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MASTER

THE HIGH FLUX ISOTOPE REACTOR

Selected Construction Drawings

Volume 2

OAK RIDGE NATIONAL LABORATORY

operated by

UNION CARBIDE CORPORATION

for the

U.S. ATOMIC ENERGY COMMISSION

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OAK RIDGE NATIONAL LABORATORY
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INTRODUCTION

This volume is intended to supplement the descriptive material and schematic drawings contained in Volume 1. It contains an up-to-date list of HFIR construction drawings with reproductions of those 178 drawings which depict the more important components and systems. They are presented here in order to provide the reference material in a readily available form. For the most part these drawings have been reduced from the original F and D sizes, and it is realized that in some cases they may not be completely legible. It is suggested that their usefulness can be greatly enhanced through the use of a magnifying glass.

The Editors

EXPLANATION OF DRAWING NUMBERING SYSTEMS

Singmaster and Breyer Drawings

The Singmaster and Breyer drawings give fairly complete information on all but the ORNL-supplied material. They do not include all the detail which the manufacturers' drawings give, nor will they give detailed mounting or attachment schemes. The S and B job number for the HFIR is 1546, the second number refers to the area within the HFIR site, and the letter refers to the type of system. Thus for drawing No. 1546-01-M-5501:

1546 — HFIR
01 — Reactor Building
M-5501 — Mechanical drawing

For convenience the S and B job number (1546) is omitted from the listings.

01	Reactor Building
02	O and M Building
03	Cooling Tower and CT Equipment Building
04	Electrical Building
05	Yard Area and Miscellaneous
A-1000	Architectural
E-2000	Electrical, Power Distribution
E-2100 and 2200	Electrical, Control and Wiring Diagram
H and V-3000	Heating and Ventilating (H&V)
I-4000	Instrumentation
M-5000	Mechanical Layout
M-5500	Process Piping
P-5900	Plumbing
S-6000	Structural
U-7000	Utility, Roads — Site Plans
U-7100	Utility, Piping
U-7200	Utility, Line Nomenclature
U-7300	Utility, Storage Tanks
U-7400	Utility, Excavations

ORNL Reactor Controls Drawings

The ORNL reactor controls drawings include both the details of ORNL-fabricated instrumentation systems and the control diagrams (i.e., relay-contact networks). They do not include manufacturing details of instrumentation purchased outside ORNL. RC-11 refers to the HFIR project; Q numbers are given to instrumentation systems which may be in general usage. Some equipment items have been given both RC and Q numbers. Modifications for the HFIR would *not* be shown on Q prints; therefore the RC number is shown.

Q-2091-1 thru 6	Alpha or β - γ Lab Monitors
Q-2240-3 thru 22	Constant Air Monitors
Q-2288-1 thru 40	N-16 Monitor
Q-2310-1 thru 2	Constant Air Monitors
Q-2350-1 thru 13	Liquid Waste Monitoring
Q-2351-1 thru 52	Gaseous Waste Monitoring
Q-2352-1 thru 5	Sampling Sink Radiation Monitors
Q-2353-1 thru 6	Cooling Water — Linear-Log Radiation Monitor

RC11-1-1A thru C	Safety and Control — Block Diagram — Obsolete
RC11-1-2A thru P	Rod Control — Elementary Diagram
RC11-2	Cabinets B-C-D — Wiring Diagrams
RC11-3	Rod Drive Platform
RC11-4	Instrument Cabinet Construction
RC11-5	Process Panelboard E
RC11-6	Instrument Cabinet Construction
RC11-7	
RC11-8	Instrument Air and Pneumatic System
RC11-9-1 thru 4	Obsolete
RC11-9-5A thru D	Modular Reactor Instrumentation
RC11-9-6A thru F	Chamber Voltage — Monitor and Test Unit
RC11-9-7A thru F	Chamber High Voltage Supply and Flux Amplifier
RC11-9-8A thru F	Flux Reset Mechanism
RC11-9-9	
RC11-9-10A thru F	Operational Amplifier

RC11-9-11A thru F	Dual Signal Converter
RC11-9-12A thru F	Analogue Multiplier
RC11-9-13A thru F	Fast Trip Comparator
RC11-9-14	
RC11-9-15A thru F	Logical OR
RC11-9-16A thru F	Magnet Control Amplifier
RC11-9-17A thru F	HFIR Test Circuit
RC11-9-51 thru 54	Safety System
RC11-9-55A thru 61A	Drawer Interconnection & Wiring
RC11-10	Obsolete
RC11-11-1 thru 9	Miscellaneous
RC11-12-1 thru 5	Obsolete
RC11-12-5A thru E	Servo Demand Drive Unit
RC11-12-6A thru E	Servo Power Amplifier Driver Unit
RC11-12-7A thru E	Servo Power Amplifier Output Unit
RC11-12-51	Servo System
RC11-12-55A thru 58B	Drawer Interconnection & Wiring
RC11-13-1A thru H	Pulse Amplifier and Count Rate Meter
RC11-13-2A thru F	0.1 Hp Motor — Servo Amplifier
RC11-13-3	
RC11-13-4A thru T	$\frac{3}{4}$ inch Fission Chamber and Preamp
RC11-13-5A thru D	Obsolete
RC11-13-6A thru F	Linear Count Rate Meter
RC11-13-51 thru 54	Wide Range Counting Instrument
RC11-13-55A thru 60B	Drawer Interconnection & Wiring
RC11-14-1 thru 18	PCP II — Multisection Ion Chamber
RC11-15-1 thru 6	+15, +25 Volt Power Supply
RC11-16-1 thru 6	-15, -25 Volt Power Supply
RC11-17-1 thru 6	$\pm$ 10 Volt Power Supply
RC11-18	
RC11-19	
RC11-20	
RC11-21-1 thru 7	32 V DC to 115/6.3 V AC Inverter
RC11-22-1 and 2	Magnet
RC11-23-1 thru 3	Meter Module

Reactor Division Drawings

The Reactor Division drawings are of the ORNL-supplied equipment — mainly the reactor-vessel internals, including fuel, control rods, experiments, and various supporting structures.

COMPLETE DRAWING LIST

Singmaster and Breyer Drawings (as of April 6, 1964)

Throughout this section, the first column lists drawing numbers; the second column, revision numbers; and the third column, drawing titles.

01-A-1001	2	Reactor Bldg. — Plan of Sub-Pile Room and Primary Heat Exchanger Cells	01-E-2003	4	One-Line Diagram — 480 V Normal Power Sub-Station No. 1 Reactor Bldg.	01-E-2043	0	Reactor Bldg. — Power and Control Conduit Layout Beam Ports
01-A-1002	2	Reactor Bldg. — Ground Floor Plan	01-E-2004	4	One-Line Diagram — 480 V Normal Power Sub-Station No. 2 Reactor Bldg.	01-E-2044	1	Reactor Bldg. — Power and Control Layout — Personnel Bridge
01-A-1003	4	Reactor Bldg. — First Floor Plan	04-E-2005	4	One-Line Diagram — 480 V Normal Power Sub-Station No. 3 Electrical Bldg.	01-E-2046	2	Reactor Bldg. — Power and Control Sections and Details
01-A-1004	3	Reactor Bldg. — Second Floor Plan	04-E-2006	5	One-Line Diagram — 480 V Normal Power Sub-Station No. 4 Electrical Bldg.	01-E-2047	1	Reactor Bldg. — Underground Duct Bank (South)
01-A-1005	2	Reactor Bldg. — Third Floor Plan	04-E-2007	4	One-Line Diagram — Normal Emergency System No. 1 and Fail Free System	01-E-2048	0	Reactor Bldg. — Underground Duct Bank (North)
01-A-1006	0	Reactor Bldg. — Roof Plan and Details	04-E-2008	3	One-Line Diagram — Normal — Emergency System No. 2	01-E-2049	2	Reactor Bldg. — Power and Control Conduits — Sections and Details
01-A-1007	2	Reactor Bldg. — Elevations	01-E-2009	3	One-Line Diagram — Instrument Power	01-E-2050	2	Reactor Bldg. — Underfloor Duct Sections
01-A-1008	2	Reactor Bldg. — Section A/1008	01-E-2010	2	One-Line and Elementary Diagrams Office and Maintenance Bldg.	01-E-2051	3	Reactor Bldg. — Section and Details
01-A-1009	1	Reactor Bldg. — Section B/1009	01-E-2011	1	Reactor Bldg. — Lighting Layout Sub-Pile and Heat Exchange Rooms	01-E-2052	4	Reactor Bldg. — Power Sections and Details
01-A-1010	1	Reactor Bldg. — Wall Sections	01-E-2012	1	Reactor Bldg. — Lighting Layout Ground Floor	01-E-2053	3	Reactor Bldg. — Power and Control Conduit Layout Details
01-A-1011	1	Reactor Bldg. — Room Finish Schedule	01-E-2013	2	Reactor Bldg. — Lighting Layout First Floor	01-E-2054	4	Reactor Bldg. — Power and Control Sections and Details
01-A-1012	3	Reactor Bldg. — Door Schedule and Details	01-E-2014	3	Reactor Bldg. — Lighting Layout Second Floor	01-E-2055	2	Reactor Bldg. Tray Details — Auxiliary Control Room
01-A-1013	1	Reactor Bldg. — Details of Stair No. 2 and at Observation Gallery and Control Room	01-E-2015	2	Reactor Bldg. — Lighting Layout Reactor Bay and Third Floor	01-E-2056	2	Control Room Equipment Arrangements and Details
01-A-1014	1	Reactor Bldg. — Miscellaneous Details	01-E-2016	2	Reactor Bldg. — Lighting Layout Sections and Details	01-E-2057	2	Reactor Bldg. — Power and Control Conduit Layout Monitoring Platform
01-A-1015	2	Reactor Bldg. — Reflected Ceiling Plans and Details	01-E-2017	1	Reactor Bldg. — Lighting Layout Sections and Details	05-E-2058	3	Grounding Area Plan
01-A-1016	2	Reactor Bldg. — Details of Stair No. 1 and Elevator	01-E-2018	1	Fixture Schedule	01-E-2059	2	Reactor Bldg. — Grounding Plan — Roof, Third and Second Floors
01-A-1017	1	Reactor Bldg. — Details Stairs Nos. 3, 4, and 5 and Typical Stair Details	01-E-2019	3	General Notes, Symbols and Receptacle Schedule	01-E-2060	4	Reactor Bldg. — Grounding Plan — Ground and First Floors
01-A-1018	3	Reactor Bldg. — Details Toilets and Locker Rooms	01-E-2020	2	Panel Schedule A to G	05-E-2061	2	Grounding — Details
02-A-1101	0	Office and Maintenance Bldg. — Ground Floor and Roof Plans	01-E-2021	4	Reactor Bldg. — Panel Schedules	05-E-2062	3	Yard Underground Distribution Area Plan
02-A-1102	0	Office and Maintenance Bldg. — Elevations and Sections	01-E-2022	1	Panel Schedule	05-E-2063	4	Yard Underground Distribution Duct Bank, Sections and Details
02-A-1103	0	Office and Maintenance Bldg. — Wall Sections	01-E-2023	6	Panel Schedules	05-E-2064	2	Manhole No. 4, Handholes Nos. 1, 2, 4, and 5 and Duct Bank — Sections and Details
02-A-1104	0	Office and Maintenance Bldg. — Room Finish Schedule	01-E-2024	4	Reactor Bldg. and Miscellaneous Areas Panel Schedules	01-E-2065	3	Manhole No. 3 — Sections and Details
02-A-1105	0	Office and Maintenance Bldg. — Door Schedule and Details	01-E-2026	3	One-Line Diagram — Instrument Power Panels P-1A, P-1B, P-31, P-32, and P-33	05-E-2066	1	Yard Underground Distribution Manhole No. 1 — Sections and Details
02-A-1106	0	Office and Maintenance Bldg. — Reflected Ceiling Plan and Details	01-E-2030	2	Reactor Bldg. — Power and Control Conduit Layout Sub-Pile Room	04-E-2067	4	Electrical Bldg. — Equipment Layout
02-A-1107	1	Office and Maintenance Bldg. — Details — Locker and Toilet Rooms and Miscellaneous Interior Detail	01-E-2031	6	Reactor Bldg. — Power and Control Conduit Layout Ground Floor	04-E-2068	4	Electrical Bldg. — Power and Control Layout — Underground
04-A-1201	3	Electrical Bldg. — Plans, Sections and Elevations	01-E-2032	4	Reactor Bldg. — Power and Control Conduit Layout Ground Floor	04-E-2069	3	Electrical Bldg. — Power and Control Layout — Overhead
04-A-1202	0	Electrical Bldg. — Wall Sections and Details	01-E-2033	6	Reactor Bldg. — Power and Control Layout First Floor	04-E-2070	4	Electrical Bldg. — Lighting and Grounding Layout
05-A-1301	0	Typical Architectural Details	01-E-2034	5	Reactor Bldg. — Power and Control Conduit Layout First Floor Plan	04-E-2071	3	Switchgear and Substation Elevations and Details — Electrical Bldg.
05-A-1302	1	Fan Shed Plans Elevation and Details	01-E-2035	3	Reactor Bldg. — Power and Control Conduit Layout Second Floor	05-E-2072	1	Manhole No. 2 and Handhole No. 3 — Sections and Details
05-A-1303	0	Cooling Tower Equipment Bldg. — Plans, Elevations and Details	01-E-2036	2	Reactor Bldg. — Power and Control Conduit Layout Second Floor	03-E-2073	1	Cooling Tower and Control Layout
05-E-2001	1	Electrical Key Plans	01-E-2037	2	Reactor Bldg. — Power and Control Conduit Layout Third Floor and Misc. Areas	03-E-2074	3	Cooling Tower Power and Control Layout
04-E-2002	4	One-Line Diagram — Normal Power — 13.8 KV and 2.4 KV Distribution	01-E-2038	2	Reactor Bldg. — Power and Control Conduit Layout Details	03-E-2075	5	Cooling Tower Equipment Bldg. — Power-Lighting and Control Conduit Layout
			01-E-2039	1	Reactor Bldg. — Power and Control Conduits Sections and Details	05-E-2076	3	Outdoor Lighting Plan
			01-E-2040	2	Reactor Bldg. — Power Details	05-E-2077	0	Yard Lighting — Sections and Details
			01-E-2041	5	Substation, Motor Control Center and Terminal Box Details	01-E-2079	3	Reactor Bldg. — Fire Alarm, Intercom and Sound Powered Phone Systems — Ground Floor
			01-E-2042	5	Reactor Bldg. — Details for Terminal and Junction Boxes	01-E-2080	4	Reactor Bldg. — Fire Alarm, Intercom and Sound Powered Phone Systems — First Floor
						01-E-2081	3	Reactor Bldg. — Fire Alarm, Intercom and Sound Powered Phone Systems — Second Floor
						01-E-2082	2	Reactor Bldg. — Fire Alarm, Intercom and Sound Powered Phone Systems — Third Floor

05-E-2083	3	Fire Alarm, Intercom and Sound Powered Phone Systems – Miscellaneous Areas	01-E-2120	6	Elementary Control Diagram – Process Water Equipment	04-E-2179	4	Interconnection Wiring Diagram 13.8 KV SWGR, 2400 V SWGR, 480 V SWGR 3 and 4, 480 V SWGR 1 and 2 (N.E.) and Diesel Generator
01-E-2084	5	Fire Alarm Block Diagram	05-E-2121	3	2400 V Feeder Breaker – Elementaries and Wiring Diagrams			
05-E-2085	3	Intercom and Sound Powered Phone Systems – Block Diagrams	05-E-2122	3	2400 V Main Breaker – Elementaries and Wiring Diagrams			
01-E-2086	3	Reactor Bldg. – Telephone, Public Address and Bldg. Evacuation Alarm System – Ground Floor	01-E-2123	4	480 V Substations Wiring – Diagrams	01-E-2180	3	Interconnection Wiring Diagram Nuclear Panels “A”, “B”, “C”, and “D”
01-E-2087	0	Reactor Bldg. – Telephone, Public Address and Bldg. Evacuation Alarm System – First Floor	01-E-2124	7	Elementary Control Diagrams – Miscellaneous Equipment	01-E-2181	5	Interconnection Wiring Diagram M.C.C. “B” and “E”
01-E-2088	0	Reactor Bldg. – Telephone, Public Address and Bldg. Evacuation Alarm System – Second Floor	01-E-2125	5	Elementary Control Diagram – Process Water Equipment	01-E-2182	3	Interconnection Wiring Diagram 480 V SWGR No. 1 and M.C.C. “A”
01-E-2089	0	Reactor Bldg. – Telephone, Public Address and Bldg. Evacuation Alarm System – Third Floor	05-E-2126	3	2400 V Starter Wiring Diagrams			
			01-E-2127	5	2400 V Starter Wiring Diagram	01-E-2183	2	Interconnection Wiring Diagram Process Panel “E”, Sheet No. 1
05-E-2090	2	Telephone, Public Address and Bldg. Evacuation Alarm Systems – Sections and Details and Miscellaneous Area Layout	05-E-2128	5	Elementary Control Diagram – Miscellaneous Equipment	01-E-2184	1	Interconnection Wiring Diagram Process Panel “E” Sheet No. 2
			01-E-2129	4	Elementary Control Diagrams Annunciators IE Through 4E			
05-E-2091	4	Sewage Treatment Plant and Miscellaneous Areas Power and Lighting Layout	01-E-2130	3	Elementary Control Diagrams – Annunciators B, C, D, F, G, H, and I	01-E-2185	2	Interconnection Wiring Diagram Panels “F-G, H, and I”
05-E-2092	3	Diversion Valve Station Layout	01-E-2140	6	Electrical Bill of Material	01-E-2186	1	Interconnection Wiring Diagram Console – Center Panel
05-E-2093	2	Yard Underground Distribution Electrical Duct Bank Profiles	01-E-2141	6	Electrical Bill of Material	01-E-2187	2	Interconnection Wiring Diagram Console – Left and Right Panels
05-E-2094	1	Stack and Fan Shed Power and Control Layout	01-E-2142	4	Electrical Bill of Material			
05-E-2095	2	Stack and Fan Shed Sections and Details	01-E-2143	1	Bill of Material	01-E-2188	1	Interconnection Wiring Diagram Nuclear Relay Cabinet
02-E-2096	2	Office and Maintenance Bldg. – Power and Control Layout	05-E-2145	0	Gaseous Waste Monitoring Layout and Wiring Exhaust Stack	01-E-2189	1	Interconnection Wiring Diagram Nuclear Instrument Cabinet and Process Relay Cabinet
02-E-2097	0	Office and Maintenance Bldg. – Lighting Layout and Details	01-E-2150	4	Conduit and Cable Schedule			
02-E-2098	2	Office and Maintenance Bldg. – Grounding, Telephone, Public Address, Fire Alarm, Etc.	01-E-2151	2	Conduit and Cable Schedule	01-E-2190	2	Interconnection Wiring Diagram Pull Box No. 52 – Thermocouples
			01-E-2152	3	Conduit and Cable Schedule			
05-E-2100		13.8 KV Overhead Line, Circuit Plan and Profile, from X-10 Substation to Station 13 + 80	01-E-2153	2	Conduit and Cable Schedule	01-E-2191	1	Interconnection Wiring Diagrams – Auxiliary Control Room Monitoring Cabinets and Miscellaneous Equipment
05-E-2101		13.8 KV Overhead Line, Circuit Plan and Profile, from 13 + 80 to 36 + 15.20	01-E-2154	3	Conduit and Cable Schedule	01-E-2192	2	Schematic Block Diagram Heat Power Calculators and Miscellaneous Instrumentation
05-E-2102		13.8 KV Overhead Line, Circuit Plan and Profile, from 15.20 to 57 + 97.08	01-E-2155	4	Conduit Schedule	01-E-2193	1	Interconnection Wiring Diagram Terminal Boxes 14A and B, 15A and B, and 16A and B (Safety System)
05-E-2103		13.8 KV Overhead Line, Circuit Plan and Profile, from 57 + 97.08 to 77 + 50	01-E-2156	3	Conduit Schedule	01-E-2194	2	Interconnection Wiring Diagram Terminal Boxes 10 and 11 Nuclear
05-E-2104			01-E-2157	6	Conduit Schedule	01-E-2195	2	Interconnection Wiring Diagram Terminal Box No. 1 – Process Non-Sensitive Signal
05-E-2105		13.8 KV Overhead Line, Extension of Circuit 3, Station 0 + 0 to Station 12 + 54	01-E-2158	4	Conduit Schedule	01-E-2196	2	Interconnection Wiring Diagram Terminal Box No. 9 – Process Non-Sensitive Signal
05-E-2106		13.8 KV Overhead Line, Pole Details	01-E-2159	5	Conduit Schedule	01-E-2197	1	Interconnection Wiring Diagram Terminal Box 8 (Process) and Terminal Boxes 5A and 5B (Liquid Waste Monitor)
05-E-2107		13.8 KV Overhead Line, Pole Details	01-E-2160	5	Conduit Schedule	01-E-2198	3	Interconnection Wiring Diagram Terminal Boxes Nos. 6A and 6B (H&V) and Terminal Box No. 7 (Elect. System)
05-E-2108		13.8 KV Overhead Line, Pole Details	01-E-2161	4	Cable Schedule	01-E-2199	2	Interconnection Wiring Diagram Terminal Box Nos. 1 and 2 – Sub-Pile Room
05-E-2109		13.8 KV Overhead Line, Bill of Material	01-E-2162	3	Cable Schedule			
05-E-2110		13.8 KV Overhead Line, Switching Station	01-E-2163	3	Cable Schedule	01-E-2200	3	Interconnection Wiring Diagrams Miscellaneous Terminal Boxes and Instrumentation
05-E-2111			01-E-2164	3	Cable Schedule	01-E-2201	4	Process Panel “E” Wiring Diagram – Sheet No. 1
05-E-2112			01-E-2165	6	Cable Schedule	01-E-2202	4	Process Panel “E” Wiring Diagram – Sheet No. 2
01-E-2113	5	Elementary Control Diagrams Symbols, Notes and Operating Descriptions	01-E-2166	2	Cable Schedule	01-E-2203	2	Process Panel “E” Wiring Diagram – Sheet No. 3
01-E-2114	4	Elementary Control Diagrams – Operating Descriptions	01-E-2167	4	Cable Schedule	01-E-2204	3	Process Panel “E” Wiring Diagram – Sheet No. 4
01-E-2115	3	Elementary Control Diagrams – Heating and Ventilating Equipment	01-E-2168	3	Cable Schedule	01-E-2207	3	Wiring Diagram – Console Right Panel
01-E-2116	4	Elementary Control Diagrams – Heating and Ventilating Equipment	05-E-2169	0	Cable Schedule and Conduit Schedule – Stack Monitoring System	01-E-2208	2	Wiring Diagram Console Center Panel
01-E-2117	5	Elementary Control Diagram – Process Water Equipment	01-E-2170	1	Cell 110 Interconnection Wiring Diagram	01-E-2209	1A	Wiring Diagram – Console Left Panel
05-E-2118	4	Elementary Control Diagrams – Process Water Equipment	01-E-2171	0	Wiring Diagrams Personnel Bridge and Air Con. Freeze Protection Alarm	01-E-2212	3	Wiring Diagram Nuclear Instrument Cabinet
01-E-2119	5	Elementary Control Diagram – Process Water Equipment	01-E-2172	4	Interconnection Wiring Diagram – M.C.C. – “C”, M.C.C. – “D” and 480 V SWGR No. 2	01-E-2213	4	Wiring Diagram Process Instrument Cabinet and Interconnections
			01-E-2173	4	Cell 111 – Interconnection Wiring Diagram	03-E-2215	3	Wiring Diagram Cooling Tower Instrument Board
			01-E-2174	3	Cell 112 – Interconnection Wiring Diagram			
			01-E-2175	4	Cell 113 – Interconnection Wiring Diagrams			
			01-E-2176	3	Interconnection Wiring Diagram – M.C.C. “F”, “J”, “L”, and Misc. Areas			
			03-E-2177	3	Cooling Tower Interconnection Wiring Diagram M.C.C. “K” and “N”			
			05-E-2178	2	Interconnection Wiring Diagram Motor Control Centers “G” and “H”			

