Submit the Semi-annual report (Form 3-2 & 3-3) to ME manager	Yes: 4, No: 0	4
5	Keep & File above reports	Yes: 4, No: 0	4
IV. Action taken for failure equipment			
1	Follow the ME Service request flow	Yes: 4, No: 0	4
2	When Technician can't repair the broken ME, do you contact with ME	Yes: 4, No: 0	4
V. Utilizing of ME maintenance guidebook			
1	Utilizing of ME maintenance guidebook	Yes: 4, No: 0	4
VI. Clean & arrange of Maintenance workshop			
1	Condition of cleaning & organizing workshop	Yes: 4, No: 0	4
2	Condition of ME workshop	Excellent: 4, Good: 3, Moderate: 2, Poor: 1	4
VII. Management matter			
1	Official assignment by Hospital Director	Not yet: 0, Assigned w/o evidence: 3, Assigned officially: 5	5
2	Relation ship with ME manager / Deputy ME manager	Good: 5, Moderate: 3, Poor: 1	5
3	Relation ship with Clinical department	Good: 5, Moderate: 3, Poor: 1	5
TOTAL			100

Annex 13: Trend of Scores of MET Monitoring



	Kg.Cham	Tekeo	Kg.Thom	Kg.Spue	Battambang	Kandal	Siem Reap	Kampot	Kratie	Mongkol Borei	Pursat	Prey Veng	Svay Reing	Kg.Chhang	Koh Kong	Stung Treng	Shihanuk Ville	Municipal	Kossamak	Pediatric	Khmer Soviet	Ang Duong		
Jan-07																								
Feb-07																								
Mar-07																								
Apr-07	4	39																						
May-07																								
Jun-07																								
Jul-07					13																			
Aug-07			39			24																		
Sep-07																								
Oct-07			80	85	76	70	92	83	52															
Nov-07																								
Dec-07																								
Jan-08	66			94																				
Feb-08							90																	
Mar-08																								
Apr-08	79	95	97										88	88	26								25	
May-08	90												74	74	57	48	44	38						
Jun-08				89									90	90	85	55	68	82						77
Jul-08					89								92	92	71	72	90							39
Aug-08	92																							79
Sep-08																								
Oct-08																								
Nov-08																								
Dec-08																								

