

**APPENDIX 1C**  
**AEC PROPOSED GENERAL DESIGN CRITERIA FOR NUCLEAR POWER PLANTS**

**TABLE OF CONTENTS**

	<b><u>PAGE</u></b>	
<b>1C.0</b>	<b><u>AEC PROPOSED GENERAL DESIGN CRITERIA FOR NUCLEAR POWER PLANTS</u></b>	1C.1-1
<b>1C.1</b>	<b><u>INTRODUCTION</u></b>	1C.1-1
<b>1C.2</b>	<b><u>OVERALL PLANT REQUIREMENTS</u></b>	1C.2-1
1	QUALITY STANDARDS	1C.2-1
2	PERFORMANCE STANDARDS	1C.2-1
3	FIRE PROTECTION	1C.2-1
4	SHARING OF SYSTEMS	1C.2-1
5	RECORDS REQUIREMENTS	1C.2-1
<b>1C.3</b>	<b><u>PROTECTION BY MULTIPLE FISSION PRODUCT BARRIERS</u></b>	1C.3-1
6	REACTOR CORE DESIGN	1C.3-1
7	SUPPRESSION OF POWER OSCILLATIONS	1C.3-1
8	OVERALL POWER COEFFICIENT	1C.3-1
9	REACTOR COOLANT PRESSURE BOUNDARY	1C.3-1
10	CONTAINMENT	1C.3-1
<b>1C.4</b>	<b><u>NUCLEAR AND RADIATION CONTROLS</u></b>	1C.4-1
11	CONTROL ROOM	1C.4-1
12	INSTRUMENTATION AND CONTROL SYSTEMS	1C.4-1
13	FISSION PROCESS MONITORS AND CONTROLS	1C.4-1
14	CORE PROTECTION SYSTEMS	1C.4-1
15	ENGINEERED SAFETY FEATURES PROTECTION SYSTEMS	1C.4-1
16	MONITORING REACTOR COOLANT PRESSURE BOUNDARY	1C.4-1
17	MONITORING RADIOACTIVITY RELEASES	1C.4-1
18	MONITORING FUEL AND WASTE STORAGE	1C.4-1
<b>1C.5</b>	<b><u>RELIABILITY AND TESTABILITY OF PROTECTION SYSTEMS</u></b>	1C.5-1
19	PROTECTION SYSTEMS RELIABILITY	1C.5-1
20	PROTECTION SYSTEMS REDUNDANCY AND INDEPENDENCE	1C.5-1
21	SINGLE FAILURE DEFINITION	1C.5-1
22	SEPARATION OF PROTECTION AND CONTROL INSTRUMENTATION SYSTEMS	1C.5-1
23	PROTECTION AGAINST MULTIPLE DISABILITY FOR PROTECTION SYSTEMS	1C.5-1
24	EMERGENCY POWER FOR PROTECTION SYSTEMS	1C.5-1
25	DEMONSTRATION OF FUNCTIONAL OPERABILITY OF PROTECTION SYSTEMS	1C.5-1
26	PROTECTION SYSTEMS FAIL-SAFE DESIGN	1C.5-1
<b>1C.6</b>	<b><u>REACTIVITY CONTROL</u></b>	1C.6-1
27	REDUNDANCY OF REACTIVITY CONTROL	1C.6-1
28	REACTIVITY HOT SHUTDOWN CAPABILITY	1C.6-1
29	REACTIVITY SHUTDOWN CAPABILITY	1C.6-1

