

# Contents

<b>Abstract</b>	<b>(i)</b>
<b>Acknowledgement</b>	<b>(ii)</b>
<b>Chapter 1. Steam power plant</b>	<b>01-04</b>
1.1. Introduction	01
1.2. Power plants	02
1.3. Field of use	03
1.3.1. Private industrial plant	
1.3.2. Central station	
1.4. Steam plant operation	04
1.5. Main parts and working of a steam station	04
<b>Chapter 2. BOILER</b>	<b>05-08</b>
2.1. Boiler	05
2.1.1. Boilers	
2.2. History	05
2.3. Classification of steam boilers	05
2.4. Important terms for steam boilers	07
2.5. Essenentials of a good steam boiler	08
2.6. Selection of a steam Boiler	08
<b>Chapter 3. Operation of Boilers</b>	<b>09-24</b>
3.1. Role of Boilers in Plant Operation (Steam Generation)	09
3.2. Boiler Mountings and accessories	09
3.3. Boiler accessories	11
3.4. Utilization	15
3.4.1. Steam Utilization	
3.5. The Role of Water Treatment in Steam Generation	15

3.5.1. External Treatment	
3.5.2. Internal Treatment	
3.6. Deaerators	16
3.8.1. Tray-Type Deaerating Heaters	
3.7. Condenser and Cooling Tower	18
3.8. Boiler furnace and steam drum	20
3.9. Fuel preparation system	20
3.10. Condenser	21
3.16. Feed water heater	21
3.19. Boiler Waterside Corrosion	22
3.20. Conclusions	24
<b>Chapter 4. Steam Turbine</b>	<b>25-42</b>
4.1. Steam Turbine	25
4.2. Types of turbines	26
4.2.1. Transonic turbine	
4.1.2. Contra-rotating turbines	
4.1.3. Stator less turbine	
4.1.4. Ceramic turbine	
4.1.5. Air-cooling	
4.1.6. Shrouded turbine	
4.1.7. Shroudless Turbine	
4.3. water Turbine	27
4.4. Steam Turbine	28
4.4.1. Steam turbine	
4.5. Classification of steam turbine	29
4.6. Uses of turbines	30

4.7. Operation of turbine	30
4.7.1. Impulse turbines	
4.7.2. Radial flow inward	
4.7.3. Axial flow	
4.7.4. Nozzle	
4.8. Runner and blades	32
4.9. Reaction turbines	32
4.10.1. Casting	
4.10. Multi-level steam turbines	35
4.11.1 Coupling of several turbines	
4.11.2. Shrouded tidal turbines	
4.11. Performance Monitoring	37
4.12.1. Benefits	
4.12. Others	41
4.13.1. There are many different kinds of turbines	
4.13. Advantage	42
<b>Chapter 5. Generator</b>	<b>43-47</b>
5.1. Definition	43
5.2. Steam generator	43
5.3. Types	44
5.4. Operation of Steam generator (nuclear power)	45
5.5. Typical operating conditions	45
5.6. Steam generator (Boiler)	46

5.7. Steam generator (component of prime mover)	46
5.8. Supercritical steam generator	47
<b>Chapter 6. Overall Controls</b>	<b>48-53</b>
6.1. Controls	48
6.1.1. Operation guidance	
6.1.2. Economic supervision	
6.2. The main purpose of providing controls is as follows	49
6.3. Selection of instrumentation	49
6.4. Automatic Control Systems	50
6.5. Combustion control system	50
6.6. The main function of a combustion control system	50
6.7. Steam temperature control system	50
6.8. Feed water control system	51
6.9. The types of the water control systems	51
6.10. Centralised control	51
6.11. Control Panel	52
6.12. Switch gear	52
6.13. Electric type control	52
6.14. Automatic tripping	53
<b>Conclusion</b>	<b>54</b>
<b>Bibliography</b>	<b>55</b>