01-E-2219	1A	General Arrangement Panels "F", "G", "H", and "I"	02-H&V-3043	1	Office and Maintenance Bldg. — H&V Ground Floor and Roof Plan	01-I-4039	1A	Process Panelboard "E" Construction Details
01-E-2220	3	Electric Power System — Panel "I" — Equipment Arrangement and B/M	02-H&V-3044	1	Office and Maintenance Bldg. — Sections and Details	01-I-4040	2	Reactor Console Construction Details
01-E-2221	3	Wiring Diagram — Panel "I"	02-H&V-3045	1	Office and Maintenance Bldg. — Utility Room Piping Plan	01-I-4041	3	Reactor Console — Equipment List
01-E-2222	1A	Panels "F" — "G" — "H" and "I" — Construction Details	02-H&V-3046	0	Office and Maintenance Bldg. — Utility Room — Sections	01-I-4042	1	Instrument Installation Details
01-E-2224	1A	Health Physics Monitor Panel "H" Equipment Arrangement and B/M	02-H&V-3047	1	Office and Maintenance Bldg. — Equipment Schedules	01-M-5011	0	Reactor Bldg. — Isometric of Pool Area
01-E-2225	2	Health Physics Monitor Panel "H" Wiring Diagram	05-H&V-3051	5	Heating and Ventilating General Arrangement — Exhaust System	01-M-5012	0	Reactor Bldg. — Pool Cover Assembly
01-E-2228	1A	Waste Systems — Panels F and G Equipment Arrangement and B/M	05-H&V-3052	3	Heating and Ventilating — Exhaust Stack Breeching and Fans	01-M-5014	1	Reactor Bldg. — Personnel Bridge General Arrangement
01-E-2229	5	Waste System — Panel "F-G" Wiring Diagram	05-H&V-3053	3	Heating and Ventilating — Exhaust Stack Breeching and Fans	01-M-5015	2	Reactor Bldg. — Fuel Element Seats for Clean Pools
01-E-2232	1A	Nuclear Relay Cabinet Equipment Arrangement and B/M	05-H&V-3054	3	Heating and Ventilating — Filter Pit Details	01-M-5016	0	Reactor Bldg. — Inter Pool Transfer Platforms for Fuel Elements
01-E-2233	2	Nuclear Relay Cabinet Wiring Diagram Sections "D" and "E"	05-H&V-3055	2	Heating and Ventilating — Filter Pit Details	01-M-5018	1	Reactor Bldg. — Pool Separation Gates General Arrangement
01-E-2234	2	Nuclear Relay Cabinet Wiring Diagram Sections "A", "B", and "C"	05-H&V-3056	1	Heating and Ventilating — Filter Pit Details	01-M-5019	2	Reactor Bldg. — Defective Fuel Element Stations Arrangement
01-E-2235	1A	Nuclear Relay Cabinet Construction Details	05-H&V-3060	2	Cooling Tower Equipment Bldg. — H&V — Plan and Sections	01-M-5020	1	Reactor Bldg. — Pool Separation Gates Abutment Guide Assembly and Details
01-E-2236	1A	Critical Facility Relay Cabinet Sheet Metal and Construction Details	01-I-4001	4	Instrument Application Diagram — Reactor Primary Coolant Loop	01-M-5021	0	Reactor Experimental Facility Layout Vertical Section — "A — A"
01-E-2238	2	Process Relay Cabinet Layout, Equipment Arrangement, Construction Details and B/M	01-I-4002	3	Instrument Application Diagram — Reactor Primary Coolant System Heat Power System	01-M-5022	1	Reactor Bldg. — Reactor Exp. Facility Layout — Horizontal Section
01-E-2239	2	Process Relay Cabinet Wiring Diagram	01-I-4003	2	Instrument Application Diagram — Reactor Primary Coolant Cleanup System	01-M-5023	1	Reactor Bldg. — Pool Cover Sections and Details
01-E-2240	1A	Nuclear Panels A, B, C, and D — Sheet Metal Layout	01-I-4004	3	Instrument Application Diagram — Pools Coolant Systems	01-M-5024	0	Reactor Bldg. — Fuel Element Seat for Reactor Pool
01-E-2241	2	Nuclear Panels A, B, C, and D — Construction Details	01-I-4005	2	Instrument Application Diagram — Pools Coolant Cleanup System	01-M-5025	1	Reactor Bldg. — Critical Facility Pool Gate Assembly and Details
01-H&V-3001	2	Reactor Bldg. — H&V Air Flow Diagrams	01-I-4006	4	Instrument Application Diagram — Secondary Cooling System	01-M-5027	0	Reactor Bldg. — Personnel Bridge Platform Assembly and Details
01-H&V-3003	2	Reactor Bldg. — H&V Steam and Water Flow Diagrams	01-I-4007	4	Instrument Application Diagram — Secondary Cooling System Tower and Plant Demineralizing System	01-M-5028	0	Reactor Bldg. — Personnel Bridge Truck Assembly and Details
01-H&V-3004	2	Reactor Bldg. — H&V Sub-Pile Room and Roof Plan	01-I-4008	3	Instrument Application Diagram — Intermediate Level and Process Waste Systems	01-M-5029	1	Reactor Bldg. — Pool Separation Gates Sections and Details
01-H&V-3005	3	Reactor Bldg. — H&V Ground Floor Plan	01-I-4009	3	Instrument List and Index Sheets No. 1 Through 111	01-M-5030	2	Reactor Bldg. — Horizontal Beam Hole Liner Assembly
01-H&V-3006	4	Reactor Bldg. — H&V First Floor Plan	01-I-4020	3	Process Panelboard "E" — General Arrangement and B/M	01-M-5032	1	Reactor Bldg. — Engineering Facility Tube Liners and Plugs — Assembly
01-H&V-3007	3	Reactor Bldg. — H&V Second Floor Plan	01-I-4021	2	Process Panelboard "E" — Instrument Location and Tubing Connection Details	01-M-5034	1	Reactor Bldg. — Experimental Vertical Tube and Lift Tube Liners with Plugs Section and Assembly
01-H&V-3008	1	Reactor Bldg. — H&V Third Floor Plan	01-I-4022	2	Reactor Console Layout and Details	01-M-5036	3	Resin Disposal Unit Assembly
01-H&V-3010	3	Reactor Bldg. — H&V Mechanical Equipment Room Plan	01-I-4023	2	Reactor Console — Instrument Arrangement and Cutout Detail	01-M-5038	0	Reactor Bldg. — Personnel Bridge Drive Assembly and Details
01-H&V-3011	2	Reactor Bldg. — H&V Mechanical Equipment Room Section	01-I-4024	4	Primary Coolant System — Instrument Installation Details	01-M-5039	1	Reactor Bldg. — Pool Separation Gates Auxiliary Slide Gate Guide
01-H&V-3012	2	Reactor Bldg. — H&V Mechanical Equipment Room Sections	01-I-4025	3	Instrument Installation Details	01-M-5040	2	Reactor Bldg. — Inter Pool Transfer Platforms — Details
01-H&V-3013	3	Reactor Bldg. — H&V Sections and Details	01-I-4026	3	Instrument Installation Details	01-M-5042	2	Reactor Bldg. — Defective Fuel Element Station Sections and Details
01-H&V-3014	3	Reactor Bldg. — H&V Sections and Details	01-I-4027	3	Instrument Installation Details	01-M-5043	0	Reactor Bldg. — Defective Fuel Element Station Section and Details
01-H&V-3015	1	Reactor Bldg. — H&V Section and Details	01-I-4028	2	Instrument Mounting Details	01-M-5045	1	Resin Disposal Unit Details
01-H&V-3016	1	Reactor Bldg. — H&V Section and Details	01-I-4029	1	Reactor Building — Junction Box Details	01-M-5046	1	Reactor Bldg. — Pool Separation Gates Auxiliary Slide Gate — Assembly and Details
01-H&V-3017	1	Reactor Bldg. — H&V Steam Service Piping	01-I-4030	3	Instrument Installation Details	01-M-5047	1	Reactor Bldg. — Pool Separation Gates Auxiliary Slide Gate Operating Mechanism
01-H&V-3018	3	Reactor Bldg. — H&V Special Building Hot Exhaust System	01-I-4031	3	Instrument Mounting Details	01-M-5048	1	Reactor Bldg. — Pool Separation Gates Lower Sections
01-H&V-3019	2	Reactor Bldg. — H&V Special Bldg. Hot Exhaust System	01-I-4032	3	Reactor Building First Floor — Instrument Tubing Layout	01-M-5049	1	Reactor Bldg. — Pool Separation Gates — Upper Section
01-H&V-3020	2	Reactor Bldg. — Hot Off-Gas System	01-I-4033	3	Reactor Building Ground Floor — Instrument Tubing Layout	01-M-5050	2	Reactor Bldg. — Ion Chamber Tube Assembly
01-H&V-3021	4	Reactor Bldg. — Hot Off-Gas System	01-I-4034	4	Process and Nuclear Instrument Cabinets — Instrument Installation Details	01-M-5051	0	Reactor Bldg. — Ion Chamber Tube Details and Sections
01-H&V-3022	0	Reactor Bldg. — H&V Miscellaneous Details	01-I-4035	1	Central Control Area — Instrument Interconnection Installation	01-M-5052	1	Reactor Bldg. — Personnel Bridge and Cover Travel Control Diagram
01-H&V-3023	2	Reactor Bldg. — Hot Off-Gas System	05-I-4036	2	Intermediate Level Process Waste — Instrument Installation Details			
00-H&V-3024	1	H&V Ductwork Details	01-I-4037	3	Instrument Installation Details			
00-H&V-3025	1	H&V Piping Details	05-I-4038	2	Secondary Cooling System — Local Instrument Arrangement and Installation			
00-H&V-3026	3	Reactor Bldg. — H&V Equipment Schedule						
00-H&V-3027	3	Reactor Bldg. — H&V Equipment Schedule						
01-H&V-3028	1	H&V Reactor Bldg. Control Diagram						
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02-H&V-3041	1	Office and Maintenance Bldg. — Air Flow and Control Diagrams						
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01-M-5054	1	Reactor Bldg. — Reactor Experimental Facility Service Piping — Sections and Details	01-M-5534	7	Engineering Flow Diagram Reactor Primary Coolant Low-Pressure System	01-S-6020	1	Reactor Bldg. — Pool Structure, Pump and Heat Exchanger Rooms, Sections and Detail
01-M-5056	1	Reactor Bldg. — Reactor Experimental Facility Shutter Control Shaft Liner and Plug and Horizontal Beam Plug	01-M-5535	4	Engineering Flow Diagram — Process Water System	01-S-6021	2	Reactor Bldg. — Pool Structure, Pump and Heat Exchanger Rooms, Details — Sheet 7 of 9
01-M-5057	1	Reactor Bldg. — Reactor Installation — Elevation	01-M-5536	0	Reactor Bldg. — Composite Looking North Thru Experimental and Beam Rooms	01-S-6023	0	Reactor Bldg. — Pool Structure, Pump and Heat Exchanger Rooms, Miscellaneous Details — Anchor Bolts
01-M-5058	1	Reactor Bldg. — Reactor Installation — Plan	01-M-5537	0	Reactor Bldg. — Composite Looking West Thru Experimental and Beam Room	01-S-6024	2	Reactor Bldg. — South Part Ground Floor Slab Plan, Sections and Details
01-M-5501	4	Engineering Flow Diagram — Pool Coolant System	01-M-5538	0	Reactor Bldg. — Piping Supports Plan at Pools, Primary Pumps, and Exchangers	01-S-6025	3	Reactor Bldg. — Ground Floor Slab Plan Sections and Details — North Part
01-M-5502	6	Engineering Flow Diagram — Secondary Coolant and Plant Demineralizing Water Systems	01-M-5539	1	Reactor Bldg. — Supports, Plan Primary Pump and Exchanger Cell	01-S-6026	4	Reactor Bldg. — Regeneration and Cleanup Rooms — Plans and Sections
01-M-5503	2	Reactor Bldg. — Process Equip. Arrangement — Ground Floor	01-M-5540	1	Support Plan Demineralizers — Ground Floor	01-S-6027	2	Reactor Bldg. — Regeneration and Cleanup Rooms — Sections and Details
01-M-5504	2	Reactor Bldg. — Process Equip. Arrangement — First Floor	01-M-5541	8	Engineering Flow Diagram Primary Reactor Coolant High Pressure System	01-S-6028	2	Reactor Bldg. — First Floor Steel Framing — South Part
01-M-5505	3	Reactor Bldg. — Piping Arrangement, Plan of Pool Area — Second Floor	01-M-5542	0	Support Plan — Process Equipment — First Floor	01-S-6029	3	Reactor Bldg. — Second Floor Steel Framing — South Part
01-M-5506	7	Reactor Bldg. — Piping Arrangement Plan at Pools, Primary Pumps and Exchangers	01-M-5543	1	Support Plan — Demineralizers and Deaerators — First Floor	01-S-6030	1	Reactor Bldg. — First Floor Slabs — South Part
01-M-5507	7	Reactor Bldg. — Piping Arrangement — Plan Primary Pump and Exchanger Cell	01-M-5544 thru M-5560		VOID	01-S-6031	1	Reactor Bldg. — Second Floor Slab — South Part
01-M-5508	3	Reactor Bldg. — Piping Arrangement Longitudinal Section Thru All Pools	01-M-5561	2	Reactor Primary Coolant Piping Instrument Conn. Details	01-S-6032	3	Reactor Bldg. — First Floor Framing — North Part
01-M-5509	6	Reactor Bldg. — Piping Arrangement Section Thru Reactor Pool and Primary Loop Tunnel	01-M-5562	1	Reactor Inlet Yoke Assembly and Instr. Details	01-S-6033	3	Reactor Bldg. — Second Floor Framing — North Part
01-M-5511	3	Piping Arrangement — Plan Shield Face Facilities and Primary Loop	01-M-5563	3	Piping Arrangement — Demineralizers Sections	01-S-6034	2	Reactor Bldg. — Third Floor and Roof Framings — North Part
01-M-5512	7	Piping Arrangement — Plan Process Equipment — Ground Floor	01-M-5564	1	Reactor Bldg. — Reactor Primary Coolant Piping Isometric Spool Assembly	01-S-6035	1	Reactor Bldg. — Roof Framing — South Part
01-M-5513	7	Piping Arrangement — Plan Process Equipment — First Floor	01-M-5565	3	Piping Arrangement Plan and Sections of Demineralizers — Ground Floor	01-S-6036	3	Reactor Bldg. — Beam Schedule
01-M-5514	1	VOID	01-M-5566	3	Piping Arrangement Plan — Demineralizers — Sections	01-S-6037	0	Reactor Bldg. — Column Schedule and Details — North Part
01-M-5515	6	Piping Arrangement — Sections Process Equipment — Ground Floor	01-M-5567	3	Piping Arrangement Plan — Demineralizers — Sections	01-S-6038	1	Reactor Bldg. — Crane Girders and St'l Details
01-M-5516	5	Piping Arrangement — Sections Process Equipment — First Floor	01-M-5568	0	HP Coolant	01-S-6039	0	Reactor Bldg. — Stair and Railing Details
01-M-5517	3	Piping Arrangement — Plan and Sections — Demineralizers and Deaerators — First Floor	01-M-5569	0	HP Coolant	01-S-6040	3	Pool Structure Heat Exchanger and Pump Rooms — Equipment Platforms
01-M-5518	2	Reactor Bldg. — Piping Arrangement — PWD and ILW Drainage Systems — Second and Third Floors	01-M-5570	0	HP Coolant	01-S-6041	3	Miscellaneous Equipment Settings
01-M-5519	4	Piping Arrangement — Drainage System — First Floor	01-P-5901	1	Reactor Bldg. — Plumbing — Ground Floor Plan	01-S-6042	3	Miscellaneous Equipment Settings
01-M-5520	3	Piping Arrangement — PWD and ILDW Drainage Systems — Ground Floor — Sub-Pile Room and Primary Exchanger Pit	01-P-5902	0	Reactor Bldg. — Plumbing — First Floor Plan	01-S-6043	0	Reactor Bldg. — Truck Air Lock
01-M-5521	2	Reactor Bldg. — Piping Arrangement — PWD and ILW Drainage Systems — Details	01-P-5903	2	Reactor Bldg. — Plumbing — Second and Third Floor Plans	01-S-6044	2	Reactor Bldg. — Elevator and Stair Tower Framing — North Part
01-M-5522	3	Reactor Bldg. — Piping Arrangement — PWD and ILW Drainage Systems — Details	01-P-5905	0	Plumbing Riser Diagram and Details — Reactor Building	01-S-6045	1	Reactor Bldg. — Pool Lining Plan and Elevations
03-M-5524	4	Piping Arrangement — Plan Cooling Tower	02-P-5910	0	Office and Maintenance Building — Plumbing Plan and Details	01-S-6046	2	Reactor Bldg. — Pool Lining — Sections and Details
03-M-5525	3	Piping Arrangement — Sections Cooling Tower	01-S-6001	4	Reactor Bldg. — Building Foundation Plan	01-S-6047	0	Reactor Bldg. — Pool Lining Sections and Details
01-M-5526	6	Piping Arrangement — Process Equipment — Sections and Details — Ground and First Floors	01-S-6002	4	Reactor Bldg. — Foundation Walls Elevations	01-S-6048	1	Reactor Bldg. — Pool Lining Details and Decontamination Pad
01-M-5527	2	Pipe Support Details — Sheet No. 1	01-S-6003	1	Reactor Bldg. — Foundations — Sections	01-S-6049	0	Reactor Bldg. — Concrete Walls
01-M-5528	1	Reactor Bldg. — Pipe Support — Sheet No. 2	01-S-6004	1	Reactor Bldg. — Foundations — Sections and Details	01-S-6050	1	Reactor Bldg. — Superstructure 8 in. Concrete Walls
01-M-5529	1	Support — Plan — Process Equipment — Ground Floor	01-S-6010	0	Reactor Bldg. — Floor Live Loadings	01-S-6051	3	Reactor Bldg. — Pool Structure Penetrations and Embedments
01-M-5530	3	Reactor Bldg. — Miscellaneous Details	01-S-6012	2	Reactor Bldg. — Standard Concrete Details	01-S-6052	2	Reactor Bldg. — Pool Structure Penetrations and Embedments
01-M-5532	5	Line Nomenclature for M-5500 Series Drawings	01-S-6013	2	Reactor Bldg. — Column Schedule and Details South Part	01-S-6053	1	Reactor Bldg. — Pool Structure Penetrations and Embedments
			01-S-6014	2	Reactor Bldg. — Monitoring Platform	01-S-6054	4	Reactor Bldg. — Pool Structure Penetrations and Embedments
			01-S-6015	3	Reactor Bldg. — Sub-Pile, Heat Exchanger Basement Rooms, Plans and Sections	01-S-6058	1	Reactor Bldg. — Pool Lining Drainage Lines
			01-S-6016	8	Reactor Bldg. — Sub-Pile, Pump and Heat Exchanger Basement Rooms, Plan and Sections	02-S-6059	0	Office and Maintenance Bldg. — Roof Framing
			01-S-6017	6	Reactor Bldg. — Pool Structure Heat Exchanger and Pump Rooms, Plan and Sections	02-S-6060	0	Office and Maintenance Bldg. — Foundation — Plan and Sections
			01-S-6018	2	Reactor Bldg. — Pool Structure Heat Exchanger and Pump Rooms, Plan and Details	02-S-6061	0	Office and Maintenance Bldg. — Ground Floor Plan and Sections
						04-S-6062	4	Electrical Bldg. — Floor and Roof Plans