**APPENDIX 1C**  
**AEC PROPOSED GENERAL DESIGN CRITERIA FOR NUCLEAR POWER PLANTS**

**TABLE OF CONTENTS**

	<b><u>PAGE</u></b>
30 REACTIVITY HOLDDOWN CAPABILITY	1C.6-1
31 REACTIVITY CONTROL SYSTEMS MALFUNCTION	1C.6-1
32 MAXIMUM REACTIVITY WORTH OF CONTROL RODS	1C.6-1
<b>1C.7 <u>REACTOR COOLANT PRESSURE BOUNDARY</u></b>	<b>1C.7-1</b>
33 REACTOR COOLANT PRESSURE BOUNDARY CAPABILITY	1C.7-1
34 REACTOR COOLANT PRESSURE BOUNDARY RAPID PROPAGATION FAILURE PREVENTION	1C.7-1
35 REACTOR COOLANT PRESSURE BOUNDARY BRITTLE FRACTURE PREVENTION	1C.7-1
36 REACTOR COOLANT PRESSURE BOUNDARY SURVEILLANCE	1C.7-1
<b>1C.8 <u>ENGINEERED SAFETY FEATURES</u></b>	<b>1C.8-1</b>
<b>A. <u>GENERAL REQUIREMENTS</u></b>	<b>1C.8-1</b>
37 ENGINEERED SAFETY FEATURES BASIS FOR DESIGN	1C.8-1
38 RELIABILITY AND TESTABILITY OF ENGINEERED SAFETY FEATURES	1C.8-1
39 EMERGENCY POWER FOR ENGINEERED SAFETY FEATURES	1C.8-1
40 MISSILE PROTECTION	1C.8-1
41 ENGINEERED SAFETY FEATURES PERFORMANCE CAPABILITY	1C.8-1
42 ENGINEERED SAFETY FEATURES COMPONENTS CAPABILITY	1C.8-1
43 ACCIDENT AGGRAVATION PREVENTION	1C.8-1
<b>B. <u>EMERGENCY CORE COOLING</u></b>	<b>1C.8-2</b>
44 EMERGENCY CORE COOLING SYSTEMS CAPABILITY	1C.8-2
45 INSPECTION OF EMERGENCY CORE COOLING SYSTEMS	1C.8-2
46 TESTING OF EMERGENCY CORE COOLING SYSTEMS COMPONENTS	1C.8-2
47 TESTING OF EMERGENCY CORE COOLING SYSTEMS	1C.8-2
48 TESTING OF OPERATIONAL SEQUENCE OF EMERGENCY CORE COOLING SYSTEMS	1C.8-2
<b>C. <u>CONTAINMENT</u></b>	<b>1C.8-2</b>
49 CONTAINMENT DESIGN BASIS	1C.8-2
50 NIL-DUCTILITY TEMPERATURE REQUIREMENT FOR CONTAINMENT MATERIAL	1C.8-2
51 REACTOR COOLANT PRESSURE BOUNDARY OUTSIDE CONTAINMENT	1C.8-3
52 CONTAINMENT HEAT REMOVAL SYSTEMS	1C.8-3
53 CONTAINMENT ISOLATION VALVES	1C.8-3
54 CONTAINMENT LEAKAGE RATE TESTING	1C.8-3
55 CONTAINMENT PERIODIC LEAKAGE RATE TESTING	1C.8-3
56 PROVISIONS FOR TESTING OF PENETRATIONS	1C.8-3
57 PROVISIONS FOR TESTING OF ISOLATION VALVES	1C.8-3

**APPENDIX 1C**  
**AEC PROPOSED GENERAL DESIGN CRITERIA FOR NUCLEAR POWER PLANTS**

**TABLE OF CONTENTS**

	<b><u>PAGE</u></b>
D. <u>CONTAINMENT PRESSURE REDUCING</u>	1C.8-3
58 INSPECTION OF CONTAINMENT PRESSURE-REDUCING SYSTEMS	1C.8-3
59 TESTING OF CONTAINMENT PRESSURE-REDUCING SYSTEMS COMPONENTS	1C.8-3
60 TESTING OF CONTAINMENT SPRAY SYSTEMS	1C.8-4
61 TESTING OF OPERATIONAL SEQUENCE OF CONTAINMENT PRESSURE-REDUCING SYSTEMS	1C.8-4
E. <u>AIR CLEANUP</u>	1C.8-4
62 INSPECTION OF AIR CLEANUP SYSTEMS	1C.8-4
63 TESTING OF AIR CLEANUP SYSTEMS COMPONENTS	1C.8-4
64 TESTING OF AIR CLEANUP SYSTEMS	1C.8-4
65 TESTING OF OPERATION SEQUENCE OF AIR CLEANUP SYSTEMS	1C.8-4
<b>1C.9</b> <u><b>FUEL AND WASTE STORAGE SYSTEMS</b></u>	1C.9-1
66 PREVENTION OF FUEL STORAGE CRITICALITY	1C.9-1
67 FUEL AND WASTE STORAGE DECAY HEAT	1C.9-1
68 FUEL AND WASTE STORAGE RADIATION SHIELDING	1C.9-1
69 PROTECTION AGAINST RADIOACTIVITY RELEASE FROM SPENT FUEL AND WASTE STORAGE	1C.9-1
<b>1C.10</b> <u><b>PLANT EFFLUENTS</b></u>	1C.10-1
70 CONTROL OF RELEASES OF RADIOACTIVITY TO THE ENVIRONMENT	1C.10-1
<b>1C.11</b> <u><b>REFERENCES</b></u>	1C.11-1

**APPENDIX 1C**  
**AEC PROPOSED GENERAL DESIGN CRITERIA FOR NUCLEAR POWER PLANTS**

**LIST OF ACRONYMS**

ASTM	American Society for Testing and Materials
GDC	General Design Criteria
LOCA	Loss-of-Coolant Accident
NDTT	Nil-Ductility Transition Temperature
SACM	Societe Alsacienne De Constructions Mecaniques De Mulhouse