PREFACE

With the experience in power industry of more than three decades, EGAT has developed a great deal of skills and knowledge in operation and maintenance (O&M). However, those skills and knowledge, which need to be collected systematically, are still scattered because of some reasons such as personnel retirement, position rotation, etc.

In order to solve this problem, EGAT by South East Asia Center for Training in Energy for Development (SEACTED) has developed Center of Excellence for Hydro Power Plant Project in collaboration from experienced hydro power plant staff. The skills and knowledge on hydro power plant O & M has been gathered, systemized, and transferred as "Basic Hydro Power Plant Training" material. The material explains the basic idea of how HPP develop. It is also used as a tool for increasing potential of hydro power plant O &M personnel, also the other people who are interested in this field.

The content in this book might not be perfectly composed. Therefore, we are very please to any of your suggestion that helps complete this material.

Collectors Group

CONTENTS

PREFACE

CHAPTER 1	THE ROLE OF HYDROELECTRIC POWER PLANT IN THAILAND	1-1
	1.1 Introduction	1-1
	1.2 Electric Power Transmission and Distribution Systems	1-6
CHAPTER 2	HYDRAULIC PRINCIPLE AND POWER PLANT EQUIPMENT	2-1
	2.1 Hydraulic Principles	2-1
	2.2 Main Equipment of Hydroelectric Power Plant	2-10
CHAPTER 3	RESERVOIR AND WATER MANAGEMENT	3-1
	3.1 Hydrology	3-1
	3.2 Dam	3-15
	3.3 Intakes and Spillways	3-32
	3.4 Reservoir Administration and Management	3-38
CHAPTER 4	HYDRAULIC TURBINE	4-1
	4.1 Type of Hydraulic Turbine	4-2
	4.2 Impulse Turbine	4-3
	4.3 Reaction Turbine	4-7
	4.4 Selecting of Hydraulic Turbine	4-14
CHAPTER 5	CONTROL SYSTEM FOR WATER TURBINE	5-1
	5.1 Fundamental Theory of The Control System	5-1
	5.2 The control of Water Turbine	5-5

	5.3 Turbine Monitoring and Protection System	5-12
	5.4 Digital Control System	5-14
CHAPTER 6	ELECTRICITY GENERATOR	6-1
	6.1 The Fundamental Theory of The Electricity Generator	6-1
	6.2 Generator Construction	6-9
	6.3 Supporting Equipment for The Generator	6-21
	6.4 The Excitation and The Synchronization	6-26
CHAPTER 7	POWER GENERATOR CONTROL SYSTEM	7-1
	7.1 Power Control	7-1
	7.2 Monitoring and Warning System	7-7
	7.3 Protection Relay	7-22
	7.4 Computer Controller	7-32
CHAPTER 8	ELECTRICITY GENERATING UNIT COMPONENTS	8-1
	8.1 Type of Auxiliary Equipment	8-1
	8.2 Plant Cooling & Lubrication System	8-21
CHAPTER 9	AUXILIARY EQUIPMENTS OF THE POWER PLANT	9-1
	9.1 Transformer	9-1
	9.2 Switchyard	9-7
	9.3 High Voltage and Protection	9-10
	9.4 Station Service and DC Equipment	9-17
CHAPTER 10	START-UP AND MAINTENANCE	10-1
	10.1 The Start up	10-1
	10.2 The Maintenance	10-9
APPENDIX		