

## CHAPTER 6

### IMPLEMENTATION PLAN

MIS system implementation is the process of installing hardware and software and getting the system up and running. The system implementation generally consists of a defined set of activities including planning and scheduling the installation processes, developing and testing software program, preparing the site and installing and testing the hardware, selecting and training personnel, completing documentation, testing the system, and converting from the old to the new system.

In developing the implementation plan for implementing MIS for the power plant , the process will involve:

- 1) Announce the implementation and setting up the teams to do the implementation.
- 2) The sequence of software modules to be implemented.
- 3) Computer system and network implementation schedule.

#### 6.1 MIS Implementation Strategy

The software selection for the power plant, which is outlined in chapter 5, is currently in use in EGAT mainframe and the hardware was installed. Then the MIS implementation strategy for the power plant is considered in three parts, which consists of processes involved in the implementation, redesign the power plant working processes and strategy for Implementation teams.

The process strategy of implementing MIS will involve:

- 1) Preparing the database necessary for an implementation.
- 2) Initial implementation of the software database and equipment.
- 3) Introducing the features of the systems, with changes to the working processes, where appropriate.
- 4) Introducing the features that use the data that accumulates in the system, to give planners and management improve information concerning the operations, and has a greater understanding of the businesses.

#### **6.1.1 Redesign Process**

Business process redesign involves an information system that induces a fundamental change in the way the organization conducts its internal process [2].

Implementing MIS will allow the power plant to improve the way it operates in two significant steps. The first step to achieve improvements is to use the new MIS technology to allow the power plant perform its current functions more quickly and efficiently, and to collect more information. The second source of improvements comes from changing the way the power plant operates, using the technology to support the change. The first step represents the conventional way to implement computer systems, and the second involves redesign the working process prior to implementing the computer systems.

#### **6.1.2 Strategy for Implementation Teams**

The MIS implementation teams take staff, from the power plant and from the Contractor team, to implement the MIS. These people need to be organized, trained, and managed to complete the MIS implementation as quickly and efficiently as possible. The

teams need to be set up in manageable working groups, with clearly defined goals and responsibilities. The quality of people chosen will affect the quality of the final systems. As MIS will have a major effect on the power plant, the management should ensure that the people selected are the most suitable.

### 6.1.3 Management of Implementation

The MIS is a tool that enables an organization to commercially run the business in effectiveness. To accomplish the MIS implementation, the lowest organization's units have to understand the advantage they will get, accept this implementation and they shall provide full cooperation. Meanwhile, the highest level and the management team must sincerely support an implementation, also they should pay attention to close monitor project progress and control to ensure that the implementation shall follow the plan.

As project planning is usually done in one of two ways [2]:

- 1) Top down, where the planning is started with an analysis of the overall business objectives and works down to specific systems.
- 2) Bottom up planning starts with the needs of a particular system, develops the needs for that system and other systems on that same level, and works upward toward an integration of systems.

The development of the MIS implementation plan requires a Top down approach since its advantage is that systems are developed with an overall perspective of the needs of the business. Correct and appropriate systems are developed on a timely basis.

The methodology required of project planning approach is summarized as in Figure 6-1.

#### **6.1.3.1 Scope Control**

The first step, the major goals of the MIS implementation shall be clearly identified then define a strategy. The procedures and results are described in Chapter 3 and 4 of the Plan.

#### **6.1.3.2 Time Control**

This step creates the detailed activities that will be required for the implementation of the MIS modules, identifies the priority of the work that will be performed and schedules these activities.

#### **6.1.3.3 Resource Allocation**

This step is conducted to do resource leveling. The results of this resource allocation are described in Chapter 7 of the Plan.

#### **6.1.3.4 Cost Control**

This step is estimating the budget that will be required for the MIS implementation. The budget is determined by reviewing the plan and the resource allocation. The results are described in Chapter 8 of the Plan.