04-S-6063	4	Electrical Bldg. — Foundations and Equipment Settings	05-U-7128	3	Process Waste and ILW Details	Q-2240-6	0	Constant Air Monitors — Assembly Products Meter Modification
05-S-6064	3	Filter Pits and Resin Disposal Pit — Plans and Sections	05-U-7129	2	Utility Profiles — Sanitary Sewer System	Q-2240-7		Constant Air Monitors — Count Rate Meter Parts List
05-S-6065	3	Filter Pits and Resin Disposal Pit — Sections and Details	05-U-7130	2	Process Waste and ILW Details	Q-2240-9	2	Constant Air Monitors — Filter Tape Drive Control Detector and Chassis Support
05-S-6066	2	Concrete Pool Water Storage Tank	05-U-7131	2	Utility Profiles — Potable and Fire Water			
05-S-6067	2	Stack Foundation and Platform Details	05-U-7132	5	Fire, Potable and Coolant Water Details	Q-2240-10	2	Constant Air Monitors — Filter Tape Drive Control Chassis
03-S-6068	4	Cooling Tower Basin — Plan and Sections	05-U-7140	5	Flow Diagram — Steam Distribution	Q-2240-11	1	Constant Air Monitors — Filter Tape Drive Control Panel
03-S-6069	5	Cooling Tower Basin — Sections and Details	05-U-7141	4	Flow Diagram — Fire and Potable Water	Q-2240-12		Constant Air Monitors — Filter Tape Drive Beta-Gamma Parts List
01-S-6070	0	Transformer Foundation — Plans and Sections	05-U-7144	2	Superseded by Dwg. 7146			
05-S-6071	3	Cooling Tower Equipment Bldg. — Foundations and Roof	05-U-7145	4	Flow Diagram — Process Waste and ILW	Q-2240-14	1	Constant Air Monitors — Pump Assembly Mounting Plate and Details
05-S-6072	0	Shed Over Stack Breeching and Fans — Plans — Superstructure	05-U-7146	0	Flow Diagram — Compressed Air			
05-S-6073	2	Shed Over Stack Breeching and Fans — Plans — Foundations	05-U-7147	4	Flow Diagram — Chemical Treatment (Nitric, Sulphuric, Sodium Hypochlorite and Caustic Soda)	Q-2240-15	1	Constant Air Monitors — Pump Assembly Panel and Details
05-S-6074	0	Sewage Treatment Plant — Plan and Sections				Q-2240-16		Constant Air Monitors — Pump Assembly Parts List
05-S-6075	0	Sewage Treatment Plant — Sections and Details	05-U-7201	3	Line Nomenclature for U-7000 Series Drawings	Q-2240-18	2	Constant Air Monitors — Alarm Panel and Chassis
01-S-6080	4	Penetrations and Embedments Schedule	05-U-7202	3	Valve Nomenclature for U-7000 Series Drawings	Q-2240-19		Constant Air Monitors — Alarm Panel — Parts List
01-S-6081	1	Primary Coolant Pump — Supports	05-U-7301	3	Pool Water Storage Tank — Piping Details	Q-2240-20	0	Constant Air Monitors — Cabinet Assembly
05-S-6082	0	Sewage Treatment Plant Foundation — Plan and Sections	05-U-7302	3	Miscellaneous Tanks Piping and Foundation Details	Q-2240-21		Constant Air Monitors — Cabinets Beta-Gamma Parts List
05-U-7001	2	Location Plan	05-U-7303	4	Chemical Treatment Tanks Piping and Foundation Details	Q-2240-22	0	Constant Air Monitors — Drawer Details
05-U-7002	5	Area Site Plan — South Part	05-U-7304	2	ILW Tank Piping and Foundation Details	Q-2288-1	2	N ¹⁶ Monitor — Monitor Shield
05-U-7003	2	Area Site Plan — North Part	05-U-7306	3	Process Waste Basins — Plan and Sections	Q-2288-2	2	N ¹⁶ Monitor — Coolant Sample Tube
05-U-7004	0	Boring Logs	05-U-7307	3	Process Waste Basin Details	Q-2288-3	1	N ¹⁶ Monitor — Shield No. 1 — Assembly
05-U-7006	2	Access Road — Plan and Profile	05-U-7308	2	Cooling Tower Equipment Bldg. — Piping and Details	Q-2288-4	0	N ¹⁶ Monitor — Shield No. 1 Details — Sheet 1
05-U-7007	0	Access Road — Cross Sections	05-U-7309	1	Superseded by Dwg. 7310	Q-2288-5	0	N ¹⁶ Monitor — Shield No. 1 Details — Sheet 2
05-U-7008	1	Access Road — Cross Sections	05-U-7310	0	Sewage Treatment Plant — Piping and Details	Q-2288-6	1	N ¹⁶ Monitor — Shield No. 2 — Assembly
05-U-7009	3	Plot Plan	05-U-7401	1	Excavation Plan	Q-2288-7	0	N ¹⁶ Monitor — Shield No. 2 Details — Sheet 1
05-U-7010	3	Plot Plan	05-U-7402	1	Excavation Profiles	Q-2288-8	1	N ¹⁶ Monitor — Shield No. 2 Details — Sheet 2
05-U-7011	3	Plot Plan	05-U-7403	1	Excavation Profiles	Q-2288-9	2	N ¹⁶ Monitor — Shield No. 3 — Assembly
05-U-7012	3	Plot Plan	05-U-7404	1	Excavation Profiles	Q-2288-10	0	N ¹⁶ Monitor — Shield No. 3 Details — Sheet 1
05-U-7013	0	Service Roads — Plan, Profile, and Typical Sections				Q-2288-11	1	N ¹⁶ Monitor — Shield No. 3 Details — Sheet 2
05-U-7014	0	Service Road Profiles				Q-2288-12	1	N ¹⁶ Monitor — Shield No. 3 Details — Sheet 3
05-U-7016	2	Service Roads, Fence and Ditch Details				Q-2288-13	1	N ¹⁶ Monitor — Shield No. 4 — Assembly
05-U-7017	0	Service Roads, Fence and Ditch Details				Q-2288-14	0	N ¹⁶ Monitor — Shield No. 4 — Details
05-U-7018	3	Access Road Details				Q-2288-15	1	N ¹⁶ Monitor — Instrumentation
05-U-7019	2	Rough Grading — Plan				Q-2288-16	1	N ¹⁶ Monitor — Scintillation Det. and Details
05-U-7021	0	Flow Diagram — Diesel Generators and Fuel Oil				Q-2288-17	0	N ¹⁶ Monitor — Scintillation Detector, Connector Box and Shield Details
05-U-7101	4	Area Utility Plan — South Part						
05-U-7102	0	Area Utility Plan — North Part				Q-2288-18	1	N ¹⁶ Monitor — Scintillation Detector Preamp Circuit, Connector Box and Power Supply Details
05-U-7112	5	Utility Plan — Yard Piping						
05-U-7113	4	Utility Plan — Yard Piping	Q-2091-1	3	Alpha or Beta-Gamma Lab Monitor — Radiation Monitor (with High Level Alarm) — Circuit	Q-2288-19	0	N ¹⁶ Monitor — Scintillation Detector Assembly Details
05-U-7114	7	Utility Plan — Yard Piping	Q-2091-2	2	Alpha or Beta-Gamma Lab Monitor — Radiation Monitor (with High Level Alarm) — Chassis Side Bkt. and Details	Q-2288-20	0	N ¹⁶ Monitor — Scintillation Detector Parts List
05-U-7115	5	Utility Plan — Yard Piping	Q-2091-3	2	Alpha or Beta-Gamma Lab Monitor — Radiation Monitor (with High Level Alarm) — Panel	Q-2288-21	0	N ¹⁶ Monitor — DD2 Linear Amp and Preamp Circuit
05-U-7116	2	Utility Profiles — Steam Distribution				Q-2288-22	0	N ¹⁶ Monitor — Chassis
05-U-7117	2	Utility Profiles — Potable, Process and Fire Water				Q-2288-23	0	N ¹⁶ Monitor — Details
05-U-7118	3	Utility Profiles Coolant Water Supply and Return				Q-2288-24	0	N ¹⁶ Monitor — Details
05-U-7119	1	Utility Profiles — Storm Sewer System	Q-2091-4	1	Alpha or Beta-Gamma Lab Monitor — Radiation Monitor (with High Level Alarm) — Term Bds.	Q-2288-25	0	N ¹⁶ Monitor — Shield Box
05-U-7120	4	Utility Profiles — Process Waste and ILW Systems				Q-2288-26	0	N ¹⁶ Monitor — Term Boards
05-U-7121	3	Utility Profiles — Miscellaneous Systems and Drains	Q-2091-5	0	Alpha or Beta-Gamma Lab Monitor — Radiation Monitor (with High Level Alarm) — Parts List	Q-2288-27	0	N ¹⁶ Monitor — Parts List
05-U-7122	2	Steam Distribution Details				Q-2288-28	0	N ¹⁶ Monitor — Differential and Integral PHS Circuit and Details
05-U-7123	3	Fire, Potable, Process and Coolant Water Details	Q-2091-6	0	Alpha or Beta-Gamma Lab Monitor — Radiation Monitor (with High Level Alarm) — Metal Photo Process Panel	Q-2288-29	0	N ¹⁶ Monitor — Delay-Line Construction
05-U-7124	1	Sanitary Sewer Details	Q-2240-3	1	Constant Air Monitors — Count Rate Meter Chassis	Q-2288-30	0	N ¹⁶ Monitor — Differential and Integral PHS Parts List
05-U-7125	1	Storm Sewer Details	Q-2240-4	1	Constant Air Monitors — Count Rate Meter Panel and Mounting Boards	Q-2288-31	0	N ¹⁶ Monitor — Metalphoto Process Panel
05-U-7126	2	Process Waste and ILW Details (Diversion Valves)				Q-2288-32	0	N ¹⁶ Monitor — Differential and Integral PHS Metalphoto Process Panel
05-U-7127	3	Miscellaneous Details (Diesel Fuel Oil Supply, Air Start-Up and Beam Tube Incasement)	Q-2240-5	1	Constant Air Monitors — Count Rate Meter Terminal Boards	Q-2288-35	0	N ¹⁶ Monitor — Linear Count Rate Meter Circuit

ORNL Reactor Controls Drawings (As of March 9, 1964)

Throughout this section, the first column lists drawing numbers; the second column, revision numbers; and the third column, drawing titles.