Annex 14: List of Participants of ME Managers

No	Province	MEM Seminar I	MEM Seminar II	MEM Brush-up
1	Prey Veng	Dr.Ly Bun Thoeun	Dr. Ly Bun Thoeun	Dr. Ly Bun Thoeun
2		NU.Em Sitha	Nu. Em Sitha	Nu. Em Sitha
3	Siem Reap	MA.Mol Neng	MA. Mol Neng	MA. Mol Neng
4		Mr.Sam Silavichet	Mr. Sam Silavichet	Mr. Sam Silavichet
5	Kg. Chhnang	Dr.So Rintiravuthy	Dr. Nhoung Khosok	Dr. Ngoung Khosok
6		Dr.Sar Savath	Dr. Sar Savath	Dr. Sar Savath
7	Battambang	Dr.Oung Many	Dr. Oung Many	Dr. Oung Many
8		Mr.Men Sombath	Mr. Phy Chantlayoung	Mr. Phy Chantlayoung
9	Strung Treng	Mr.Dor Sothy	Dr. Dor Sothy	Dr. Dor Sothy
10		Dr.Suy Sopheap	Mr. Mom Sivun	Mr. Mom Sivun
11	Kg. Cham	Dr.Mey Moniborin	Dr. Mey Moniborin	Dr. Mey Moniborin
12		Mr. Song Meng	Mr. Song Meng	Mr. Song Meng
13	Pursat	Dr.Chan Sokha	Dr. Chan Sokha	Dr. Chan Sokha
14		Mr.Sim Hun	MA. Sim Hun	MA. Sim Hun
15	Koh Kong	Dr.Soun Som Reth	Dr. Soun Samith	
16		NU.Men Samet	Nu. Men Samet	Nu. Men Samet
17	Kandal	Dr.Em Sokchea	Dr. Em Sokchea	Dr. Em Sokchea
18		Ms.Hem Chanthen	Ms. Hem Chanthen	Ms. Hem Chanthen
19	Banteay Meanchey	Dr.Srey Chanry	Dr. Srey Chanry	Dr. Srey Chanry
20		Mr.Or Kanal	Mr. Or Kanal	Mr. Or Kanal
21	Takeo	Dr.Chhouv Chhuon		Dr. Chhouv Chhuon
22		Mr.Kou Seng	Mr. Kou Seng	Mr. Tao Ro
23	Svay Rieng	Dr.Hout Vutha	Dr. Tean Sabon	Dr. Tean Sabon
24		Mr.Ou Sophal	Mr. Ou Sophal	Mr. Ou Sophal
25	Sihanouk Ville	MA.Keo Saroeun	MA. Keo Saroeun	
26		NU.Tuy Sareth	Nu. Tuy Sareth	Nu. Tuy Sareth
27	Kg. Thom	Dr.Ngeth Bochum	Dr. Nget Bochum	Dr. Nget Bochum
28		Mr. Chan Sokhan	Ms. Kong Sophalna	Ms. Kong Sophalna
29	Kampot	MA.Ngoun Chanboara	MA. Ngoun Chanbora	MA. Ngoun Chanbora
30		Mr.Chheang Krisna	Mr. Chheang Krisna	Mr. Chheang Krisna
31	Kg. Speu	NU. Sorn Thach	Nu. Sorn Thach	Ph. Ngoy Song
32		Ph.Ngoy Song	Ph. Ngoy Song	Nu. Sorn Thach
33	Kratie	Mr.Suon Our	Dr. Keang Hong	
34		Mr.Boeuy Mach	Mr. Boeuy Mach	Mr. Boeuy Mach
35	Phnom Penh Municipal	Dr.Long Ky	Dr. Long Ky	Dr. Long Ky
36		Mr. Tith Sokeng		Ms. Som Chantha
37	NH. Preah Kossamak	Dr. Sek Sokooun	Dr. Sek Sokooun	
38		Dr.Ek Sonsathya		Mr. Ek Sonsatha
39	NH. Khmer-Soviet	Dr.Tan Phally	Dr. Tan Phally	Dr. Tan Phally
40	Friendship	Mr.Chieu Chin Banaul	Mr. Chieu Chin Banaul	Mr. Chieu Chin Banaul
41	NPH	Dr.Kdan Yuvatha	Dr. Kdan Yuvatha	Dr. Kdan Yuvatha
42		Dr. Ket Vansith	Dr. Ket Vansith	Dr. Ket Vansith
43	Preah Anduong Hospital	Dr. Lou Lykhean	Dr. Lim Pengsieng	Dr.Lim Pengsieng
44	(NH)	Mr.Lim Heaply	Dr. Chou Rady	Mr.Chou Rady

Annex 15: Difference of Scores of Pre- and Post-tests by Group and Participant (ME Management)

PHD Directors

Provinces	Pre-test	T-score	Post-Test	T-score
Prey Veng	21	20.9	50	40.3
Siem Reap	50	45.6	57	46.1
Kg. Chhnang	57	51.5	62	50.3
Battambang	67	60.0	73	59.5
Stung Treng				
Kg. Cham	32	30.2		
Pursat	46	42.2	51	41.1
Kok Kong	52	47.3	62	50.3
Kandal	58	52.4	58	46.9
Banteay Meanchey	61	54.9		
Takeo	54	49.0	63	51.1
Svay Rieng	62	55.8	65	52.8
Sihanouk Ville	46	42.2	51	41.1
Kg. Thom	60	54.1	61	49.5
Kampot	52	47.3	61	49.5
Kg. Speu	59	53.2	64	52.0
Kratie	61	54.9	63	51.1
Phnom Penh	57	51.5		
Average (PHD)	52.6		60.1	
S.D. (PHD)	11.5		6.3	