#### **6.1.3.5 Project Progress Reviews**

Routine project reviews should be conducted in order to monitor the MIS implementation progress. All activities must be clearly defined so that they can be performed, measured, and managed. A monthly reporting should be established for the project reviews, to ensure that all levels of management are informed on the project progress and any issues that have occurred [2].

STEP	DESCRIPTION
1	Define the Scope - Determine the major goals to be accomplished
2	Create the Activities Schedule - Define the detailed tasks - Identify the logic and external constraining factors.
3	Perform Task - Conduct resource leveling - Priorities work to be performed
4	Finalize Budgets - Determine and negotiate the budget based on the scenario developed in Step 3
5	Establish a Progress Reporting and Review Cycle - Set cycle duration - Establish report formats - Track project progress - Track resource use and changing requirements - Track costs - Controls scope changes

Figure 6-1 Project Planning Methodology

The MIS implementation plan should be an updating plan, which is reviewed and revised regularly, based on the changes that are occurring within organization such as system environment, privatization, interfaces with other systems, and changes in policies and procedures. Monthly progress meeting should be schedule with the MIS project committee to report on the project progress. The meeting will be conducted to ensure that acceptable progress has been made, and to discuss solutions or action to be taken on at any critical problem areas.

The MIS implementation schedule, resource usage, and costs will be monitored as described below [6].

1) Track project progress. The project progress will report in terms of actually started date and finished date is gathered completed percent, remaining percent and expectation of finished date. This information will be in a monthly progress reporting form, which will be distributed to all team leaders to update their monthly reports. Figure 6-2 shows the project progress format.

2) Track resource usage. The resource usage will be captured its actual time spent, the result can be utilized for a revision of resource usage.

3) Track costs. It will monitor costs of an individual activity and resource.

Monthly Progress Report

Activity_id	Activity Description	Plan Start Date	Plan Finish Date	Actual Start Date	Actual Finish Date	% Complete	% Remaining	Expected Finish Date

ISSUE LOG

Issue Log Control No.	Description of Problem	Author	Priority	Response	Date Submitted	Date Assigned	Date Complete

Figure 9-2. The Progress Format

## 6.2 The MIS Master Plan

From the analysis of the power plant information requirement in Chapter 4, the purpose of MIS implementation is to implement some major modules (applications software) concurrently and use phasing approach (implement most critical system first then less critical later). An analysis of the priority applications should be performed. The management and the implementation team should involve in this analysis. In comparison for obtaining the priority of each application, it should define score of each ranked criteria (performance measure is used as ranked criteria for this case) of the application. Then each performance of such application is analyzed and ranked on scale of "1" to "10". Finally, an application that has highest score represents the most need application, in other word it has highest priority. Figure 6-3 shows the application ranking, the rows of matrix show applications software while the columns list item of performance measure. The numbers in matrix indicate ranked criteria and the last column is the total score of applications. The list of priority applications determines the implementation sequence of the MIS plan. Figure 6-4 shows the overall MIS implementation plan for the power plant.



	Performance Measure														Total			
	Plant Efficiency Measure	Generation Cost vs Plan	Generation Cost per kWh	Unplanned Outage	Availability Measure	Load loss incidents	Maintenance Time vs Plan	Maintenance Cost vs Plan	Planned Outage	Breakages and Faults	Cash Flow Budget	Expenditure vs Plan	Staff Efficiency	Staff Utilization		Staff vs Plan	Training Days	Staff Skill Mix
Equipment Register	10	10	10	10	10	9	9	9	9	9	7	8	9	9	7	6	6	147
Maintenance Scheduling	9	9	9	9	9	9	9	9	9	9		9	9	9	9	6	8	140
Work Order	9	9	9	9	9	9	9	9	9	9		9	9	9	9	6		132
Condition Monitoring		9	9	9	9		9	9	9	9		8	9	9	9			107
Equipment Tracing	9	9	9	9	9	9	9	9	9	9								90
Labor Costing		9					9	9	9	9			9	9	7	6		76
Production and Operating Statistics	9	9	9		9	9	9		10	10								74
Equipment Costing		8	8	8			8	8	8	8		8						64
Project Control	10						7	7	7	7			9	9	7			63
Fuel and Oil Issue		9	7					7	7	7								37
Inventory and Warehouse Management	9	9	9		9		9	9	9		9	9						81
Purchasing	9	9	9		9		9	9	9		9	9						81
Inventory Tracing							8	8	7		7	7						37
Forward Purchase Agreement							8	8	7		7	7						37
General Ledger		9	9		9			9	9			9						54
Financial Report			9	9			9	9	10			7						53
Budgeting		9				9	8	8			7	8		8				57
Account Payable									7		7	8						22
Fixed Asset			8				8											16
Cash Management											9							9
Account Receivable											6							6
Personnel	7						7						7	7	7	7	7	49
Training	7						7						7	7	7	7	7	49
Time Recording		9											9	7	7	7	8	47
Payroll			7						7		7		7	7	8			43
Recruitment													7	5	5			17