Q-2288-36	0	N ¹⁶ Monitor – Chassis	Q-2351-16	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Detail Sheet 4	Q-2352-2	0	Sampling Sink Radiation Monitor – CRM Chassis
Q-2288-37	0	N ¹⁶ Monitor – Panel	Q-2351-17	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Cover Assembly	Q-2352-3	0	Sampling Sink Radiation Monitor – Panel and Details
Q-2288-38	0	N ¹⁶ Monitor – Resistor Boards	Q-2351-18	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Details Sheet 1	Q-2352-4	0	Sampling Sink Radiation Monitor – Terminal Boards
Q-2288-39	0	N ¹⁶ Monitor – Parts List	Q-2351-19	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Details Sheet 2	Q-2352-5	0	Sampling Sink Radiation Monitor – Parts List
Q-2288-40	0	N ¹⁶ Monitor – Meter Face	Q-2351-20	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Parts List	Q-2353-1	0	Cooling Water – Linear-Log Radiation Monitor – Circuit Schematic
Q-2310-1	1	Constant Air Monitors – Schematic Diagram	Q-2351-21	0	Gaseous Waste Monitoring – In Stack Sampler Assembly	Q-2353-2	0	Cooling Water – Linear-Log Radiation Monitor – High and Low Voltage Supply
Q-2310-2	1	Constant Air Monitors – Count Rate Meter Circuit	Q-2351-22	0	Gaseous Waste Monitoring – In Stack Sampler Details	Q-2353-2A		Cooling Water – Linear-Log Radiation Monitor – Details (Meterface)
Q-2350-1	0	Liquid Waste Monitoring – Block Diagram	Q-2351-23	0	Gaseous Waste Monitoring – In Stack Sampler Details	Q-2353-3		Cooling Water – Linear-Log Radiation Monitor – Printed Circuit Board
Q-2350-2	0	Liquid Waste Monitoring – Count Rate Meter and Controller Circuit	Q-2351-24	0	Gaseous Waste Monitoring – In Stack Sampler Details	Q-2353-4	0	Cooling Water – Linear-Log Radiation Monitor – Chassis and Panel Details
Q-2350-3	0	Liquid Waste Monitoring – Instrument and Sampling Cabinet – Assembly	Q-2351-25	0	Gaseous Waste Monitoring – In Stack Sampler Pick Up Assembly	Q-2353-5	0	Cooling Water – Linear-Log Radiation Monitor – Geiger Tube Probe Details
Q-2350-4	0	Liquid Waste Monitoring – Instrument and Sampling Cabinet – Piping and Conduit Details	Q-2351-26	0	Gaseous Waste Monitoring – In Stack Sampler Pick Up Details	Q-2353-6	0	Cooling Water – Linear-Log Radiation Monitor – Parts List
Q-2350-5	0	Liquid Waste Monitoring – Instrument and Sampling Cabinet – Details	Q-2351-27	0	Gaseous Waste Monitoring – In Stack Sampler Tube and Pipe Details	RC11-1-1A		Superseded by S & B Dwg. No. E-2301
Q-2350-6	0	Liquid Waste Monitoring – Instrument and Sampling Cabinet – Details	Q-2351-28	0	Gaseous Waste Monitoring – In Stack Sampler Outline	RC11-1-1B	0	Control Block Diagram
Q-2350-7	0	Liquid Waste Monitoring – Pump Controller Circuit, Panel and Chassis Details	Q-2351-29	1	Gaseous Waste Monitoring – CRM, Panel and Monitoring Boards	RC11-1-1C	4	Elementary Diagram Rod Controls on “A” Bus
Q-2350-8	0	Liquid Waste Monitoring – Process Waste Auxiliary Control Panel	Q-2351-30	0	Gaseous Waste Monitoring – CRM Terminal Boards	RC11-1-2A	2	Elementary Diagram Rod Controls on “B” Bus
Q-2350-9	0	Liquid Waste Monitoring – Count Rate Meter Term Boards	Q-2351-31	0	Gaseous Waste Monitoring – CRM Chassis	RC11-1-2B	2	Elementary Diagram Rod Controls on “C” Bus
Q-2350-10	0	Liquid Waste Monitoring – Count Rate Meter Panel	Q-2351-32	0	Gaseous Waste Monitoring – Filter Tape Drive and Alpha Air Mon. Assy.	RC11-1-2C	2	Elementary Diagram Rod Controls on “D” Bus
Q-2350-11	0	Liquid Waste Monitoring – Count Rate Meter Chassis	Q-2351-33	0	Gaseous Waste Monitoring – Filter Tape Drive – Alpha Details	RC11-1-2D	0	Elementary Diagram Rod Controls on A-C Bus Sheet 1
Q-2350-12	0	Liquid Waste Monitoring – Count Rate Meter Panel	Q-2351-34	0	Gaseous Waste Monitoring – Filter Tape Drive Details	RC11-1-2E	3	Elementary Diagram Rod Controls on A-C Bus Sheet 2
Q-2350-13	0	Liquid Waste Monitoring – Parts List for Q-2350-2	Q-2351-35	0	Gaseous Waste Monitoring – Filter Tape Drive Details	RC11-1-2F	2	Elementary Diagram Shim Rod Drives – Sheet 1
Q-2351-1	0	Gaseous Waste Monitoring – Instr. Plan Stack Area	Q-2351-36	0	Gaseous Waste Monitoring – Filter Tape Drive Alpha Scin. Det. Assembly and Details	RC11-1-2G	1	Elementary Diagram Contact Tabulations
Q-2351-2	0	Gaseous Waste Monitoring – Stack Platform Instruments and Power	Q-2351-37	0	Gaseous Waste Monitoring – Parts List	RC11-1-2H	4	Superseded by S & B Dwg. No. E-2129
Q-2351-3	0	Gaseous Waste Monitoring – Stack Instrumentation Block Diagram and Wiring	Q-2351-38	0	Gaseous Waste Monitoring – Filter Tape Drive Cover Detail	RC11-1-2I		Superseded by S & B Dwg. No. E-2130
Q-2351-4	1	Gaseous Waste Monitoring – Particulate Monitor Elementary Diagram	Q-2351-39	0	Gaseous Waste Monitoring – Cable Z Matching Amp for Alpha Assembly	RC11-1-2J	0	Superseded by S & B Dwg. No. E-2130
Q-2351-5	1	Gaseous Waste Monitoring – Count Rate Meter Circuit Diagram	Q-2351-40	0	Gaseous Waste Monitoring – Etched Wiring Board for Q-2351-39	RC11-1-2K	0	Superseded by S & B Dwg. No. E-2130
Q-2351-6	1	Gaseous Waste Monitoring – Count Rate Meter Front Panel	Q-2351-41	0	Gaseous Waste Monitoring – Cable Z Matching Amp for β - γ Etched Board	RC11-1-2L	0	Superseded by S & B Dwg. No. E-2130
Q-2351-7	0	Gaseous Waste Monitoring – Particulate Monitor Filter Tape Drive – Control Chassis	Q-2351-42	0	Gaseous Waste Monitoring – Cable Z Matching Amp for β - γ Assembly and Parts List	RC11-1-2M	0	Superseded by S & B Dwg. No. E-2130
Q-2351-8	0	Gaseous Waste Monitoring – Particulate Monitor Filter Tape Drive – Alarm Panel and Chassis	Q-2351-43	0	Gaseous Waste Monitoring – CRM Chassis	RC11-1-2N	0	Superseded by S & B Dwg. No. E-2130
Q-2351-9	0	Gaseous Waste Monitoring – Outdoor Cabinet Beta-Gamma Layout	Q-2351-44	0	Gaseous Waste Monitoring – Filter Tape Drive Control and Detector Panel	RC11-1-2P	0	Elementary Diagram Contact Tabulation – Sheet 2
Q-2351-10	0	Gaseous Waste Monitoring – Outdoor Cabinet Alpha Layout	Q-2351-45	0	Gaseous Waste Monitoring – Weatherproof Cab. Mod. D Assembly	RC11-2-1		Equipment Layout Panel B, C, and D
Q-2351-11	0	Gaseous Waste Monitoring – Auxiliary Control Room Particulate Monitor Panel Layout	Q-2351-46	0	Gaseous Waste Monitoring – Weatherproof Cab. Mod. D Details	RC11-2-1A		Wiring Diagram Panel B, C, and D
Q-2351-12	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Assembly	Q-2351-47	0	Gaseous Waste Monitoring – Weatherproof Cab. Mod. D Details	RC11-2-1B		Wiring Diagram Panel B, C, and D
Q-2351-13	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Detail Sheet 1	Q-2351-48	0	Gaseous Waste Monitoring – Weatherproof Cab. Mod. D Details	RC11-2-1C		Wiring Diagram Panel B, C, and D
Q-2351-14	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Detail Sheet 2	Q-2351-49	0	Gaseous Waste Monitoring – CAM Pump Assembly Panel and Details	RC11-2-2		Equipment Layout – Servo Channels
Q-2351-15	0	Gaseous Waste Monitoring – Particulate Monitor – Filter Tape Drive and Beta Gamma Shield – Detail Sheet 3	Q-2351-50	0	Gaseous Waste Monitoring – CAM Pump Assy. Mtg. Plate and Details	RC11-2-2A		Wiring Diagram – Servo Channel A
			Q-2351-51	0	Gaseous Waste Monitoring – CAM Pump Assembly Parts List	RC11-2-2B		Wiring Diagram – Servo Channel B
			Q-2351-52	0	Gaseous Waste Monitoring – CAM Filter Tape Drive Control Detector and Chassis Support	RC11-2-2C		Wiring Diagram – Servo Channel C
			Q-2352-1	0	Sampling Sink Radiation Monitor – Control Circuit	RC11-3-1		Rod Drive Support Platform Intercon. Diagram Sheet 1
						RC11-3-2		Rod Drive Support Platform Intercon. Diagram Sheet 2
						RC11-3-3		Rod Drive Support Platform Intercon. Diagram Sheet 3
						RC11-4-1	1	Servo Channel Cabs. A, B, C, N ¹⁶ and Faulty Fuel Element Detector Cabinets Construction
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						RC11-5-1B	1	Process Panelboard “E” Equipment Arrangement – Sheet 2
						RC11-5-2A	1	Process Panelboard “E” Equipment Arrangement and Details – Sheet 1
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RC11-6-1	0	Process and Nuclear Instrument Cabinets Construction and Details	RC11-9-12E	Analog Multiplier — Assembly	RC11-10-9	0	Instrument Application Diagram S.B.H.E., O.H.O.G., and C.H.O.G. Systems
RC11-7			RC11-9-12F	0 Analog Multiplier — Parts List	RC11-10-10	0	S.B.H.E., O.H.O.G., and C.H.O.G. Systems, Sections and Details
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RC11-8-2	0	Instrument Air One Line Distribution — Now S & B Dwg. No. U-7146	RC11-9-13B	0 Fast Trip Comparator — Details	RC11-11-1	1	Modification of Multipoint Recorder for N ¹⁶ Monitoring System
RC11-8-3		Instrument Air Sheet 1, Future	RC11-9-13C	0 Fast Trip Comparator — Panel	RC11-11-2	0	Special Lighted Actuator for GE Type SBM Switch
RC11-8-4		Instrument Air Sheet 2, Future	RC11-9-13D	0 Fast Trip Comparator — Printed Circuit Board	RC11-11-3	1	Resistance Bulb with Test Nozzle
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RC11-9-6B		Chamber Voltage Monitor and Test Unit — Details	RC11-9-15F	0 Logical OR — Parts List	RC11-12-3		Now ORNL Dwg. No. RC11-12-53
RC11-9-6C		Chamber Voltage Monitor and Test Unit — Panel	RC11-9-16A	1 Magnet Control Amplifier — Circuit	RC11-12-4		Obsolete
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RC11-9-7A		Chamber High Voltage Supply and Flux Amplifier — Circuit	RC11-9-16E	Magnet Control Amplifier — Assembly	RC11-12-5C	0	Servo Demand Drive Unit — Panel
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RC11-9-7D		Chamber High Voltage Supply and Flux Amplifier — Printed Circuit Board	RC11-9-17B	HFIR Test Circuit — Details	RC11-12-6A		Servo Power Amplifier Driver Unit — Circuit
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RC11-9-7F		Chamber High Voltage Supply and Flux Amplifier — Parts List	RC11-9-17D	HFIR Test Circuit — Printed Circuit Board	RC11-12-6C		Servo Power Amplifier Driver Unit — Panel
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RC11-9-8D	0	Flux Reset Mechanism — Printed Circuit Board	RC11-9-52		RC11-12-7B		Servo Power Amplifier Output Unit — Layout
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			RC11-10-5	0 Superseded by S & B Dwg. No. E-2057	RC11-13-1D	0	Pulse Amplifier and Count Rate Meter — Panel
			RC11-10-6	0 Monitoring Platform Equipment Arrangement and Conduit Layout	RC11-13-1E	0	Pulse Amplifier and Count Rate Meter — Printed Circuit Board
			RC11-10-7		RC11-13-1F		Pulse Amplifier and Count Rate Meter — Assembly
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RC11-13-2A	0	0.1 HP Motor-Servo Amplifier — Circuit	RC11-13-52B	A	Per cent Power Meter Scale	RC11-15-2	1	+15, +25 volt Power Supply — Details
RC11-13-2B	1	0.1 HP Motor-Servo Amplifier — Details	RC11-13-52C	A	Chamber Position Meter Scale	RC11-15-3	0	+15, +25 volt Power Supply — Panel
RC11-13-2C	0	0.1 HP Motor-Servo Amplifier — Panel	RC11-13-52D	A	Counts per Second Meter Scale	RC11-15-4	1	+15, +25 volt Power Supply — Printed Circuit Board
RC11-13-2D	0	0.1 HP Motor-Servo Amplifier — Printed Circuit Board	RC11-13-53	D	Circuit	RC11-15-5		+15, +25 volt Power Supply — Assembly
RC11-13-2E		0.1 HP Motor-Servo Amplifier — Assembly	RC11-13-54			RC11-15-6	0	+15, +25 volt Power Supply — Parts List
RC11-13-2F	0	0.1 HP Motor-Servo Amplifier — Parts List	RC11-13-55A	D	Drawer Interconnections, Sheet 1	RC11-16-1	0	-15, -25 volt Power Supply — Circuit
RC11-13-3			RC11-13-55B	D	Drawer Interconnections, Sheet 2	RC11-16-2	0	-15, -25 volt Power Supply — Details
RC11-13-4A	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Fission Chamber & Preamplifier Housing Assemblies	RC11-13-55C	D	Drawer Interconnections, Sheet 3	RC11-16-3	0	-15, -25 volt Power Supply — Panel
RC11-13-4B	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Fission Chamber Housing Details	RC11-13-56A	D	Wide-Range Counting Instrument Drawer No. 1 — Wiring	RC11-16-4	1	-15, -25 volt Power Supply — Printed Circuit Board
RC11-13-4C	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Preamplifier Housing Details	RC11-13-56B	D	Drawer No. 1 Details	RC11-16-5		-15, -25 volt Power Supply — Assembly
RC11-13-4D	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Preamplifier Circuit Diagram	RC11-13-57A	D	Drawer No. 2 Wiring	RC11-16-6	0	-15, -25 volt Power Supply — Parts List
RC11-13-4E	1	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Preamplifier Wiring Diagram	RC11-13-57B	D	Drawer No. 2 Details	RC11-17-1	0	± 10 volt Power Supply — Circuit
RC11-13-4F	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Preamplifier Layout & Details	RC11-13-58A	D	Drawer No. 3 Wiring	RC11-17-2	0	± 10 volt Power Supply — Details
RC11-13-4G	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Preamplifier Potting Mold	RC11-13-58B	D	Drawer No. 3 Details	RC11-17-3	0	± 10 volt Power Supply — Panel
RC11-13-4H	1	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Preamplifier Parts List	RC11-13-59A	D	Drawer No. 4 Wiring	RC11-17-4	1	± 10 volt Power Supply — Printed Circuit Board
RC11-13-4I			RC11-13-59B	D	Drawer No. 4 Details	RC11-17-5		± 10 volt Power Supply — Assembly
RC11-13-4J	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — DC Power Supply — Circuit	RC11-13-60A	D	Drawer No. 5 Wiring	RC11-17-6	0	± 10 volt Power Supply — Parts List
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RC11-13-4M	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — DC Power Supply — Circuit Board	RC11-14-2	0	PCP II Multi-Section Ion Chamber — Chamber Housing Assembly	RC11-20		
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RC11-13-4O			RC11-14-4	0	PCP II Multi-Section Ion Chamber — Connector and Cable Assembly	RC11-21-2	0	32 volt DC to 115/6.3 volt 60 cycle Inverter — Details
RC11-13-4P			RC11-14-5	0	PCP II Multi-Section Ion Chamber — Chamber Assembly — Casing Subassembly Details	RC11-21-3	0	32 volt DC to 115/6.3 volt 60 cycle Inverter — Panel
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RC11-13-4R	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — Fiberglass Coax Assembly	RC11-14-7	0	PCP II Multi-Section Ion Chamber — Chamber Assembly — Plug Housing Subassembly	RC11-21-5		32 volt DC to 115/6.3 volt 60 cycle Inverter — Assembly
RC11-13-4S		$\frac{3}{4}$ inch Fission Chamber & Preamp. — DC Power Supply — Assembly	RC11-14-8	0	PCP II Multi-Section Ion Chamber — Chamber Assembly — Insulators Details	RC11-21-6	0	32 volt DC to 115/6.3 volt 60 cycle Inverter — Transform Specification
RC11-13-4T	0	$\frac{3}{4}$ inch Fission Chamber & Preamp. — DC Power Supply — Parts List	RC11-14-9	0	PCP II Multi-Section Ion Chamber — Chamber Assembly — Core Details	RC11-21-7	0	32 volt DC to 115/6.3 volt 60 cycle Inverter — Parts List
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RC11-13-6A	D	Linear Count Rate Meter Circuit	RC11-14-14	0	PCP II Multi-Section Ion Chamber — Sensitive Volume Sub-assembly — Insulators	RC11-23-3		Meter Module — Parts List
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DRAWING NO.		1246-01-A1001	REV.	2
REFERENCE DRAWING		NO.		
REACTOR BLDG.	ELEVATIONS	1246-01-A-1001		
11	"	SECTIONS	1246-01-B-1001	
12	"	DOOR SCHEDULES	1246-01-C-1001	
13	"	ROOM FINISH DET.	1246-01-D-1001	
SPECIFICATION		REF.		
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N. Y.</p>				
<p align="center">FOR</p>				
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p>				
<p align="center">OAK RIDGE, TENNESSEE</p>				
<p align="center">APPROVED</p>				
<p align="center">SINGMASTER & BREYER</p>				
BY	<i>J. Russell</i>		DATE	3-7-54
<p align="center">UNION CARBIDE NUCLEAR COMPANY</p>				
BY	C. E. WILKINS		DATE	12-10-54
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p>				
BY	P. B. SORENS		DATE	9-10-54
<p align="center">HIGH FLUX ISOTOPE REACTOR</p>				
<p align="center">REACTOR BUILDING</p>				
<p align="center">PLAN OF SUB PILE ROOM AND</p>				
<p align="center">PRIMARY HEAT EXCHANGER CELLS</p>				
DRAWN BY		CYRIL JFC	DATE	4-6-54
CHECKED BY		NO. 37	CONTRACT NO.	
DATE	2-5-56	DRAWING NO.	1246-01-A1001	REV.
SCALE 1/4" = 1'-0"				

**CERTIFIED
FOR CONSTRUCTION**

LEGEND AND ABBREVIATIONS

- (101) DOOR NUMBER
[101] ROOM NUMBER

CH	CEILING HEIGHT	DRAWING NO. 1546-01-A-1002	REV. 2
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REFERENCE DRAWING		NO.
REACTOR BLDG.	ELEVATIONS	1546-01-A-1007
"	"	WALL SECTIONS 1546-01-A-1010
"	"	SECTIONS 1546-01-A-1008 1009
"	"	ROOM FINISH SCH 1546-01-A-1011

SPECIFICATION	REF.
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.</p>	

U. S. ATOMIC ENERGY COMMISSION

APPROVED

APPROVED
SINGMASTER & BREYER

520 BY J. Russell DATE 5-9-61
UNION CARBIDE NUCLEAR COMPANY

BY	C. E. WINTERS	DATE 3-29-61
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U. S. ATOMIC ENERGY COMMISSION
BY H. JACKSON DATE 4-4-67

BT	DATE 4-4-67
HIGH FLUX ISOTOPE REACTOR	

17	REACTOR BUILDING
----	------------------

GROUND FLOOR PLAN

[illegible]

DRAWN JFC	CHKD EW	DATE 2-4-68	CONTRACT NO. AT-401-2688
DATE 11-17-68	DRAWING NO.		REV.

SCALE	1/8" = 1'-0"	1546-01-A-1002	2
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NOTES

1. TOP OF FLOOR SLAB ELBY: B17-0²
UNLESS OTHERWISE NOTED.
2. SEE STRUCT DWG 154G-01A-6024 & 6025
FOR SLOPES IN FLOOR SLABS.
3. FOR DETAILS AT DOORS *G-16 & G-17
SEE DWG 154G-01A-1014
4. FOR LOJVERS IN CONCRETE WALLS
SEE DWG 154G-01A-1007.
5. FLOOR, DRAIN LOCATIONS AND ELEVATIONS DWG M-5520

**CERTIFIED
FOR CONSTRUCTION**

[illegible]

NOTES

1. TOP OF SLAB ELEV. 851'-2" UNLESS OTHERWISE NOTED.
2. SEE DWG. A-1002 FOR GENERAL NOTES ABBREVIATIONS AND LEGEND.
3. SEE HAV DWGS FOR LOCATION & SIZE OF FAN OPNGS.
4. W-DOORS NORMALLY LOCKED DURING REACTOR OPERATION.
5. FLOOR DRAIN LOCATIONS AND ELEVATIONS DWG. M-5515

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FOR CONSTRUCTION**

DRAWING NO.		REV.
1546-01-A-1004		3.
REFERENCE DRAWING		NO.
1. REACTOR BLDG	ELEVATIONS	1546-01-A-1007
2	WALL SECTION	1546-01-A-1010
3	SECTIONS	1546-01-A-1008
4	ROOM FINISH DET.	1546-01-A-1011
5	TYPICAL ARCH. DETAILS	1546-01-A-1002
SPECIFICATION		REF.
SINGMASTER & BREYER		
METALLURGISTS & CHEMICAL ENGINEERS		
420 LEXINGTON AVE. NEW YORK 17, N. Y.		
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p> <p align="center">OAK RIDGE, TENNESSEE</p> <p align="center">APPROVED</p> <p align="center">SINGMASTER & BREYER</p> <p align="center"><i>Charles E. Breyer</i> DATE 3-21-61</p> <p align="center">UNION CARBIDE NUCLEAR COMPANY</p> <p align="center">BY J. C. E. WINTERS DATE 4-4-61</p> <p align="center">U. S. ATOMIC ENERGY COMMISSION</p> <p align="center">BY R. B. SOMERS DATE 4-7-61</p> <p align="center">HIGH FLUX ISOTOPE REACTOR</p> <p align="center">REACTOR BUILDING</p> <p align="center">SECOND FLOOR PLAN</p>		

[illegible]

**CERTIFIED
FOR CONSTRUCTION**

NOTES:

1. TOP OF FLOOR SLAB ELEV. 865'-2" UNLESS OTHERWISE NOTED.
2. SEE DWG. A-1002 FOR GENERAL NOTES, ABBREVIATIONS & LEGEND
3. FINISHED CEILING HEIGHT IN ROOMS NO. 301, 302, 303, 304, 310 & 301-A TO BE 9'-0"
4. FLOOR VENTING LOCATION AND ELEVATIONS DWG. P. 9003

DRAWING NO.		1546-01-A-1005	REV.
REFERENCE DRAWING		NO.	
REACTOR BLDG ELEVATIONS		1546-01-A-10	
1	2	WALL SECTIONS	1546-01-A-10
2	3	SECTIONS	1546-01-A-11
3	4	ROOM FINISH SCH.	1546-01-A-11
SPECIFICATION		REF.	
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMISTS 430 LEXINGTON AVE. NEW YORK 17, N. Y.</p>			
<p align="center">U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE</p>			
<p align="center">APPROVED</p>			
BY	SINGMASTER & BREYER		DATE 3-24
	UNION CARBIDE NUCLEAR COMPANY		
BY	C. F. WINTERS		DATE 2-27
	U. S. ATOMIC ENERGY COMMISSION		
BY	L. H. JACKSON		DATE 6-8-54
<p align="center">HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING THIRD FLOOR PLAN</p>			
DRAWN	JRC	CHKD	EW
DATE	11-28-50	DRAWING NO.	
SCALE	1" = 1'-0"	1546-01-A-1005	
		DATE	7-26-54
		CONTRACT	NY 1460-100
		BY	NY

[illegible]

④ TYPICAL SCUPPER AND LEADER HEAD DETAIL

2 COL.
TYPICAL
ROOF CURB DETAIL
FOR EXHAUST FANS

DETAIL
TYPICAL LEADER
OFFSET THRU ROOF

11
1006

TYPICAL ROOF DRAIN DTL
1 1/2" x 1'-0"

12
1006 LT.WT.CD

13
1006

ROOF PLAN

[illegible]

LOUVER SCHEDULE			
NO	NO	WALL OPENING	LOUVER TYPE
LV-1	1	6'-0" x 8'-0"	FIXED LOUVER 15" CG WALL
LV-2	1	6'-0" x 8'-0"	" " " " " "
LV-3	1	6'-0" x 8'-0"	" " " " " "
LV-4	1	6'-0" x 8'-0"	" " " " " "
LV-5	1	6'-0" x 8'-0"	" " " " " "
LV-6	1	6'-0" x 8'-0"	" " " " " "

- NOTES**
- FOR DETAILS OF PARAPETS, SCUFFERS, LEADERS & OTHER ROOF ITEMS SEE DWG A-1004 & A-1005
 - FOR DETAILS OF LADDERS, EXT. DOORS & CANOPY AT DOORS SEE DWG A-1014
 - FOR DETAILS AT STAIR #1 BULKHEAD & DOOR SEE DWG A-1016
 - FOR DETAILS AT DOOR #101 CANOPY SEE DWG A-1018 FOR DOOR #111 CANOPY DWG A-1014
 - FOR DETAILS OF END WALLS EL. 811'-0" TO EL. 808'-0" SEE DWG S-6000
 - FOR DETAILS OF CONG. WALLS ABOVE EL. 808'-0" SEE DWG S-6000
 - FOR GRADES AT EXTERIOR WALLS DWG S-1009, 1010, 1012

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FOR CONSTRUCTION**

DRAWING NO. 1546-01-A-1007		REV. 2
REFERENCE DRAWING NO.		
REACTOR BUILDING, BLAUS		
WALL SECTIONS A-1014		
SECTIONS A-1018		
A-1009		
SPECIFICATION REF.		
SINGMASTER & BREYER		
METALLURGISTS & CHEMICAL ENGINEERS		
420 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION		
OAK RIDGE, TENNESSEE		
APPROVED		
SINGMASTER & BREYER		
BY <i>[Signature]</i>		DATE 3-31-61
UNION CARBIDE NUCLEAR COMPANY		
BY C. E. WINTER		DATE 4-11-61
U. S. ATOMIC ENERGY COMMISSION		
BY L. H. JACKSON		DATE 4-18-61
HIGH FLUX ISOTOPE REACTOR		
REACTOR BUILDING		
ELEVATIONS		
DRAWN M.C. CHECKED J.C. DATE 4-11-61		
DATE 12-8-60		
SCALE 1/8" = 1'-0"		
DRAWING NO. 1546-01-A-1007		
REV. 2		

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NOTE -
SEE DWG. A-1002 FOR GENERAL NOTES -
APPROPRIATIONS AND LEGEND.
SEE STRUCTURAL DWGS. AS NOTED FOR CONCRETE
STRUCTURE DIMENSIONS AND DETAILS.