RH Directors

Institutions	Pre-test	T-score	Post-Test	T-score
Prey Veng RH	55	49.8	60	48.6
Siem Reap RH	28	26.8	57	46.1
Kg. Chhnang RH	59	53.2	63	51.1
Battambang RH				
Stung Treng RH	64	57.5		
Kg. Cham RH	58	52.4	62	50.3
Sampov Meas RH	59	53.2		
Kok Kong RH	59	53.2	62	50.3
Chhay Chom Nas RH			63	51.1
Mongkul Borei RH	55	49.8		
Don Keo RH				
Svay Rieng RH			56	45.3
Sihanouk Ville RH				
Kg. Thom RH	65	58.3	68	55.3
Kampot RH	53	48.1	53	42.8
Kg. Speu RH	62	55.8	64	52.0
Kratie RH	57	51.5	59	47.8
Phnom Penh Municipal RH				
Kossamak NH				
Preah Ang Dung NH	58	52.4		
Pediatric NH				
Khmer-Soviet Friendship NH	51	46.4		
Average (RH Directors)	55.9		60.6	
S.D. (RH Directors)	8.9		4.2	

ME Managers

Institutions	Pre-test	T-score	Post-Test	T-score
Prey Veng RH	65	58.3	58	46.9
Siem Reap RH	65	58.3	70	57.0
Kg. Chhnang RH	63	56.6	80	65.3
Battambang RH	62	55.8	65	52.8
Stung Treng RH	58	52.4	74	60.3
Kg. Cham RH	65	58.3		
Sampov Meas RH	59	53.2	68	55.3
Kok Kong RH			68	55.3
Chhay Chom Nas RH	62	55.8	64	52.0
Mongkul Borei RH			61	49.5
Don Keo RH				
Svay Rieng RH	61	54.9	60	48.6
Sihanouk Ville RH	71	63.4	59	47.8
Kg. Thom RH	61	54.9	79	64.5
Kampot RH	55	49.8	63	51.1
Kg. Speu RH	60	54.1	78	63.6
Kratie RH	70	62.6	73	59.5
Phnom Penh Municipal RH			58	46.9
Kossamak NH	60	54.1		
Preah Ang Dung NH	44	40.5	59	47.8
Pediatric NH	62	55.8	65	52.8
Khmer-Soviet Friendship NH	58	52.4		
Average (ME Managers)	61.2		66.8	
S.D. (ME Managers)	5.9		7.4	

ME Deputy Managers

Institutions	Pre-test	T-score	Post-Test	T-score
Prey Veng RH	61	54.9	59	47.8
Siem Reap RH	60	54.1	78	63.6
Kg. Chhnang RH	60	54.1	62	50.3
Battambang RH	51	46.4	57	46.1
Stung Treng RH	51	46.4	84	68.7
Kg. Cham RH	62	55.8	58	46.9
Sampov Meas RH	59	53.2	76	62.0
Kok Kong RH	62	55.8	70	57.0
Chhay Chom Nas RH	49	44.7	49	39.4
Mongkul Borei RH			68	55.3
Don Keo RH	63	56.6	72	58.6
Svay Rieng RH	56	50.7	87	71.2
Sihanouk Ville RH	64	57.5	65	52.8
Kg. Thom RH	62	55.8	68	55.3
Kampot RH	59	53.2	62	50.3
Kg. Speu RH	55	49.8	60	48.6
Kratie RH	61	54.9	58	46.9
Phnom Penh Municipal RH				
Kossamak NH				
Preah Ang Dung NH	52	47.3	64	52.0
Pediatric NH	62	55.8		
Khmer-Soviet Friendship NH	60	54.1	69	56.1
Average (ME Deputy Managers)	58.4		66.6	
S.D. (ME Deputy Managers)	4.6		9.7	

ME Technicians

Institutions	Pre-test	T-score	Post-Test	T-score
Prey Veng RH	29	27.7	50	40.3
Siem Reap RH	56	50.7	71	57.8
Kg. Chhnang RH	54	49.0	47	37.8
Battambang RH	59	53.2	60	48.6
Stung Treng RH	0		0	
Kg. Cham RH	47	43.0	55	44.4
Sampov Meas RH	65	58.3	56	45.3
Kok Kong RH	56	50.7	64	52.0
Chhay Chom Nas RH	56	50.7	47	37.8
Mongkul Borei RH	51	46.4	60	48.6
Don Keo RH	67	60.0	76	62.0
Svay Rieng RH	50	45.6	69	56.1
Sihanouk Ville RH	61	54.9	63	51.1
Kg. Thom RH	50	45.6	64	52.0
Kampot RH	52	47.3	57	46.1
Kg. Speu RH	50	45.6	79	64.5
Kratie RH	60	54.1	62	50.3
Phnom Penh Municipal RH	24	23.4	24	18.6
Kossamak NH	66	59.2	58	46.9
Preah Ang Dung NH			38	30.3
Pediatric NH	61	54.9	66	53.6
Khmer-Soviet Friendship NH	12	13.2	37	29.4
Average (ME Deputy Managers)	48.9		54.7	
S.D. (ME Deputy Managers)	17.8		17.8	
Average (All)	55.2		61.7	
S.D. (All)	11.7		12.0	