Figure 6-3. Applications Ranking

Figure 6-4. The MIS Master Plan For Wang Noi Power Plant

ID	Task Name	Duration	Start	1999			2000			2001		
				Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2
1	Supplies Management System Project	152d	Thu 1/4/99	██████████								
2	Inventory Management	152d	Thu 1/4/99	██████████								
3	Purchasing	152d	Thu 1/4/99	██████████								
4	Warehouse Management	152d	Thu 1/4/99	██████████								
5	Plant Operation and Maintenance Management System (MMS) Project	260d	Thu 1/4/99	██████████								
6	Plant Operation System	260d	Thu 1/4/99	██████████								
7	Plant Maintenance & Facilities Management System	260d	Thu 1/4/99	██████████								
8	Financial Management system (FMS)	105d	Mon 3/4/00					██████████				
9	General Ledger	70d	Mon 3/4/00					██████████				
10	Fixed Asset	70d	Mon 3/4/00					██████████				
11	Budgeting	20d	Sat 3/6/00						██████████			
12	Financial reports	60d	Sat 3/6/00						██████████			
13	Account Payable	15d	Mon 3/7/00						██████████			
14	Account Receivable	15d	Mon 3/7/00						██████████			
16	Cash management	15d	Mon 3/7/00						██████████			
15	Human Resource Management System (HRMS)	130d	Mon 2/4/01								██████████	
17	Personnel	130d	Mon 2/4/01								██████████	
18	Training	130d	Mon 2/4/01								██████████	
19	Time Recording	130d	Mon 2/4/01								██████████	
20	Payrol	130d	Mon 2/4/01								██████████	
21	Recruitment	130d	Mon 2/4/01								██████████	

Project: The MIS Master Plan Date: Tue 21/3/00	Task	██████████	Summary	██████████	Rolled Up Progress	██████████
	Progress	██████████	Rolled Up Task	██████████		
	Milestone	◆	Rolled Up Milestone	◇		