DRAWING NO. 1546-01-A-1009		REV. 1
REFERENCE DRAWING NO.		
REACTOR BLDG - PLANS 1546-01-A-1001 TO A-1008 INCL.		
SPECIFICATION REF.		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y. FOR THE U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED SINGMASTER & BREYER DATE 3-24-61		
BY C. E. WINTER DATE 4-4-61 U. S. ATOMIC ENERGY COMMISSION		
BY L. H. JACKSON DATE 4-10-61 HIGH FLUX ISOTOPE REACTOR		
REACTOR BUILDING SECTION		
DRAWN BY JFC CHECKED JFC DATE 12-12-60 NO. 1009		
DATE 11-15-60 SCALE 1/8" = 1'-0"		

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
1					1				
2					2				
3					3				
4					4				
5					5				
6					6				
7					7				
8					8				
9					9				
10					10

GROUND FLOOR PLAN 1/8" = 1'-0"
FIN. PL. ELEV. 83'-0"

TYPICAL DTL. ROOF CURB STRIP FLASHING AT AREA
FAN WALL & VENTS THROUGH ROOF SHOWN ON
DWG. A-1101 & WALL SECTIONS A-1103

ROOF PLAN 1/16" = 1'-0"
HIGH AND LOW POINT OF ROOF ELEV.
ARE TO TOP OF CONC. ROOF SLAB
1 - FAN - FRESH AIR INTAKE
2 - FAN - EXHAUST FAN

LEGEND AND ABBREVIATIONS

CONCRETE	EWG	ELECTRIC WATER COOLER
CONCRETE BLOCK	EPB	ELECTRIC PANEL BOARD
STRUCTURAL GLAZED FACING TILE (SGFT)	AL	ACTIVE LEAF (DOOR)
BRICK		
INSULATION		
N.I.C.		
NOT IN CONTRACT		
PTD		
PAPER TOWEL DISPENSER		
	RD	ROOF DRAIN
	RL	ROOF LEADER
	FD	FLOOR DRAIN
	FHC	FIRE HOSE CABINET
	SS	SERVICE SINK
	10	DOOR NUMBER
	22	ROOM NUMBER
	100	SECTION NO. OR DTL.
	100	SECTION INDICATION

GENERAL NOTES

- ALL PARTITIONS TO BE 4" CONCRETE BLOCK UNLESS OTHERWISE NOTED.
- ALL PARTITIONS SHALL EXTEND TO HEIGHT OF FIRST JOINT OF CONC. BLOCK COUNTING ABOVE SUSPENDED CEILING, EXCEPT AS INDICATED TRUSS SPACE NO. 100 - EXTEND PARTITION TO TOP OF ROOF SLAB.
- SECTIONS A-A, B-B, C-C, DWG. A-1102.
- ALL WINDOWS TYPE (2) EXCEPT AS NOTED.
- FIN. FLOOR FINISH DWG. A-1103.

TOP OF CONC. ROOF SLAB
FIN. FLOOR FINISH

REFERENCE DRAWING	NO.
ELEVATIONS & SECTIONS	1546-02-A-1102
WALL SECTIONS	1546-02-A-1103
FINISH & SCHEDULE	1546-02-A-1104
DOOR SCHEDULE & RESIDENT DTL.	1546-02-A-1105
LOCKER & TOILET RM DTL. & MISC. DETAILS	1546-02-A-1107

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK 17, N.Y.
(NYC)

U. S. ATOMIC ENERGY COMMISSION
OXFORD, TENNESSEE

APPROVED
SINGMASTER & BREYER
DATE 3-9-61

BY *[Signature]*
UNION CARBIDE NUCLEAR COMPANY
DATE 3-17-61

BY C. E. WINTERS
U. S. ATOMIC ENERGY COMMISSION
DATE 3-21-61

HIGH FLUX ISOTOPE REACTOR
OFFICE AND MAINTENANCE BUILDING

GROUND FLOOR AND ROOF PLANS

DRAWN GEETTY OK'D WLE DATE 3-15-61
DATE 11-30-60
SCALE AS NOTED 1546-02-A-1101

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
1	ISSUED FOR TITLE II APPROVAL	WNG	WFC	3-15-61	1	ISSUED FOR TITLE II APPROVAL	WNG	WFC	3-15-61
2	ISSUED FOR TITLE I APPROVAL	WNG	WFC	3-15-61	2	ISSUED FOR TITLE I APPROVAL	WNG	WFC	3-15-61
3	ISSUED FOR TITLE I APPROVAL	WNG	WFC	3-15-61	3	ISSUED FOR TITLE I APPROVAL	WNG	WFC	3-15-61

DRAWING NO. 1546-02-A-1102		REV. C
REFERENCE DRAWING		NO.
GROUND FLOOR PLAN AND ROOF PLAN		1546-02-A-1101
WALL SECTIONS		1546-02-A-1105
ENTRANCE DETAILS		1546-02-A-1107
SPECIFICATION		REF.
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y. [FAX]</p>		
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p> <p align="center">OAK RIDGE, TENNESSEE</p>		
<p align="center">APPROVED</p>		
BY	SINGMASTER & BREYER <i>Russell</i>	DATE 3-9-61
	UNION CARBIDE NUCLEAR COMPANY	
BY	C. E. WINTERS	DATE 3-17-61
	U. S. ATOMIC ENERGY COMMISSION	
BY	L. H. JACKSON	DATE 3-21-61
<p align="center">HIGH FLUX ISOTOPE REACTOR</p>		
<p align="center">OFFICE AND MAINTENANCE BUILDING</p> <p align="center">ELEVATIONS AND SECTIONS</p>		
DRAWN GSEY	CHKD WLM	DATE 3-12-61
DRAWING NO.		CONTRACT NO. 47-10-1-3888
DATE 12-7-60	1546-02-A-1102	
SCALE 1/8" = 1'-0"		REV. 0

NOTE
FOR DOOR TYPES SEE DWG NO 1546-01-A-1012 IN FACTOR PLD6
FOR FRAME & SADDLE TYPES SEE DWG NO 1546-00-A-18Q1

- GENERAL NOTES**
1. SEE DWG. A-1002 FOR LEGEND & APPROPRIATE DIMENSIONS
 2. ROOM FINISH WILL BE STEEL TROWLED, COLIC. IN SWITCHGEAR AREA & DIESEL GEN. ROOM & VINYL COATING ON BATTERY RM FLO.
 3. FOR FINISH PAINTING SEE SPEC. NO. 27 FOR PROTECTIVE COATING SEE SPEC. NO. 109.
 4. SEE DWG. A1003 FOR LIGHTS, AUTOMATIC LEVERING WALL SECTIONS AND CHAIRS & LAPPERS. DETAILS
 5. SEE DWG. A1004 FOR DETAILS AT SCUFFERS, 1/4 SECTION. ELEV.
 6. FOR CONTINUATION OF PIPING OUTSIDE OF BLDG. SEE DWG. U-7114
 7. FOR PLUMBING LEGEND SEE DWG. P-6905

	DRAWING NO.	1346-0A-A-201	REV.	3
	REFERENCE DRAWING	NO.		
	WALL SECTIONS	1346-0A-A-180		
	UTILITY PLAN - YARD PIPING	1346-0B-U-171		
	FLOOR & ROOF RAILING PLANS	1346-0A-U-71		
	FOUNDATIONS & EQUIPMENT SETTINGS	1346-0A-E-60		
	H.E.V. SPEC. SECTION, H.E.V. DUCT & PIPING DETL.	1346-00 H.E.V. 3		
	SPECIFICATION	REF.		
	SINGMASTER & BREYER METALLURGICAL & CHEMICAL ENGINEERS 430 METALLURGICAL AVE. NEW YORK 17, N. Y. <div style="text-align: center;">FOR</div>			
	U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
	APPROVED SINGMASTER & BREYER			
546	BY	<i>J.C. Russell</i>	DATE	2-24-61
CHC	BY	W. J. MORGAN	DATE	3-6-61
547	BY	U. S. ATOMIC ENERGY COMMISSION	DATE	3-9-61
548	BY	L. H. JACKSON	DATE	3-9-61
549	HIGH FLUX ISOTOPE REACTOR			
550	ELECTRICAL BUILDING			
551	PLANS, SECTIONS & ELEVATIONS			
552	DRAWN BY	CHD JRC	DATE	1-15-61
553	DRAWN BY	1346-0A-A-191	CONTRACT	NO. AT-100-100
554	DATE	12-14-60	DRAWING NO.	1346-0A-A-191

NOTES:
SIZE OF LOUVERS & LOUVER
PENTHOUSES IN GENERATOR RA
SHALL BE VERIFIED WITH CERTIFIED
GENERATOR VENDOR PRINTS BEFORE
SUBMITTING SHOP DRAWINGS.

															3	REAR TIRE HOSE CAB & STANDOFF, & ADD T.F. AS PER TCG 50. REV. P.D. LOCATION	MLG	WFO	8/21/66	N/R	-	N/R	-	0	CERTIFIED FOR CONSTRUCTION	W.C. JFC	8/21/66	10/1/66	MECH	10/1/66
															2	CONCRETE DOOR SILLING, NEW FLOOR DRAIN AG. P.D. CH. ORDER # 57	JFC	WFO	8/21/66	N/R	-	N/R	-	0	ISSUED FOR TITLE II APPROVAL	W.C. JFC	8/21/66	10/1/66	STRUC	10/1/66
															1	SH CON. DRAIN CORR. TO FLOORING, JUL. SILL, RELOC. INTG. TAG. PIPING TEMP. ADDD SIZES TO STEAM & RET. PIPING	WNG	JFC	8/21/66	N/R	-	N/R	-	0	ISSUED FOR TITLE I APPROVAL	W.C. JFC	8/21/66	10/1/66	UTL	10/1/66
															1		WNG	JFC	8/21/66	N/R	-	N/R	-	0	ISSUED FOR TITLE I APPROVAL	W.C. JFC	8/21/66	10/1/66	UTL	10/1/66

REVISIONS

NO.	BY	CHK	APPR.	DATE	APPR.	DATE	APPR.	DATE
1	WFO	JFC	WFO	8/21/66	WFO	8/21/66	WFO	8/21/66

PLANS, SECTIONS & ELEVATIONS

DRAWN BY: W

CHKD: JFC

DATE: 12-14-66

DRAWING NO. 1510-00A-11901

EAVE & GUTTER DETAIL
SCALE 1 1/2" = 1'-0"

SECTION "BB"
SCALE 3"=110'

WEST ELEVATION
SCALE 1"=10'

EAST ELEVATION
SCALE 1/8" = 1'-0"

RIDGE ROLL DETAIL
SCALE 1/2" = 1'-0"

DETAIL "A"
SCALE 1 1/2" = 1'-0"

- 1 SEE DW 1546-01-A-1002 FOR GENERAL NOTES. LEGEND & ABBREVIATIONS
- 2 DOOR TO BR RM. D.W. 7'-0" x 1 1/2". IN TYPE 'G' AS SHOWN ON DW 1546-01-A-1002. FRAME SHALL BE TYPE 14 AS SHOWN ON DW 1546-01-A-1001. HARDWARE SHALL BE SET - 5. DOOR TO HAVE 3/4" x 1" ADJUSTABLE LOUVER, NON TYPICAL DETAIL SEE .
- 3 SEE SPEC SECTION 12 FOR DESCRIPTION AND SPACING OF PARTS FOR CORR. CRW ASS.
- 4 SEE SPEC. NO 27 FOR FINISH PAINTING. SEE SPEC. NO 100 " PROTECTIVE COATINGS.

SECTION 'A-A'
SCALE 1/4" = 1'-0"

REMOVABLE TRANSOM DETAIL
SCALE 3"=1'-0"

SECTION CC

[illegible]

FLOOR PLAN
1/4" = 1'-0"

SECTION C-C
3/4" = 1'-0"

SECTION D-D
3/4" = 1'-0"

SOUTH ELEVATION

WEST ELEVATION

SECTION B-B
3/4" = 1'-0"

NORTH ELEVATION

SECTION A-A

ROOF PLAN

REMOVABLE TRANSOM DETAIL
SCALE 3/4" = 1'-0"

VERTICAL SECTION THRU LOUVER
SCALE 1/2" = 1'-0"

ROOF CURB FOR EXHAUST FAN
SCALE 1/2" = 1'-0"

LADDER DETAIL
SCALE 1/2" = 1'-0"

DOOR SCHEDULE											
NO.	TYPE	DOOR OPG.	THICK.	MAT.	SWING	SLATING	FRAME	FRAME SADDLE	REMARKS	HARDWARE	SET NO.
1	B	5'-0" x 7'-0"	1 1/2"	H.N.	R.H.	CLNG	16	P.S.	SEE REMOVABLE TRANSOM	#5	
2	E	5'-0" x 7'-0"	1 1/2"	H.N.	L.H.	CLNG	16	P.S.	"	#11	
3	B	5'-0" x 7'-0"	1 1/2"	H.N.	R.H.	CLNG	16	P.S.	"	#5	

NOTE
SEE DWG 1546-00-A-1501 FOR TYPICAL DETAILS OF DOOR FRAMES & SADDLES

- NOTES
- SEE DWG NO. 1546-01-A-1002 FOR GENERAL NOTES, LEGEND & ABBREVIATIONS
 - SEE DWG NO. 1546-00-A-1501 FOR TYPICAL DETAILS OF MASONRY WALLS, PARTITIONS & ALUM. COPING
 - SEE DWG NO. 1546-01-A-1006 FOR TYPICAL DETAILS OF SCUPPER & LEADER HEAD
 - PROVIDE 6" MIN. BEARING AT STEEL LINTELS
 - FOUNDATION AND STRUCTURAL FRAMING DTLS DWG. NO. 1546-05-S-6071
 - ELECTRICAL PLAN AND DTLS DWG. NO. 1546-05-E-2071
 - SEE SPEC. NO. 27 FOR FINISH PAINTING. SEE SPEC. NO. 109 FOR PROTECTIVE COATING.

DRAWING NO. 1546-05-A-1303		REV. 0
REFERENCE DRAWING NO.		
PIPING DETAIL		1546-05-U-1508
H.E.V. PLAN AND DETAILS		1546-05-H.E.V.3060
SPECIFICATION REF.		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY SINGMASTER & BREYER DATE 3-28-61		
BY UNION CARBIDE NUCLEAR COMPANY DATE 4-10-61		
BY C. E. WINTER DATE 4-10-61		
U. S. ATOMIC ENERGY COMMISSION		
BY L. H. JACKSON DATE 4-15-61		
HIGH FLUX ISOTOPE REACTOR		
COOLING TOWER EQUIP. BLDG.		
PLANS, ELEVATIONS & DETAILS		
DEPT. CHG.	DATE 3-17-61	DRAWING NO. 1546-05-A-1303
ARCH. CHG.		
ELECT. CHG.		
M.E.V. CHG.		
INST. CHG.		
MECH. CHG.		
STRUC. CHG.		
UTIL. CHG.		
CERTIFIED FOR CONSTRUCTION		
1546-05-A-1303

NOTES

1. FOR UNDERGROUND DUCT RUNS SEE DWG 1546-05-E-206E
2. DWG NÚ REFERRED TO ABOVE SHOW THE MAIN POWER LAYOUTS
FOR THE EQUIPMENT.