Annex 16: ME Management Follow up Check Sheet (in-house)

Hospital Name: _____

Date: / /

Province Name: _____

By: _____

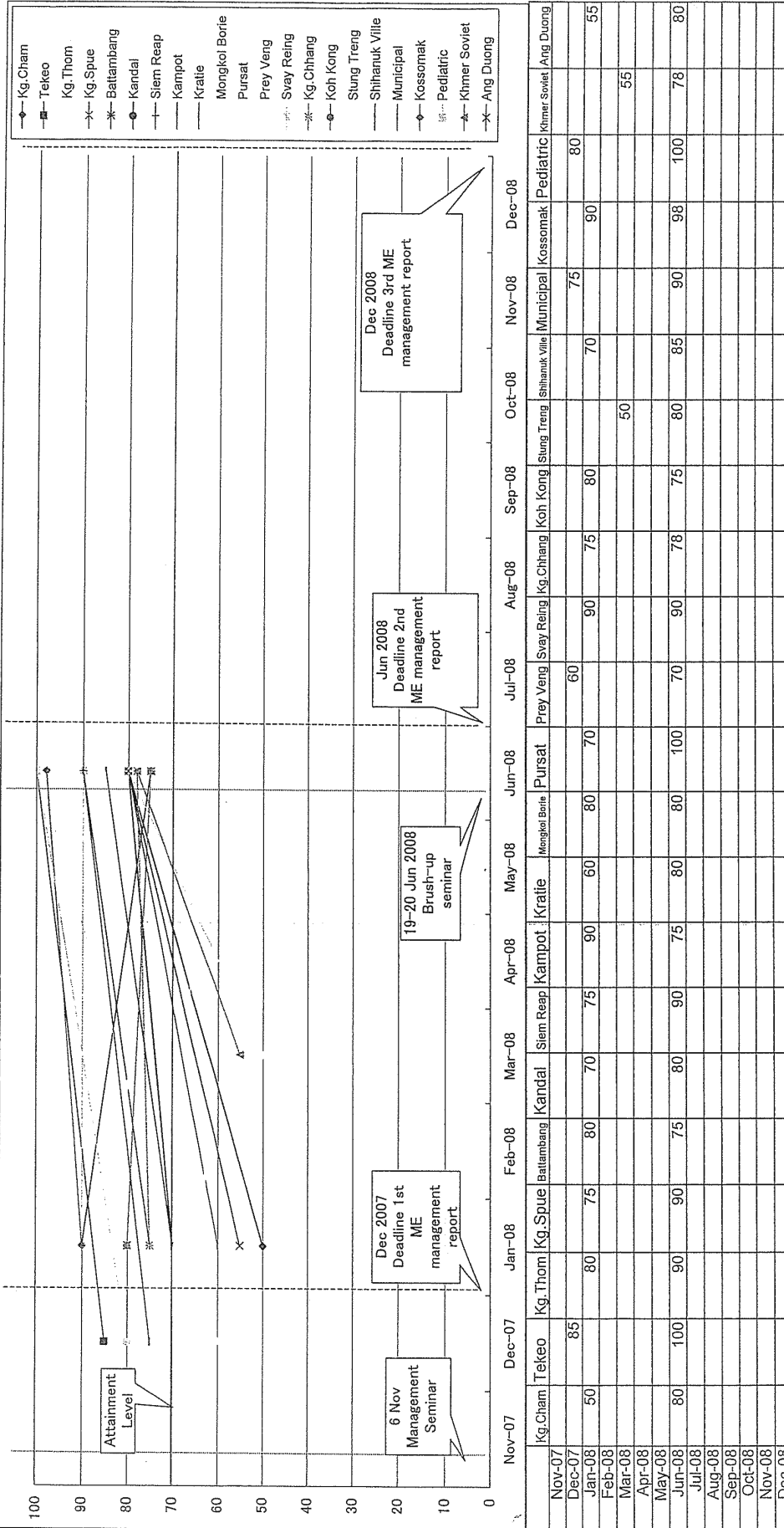
Form	Check points	Criteria	Highest score
All forms	Submission of the form to MoH	Full necessary set on time: 40; On time but not full: 30; Full but delay: 20; Not full and delay: 10; Not submit = 0	40
F1-2	Evaluation of DMEM activities	Reasonable:5, Not reasonable: 0	5
	Evaluation of MET activities	Reasonable:5, Not reasonable: 0	5
	Evaluation of MEMWG activities	Reasonable:5, Not reasonable: 0	5
F2-3	Estimation of repair cost	Correct: 5, Incorrect: 0	5
	Estimation of replacement cost	Correct: 5, Incorrect: 0	5
	Calculation of operational percentages	Correct: 5, Incorrect: 0	5
F3-2	Update of ME condition	75%~100% = 30; 50%~75% = 20; 25%~50% = 10; 0%~25% = 0	30
TOTAL			100

