## CONTENTS


I. INTRODUCTION ..... 9

II. DESIGN BASIS ..... 11

III. TOKAMAK, AUXILIARY SYSTEM AND FACILITY OVERVIEW ..... 15
1. TOKAMAK DEVICE ..... 15
2. AUXILIARY SYSTEMS ..... 17
3. FACILITIES AND MAINTENANCE ..... 18

IV. ITER TOKAMAK DEVICE CONCEPT AND LAYOUT ..... 23
1. INTEGRATION ..... 23
2. ITER EQUATORIAL PORT ALLOCATIONS ..... 27
3. REACTOR BUILDING LAYOUT ..... 29

V. ITER SYSTEM DESCRIPTIONS ..... 33
1. MAGNET SYSTEMS ..... 33
1.1 Toroidal field coils ..... 35
1.2 Poloidal field coils ..... 36
1.3 Cryogenic systems ..... 40
2. CONTAINMENT STRUCTURES ..... 40
2.1 Vacuum vessel ..... 40
2.2 Cryostat vessel ..... 41
2.3 Machine gravity supports ..... 41
2.4 Attaching locks ..... 41
2.5 Passive loops and active coils ..... 44
3. FIRST WALL ..... 44
3.1 FW design requirements ..... 44
3.2 FW design and integration with blanket/shield modules . 45
3.3 FW armor ..... 48
4. DIVERTOR PLATE ..... 50
4.1 Divertor design and materials ..... 50
4.2 Divertor performance and lifetime issues ..... 51
4.3 Other design considerations ..... 54
5. BLANKET/SHIELD SYSTEM ..... 54
5.1 Blanket segments ..... 55
5.2 Shielding ..... 62

6. MAINTENANCE EQUIPMENT ..... 64
6.1 Design requirements for maintenance ..... 64
6.2 Equipment ..... 65
7. CURRENT DRIVE AND HEATING ..... 65
7.1 Concept description ..... 65
7.2 Alternate concept descriptions ..... 67
8. FUEL CYCLE SYSTEM ..... 73
8.1 Scope and primary requirements ..... 73
8.2 System design ..... 73
8.3 Tritium inventories in ITER ..... 76
9. DIAGNOSTICS ..... 77
9.1 Diagnostics requirements ..... 77
9.2 Plasma Diagnostics in ITER ..... 77