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO. 1946-07-E-2001		REV. 1
REFERENCE DRAWING	NO.	
SPECIFICATION	REF. SECTION 107	
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N. Y.</p>		
<p align="center">FOR</p>		
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p>		
<p align="center">OAK RIDGE, TENNESSEE</p>		
<p align="center">APPROVED</p>		
<p align="center">SINGMASTER & BREYER</p>		
BY <i>J. Russell</i>	DATE 6-2-61	
<p align="center">UNION CARBIDE NUCLEAR COMPANY.</p>		
BY C. E. WINTERS	DATE 6-12-61	
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p>		
BY H. B. SOMERS	DATE 6-16-61	
<p align="center">HIGH FLUX ISOTOPE REACTOR</p>		
<p align="center"><u>ELECTRICAL KEY PLANS</u></p>		
DRAWN 16/MLB	CHECKED 5/ML	DATE 5-2-61
DATE 9-2-60	DRAWING NO.	
SCALE 1/8"=1'-0"	1946-07-E-2001	
REV.		1

[illegible]

**CERTIFIED
FOR CONSTRUCTION**

NOTE:
FOR MAIN COOLANT
PUMP PONY DRIVE
CIRCUITS SEE DWG
1540-04-E-2007

[illegible]

ONE LINE DIAGRAM SYMBOLS

	POWER TRANSFORMER		MOLDED CASE BREAKER, ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP, 100A FRAME SIZE, 25A CONTINUOUS CURRENT RATING, 30-180A AN. TRIP RANGE
	POTENTIAL TRANSFORMER 2 INDICATES NUMBER 440-110V INDICATES VOLT. RATIO		2 POLE CIRCUIT BREAKER CONNECTED TO PHASES A & B.
	CURRENT TRANSFORMER 2 INDICATES NUMBER 600/5-CT RATIO, D-INDICATES DOWNTYPE		MAGNETIC NON-REVERSING STARTER WITH 2 THERMAL OVERLOAD HAND RESET ELEMENTS. 2- INDICATES STARTER SIZE.
	CURRENT TRANSFORMER 2 INDICATES NUMBER 600/5-CT RATIO, D-INDICATES DOWNTYPE		2 SPEED MAGNETIC STARTER
	CIRCUIT BREAKER (AIR) RELAY TRIP INDICATES DRAWOUT TYPE		REVERSING STARTER F-R FWD-REVERSE O-C OPEN-CLOSE
	CIRCUIT BREAKER (OIL) RELAY TRIP INDICATES DRAWOUT TYPE		INDUCTION MOTOR - 10 INDICATES HP
	CIRCUIT BREAKER ELECT OPERATED DUAL MAGNETIC SERIES TRIP 600A FRAME SIZE, 400A TRIP RATING, DRAWOUT TYPE		INDICATING LIGHT
	CIRCUIT BREAKER DRAWOUT TYPE, MANUALLY OPERATED, SHUNT TRIP & SERIES TRIP		BATTERY
	INDICATES HORN GAP DISCONNECT SWITCH		BATTERY CHARGER
	FUSE		LOCATED ON MAIN CONTROL BD.
	POTHEAD		CONSTANT VOLTAGE TRANSFORMER
	GROUND		I.C. INTERRUPTING CAPACITY
	LIGHTNING ARRESTER		N.O. NORMALLY OPEN
	<u>METER OR RELAY</u> A- AMMETER V- VOLT METER WH- WATT HOUR METER, W- DEMAND ATTACHMENT T- TIMER 27- UNDERVOLTAGE RELAY 49- THERMAL OVERLOAD RELAY 50- INSTANTANEOUS OVERCURRENT RELAY 51- INVERSE TIME OVERCURRENT RELAY 50N- GROUND RELAY-INSTANTANEOUS ET- ELAPSED TIME METER F- FREQUENCY METER 51N- GROUND RELAY- INVERSE TIME		N.C. NORMALLY CLOSED
	<u>SWITCH OR SIMILAR DEVICE</u> VS- VOLT METER SWITCH AS- AMMETER SWITCH FS- FLOAT SWITCH PS- PRESSURE K- KEY INTERLOCK TR- TRANSDUCTOR SZ- CONTROL SW LS- LEVEL SW		2 SPEED MAGNETIC STARTER WITH REVERSING CONTROL ON SLOW SPEED SF - SLOW FORWARD FF - FAST FORWARD SR - SLOW REVERSE
	RESISTOR OR HEATER		60A, 440V, 3Ø POWER RECEPTACLE
	INDICATES STABS FOR DRAWOUT (AS IN MCC) MOLDED CASE BREAKER, THERMAL MAGNETIC TRIP, 100A FRAME SIZE, 70A TRIP RATING 2 INDICATES 30,000 A. 45YM. INT. CAP. FOR 100A. BRK. 3 (A) = 15,000 A. 45YM. INT. CAP. FOR 100A. BRK.		HIGH VOLTAGE MAGNETIC STARTER
	RECTIFIER		AUXILIARY CONTROL CABINET
			AUTOMATIC TRANSFER SWITCH N- NORMAL SUPPLY. E- EMERGENCY SUPPLY.
			PAPER INSULATED LEAD COVERED, NEOPRENE JACKETED
			RUBBER INSULATED, NEOPRENE JACKETED
			POLYETHYLENE, INSULATED PVC JACKET.
			MANUAL MOTOR STARTER

NOTES

1. FOR GENERAL NOTES SEE DWG. # 1546-01-E-2003.
2. FOR ELEMENTARY CONTROL DIAGRAM SCHEDULE SEE DWG. 1546-01-E-2003.

ONE LINE DIAGRAM 480V NORMAL POWER REACTOR BLDG SUB-STATION #	DRAWING NO. 1946-04-E-2002	REV. 4
REFERENCE DRAWING	NO.	
ONE LINE DIAGRAM 480V NORMAL POWER REACTOR BLDG SUB-STATION #	1946-04-E-2000	
ONE LINE DIAGRAM 480V NORMAL POWER ALUMINUM BUS SUB-STATION #	1946-04-E-2001	
ELECTRICAL EQUIP BLDG SUB-STATION #	1946-04-E-2002	
ONE LINE DIAGRAM 480V NORMAL POWER ELECTRICAL EQUIP BLDG SUB-STATION #	1946-04-E-2003	
ONE LINE DIAGRAM 480V NORMAL POWER SYSTEM # & FAS FREE SYSTEM	1946-04-E-2004	
ONE LINE DIAGRAM INSTRUMENT POWER	1946-04-E-2005	
SPECIFICATION	NIP	SECT. 107

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
LEXINGTON AVE. NEW YORK 17, N. Y.
ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED

SINGMASTER & BREYER

BY *J. Knoll* DATE 4-20-61

UNION CARBIDE NUCLEAR COMPANY

BY C.E. WINTERS DATE 5-2-61

U. S. ATOMIC ENERGY COMMISSION

HIGH FLUX ISOTOPE REACTOR
ONE LINE DIAGRAM
NORMAL POWER

13.8KV & 2.4KV DISTRIBUTION			
DRAWN M.J.R.	CHECKED <i>SP/20</i>	DATE 1-3-6	CONTRACT NO. AT. 100-0-2002
DATE 9-2-6	DRAWING NO.		REV.
SCALE	1566-04-E-2002		4

1. ALL TRANSFORMERS AND ISOLATING TRANSFORMERS, ZINC OXIDE ARRESTERS SHALL BE FURNISHED BY THE GOVERNMENT AND INSTALLED BY THE CONTRACTOR. A COMPLETE DESCRIPTION OF ALL EQUIP. FURNISHED BY THE GOVERNMENT IS GIVEN IN SECT. 2 OF THE SPEC.
2. WITHIN TWO WEEKS OF RECEIVING A.C. CABLES SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:
#12 THROUGH #2 - "TYPE THW"
#1 THROUGH "BOMCH" - "TYPE THW"
ALL DC WIRING SHALL BE POLYETHYLENE INSULATION WITH PVC JACKET.
3. SPACES & SPARES ON MCCB'S & PANELS NOT SHOWN
4. FOR COMPLETE DESCRIPTION OF LOAD CONNECTED TO LIGHTING & POWER PANELS SEE PANEL SCHEDULE B.
5. ALL CIRCUIT BREAKERS, STARTERS & SWITCHES ARE 3 POLE UNLESS OTHERWISE NOTED.

ELEMENTARY DIAGRAM SCHEDULE	
BLEM. NOS	DNAG. NOS
*1-5	1546-02-E-2010
*6-12	1546-01-E-2117
*13-18	1546-01-E-2124
*16	1546-05-E-2118
*17-23	1546-01-E-2119
*18	1546-01-E-2120
*20	1546-05-E-2077
*21	1546-01-E-2120
*22-24	1546-05-E-2118
*25-26	1546-01-E-2117
*27	1546-01-E-2129
*28-29	1546-01-E-2124
*30-31	1546-01-E-2115
*42-47	1546-01-E-2116
*48-53	1546-01-E-2124
*54	1546-01-E-2123
*55	1546-01-E-2044
*56-63	1546-01-E-2128
*64-66	1546-01-E-2116
*67	1546-01-E-2117
*68	1546-05-E-2121
*69	1546-01-E-2124
*70	1546-01-E-2123

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO.		1546-01-E-2003		REV.		4	
REFERENCE DRAWING NO.							
ONE LINE DIAGRAM "POWER TO REV. 2-4-9V DISTRIBUTION"				1546-04-E-2002			
ONE LINE & EQUIPMENT DIAGRAM OFFICE & MAINTENANCE BLDG.				1546-02-E-2000			
SPECIFICATION				REF. 506 NEW 107			
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEONSTON AVE. NEW YORK 17, N. Y.</p>							
<p align="center">[BOX]</p>							
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p>							
<p align="center">OAK RIDGE, TENNESSEE</p>							
<p align="center">APPROVED</p>							
<p align="center">SINGMASTER & BREYER</p>							
BY		<i>C. E. Winters</i>		DATE		4-28-61	
<p align="center">UNION CARBIDE NUCLEAR COMPANY</p>							
BY		C. E. WINTERS		DATE		5-16-61	
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p>							
BY		L. H. JACKSON		DATE		5-18-61	
<p align="center">HIGH FLUX ISOTOPE REACTOR</p>							
<p align="center">ONE LINE DIAGRAM</p>							
<p align="center">480V NORMAL POWER</p>							
<p align="center">SUB-STATION NO. 1</p>							
<p align="center">DRAWING BLDG.</p>							
DRAWN BY		J. R. OYED		DATE		5-1-61	
SCALE		1" = 10'		NO. SHEETS		1 OF 1	
DATE 7-3-60				DRAWING NO.			
1546-01-E-2003				REV. 4

NOTES:
1. FOR LIST OF SYMBOLS SEE DWG. 1546-04-E-2002
2. FOR GENERAL NOTES SEE DWG. 1546-01-E-2003

																				480V - NORMAL POWER																				INST. 10/1/61	
																				SUB-STATION NO 3																				MECH. 10/1/61	
																				ELECTRICAL BLDG.																				STRUC. 10/1/61	
																																								UTIL. 10/1/61	
																																								DRAWN M.J.R.	
																																								CHECKED	
																																								DATE 1/1/61	
																																								NO. 10/1/61	
																																								SCALE	
																																								DRAWING NO.	
																																								1546-04-E-2005	
																																								BY	

DRAWING NO. 1546-04-E-2005		REV. 4
REFERENCE DRAWING		NO.
ONE LINE DIAGRAM NORMAL POWER 15 KV	1546-04-E-2002	
ONE LINE DIAGRAM 480V NORMAL POWER	1546-01-E-2003	
ONE LINE DIAGRAM 480V NORMAL POWER	1546-04-E-2006	
ONE LINE DIAGRAM 480V NORMAL POWER	1546-04-E-2007	
ONE LINE DIAGRAM 480V NORMAL POWER	1546-04-E-2008	
ONE LINE DIAGRAM 480V NORMAL POWER	1546-04-E-2009	
SPECIFICATION		REF. SECTION-107
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED SINGMASTER & BREYER		
BY C. E. WINTERS	DATE 4-2-61	
BY L. H. JACKSON	DATE 5-16-61	
HIGH FLUX ISOTOPE REACTOR ONE LINE DIAGRAM 480V NORMAL POWER SUB-STATION NO. 3 ELECTRICAL DLDG.		
DRAWN M.J.R.	CHKD. J.L.	DATE 7-1-61
DATE 9-3-61	DRAWING NO.	NO. 27-1001-1000
SCALE	1546-04-E-2005	REV. 4

DRAWING NO.		1546-04-E-2006	REV. 5
REFERENCE DRAWINGS		NO.	
THE LINE DIAGRAM - NORMAL POWER 35KV 1-2 K.V. DISTRIBUTION		1546-04-E-2002	
ONE LINE DIAGRAM - 240V NORMAL POWER		1546-04-E-2003	
ELECTRICAL BLDG. SUB-STATION # 1		1546-04-E-2005	
ELECTRICAL BLDG. SUB-STATION # 2		1546-04-E-2006	
ONE LINE DIAGRAM - EMERGENCY 555 T.M. # 1		1546-04-E-2008	
SPECIFICATION	REF.		SECTION 107
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N. Y. [FOR]</p>			
<p align="center">U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE</p>			
<p align="center">APPROVED</p>			
<p align="center">SINGMASTER & BREYER</p>			
BY	<i>J. C. Russell</i>	DATE	4-28-61
BY	C. W. WINTERS	DATE	5/16/61
BY	L. L. JACKSON	DATE	5/16/61
<p align="center">HIGH FLUX ISOTOPE REACTOR ONE LINE DIAGRAM 480V NORMAL POWER SUB-STATION NR 4 ELECTRICAL BLDG.</p>			
DRAWN BY	CHKD	DATE	NO. OF SHEETS
DATE	5-2-60	1546-04-E-2006	REV.
SCALE			5

**CERTIFIED
FOR CONSTRUCTION**

- NOTES
- ON SUSTAINED FAILURE OF NORMAL POWER, AUX. CONTACT IN THE AUTOMATIC TRANSFER SWITCH WILL TRIP ALL FEEDER BREAKERS EXCEPT M.C.C. 'H' FEEDER BREAKER & START THE DIESEL WHEN DIESEL IS UP TO RATED SPEED AND IS DELIVERING RATED VOLTAGE. AUTO TRANSFER SWITCH WILL THROWOVER TO EMERG. TIMER WILL CLOSE THE FEEDER BREAKERS IN SEQUENCE AS FOLLOWS:
T2-1-10 SECONDS, T2-2-20 SECONDS, T2-3-30 SECONDS, T2-4-30 SECONDS.
TRANSFER SWITCH WILL THROWBACK TO NORMAL POSITION AFTER NORMAL POWER HAS BEEN RESTORED FOR 30 SECONDS.
 - TO TEST THE DIESEL GENERATOR THE DIESEL WILL BE STARTED MANUALLY & THE TEST BREAKER WILL BE CLOSED. THIS WILL CAUSE THE TRANSFER SWITCH IN THE LIGHTING FEEDER TO THROW THE LIGHTING LOAD OVER TO THE DIESEL. IN THE EVENT OF A POWER FAILURE AN AUXILIARY CONTACT ON THE MAIN TRANSFER SWITCH WILL AUTOMATICALLY TRIP THE TEST BREAKER.
 - FOR LIST OF SYMBOLS SEE DWG. # 1546-04-E-2002.
 - FOR GENERAL NOTES SEE DWG. # 1546-01-2003.
 - MAXIMUM MOTOR LOAD WITH UNDERVOLTAGE RELEASE TO BE ADDED TO TRANSURANIUM FEEDER TO BE 100 HP (NEC CODE LETTER 'F' MOTORS). TOTAL RUNNING LOAD 100KVA MAX.
 - MAXIMUM MOTOR LOAD WITH UNDERVOLTAGE RELEASE TO BE ADDED TO BUS DUCT TO BE 100 HP (NEC CODE LETTER 'F' MOTORS).
 - SIMPLE PUMP MOTOR STARTER PROVIDED WITH INTEGRAL START-STOP PUSHBUTTON IN COVER.

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FOR CONSTRUCTION

DRAWING NO. 1546-04-E-2008		REV. 4
REFERENCE DRAWING NO.		
ONE LINE DIAGRAM NORMAL POWER 15.2 KV 2-2-4-3-5 DISTRIBUTION 1546-04-E-2002		
ONE LINE DIAGRAM 480V NORMAL POWER CRITICAL BUS - SUB STATION #1 1546-01-E-2003		
ONE LINE DIAGRAM 480V NORMAL POWER ELECT. EQUIP. BLDG. SUB STATION #2 1546-04-E-2004		
ONE LINE DIAGRAM NORMAL EMERGENCY SYSTEM #1 1546-04-E-2007		
SPECIFICATION		REV. SECTION 107
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY SINGMASTER & BREYER DATE 5-5-61		
BY C. E. WILKES DATE 5-16-61		
BY U. S. ATOMIC ENERGY COMMISSION DATE 5-22-61		
BY L. H. JACKSON		
HIGH FLUX ISOTOPE REACTOR		
ONE LINE DIAGRAM NORMAL - EMERGENCY SYSTEM #2		
DRAWN M. R. CHKD. DATE 5-5-61		
DATE 5-5-61 DRAWING NO. 1546-04-E-2008		
SCALE 1" = 100'

- NOTES
- FOR LIST OF SYMBOLS SEE DWG. 1546-04-E-2002.
 - FOR GENERAL NOTES SEE DWG. 1546-01-E-2009.
 - FOR ONE LINE DIAGRAM SHOWING DISTRIBUTION FROM PANELS P-1A, P-1B, P-1D, P-31, P-32, P-33, SEE DWG. NO. 1546-01-E-2009.
 - FIELD DISCONNECT SWITCH TO BE FURNISHED & INSTALLED BY PKG. INSTALLATION CONTE IN MAIN CONTROL RM. REGULATING ROD DRIVE MOTOR, CONSTANT CURRENT REGULATORY & AMPLIFIER TO BE FURNISHED AND INSTALLED BY OEM.

**CERTIFIED
FOR CONSTRUCTION**

REVISIONS										REVISIONS									
NO.	DATE	BY	CHK.	DATE	BY	CHK.	DATE	BY	CHK.	NO.	DATE	BY	CHK.	DATE	BY	CHK.	DATE	BY	CHK.
1	5/1/61	WJR	WJR	5/1/61	WJR	WJR	5/1/61	WJR	WJR	1	5/1/61	WJR	WJR	5/1/61	WJR	WJR	5/1/61	WJR	WJR
2	5/1/61	WJR	WJR	5/1/61	WJR	WJR	5/1/61	WJR	WJR	2	5/1/61	WJR	WJR	5/1/61	WJR	WJR	5/1/61	WJR	WJR
3	5/1/61	WJR	WJR	5/1/61	WJR	WJR	5/1/61	WJR	WJR	3	5/1/61	WJR	WJR	5/1/61	WJR	WJR	5/1/61	WJR	WJR
4	5/1/61	WJR	WJR	5/1/61	WJR	WJR	5/1/61	WJR	WJR	4	5/1/61	WJR	WJR	5/1/61	WJR	WJR	5/1/61	WJR	WJR

DRAWING NO.	1546-01-E-2009	REV.	4
REFERENCE DRAWING	NO.	1546-04-E-2002	1546-01-E-2009
ONE LINE DIAGRAM - NORMAL POWER - 13.8KV & 480V DISTRIBUTION	1546-04-E-2002	ONE LINE DIAGRAM - 480V NORMAL POWER REACTOR BLDG. SUB-STATION #1	1546-01-E-2009
ONE LINE DIAGRAM - NORMAL - EMERGENCY SYSTEM #1 & 2	1546-04-E-2007	ONE LINE DIAGRAM - NORMAL - EMERGENCY SYSTEM #2	1546-04-E-2009
SPECIFICATION	REF.	SECTION 107	
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.			
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
APPROVED SINGMASTER & BREYER			
BY	DATE	DATE	DATE
BY	DATE	DATE	DATE
BY	DATE	DATE	DATE
HIGH FLUX ISOTOPE REACTOR			
ONE LINE DIAGRAM			
INSTRUMENT POWER			
DRAWN M.J.R.	CHKD	DATE	DATE
DATE	DATE	DATE	DATE
SCALE	1546-01-E-2009	REV.	4

EXHAUSTER CONTROL CIRCUIT
02-391-FN-4

4 H-V FAN CONTROL CIRCUIT
02-391-HV-2

PACKAGED UNIT CONTROL CIRCUIT
02-392-AC-1
LUNCH ROOM

3 H-V FAN CONTROL CIRCUIT
02-391-FN-6
MAINT. & ASSEMBLY

EXHAUSTER CONTROL CIRCUIT
02-391-FN-5
LABORATORY

EXHAUSTER CONTROL CIRCUIT
02-391-FN-1
LOCKER ROOM & TOILET

NOTES:

- 1-FOR LIST OF SYMBOLS SEE DWG. 1546-04-E-2002
- 2-FOR GENERAL NOTES SEE DWG. 1546-04-E-2003
- 3-FOR POWER LAYOUT SEE DWG. 1546-02-E-2096
- 4-FOR LIGHTING LAYOUT SEE DWG. 1547-02-E-2097
- 5-DOTTED WIRING INDICATES CONTROL WIRING OF PACKAGE AIR CONDITIONING UNIT. SOLID WIRING INDICATES WIRING MODIFICATIONS TO BE ACCORD.
- 6-FOR OPERATING DESCRIPTION OF HEV MOTOR SEE DWGS. 1546-02-HEV-3041 & 1546-02-HEV-3042