Note:

- >> Necessary full set means all forms except F2-2, for second semiannual report (December)
- >> Necessary full set means all forms except F1-1, F2-1, F2-2 and F3-1, for first semiannual report (June)



Annex 17: Result of Evaluation on ME Management Report



Annex 18: MEM-WG Follow up Criteria

No	Description	How to make a score	Unit Score	Evaluation of indicator	Full Score
II: Collaboration & role of MEM-WG					
1	Holding ME management meeting	Attend all of stakeholder mentioned in ME management manual	8	Check "Form 2-3"	8
		Attended without clinical department	6		
		Attended without administration department	5		
		Clinical and administration dept. no attended	4		
		Only MEM-WG attended	2		
No meeting was hold	0				
2	MEM-WG meeting, (Information, Communication and Consultation, etc)	Every one month	8	Interview to MEM-WG	8
		Every two months	6		
		Every three months	5		
		Every six months	4		
		Only necessary occasion	2		
Nothing	0				
3	Coordination with Administrative section	Good	6	Interview to Administration department or MEM-WG	6
		Moderate	4		
		Poor	2		
4	Keep & File Copy of full set ME management report (Form 1-3)	Arranged properly with binder file	6	Check actual condition	6
		Just put binder file	4		
		Just keeping	2		
		No keeping	0		
5	Preparation of maintenance budget	Describe appropriate budget in AOP	8	Interview to MEM or Accounting department Check AOP	8
		No description in AOP, but using budgets for ME maintenance	4		
		No description and never use budgets for maintenance	0		
6	Correspondent for failure ME (After guarantee period finish)	Contact to MoH	6	Interview to MEM-WG or Director	6
		Contact to local agent	4		
		Contact to Donor	2		
		No action	0		
7	Introduce information about MEM-WG to Clinical department	Introduce in the meeting	8	Interview to MEM or MEDM	8
		Explain by verbal only	6		
		No action	0		
II: Role of MEM					
1	Making ME management report (Form 1-2)	Complete	6	Check "Form 1-2"	6
		Incorrect	4		
		No make	0		
2	Activity of ME Manager	Good	6	Interview to MEDM	6
		Moderate	4		
		Poor	2		
III: Role of MEDM					
1	Making ME management report (Form 2-2)	Complete	6	Check "Form 2-2"	6
		Incorrect	4		
		No make	0		
2	Making Minuts of ME management meeting (Form 2-3)	Complete	6	Check "Form 2-3"	6
		Incorrect	4		
		No make	0		
3	Activity of MEDM	Good	6	Interview to MEM	6
		Moderate	4		
		Poor	2		
4	Collaboration ME condition Update with MET	Good	6	Interview to MET	6
		Moderate	4		
		Poor	2		
5	Commissioning of received ME	Every time follow the commissioning procedure mentioned in ME management manual, and fill up sheets	8	Check "Form 2-4, (ME Information sheet)". Interview to MEDM.	8
		Not follow the commissioning procedure, but fill up sheets	6		
		Follow the commissioning procedure, but not fill up sheets	4		
		No action	0		
6	Keep & File ME Information sheet (Form 2-4)	Arranged properly	6	Check actual condition.	6
		Just put binder file	4		
		Just keeping	2		
		No keeping	0		
				TOTAL	100