### 6.3 The Twelve Months Plan

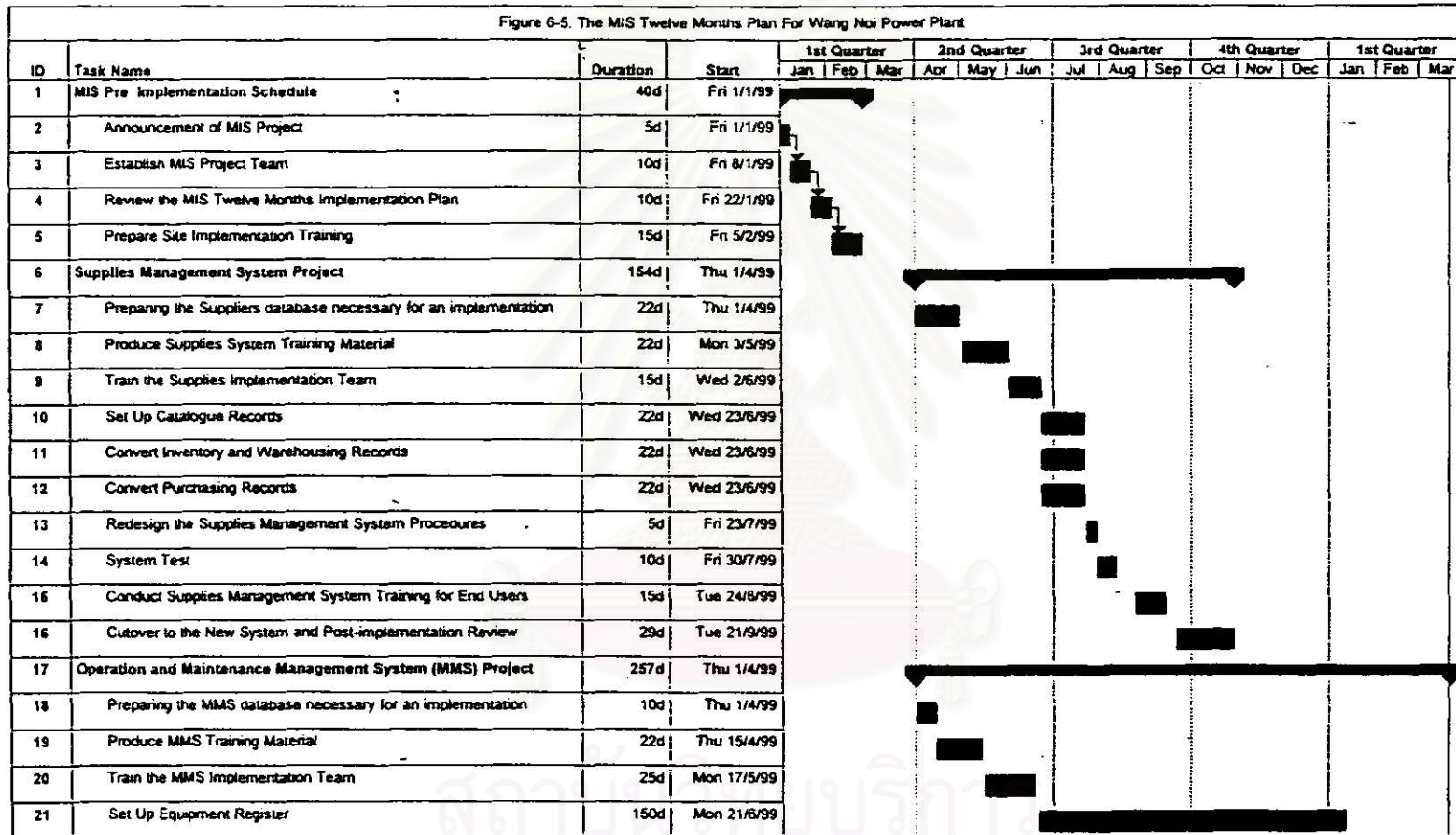
As mention in Chapter 5, EGAT establishes a project to implement the "MIMS" application software and setup the implementation team, which has many experiences in implement the modules of Operations and Maintenance Management System (MMS) and Supplies management System at several thermal power plants and all hydro power plants in EGAT. This team is acting as the Contractor for the power plant to do the implementation of those modules.

The MIS twelve months implementation plan begins with the power plant announcing the MIS project and establishing its implementation team, a number of preparing the database necessary for an implementation, which ensures that the software modules shall be properly installed. Figure 6-5 shows the twelve months implementation plan. The activities in the plan are activities that the Contractor used for implement at several power plants. The following sub-sections describe the detailed activities of the MIS twelve-month implementation plan.

#### 6.3.1 Announcing the Implementation and Establishing the Wang Noi Implementation Team

The purpose of the announcement of the MIS implementation is to inform the employees of the decision to implement the new system and to ask for the employees' cooperation. The MIS committee establishes the Implementation team as the project team. Chapter 7 describes the MIS implementation organization, responsibilities, and scale of resources required.

