

OVERALL TABLE OF CONTENTS

- I Overview
 - I.0 Introduction
 - I.1 Plant Design Specification
 - I.2 Main Physics Parameters and Assessment
 - I.3 Design Overview
 - I.4 Cost and Schedule

- II Design Description and Analysis
 - II.1 Magnet System
 - II.2 Vacuum Vessel and In-vessel Components
 - II.3 Cryostat and Thermal Shields
 - II.4 Fuel Cycle
 - II.5 Water Cooling System
 - II.6 Plasma Diagnostic System
 - II.7 Heating and Current Drive System
 - II.8 Site Layout - Buildings - Plant Service Systems
 - II.9 Initial Assembly
 - II.10 Tokamak Maintenance

I.1 Plant Design Specification

I.1.1	Programmatic Objective	3
I.1.2	Technical Objectives and their Interpretation	3
I.1.2.1	Interpretation	3
I.1.2.2	Scope of the EDA	9
I.1.2.3	Design Principles	10
I.1.3	Safety Principles and Criteria	10
I.1.3.1	Safety Objectives	10
I.1.3.2	Safety Design Principles	11
I.1.3.2.1	Deployment of Fusion's Safety Characteristics	11
I.1.3.2.2	Passive Safety	11
I.1.3.2.3	Defence-in-Depth	11
I.1.3.2.4	Consideration of the Experimental Nature	12
I.1.3.2.5	Review and Assessment	12
I.1.3.3	Safety and Environmental Criteria	13
I.1.3.4	Generic Elements of the Safety Approach	15
I.1.3.4.1	Confinement	15
I.1.3.4.1.1	Confinement of Radioactive and Toxic Materials	16
I.1.3.4.1.2	Protection of the Confinement	16
I.1.3.4.2	Component Classification	17
I.1.3.4.3	Earthquake	17
I.1.3.4.4	Environmental Qualification	19
I.1.3.4.5	Fire	19
I.1.3.4.6	Decommissioning and Waste	19
I.1.3.4.7	Effluents	20
I.1.3.4.8	Radiation Protection	20
I.1.3.4.9	Hazardous Materials	21
I.1.3.4.10	Conventional Hazards	22
I.1.3.4.11	Security and Proliferation	22
I.1.4	Site Requirements & Assumptions	22
	Introduction	22
I	Principles for Site Requirements and Site Design Assumptions	23
II	Site Requirements	24
A.	Land	24
1.	Land Area	24
2.	Geotechnical Characteristics	24
3.	Water Supply	25
4.	Sanitary and Industrial Sewage	25
B.	Heat Sink	25
C.	Energy and Electrical Power	26
D.	Transport and Shipping	26
1.	Maximum Size of Components to be shipped	26
2.	Maximum Weight of Shipments	27
E.	External Hazards and Accident Initiators	27
F.	Infrastructure	28
G.	Regulations and Decommissioning	28
III	Site Design Assumptions	28
A.	Land	28
1.	Land Area	28
2.	Topography	28
3.	Geotechnical Characteristics	29
4.	Hydrological Characteristics	29
5.	Seismic Characteristics	29
6.	Meteorological Characteristics	30
B.	Heat Sink: Water Supply for the Heat Rejection System	30
C.	Energy and Electrical Power	31
1.	Electrical Power Reliability during Operation	31
2.	ITER Plant Pulsed Electrical Supply	31

D.	Transport and Shipping	32
1.	Highway Transport	32
2.	Air Transport	32
3.	Rail and Waterway Transport	32
E.	External Hazards and Accident Initiators	32
1.	External Hazards	32
2.	External (Natural) Accident Initiators	32
F.	Infrastructure	33
1.	Industrial	33
2.	Workforce	34
3.	Socioeconomic Infrastructure	34
G.	Regulations and Decommissioning	35
1.	General Decommissioning	35
2.	ITER Plant "Deactivation" Scope of Work	35
H.	Construction Phase	36
I.1.5.	General Definitions	36
Table I.1.5-1	Remote Handling Classes	36
Table I.1.5-2	Steady-State Power Classes	36
Table I.1.5-3	Loading Conditions for Component Design	37
Table I.1.5-4	Damage Limits in Plant and Component Level	38
Table I.1.5-5	Damage Limits for Loading Conditions	39
Table I.1.5-6	Plant States	39
Table I.1.5-7	General Acronyms	40
I.1.6	ITER Design Documentation	41