BLOWER OR EXHAUSTER CONTROL CIRCUIT
TYPICAL (SEE SCHEDULE BELOW)

$$L_1$$

UNIT HEATER
02-390-UH-1
UTILITY ROOM

440 V. MOTOR OPERATED DOOR #45
POWER CIRCUIT

MOTOR OPERATED VERTICAL LIFT DOOR #45
CONTROL DIAGRAM

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO.		1546-OZ-E-2010		REV. 2	
REFERENCE DRAWING				NO.	
ONE LINE DIAGRAM - NORMAL POWER IS 3.5 KW LAMP RESISTOR ONE LINE DIAGRAM - ABOUT NORMAL POWER SEAL THIS DRAWING SUB STATION 1				1546-OZ-E-2008 1546-OZ-E-2008	
SPECIFICATION				REV.	
SINGMASTER & BREYER					
METALLURGISTS & CHEMICAL ENGINEERS					
420 LEXINGTON AVE. NEW YORK 17, N. Y.					
U. S. ATOMIC ENERGY COMMISSION					
OAK RIDGE, TENNESSEE					
APPROVED					
SINGMASTER & BREYER					
BY	C. E. WINTER				DATE 3-13-64
BY	U. S. ATOMIC ENERGY COMMISSION C. E. WINTER				DATE 3-17-64
BY	U. S. ATOMIC ENERGY COMMISSION L. H. JACKSON				DATE 3-27-64
HIGH FLUX ISOTOPE REACTOR					
ONE LINE AND ELEMENTARY DIAGRAMS OFFICE & MAINTENANCE P.D.G.					
DRAWN BY	CHKD BY	DATE	3-17-64	NO. 9	REV. 2
DATE	3-13-64		DRAWING NO.		1546-OZ-E-2010
SCALE					2

CERTIFIED
FOR CONSTRUCTION

SUB-FILE ROOM

DETAIL A
FOR SCHEMATIC WIRING DIAGRAM, SEE
FYR-FYTR DWG. T-3820 SH. 1

SYMBOLS

- RECEPTACLE FOR SOUND POWERED TEL. INTERCOM STATION
- MANUAL FIRE ALARM STATION
- FIRE ALARM HORN
- MASTER INTERCOM STATION
- AUTO. TEMP. DETECTOR MOUNTED WITH BOX FLUSH WITH CONCRETE CEILING
- AUTO. TEMP. DETECTOR MOUNTED ON HUNG CEILING
- AUTO. TEMP. DETECTOR MOUNTED WITH OUTLET BOX EXPOSED ON CONCRETE CEILING UNLESS OTHERWISE NOTED
- INTERCOM STATION WITH CRADLE PHONE

NOTES

- FOR FIRE ALARM BLOCK DIA. SEE DWG. 1546-01-E-2084
- MANUAL ALARM BOXES TO BE LOCATED 4'-6" ABOVE FINISHED FLOOR & MOUNTED FLUSH UNLESS OTHERWISE NOTED.
- ALL FIRE ALARM SYSTEM CONDUIT TO BE 3/4" UNLESS OTHERWISE NOTED.
- ALL INTER-COM & SOUND POWER PHONE SYSTEM CONDUIT TO BE 1" UNLESS OTHERWISE NOTED.
- INTER-COM SLAVE UNITS SHALL BE MOUNTED 8'-0" ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED. SEE DWG. 1546-01-E-2085 FOR MOUNTING DETAILS.
- SOUND POWER PHONE PLUG-IN IS TO BE LOCATED 8'-0" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. SEE DWG. 1546-01-E-2086 FOR MOUNTING DETAILS.
- FIRE ALARM HORN SHALL BE LOCATED AT EXISTING ALARMED. SEE DWG. 1546-01-E-2087 FOR MOUNTING DETAILS.
- ALL WIRE FOR FIRE ALARM, INTERCOM & SOUND POWERED SYSTEMS SHALL BE #12 TYPE THW, UNLESS OTHERWISE NOTED.
- FOR LOCATION OF FIRE ALARM DETECTORS & CONDUIT WORK TO DETECTORS & MANUAL ALARM STATIONS SEE 302 KINW (ULTR) SONIC CDR DWG. T-1121 SH. NOS. 17, 18, 19, 20 & 21

AREAS TO BE COVERED BY HEAT ACTUATED DEVICES

LOCATION OR ROOM NO.	② MOUNTED ON BOX FLUSH WITH CONCRETE CEILING	① MOUNTED ON HUNG CEILING	① BOX SURFACE MOUNTED ON CONCRETE CEILING
G-1	✓		
G-2	✓		
G-3	✓		
G-4	✓		
G-4A	✓		
G-5	✓		
G-6		✓	
G-7	✓		
G-8		✓	
G-9	✓		
G-10	✓		
G-11	✓		
G-12	✓		
G-13	✓		
STAIRS #1			✓
STAIRS #2			✓
STAIRS #3			✓
MANHOLE #3	✓		
B-1	✓		

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
1	MISC. REVISIONS & ADDED WITH	JAN	J.A.	1/24/61	2	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	3	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	4	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
5	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	6	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	7	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	8	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
9	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	10	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	11	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	12	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
13	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	14	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	15	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	16	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
17	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	18	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	19	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	20	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
21	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	22	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	23	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	24	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
25	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	26	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	27	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	28	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
29	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	30	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	31	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	32	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
33	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	34	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	35	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	36	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
37	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	38	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	39	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	40	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
41	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	42	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	43	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	44	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
45	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	46	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	47	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	48	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
49	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	50	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	51	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	52	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
53	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	54	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	55	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	56	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
57	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	58	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	59	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	60	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
61	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	62	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	63	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	64	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
65	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	66	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	67	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	68	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
69	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	70	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	71	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	72	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
73	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	74	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	75	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	76	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
77	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	78	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	79	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	80	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
81	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	82	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	83	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	84	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
85	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	86	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	87	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	88	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
89	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	90	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	91	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	92	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
93	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	94	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	95	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	96	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61
97	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	98	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	99	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61	100	REV. PER CFC VENDOR'S DWG.	L.L.	L.L.	1/24/61

AREAS NOT COVERED BY HEAT ACTUATED DEVICES			
LOCATION OR ROOM NO.	② MOUNTED WITH BOY FLUSH WITH CONCRETE CEILING	③ MOUNTED ON HUNG CEILING	④ BOX SURFACE MOUNTED ON CONCRETE CEILING
101			
102			
102A			
102B			
103			
103A			
103B			
103C			
103D			
104			
105			
105A			
105B			
106			
107			
108			
109			
110			
111			
112			
113			
114			
STAIR #1			
STAIR #2			
STAIR #3			

NOTES
 1. FOR SYMBOLS & GENERAL NOTES SEE DWG. 1546-E-2013.
 2. FOR FIRE ALARM & INTERCOM SYMBOLS SEE DWG. 1546-01-E-2079.

CERTIFIED FOR CONSTRUCTION

DRAWING NO.	1546-01-E-2080	REV.	4
REFERENCE DRAWING	NO.		
REACTOR BLDG. FA & INTERCOM 2ND FL.	1546-01-E-2079		
REACTOR BLDG. FA & INTERCOM 3RD FL.	1546-01-E-2081		
REACTOR BLDG. FA & INTERCOM 4TH FL.	1546-01-E-2082		
FIRE ALARM SYS - BLOCK DIAGRAM	1546-01-E-2084		
SPECIFICATION	REV. SECT 107		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N. Y.			
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
APPROVED			
SINGMASTER & BREYER BY <i>[Signature]</i> DATE 5/19/61			
UNION CARBIDE NUCLEAR COMPANY BY C. E. WINTERS DATE 4/5/61			
U. S. ATOMIC ENERGY COMMISSION BY L. H. JACKSON DATE 4/7/61			
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING FIRE ALARM INTERCOM & SOUND POWERED PHONE SYSTEMS FIRST FLOOR			
DRAWN	D. S. OYD	DATE	4/10/61
CHECKED	A. P. O.	DATE	4/10/61
SCALE	1/8" = 1'-0"	DRAWING NO.	1546-01-E-2080
REV.	4

**CERTIFIED
FOR CONSTRUCTION**

AREAS TO BE COVERED BY HEAT ACTUATED DEVICES			
LOCATION OR ROOM NO.	② MOUNTED WITH BOX FLUSH WITH CONCRETE CEILING	① MOUNTED ON HUNG CEILING	③ BOX SURFACE MOUNTED ON CONCRETE CEILING
301		✓	
302		✓	
303		✓	
304		✓	
305			✓
306			✓
307			✓
308			✓
309			✓
310		✓	
UPPER REACTOR BAY			✓
STAIR #1			✓
STAIR #2			✓
STAIR #3			✓

NOTES

1. FOR SYMBOLS & GENERAL NOTES SEE DWG. 1546-01-E-2019.
2. FOR FIRE ALARM & INTERCOM SYMBOLS & NOTES SEE DWG. 1546-01-E-2079.

ELEVATION
SECTION Y-Y
DETAIL OF SOUND POWER RECEPTACLE & INTERCOM STAFF STATION MOUNTING
AUDIBLE ALARM MOUNTING DETAILS

OUTLET BOX & CONDUIT EXPOSED
OUTLET BOX & CONDUIT CONCEALED
TYPICAL MOUNTING DETAILS OF HEAT ACTUATED DEVICE
NOT TO SCALE

HEAT ACTUATED DEVICE MOUNTED IN HUNG CEILING
NOT TO SCALE

CERTIFIED FOR CONSTRUCTION

DRAWING NO. 1546-01-E-2082		REV. 2
REFERENCE DRAWING NO.		
REACTOR BLDG. FA & INTERCOM QUD FL.	1546-01-E-2079	
REACTOR BLDG. FA & INTERCOM 1ST FL.	1546-01-E-2080	
REACTOR BLDG. FA & INTERCOM 2ND FL.	1546-01-E-2081	
FIRE ALARM BLOCK DIAGRAM	1546-01-E-2082	
INTERCOM SYSTEM BLOCK DIAGRAM	1546-01-E-2083	
SPECIFICATION REF. SECTION 107		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY <i>J. C. Rinehart</i>		DATE 5-26-61
BY <i>C. E. Winters</i>		DATE 5/26/61
BY <i>L. H. JACKSON</i>		DATE 6/1/61
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING FIRE ALARM, INTERCOM, & SOUND POWERED PHONE SYSTEMS THIRD FLOOR		
DRAWN D.S.	CYED AFO	DATE 5/15/61
SCALE 1/8" = 1'-0"	DRAWING NO. 1546-01-E-2082	REV. 2

PLAN

SCALE 1"=50'-0"

THIS PLAN IS FOR INFORMATION ONLY AS TO EXTENT OF FIRE ALARM & SOUND POWER SYSTEMS. SEE DWG. 1546-05-E-2083 FOR LOCATION OF DUCT BANKS & ADDITIONAL CONDUITS IN DUCT BANKS.

ENLARGED PLAN OF ELECTRICAL BLDG.

SCALE 1/8"=1'-0"

ENLARGED PLAN OF COOLING TOWER EQUIP. BLDG.

SCALE 1/8"=1'-0"

TYPICAL DETAIL OF F.A. STATION'S

SCALE 1"=1'-0"

FLOOR PLAN F.A. STATION #3

SCALE 1/2"=1'-0"

FLOOR PLAN F.A. STATION #2

SCALE 1/2"=1'-0"

FLOOR PLAN F.A. STATION #1

SCALE 1/2"=1'-0"

NOTES

1. FOR SYMBOLS & GENERAL NOTES SEE DWG. NO. 1546-E-2010.
2. FOR FIRE ALARM SYMBOLS / NOTES SEE DWG. NO. 1546-01-E-2070.
3. ADDITIONAL MASTER BOX APPEARSON FIRE ALARM STATION #3 ONLY.
4. FOR CONDUIT WORK TO DETECTORS, MANUAL ALARM STATIONS AND SPRINKLER SUPERVISORY DEVICES SEE KIDDE ULTRASONIC DWG. 7-1121 SH. 21 (S.F.B. FILE # 80757-23).

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO. 1546-05-E-2083		REV. 3
REFERENCE DRAWING YARD UNDERGROUND DISTRIBUTION AREA PLAN REACTOR BLDG. F.A. & INTERCOM GND. PL. OFFICE & MAINTENANCE BLDG.		NO. 1546-05-E-2062 1546-01-E-2070 1546-02-E-2070
SPECIFICATION SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.		SECTION 107
APPROVED BY <i>[Signature]</i> SINGMASTER & BREYER UNION CARBIDE NUCLEAR COMPANY DATE 5/26/61		
BY C.E. WINTERS U. S. ATOMIC ENERGY COMMISSION DATE 4/5/61		
BY L.H. JACKSON U. S. ATOMIC ENERGY COMMISSION DATE 4/7/61		
HIGH FLUX ISOTOPE REACTOR FIRE ALARM, INTERCOM & SOUND POWERED PHONE SYSTEMS MISC. AREAS		
DRAWN R.R.P. DATE 5-26-61		DATE 5-26-61 NO. 27, 1831, 2889
SCALE A.S. NOTED		1546-05-E-2083

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE

NOTES

- 1-110V AC CIRCUIT #6 PANEL P-3 AND 24V DC POWER SUPPLY CONDUCTORS FOR SIGNAL AND TROUBLE, SHALL BE "B" WIRE THROUGHOUT. 7/8" CABLES PREFERRED FOR D.C. CIRCUITS.
- 2-FOR INTERCONNECTION WIRE DIAGRAM OF FIRE ALARM SYSTEM SEE KIDDE ULTRASONIC DETECTION DIAG. #1121 SH-72.
- 3-FOR SCHEMATIC WIRING DIAGRAM OF FIRE ALARM SYSTEM SEE KIDDE ULTRASONIC DETECTION DIAG. #1121 SH-1.

**CERTIFIED
FOR CONSTRUCTION**

ZONE PANEL #1			
COVERS	ACTUATED BY	RESULTING OPERATION	
1 COOLING TOWER EQUIP. BLDG.	SPRINKLER VALVE WATER FLOW SW. OR EQUIP. BLDG.	AUDIBLE ALARM CIRCUITS 1-1 & 1-2 SOUND, MASTER BOX #1 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED & SHUT DOWN RELAYS ACTIVATED	
2 ELECTRICAL BLDG.	MANUAL F.A. BOX OR MANUAL F.A. BOX IN CT. EQUIP. BLDG.	AUDIBLE ALARM CIRCUITS 1-3 & 1-4 SOUND, MASTER BOX #1 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED	
3 TROUBLE SIGNAL	SPRINKLER-LOW AIR PRESS. HIGH AIR PRESS. GATE POS. SW. WATER PRESS. SW.	TROUBLE BELL SOUNDS, MASTER BOX #4 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED	
4 SPARE			

** SHUTDOWN RELAY CABINET DETAILS SHOWN ON DWG. #1546-03-E-2015, ELEMENTARY CONTROL DIAGRAM DWG. #1546-03-E-2016. SHUTDOWN RELAY CABINET NOT INCLUDED IN FIRE ALARM EQUIPMENT PACKAGE COVERED BY SPEC. SECTION 07-17 OF THE SPECIFICATIONS. ZONE PANEL TO HAVE NORMALLY OPEN CONTACT TO OPERATE SHUTDOWN RELAYS.

ZONE PANEL #2			
COVERS	ACTUATED BY	RESULTING OPERATION	
1 GROUND FLOOR SUB. PILE RM.	GROUND FLOOR & SUB. PILE RM. MANUAL F.A. BOXES OR AUTO. FIRE DETECTORS	AUDIBLE ALARM CIRCUITS 2-1 & 2-2 SOUND MASTER BOX #2 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED & ALARM SOUNDED IN MAIN CONTROL ROOM. PREACT VALVE TRIPS & FANS FN-1 & FN-2 SHUT DOWN.	
2 FIRST FLOOR REACTOR BLDG.	FIRST FLOOR MANUAL F.A. BOXES OR AUTO. FIRE DETECTORS	AUDIBLE ALARM CIRCUITS 2-3 & 2-4 SOUND MASTER BOX #2 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED & ALARM SOUNDED IN MAIN CONTROL ROOM. PREACT VALVE TRIPS & FANS FN-1 & FN-2 SHUT DOWN.	
3 SECOND FLOOR REACTOR BLDG.	SECOND FLOOR MANUAL F.A. BOXES OR AUTO. FIRE DETECTORS	AUDIBLE ALARM CIRCUITS 2-5 & 2-6 SOUND MASTER BOX #2 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED & ALARM SOUNDED IN MAIN CONTROL ROOM. PREACT VALVE TRIPS & FANS FN-1 & FN-2 SHUT DOWN.	
4 THIRD FLOOR REACTOR BLDG.	THIRD FLOOR MANUAL F.A. BOXES OR AUTO. FIRE DETECTORS	AUDIBLE ALARM CIRCUITS 2-7 & 2-8 SOUND MASTER BOX #2 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED & ALARM SOUNDED IN MAIN CONTROL ROOM. PREACT VALVE TRIPS & FANS FN-1 & FN-2 SHUT DOWN.	
5 REACTOR BLDG.	WATERFLOW SWITCH	TROUBLE BELL SOUNDS, MASTER BOX #4 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED	
6 TROUBLE SIGNAL	SPRINKLER WATERFLOW SW. GATE POS. SW. & PRESS SW.	TROUBLE BELL SOUNDS, MASTER BOX #4 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED	

ZONE PANEL #3			
COVERS	ACTUATED BY	RESULTING OPERATION	
1 MAINT. & OFFICE BLDG.	MANUAL F.A. BOXES OR SPRINKLER WATER FLOW SWITCH	AUDIBLE ALARM CIRCUITS 3-1 & 3-2 SOUND MASTER BOX #3 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED	
2 TROUBLE SIGNAL	SPRINKLER WATERFLOW SW. & PRESS SW.	TROUBLE BELL SOUNDS, MASTER BOX #4 TRIPPED, ZONE LIGHTS ON ZONE PANEL & REMOTE LIGHT CABINET EXTINGUISHED	

* OPERATION FOR A BROKEN WIRE IN SUPERVISED CIRCUIT PERFORMS SIMILAR OPERATION TO THAT SHOWN EXCEPT THAT ZONE LIGHTS ARE NOT EXTINGUISHED

DRAWING NO. 1546-01-E-2084		REV. 5
REFERENCE DRAWING NO.		
WARD UNDERGROUND DIST. AREA PLAN		1546-03-E-2062
REACTOR BLDG. F.A. INTERCOM. GND. FL.		1546-01-E-2079
F.A. INTERCOM. MISC. AREAS		1546-01-E-2083
SPECIFICATION REF. SECT. 107		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY <i>[Signature]</i> SINGMASTER & BREYER		DATE 8-25-61
BY <i>[Signature]</i> UNION CARBIDE NUCLEAR COMPANY		DATE 8/24/61
BY <i>[Signature]</i> U. S. ATOMIC ENERGY COMMISSION		DATE 8/25/61
BY <i>[Signature]</i> L. H. JACKSON		DATE 8/25/61
HIGH FLUX ISOTOPE REACTOR FIRE ALARM BLOCK DIAGRAM		
DRAWN E.R.P. CHECKED A.F.O. DATE 8/25/61 DATE 8/25/61 DRAWING NO. 1546-01-E-2084 REV. 5 SCALE NONE

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO. 1546-05-E-2090		REV. 2
REFERENCE DRAWING		NO.
TELEPHONE, PA, & BLDG EVACUATION ALARM SYSTEMS		1546-01-E-2062
" " " " " "		1546-01-E-2067
" " " " " "		1546-01-E-2068
" " " " " "		1546-01-E-2069
YARD UNDERGROUND DUCT BANK AREA PLAN		1546-05-E-2062
SPECIFICATION		REF. SECTION 107
SINGMASTER & BREYER		
METALLURGISTS & CHEMICAL ENGINEERS		
420 LEXINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION		
OAK RIDGE, TENNESSEE		
APPROVED		
SINGMASTER & BREYER		
BY	<i>(Signature)</i>	DATE 5-17-61
UNION CARBIDE NUCLEAR COMPANY		
BY	C. E. WINTER	DATE 5-19-61
U. S. ATOMIC ENERGY COMMISSION		
BY	L. H. JACKSON	DATE 5-24-61
HIGH FLUX ISOTOPE REACTOR		
TELEPHONE, PUBLIC ADDRESS & BLDG		
EVACUATION ALARM SYSTEMS		
SECTIONS & DETAILS & MISC AREA LAYOUT		
DRAWN BY	EGS	CHKD BY IL DATE 5-16-61 REV. 2
SCALE	AS SHOWN	DRAWING NO. 1546-05-E-2090

ELEMENTARY CONTROL DIAGRAM SYMBOLS

CIRCUIT BREAKER SYMBOLS

ELEMENTARY CONTROL DIAGRAM OPERATING DESCRIPTIONS

REACTOR MAIN PROCESS EQUIPMENT

This equipment group includes the pressurizer pumps 01-415-FU-1A and -1B; the primary coolant pumps 01-415-FU-1A, 1B, 1C, 1D, and the cooling tower pumps 01-415-FU-1A and -1B. Two modes of operation and controlling this equipment are provided:

1. An "Automatic sequence" whereby operation of a single master pushbutton will start the above equipment in proper sequence.
2. A "Manual control system" which permits individual control of each pump.