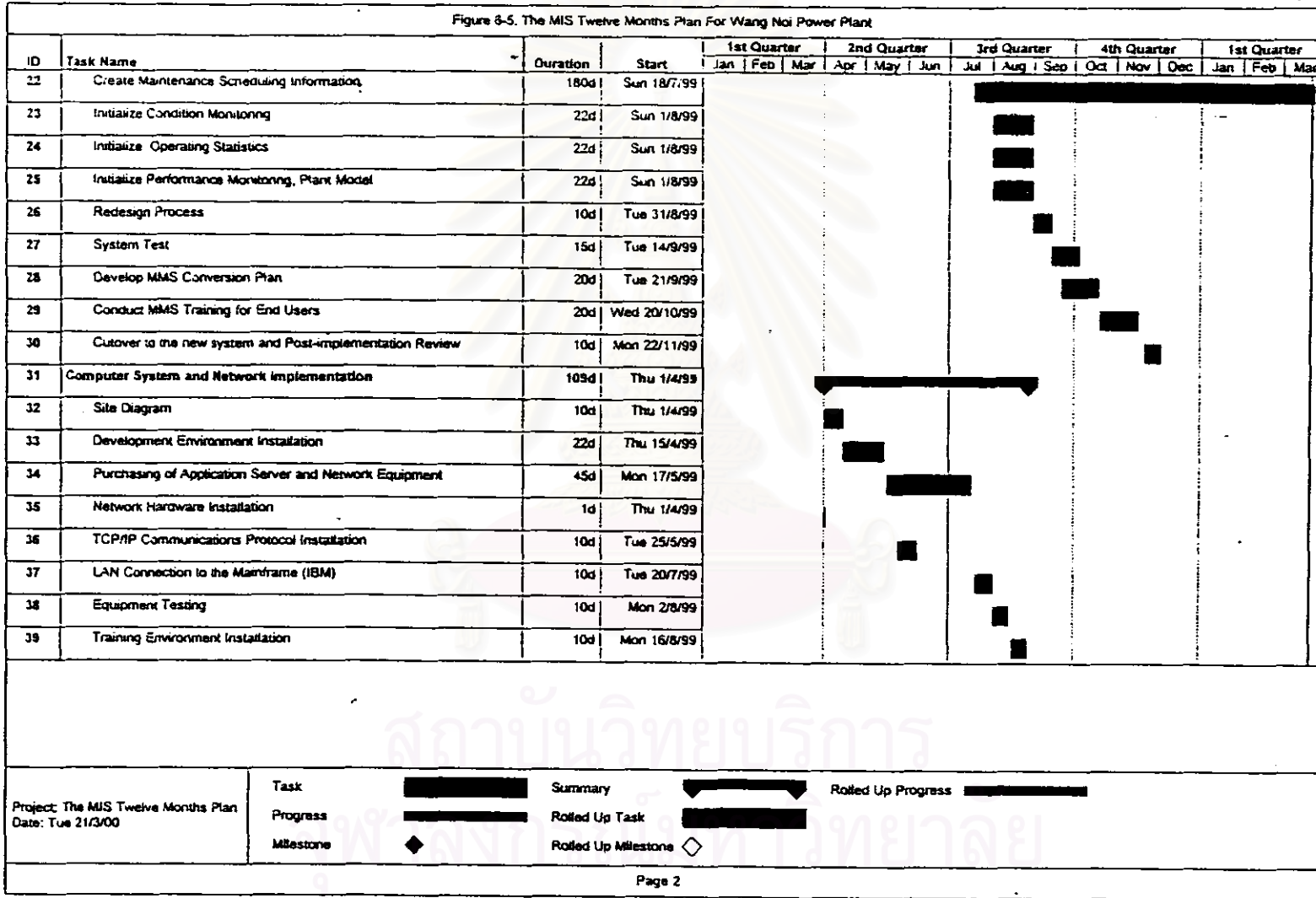
Figure 6-5. The MIS Twelve Months Plan For Wang Noi Power Plant



Project: The MIS Twelve Months Plan  
Date: Tue 21/3/00

Task [Symbol] Summary [Symbol] Rolled Up Progress [Symbol]  
 Progress [Symbol] Rolled Up Task [Symbol]  
 Milestone [Symbol] Rolled Up Milestone [Symbol]

Figure 8-5. The MIS Twelve Months Plan For Wang Noi Power Plant



## **6.3.2 Implementation Schedule and Activity Descriptions of the Supplies Management Module**

### **6.3.2.1 Preparing the Suppliers database necessary for an implementation**

This activity is a responsibility of the Contractor. Preparing the material necessary for a Supplies implementation is summarized as follow:

#### **1) Set up Standard for Supplies System Configuration**

- 1.1) System Control Files**
- 1.2) System Security Profiles**
- 1.3) Menu Structures**
- 1.4) User Authorization Levels**

#### **2) Set Up Table Files and Codes**

#### **3) Review Supplies Policies and Procedures**

#### **4) Batch System**

- 4.1) Chart of Accounts.**
- 4.2) Requirements for overnight batch runs will be reviewed and established.**

### **6.3.2.2 Produce Supplies Management Training Manuals**

The implementation strategy is that all training material shall be prepared to the Wang Noi Supplies implementation team that is attending the training course. In this regard, the training manuals will be produced to the power plant circumstances. The

team can be used as reference guides after the training is completed. This activity is a responsibility of the Contractor.

#### **6.3.2.3 Train the Supplies Implementation Team**

This activity covers the intensive training of the Wang Noi Supplies implementation team in the modules of Supplies management. This course will emphasize various aspects of the training to ensure that the implementation team throughout understands the software functions. This activity is a responsibility of the Contractor.

#### **6.3.2.4 Set Up Catalogue Records**

The purpose of this activity is to build a set of Catalogue records. This activity is a responsibility of the Contractor.

#### **6.3.2.5 Convert Inventory and Warehousing Records**

This activity will involve the conversion of inventory and warehousing data for the power plant. The data required includes the current stock on hand balances, current unit value and location information. The data will be entered by conversion from the existing system information. This activity is a responsibility of the Contractor

#### **6.3.2.6 Convert Purchasing Records**

Before starting the Supplies management system in an operational mode, the outstanding orders file must be created, for all receipts of materials can be properly entered. This activity will involve the conversion of the power plant specific purchasing records. This activity is a responsibility of the Contractor and Wang Noi Supplies implementation team.

#### **6.3.2.7 Redesign the Supplies Procedures Process**

The purpose of this activity is to review and develop the Operating Procedure that is in the operation of the Supplies management modules, particularly in the purchasing and inventory area. Policies and procedures related to these functions will be reviewed. This activity is a responsibility of the Contractor, Wang Noi Supplies management implementation team, and the MIS committee.

#### **6.3.2.8 System Test**

The purpose of this activity is to perform a trial run of the data to ensure that the Wang Noi's Supplies management functions, security, menus, etc., are working in accordance with the system configuration and in conjunction with the table files and codes established during the Supplies management preparing the database necessary for a Supplies management implementation. Any corrective action that is required will be done at this period. This activity is a responsibility of the Contractor and the Wang Noi Implementation team.

#### **6.3.2.9 Conduct Supplies Training for End Users**

This activity covers training in the Supplies management functions for users at the power plant. The content of this course will be tailored to meet the power plant requirements. This activity is a responsibility of the Contractor and Wang Noi Supplies implementation team.



#### 6.3.2.10 Supplies Management Cutover to the New System and Postimplementation Review

The Supplies management cutover to the new system, as it represents the point in time after the training program has been completed, the system startup can begin.

After a new system has operated for a brief period, it should be evaluated. This evaluation is referred to being a postimplementation review. This review is essential, since no matter how well changeover activities are planned, numerous unforeseen incidents and problems will usually arise. During the review the Contractor and the Wang Noi Supplies implementation team should verify that the new system is meeting its planned objectives. Additionally, the teams should assess the adequacy of system standards and controls, and correct all errors detected by the system. Major differences between actual and expected performance should be brought to the attention of management and necessary adjustments made.

After the review has been completed, a postimplementation review report should be prepared. The report should be presented to all affected user groups. Acceptance of the report is the concluding activity in the implementation process. When the report is accepted, control of the system is passed to the outsourcing (Information Technology Division).

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### **6.3.3 Implementation Schedule and Activity Description of the Operation and Maintenance Management Module (MMS)**

#### ***6.3.3.1 Preparing the MMS database necessary for an implementation***

This activity is a responsibility of the Contractor. Preparing the material necessary for a MMS implementation are summarized as follow:

1) Set up Standard for MMS System Configuration

- 1.1) System Control Files
- 1.2) System Security Profiles
- 1.3) Menu Structures
- 1.4) User Authorization Levels

2) Set Up Table Files and Codes

3) Review MMS Policies and Procedures

4) Define Policies for Operation and Maintenance

4.1) Maintenance Standard Jobs

4.2) Chart of Accounts

4.3) Equipment Register Structure

#### ***6.3.3.2 Produce MMS Training Manual***

The implementation strategy is that all training material shall be prepared to the Wang Noi MMS implementation team that is attending the training course. In these

regards, the training manuals will be produced to the power plant circumstances. The team can be used as reference guides after the training is completed. This activity is a responsibility of the Contractor.

#### **6.3.3.3 Create Maintenance Scheduling Information**

The Maintenance scheduling system creates lists of recurring tasks for individual work groups to be performed. This activity involves the entry of information on when the maintenance was last done in order to set up routinely the scheduled maintenance tasks. The plant measuring devices should be reviewed to determine that all pieces of equipment which need statistics for scheduling are metered. All statistical information about the equipment should be entered for scheduled preventive maintenance, predictive maintenance as well as condition monitoring maintenance. This activity is a responsibility of the Contractor and the Wang Noi MMS Implementation team.

#### **6.3.3.4 Initialize Condition Monitoring, Operating Statistics, Performance Monitoring, Plant Model**

These activities are responsibility of the Contractor and the Wang Noi MMS Implementation team. The tasks involved with the set up of the modules are described below.

##### **Condition Monitoring**

- 1) Define types of condition monitoring to be undertaken e.g. vibration analysis, shock pulse, etc.
- 2) Define equipment on which condition monitoring will be undertaken.
- 3) Define condition monitoring criteria, danger levels, etc.

### **Operating Statistics**

- 1) Discuss and agree operating statistics requirements.
- 2) Develop an overall outline for the implementation of operation statistics.

### **Performance Monitoring**

- 1) Define and agree codes and formula for recording downtime, reporting of availability/utilization and daily statistics.
- 2) Set up formula and codes.

### **6.3.3.5 Redesign Process**

A review of the power plant procedures will be conducted to ensure that Standard Operating Procedures are developed for all operation, particularly maintenance management and Supplies management related activities. The purpose of this activity is to redesign the procedures being used at the power plant for raising work orders, recording statistics, maintaining the Equipment Register, etc. All operation, maintenance and Supplies management procedures shall be set up and consequently they shall be produced as work instruction documents. This activity is a responsibility of the Contractor, the Wang Noi MMS Implementation team and MIS committee.

### **6.3.3.6 System Test**

The purpose of this activity is to perform a trial run of the data to ensure that the Wang Noi's Power Plant work order numbering system, work orders, scheduling, security, menus, etc., are working in accordance with the system configuration that had been set up for the power plant, and in conjunction with the table files and codes established during the MMS preparing the database necessary for a MMS

implementation. Any corrective action that is required will be done at this period. This activity is a responsibility of the Contractor and the Wang Noi MMS Implementation team.

#### **6.3.3.7 Develop MMS Conversion Plan**

Conversion is the process of changing from the old system to the new. Many system elements must be converted: hardware, software, data files, and procedures. A formal conversion plan should be developed and approved prior to the implementation phase. The conversion plan is similar to the implementation plan in that tasks, responsibilities, and expected completion dates should be specified for all activities.

#### **6.3.3.8 Conduct MMS Training for End Users**

This activity will cover training in the MMS functions for end users at the power plant. The content of this course will be tailored to meet the power plant requirements. This activity is a responsibility of the Contractor and the Wang Noi MMS Implementation team.

#### **6.3.3.9 Cutover to the New System and Postimplementation Review**

The cutover to the new system (discontinuing the old system when the new system is introduced), as it represents the point in time after the training program has been completed, the system can start up. After a new system has operated for a brief period, it should be evaluated. This evaluation is referred to as being a post-implementation review. This review is essential, since no matter how well changeover activities are planned, numerous unforeseen incidents and problems will usually arise. During the review the Contractor and the Wang Noi MMS implementation team should verify that the new system is meeting its planned objectives. Additionally, the teams

should assess the adequacy of system standards and controls, and correct all errors detected by the system. Major differences between actual and expected performance should be brought to the attention of management and necessary adjustments made.

After the review has been completed, a postimplementation review report should be prepared. The report should be presented to all affected user groups. Acceptance of the report is the concluding activity in the implementation process. When the report is accepted, control of the system is passed to the outsourcing (Information Technology Division).

#### **6.3.3.10 Conduct MMS Management Training**

This activity covers training in the MMS functions for management. The content of this course will be tailored to meet the Wang Noi's Power Plant requirements. This activity is a responsibility of the Contractor.

### **6.3.4 Hardware and Network Implementation**

As computer system and network system are the essential tools to support the implementation of Supplies management, Operation and Maintenance management, the availability of these systems whatever hardware and software are important during various implementation tasks. The following activities shall be proceeded:

#### **6.3.4.1 Site Diagram**

The MIS project manager has to provide site diagrams to the Contractor. These diagrams will include a campus diagram, building diagram and individual floor diagrams for all offices and buildings that will be impacted by the MIS implementation.

Each building diagram provides all pertinent information necessary for the installation of the new equipment. This is including such things as the present equipment locations, wiring cabinets and the anticipated locations for the new equipment.

#### **6.3.4.2 Development Environment Installation**

Once the site diagrams have been provided, the Contractor and the Wang Noi Network and Communication staff should review the diagrams and come to a complete agreement concerning the location for the new equipment, its cabling and electrical requirements.

#### **6.3.4.3 Purchasing of Application Server and Network Equipment**

After review of the power plant existing equipment stock, the Contractor will determine what items should be required and consequently placed orders with vendors. The purchase order should have enough lead time to let the equipment arrive in advance of the scheduled MIS implementation.

#### **6.3.4.4 Network Hardware Installation**

Once the site diagrams have been completed, and the equipment is available for installation, the Contractor should begin the installation of the equipment. The MIS project manager should be responsible for ensuring electrical requirements are met, i.e. wiring power points. The MIS project manager will designate several site personnel for being local support of the equipment. These individuals will be provided informal training by the Contractor on how to analyze local problems and assist the Network and Communication with the resolution of local problems.

#### **6.3.4.5 TCP/IP Communications Protocol Installation**

The Contractor will be responsible for configuring and implementing the TCP/IP protocol configurations. They will also configure the necessary changes in the network management software and user interface definitions.

#### **6.3.4.6 LAN Connection to the Mainframe (IBM)**

The Contractor will review the link requirements to determine the appropriate links, that probably are the existing links and where additional links, or link upgrades are required. The Contractor will configure the modem and the controller to provide the connection to the mainframe computer, which is installed at EGAT Head Office.

#### **6.3.4.7 Equipment Testing**

Once the network hardware has been installed and the software definitions are completed, the equipment reliability shall be tested, especially communications between the power plant and the mainframe have to be tested first. The Contractor and Wang Noi Network and Communication staff should ensure the WAN links are 100 percent functional.

#### **6.3.4.8 Training Environment Installation**

Once the development environment installation has been completed, the training will be conducted to the Wang Noi Network and Communication staff.