The automatic sequence facilitates operation, and permits the reactor to be brought back on the line in minimum time after a power failure. The permissive switch from the reactor key switch circuit must be closed before the automatic sequence can be started.

MASTER TIMER CIRCUIT

(Dwg. #1546-01-E-2119)

The master timer is controlled from a pushbutton at the main console. Operation of the start button will start the timer. The contacts of the timer will close in sequence to start the various pumps. The timer will automatically reset at the end of the 1 minute time cycle or during a power failure. The timer has spare contacts for future interlocking.

The timer contact "on-off" settings are adjustable in the field. A stop pushbutton is provided to permit stopping the timing sequence at any time. A panel mounted light will go on during the timing cycle.

PRESSURIZER PUMPS

01-415-FU-1A & 1B

(Dwg. #1546-01-E-2119)

The pressurizer pumps are driven by a variable speed unit consisting of a 2300 volt squirrel cage induction motor and an "eddy current type" coupling. A selector switch (SS2) is provided to permit choosing the pump which will be started in the "automatic sequence mode". In normal operation one pump will be running while the other is in standby position. In the standby position the pump will automatically start-up on a loss in primary coolant system pressure. The pump is placed in standby by operating the standby pushbutton. A blue indicating light on the panel will indicate when the pump is in standby position. The motor will be automatically stopped by the following:

1. Overload (relay must be hand reset to permit restart)
2. Ground Fault (relay must be hand reset to permit restart)
3. Opening of the 2400 volt motor starter door
4. Operation of the protective device interlocks in the variable speed drive unit.
5. Loss of voltage (A pump in standby position must be reset in that position after a power failure).

The "eddy current coupling" variable speed drive units are automatically started and stopped whenever the corresponding drive motor is started and stopped. Each unit is provided with a potentiometer for speed control and a speed indicator, located on the process panel. The Selector switches are located in the control room.

PRIMARY COOLANT PUMPS

01-415-FU-1A, 1B, 1C, 1D MAIN DRIVE MOTORS

01-415-FU-1E, 1F, 1G, 1H PONY DRIVE MOTORS

(Dwg. #1546-01-E-2120)

The primary coolant pumps are driven by a "main" a-c 2300 volt squirrel cage induction motor coupled to the pump shaft and a "pony" 120 volt d-c from a 120 volt storage battery. In parallel with a battery charger. In normal operation both motors are energized and supply positive motor torque to the load. The function of the pony motor is to provide emergency cooling flow in the event of an a-c power failure.

A selector switch (SS-3) is provided to permit choosing the spare pump, which will not be included in the automatic start-up sequence.

A permissive interlock from the reactor control system is provided in the automatic mode "starting circuit" which will prevent pump start-up unless the reactor power demand is at its minimum value. The permissive interlock is sealed out after pump start-up. A main drive motor stop button is provided on the process panel. The main drive motor will be automatically stopped by the following:

1. Overload (relay must be hand reset to permit restart)
2. Ground fault (relay must be hand reset to permit restart)
3. Opening of the 2400 volt motor starter door
4. Loss of pressure in the primary loop. (Low pressure will also prevent starting the pumps).
5. Loss of voltage

The pony motor is energized at all times. It may be shut down by opening a safety switch located in the pump compartment.

An ammeter in the metering cabinet indicates the current supplied to, or taken from, the battery. Motor and pump bearing temperatures are recorded in the main control room. The motor also has a shunt "test" field which permits full load current to be drawn by the pony motor, with the a-c motor in operation. The test pushbutton which energizes the shunt field is located on the process panel and must be manually held in the test position for the length of the test. The "test" power for the shunt field is taken from the associated starter control power transformer, and will be automatically removed on loss of a-c power or opening of the motor starter.

The following alarms are provided:

1. Winding temperature higher than normal
2. Winding temperature approaching the insulation damage point.
3. Mechanical seal failure or misoperation
4. High pump or motor bearing temperature (obtained from recorder)
5. Charge failure or DC ground in battery charger.
6. Abnormally high current to the pony motor series field
7. Abnormally low current to the pony motor series field.
8. Excessive vibration on main motor.

MAIN COOLING TOWER PUMPS

01-415-FU-6A, -6B

(Dwg. #1546-01-E-2120)

A selector switch (SS4) is provided to permit choosing the spare pump which will not be included in the automatic start-stop sequence. With the present installation of 2 pumps, the selector switch should be set to select the spare pump. A stop button is provided on the process panel, and a stop button at the motor. The motor will be automatically stopped by the following:

1. Overload (relay must be hand reset to permit restart)
2. Ground fault (relay must be hand reset to permit restart)
3. Opening of the 2400 volt motor starter door
4. Loss of voltage

Provision is made in the start circuit for an interlock with the secondary cooling system throttling valve. The permissive interlock will be sealed out after pump start-up.

PRIMARY COOLANT CLEAN-UP PUMPS

01-415-FU-2A and -2B

(Dwg. #1546-01-E-2119)

An on-off selector switch and running light are provided on the process panel, and a stop button at the motor. The pump will be automatically stopped on low water level in the primary loop deaerator and will restart automatically when the level rises again. The pump motor is connected to the normal power system and will not be in operation during a power failure. The motor will automatically restart after a power failure.

COOLING TOWER STANDBY PUMP

01-415-FU-2A

(Dwg. #1546-01-E-2119)

The pump is driven by a 2 winding, 2 speed motor. Each of the windings serve a different function. The normal high speed winding is used for normal operation of the pump, to provide secondary cooling water when the reactor is shut down and the main pumps are out of service. The slow speed winding is used to provide the emergency cooling flow required to keep the reactor at 10% of power during an a-c power outage.

HIGH SPEED WINDING

01-415-FU-2A

The high speed winding is supplied from the normal power system. A spring return start-stop selector switch and running light are provided on the process panel. Electrical and mechanical interlocks are provided between the high and low speed winding starters so that only one can be energized at a time.

LOW SPEED WINDING

01-415-FU-2B

The slow speed winding is supplied from the normal-emergency power system. A "run-off-automatic" switch is provided on the process panelboard to permit selecting the mode of operation. In the automatic position the pump will be automatically started after a loss of normal power, by an auxiliary contact on the automatic transfer switch in "Normal-Emergency Switchgear Unit #1". The pump will continue to run after normal power has been restored. The starter is interlocked with Solenoid Valve FCV-1628 so that the static head of the cooling tower will be by-passed whenever the slow speed winding is energized. A running light for the slow speed winding is also provided on the process panelboard. When the run-off-auto switch is on the off position, an alarm will be sounded in the control room.

NOTES

1. FOR COMPLETE OPERATING DESCRIPTION OF EQUIPMENT REFER TO APPROPRIATE OPERATING MANUAL. THE OPERATIONAL DESCRIPTIONS GIVEN HEREIN COVER THE HIGHLIGHTS OF THE CIRCUIT OPERATION ONLY.
2. ALL CONTACTS ARE SHOWN IN THE SHUT DOWN OR DEENERGIZED POSITION UNLESS OTHERWISE NOTED.
3. WHEREVER POSSIBLE, THE PUMP CONTROL PUSHBUTTONS AND SWITCHES LOCATED ON THE MAIN PROCESS PANELBOARDS WILL BE BACK LIGHTED MULTI-POSITION UNITS SPECIFICALLY DESIGNED FOR INCORPORATION IN GRAPHIC DIAGRAMS.

CERTIFIED
FOR CONSTRUCTION

E. & B. S&B
DEPT. CHC
ARCH. CHC
ELECT. CHC
H. & V. CHC
INST. CHC
MECH. CHC
STRUC. CHC
UTIL. CHC

REFERENCE DRAWING		NO.	
ELEM. CONTROL DIAG. PROCESS WATER EQPT	1546-01-E-2117	ELEM. CONTROL DIAG. PROCESS WATER EQPT	1546-01-E-2118
ELEM. CONTROL DIAG. PROCESS WATER EQPT	1546-01-E-2119	ELEM. CONTROL DIAG. PROCESS WATER EQPT	1546-01-E-2120
SPECIFICATION		REV.	
SINGMASTER & BREYER		REV. 5	
METALLURGISTS & CHEMICAL ENGINEERS		NEW YORK 17, N. Y.	
U. S. ATOMIC ENERGY COMMISSION		OAK RIDGE, TENNESSEE	
APPROVED		DATE 3-31-61	
BY SINGMASTER & BREYER		DATE 4-14-61	
BY C. E. WINTERS		DATE 4-19-61	
BY L. H. JACKSON		DATE 4-19-61	
HIGH FLUX ISOTOPE REACTOR		ELEMENTARY CONTROL DIAGRAMS	
SYMBOLS, NOTES & OPERATING DESCRIPTIONS		DRAWING NO. 1546-01-E-2113	
DATE 3-31-61		REV. 5	

REVISIONS										REVISIONS									
NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
5	REVISED MASTER TIMER DISC.	AW	CHC	3-31-61	2	REVISED IDENTIFIED FOR CONSTRUCTION	VO	CHC	3-31-61	1	ISSUED FOR TITLE II APPROVAL	MJR	CHC	3-31-61	1	ISSUED FOR TITLE II APPROVAL	MJR	CHC	3-31-61
4	ADDED PRIMARY COOLANT PUMP PER L. H. JACKSON LETTER OF 2-28-61	JAC	CHC	2-28-61	2	ISSUED FOR PACKAGE 1 APPROVAL	FCM	CHC	2-28-61	1	ISSUED FOR PACKAGE 1 APPROVAL	FCM	CHC	2-28-61	1	ISSUED FOR PACKAGE 1 APPROVAL	FCM	CHC	2-28-61
3	MISC. FEES	JK	CHC	2-28-61	1	CERTIFIED FOR CONSTRUCTION	MJR	CHC	2-28-61	1	CERTIFIED FOR CONSTRUCTION	MJR	CHC	2-28-61	1	CERTIFIED FOR CONSTRUCTION	MJR	CHC	2-28-61

EQUIPMENT #	FREEZE-UP PROTECTION SW.	AUXILIARY RELAY RX	AUXILIARY RELAY RY	PANEL, M.C.C. # CKT. NOS.	EP RELAY #
01-391-AC-2	01-FT-1	R-105	R-106	PNL #155, M.C.C. D, CKT. #4	01-EP-19
01-391-AC-3	01-FT-2	R-107	R-108	PNL #155, M.C.C. D, CKT. #4	01-EP-20
01-391-AC-10	01-FT-3	R-109	R-110	PNL #155, M.C.C. D, CKT. #4	01-EP-21
01-391-AC-14	01-FT-4	R-111	R-112	PNL #155, M.C.C. D, CKT. #4	01-EP-22
01-391-AC-15	01-FT-5	R-113	R-114	PNL #155, M.C.C. D, CKT. #4	01-EP-23
01-391-FN-1	01-FT-6	R-115	R-116	PNL #155, M.C.C. D, CKT. #4	01-EP-24

NOTES
1. FOR SYMBOLS & NOTES SEE DWG. # 1546-01-E-2113
2. FOR TYPICAL 440V MOTOR WIRING SEE DWG. # 1546-01-E-2117
3. FOR OPERATING DESCRIPTION SEE DWG. # 1546-01-E-2114.

CERTIFIED
FOR CONSTRUCTION

DRAWING NO. 1546-01-E-2115		REV. 3
REFERENCE DRAWING NO.		
ELEMENTARY CONTROL DIAGRAMS HEATING & VENTILATING EQUIP.		
SPECIFICATION REF. SECTION # 107		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED SINGMASTER & BREYER		
BY C. E. WILTERS	DATE 4-24-61	
BY L. H. JACKSON	DATE 4-26-61	
HIGH FLUX ISOTOPE REACTOR		
ELEMENTARY CONTROL DIAGRAMS HEATING & VENTILATING EQUIP.		
DRAWN M. J. R.	CHECKED Y. S.	DATE 4-14-61
DRAWING NO. 1546-01-E-2115		REV. 3

NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.	NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.	NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.
1	CHANGED PRESS. SWITCHES NUMBERS									2	CHANGED PRESS. SWITCHES NUMBERS									3	CHANGED PRESS. SWITCHES NUMBERS								
2	ADDED THERM. ON FA CONTR. PANEL									3	ADDED THERM. ON FA CONTR. PANEL									4	ADDED THERM. ON FA CONTR. PANEL								
3	ADDED THERM. ON FA CONTR. PANEL									4	ADDED THERM. ON FA CONTR. PANEL									5	ADDED THERM. ON FA CONTR. PANEL

A	B	C	D	UNIT COOLER	RELAY CONTACT
H31	H32	H33	H34	01-390-UC-1	R117-1
H35	H36	H37	H38	01-390-UC-2	R117-2
H39	H40	H41	H42	01-390-UC-3	R117-3
H43	H44	H45	H46	01-390-UC-4	R117-4
H47	H48	H49	H50	01-390-UC-5	R117-5
H51	H52	H53	H54	01-390-UC-6	R117-6
H55	H56	H57	H58	01-390-UC-7	R117-7
H59	H60	H61	H62	01-390-UC-8	R117-8
H63	H64	H65	H66	01-390-UC-9	R117-9
H67	H68	H69	H70	01-390-UC-10	R117-10
H71	H72	H73	H74	01-390-UC-11	R117-11
H75	H76	H77	H78	01-390-UC-12	R117-12

A	B	C	D	UNIT HEATER	RELAY CONTACT
H31	H32	H33	H34	01-390-UH-1	R117-1
H35	H36	H37	H38	01-390-UH-2	R117-2
H39	H40	H41	H42	01-390-UH-3	R117-3
H43	H44	H45	H46	01-390-UH-4	R117-4
H47	H48	H49	H50	01-390-UH-5	R117-5
H51	H52	H53	H54	01-390-UH-6	R117-6
H55	H56	H57	H58	01-390-UH-7	R117-7
H59	H60	H61	H62	01-390-UH-8	R117-8
H63	H64	H65	H66	01-390-UH-9	R117-9
H67	H68	H69	H70	01-390-UH-10	R117-10
H71	H72	H73	H74	01-390-UH-11	R117-11
H75	H76	H77	H78	01-390-UH-12	R117-12

A	B	C	D	UNIT COOLER CONTROL CIRCUITS	RELAY CONTACT
H31	H32	H33	H34	01-390-UC-1	R117-1
H35	H36	H37	H38	01-390-UC-2	R117-2
H39	H40	H41	H42	01-390-UC-3	R117-3
H43	H44	H45	H46	01-390-UC-4	R117-4
H47	H48	H49	H50	01-390-UC-5	R117-5
H51	H52	H53	H54	01-390-UC-6	R117-6
H55	H56	H57	H58	01-390-UC-7	R117-7
H59	H60	H61	H62	01-390-UC-8	R117-8
H63	H64	H65	H66	01-390-UC-9	R117-9
H67	H68	H69	H70	01-390-UC-10	R117-10
H71	H72	H73	H74	01-390-UC-11	R117-11
H75	H76	H77	H78	01-390-UC-12	R117-12

CHILLED WATER SUPPLY PUMP
01-392-PU-1

CHILLED WATER SUPPLY PUMP
01-392-PU-2

HEATING & VENTILATING UNIT
05-391-UV-1

EXHAUST FAN
04-390-FN-1
ELECT. BLDG.

UNIT HEATER
01-390-UH-1

VENTILATING UNIT
01-391-UV-1
ELECT. & BATTERY ROOM

EXHAUST FAN
01-391-FN-5
ELECT. & BATTERY ROOM

INSTRUMENT BATTERY RM
EXHAUST FAN
01-391-FN-3

CHILLER
01-392-RE-1

INDICATES EQUIPMENT AND WIRING FURNISHED WITH CHILLER

- NOTES**
- FOR NOTES & SYMBOLS SEE DWG. 1546-01-E-2113
 - FOR OPERATING DESCRIPTION SEE DWG. 1546-01-E-2114
 - FOR TYPICAL 440V MOTOR WIRING SEE DWG. 1546-01-E-2117

DRAWING NO. 1546-01-E-2116		REV. 4
REFERENCE DRAWING NO. 1546-01-E-2113		
ELEM. CONT. DIAG. SYMBOLS, NOTES, OPER. DES. 1546-01-E-2114		
SPECIFICATION REF. SECT 107		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY SINGMASTER & BREYER	DATE 4-21-61	
BY C. E. WINTERS	DATE 5-5-61	
BY U. S. ATOMIC ENERGY COMMISSION	DATE 5-9-61	
BY L. H. JACKSON	DATE 5-9-61	
HIGH FLUX ISOTOPE REACTOR		
ELEMENTARY CONTROL DIAGRAMS HEATING & VENTILATING EQUIP.		
DRAWN M. J. R.	CHECKED V. S.	DATE 4-21-61
DATE 4-21-61	DRAWING NO. 1546-01-E-2116	REV. 4

**CERTIFIED
FOR CONSTRUCTION**

TYPICAL 440V MOTOR WIRING

POOL COOLANT PUMP 01-415-PU-9A

POOL COOLANT PUMP 01-415-PU-9B

BACK LIGHTED
POOL COOLANT & POOL DEMINERALIZER
PUMP CONTROL SWITCHES
SS-10-11 & 12

IND. LIGHT	CONTACT	ON	OFF
+	1	X	
+	2	X	
+	3		X
+	4		X

PLANT DEMINERALIZER WATER STORAGE PUMP 01-415-PU-18A

BACK LIGHTED
SS-100 & SS-101

IND. LIGHT	CONTACT	ON	OFF
+	1	X	
+	2	X	
+	3		X
+	4		X

POOL SCUMPER, SURGE TANK & DEAERATOR
SHUTDOWN CIRCUITS

PLANT DEMINERALIZER WATER STORAGE PUMP 01-415-PU-18B

POOL DEMINERALIZER PUMP 01-415-PU-7A

POOL DEMINERALIZER PUMP 01-415-PU-7B

POOL LEVEL, SURGE TANK AND DEAERATOR
ALARM CIRCUITS

HNO3 PUMP 01-415-PU-15

NaOH PUMP 01-415-PU-16

PROCESS WATER PUMP 01-415-PU-17A

PROCESS WATER PUMP 01-415-PU-17B

PRIMARY DEMINERALIZER RECYCLE PUMP
01-415-PU-G

POOL DEMINERALIZER RECYCLE PUMP
01-415-PU-12

BLOWER 01-420-AB-1

NOTES
1- FOR SYMBOLS, NOTES & OPERATING DESCRIPTION
SEE ENDS 1946-10-21 & 2114

CERTIFIED
FOR CONSTRUCTION

DRAWING NO.		REV.	
1546-01-E-2117		5	
REFERENCE DRAWING		NO.	
ELEM. CONT. DIAGS. 9YM. NOTES & OPER. DES.		1546-01-E-2115	
ELEM. CONT. DIAGS. OPERATING DESCRIPTIONS		1946-01-E-2114	
SPECIFICATION		REV. SECTION 107	
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.			
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
APPROVED			
BY SINGMASTER & BREYER		DATE 3-31-61	
BY C. E. WINTERS		DATE 4-14-61	
BY L. H. JACKSON		DATE 4-13-61	
HIGH FLUX ISOTOPE REACTOR ELEMENTARY CONTROL DIAGRAM PROCESS WATER EQUIPMENT			
DRAWN A.D.		DATE 3-31-61	
SCALE 3/4"		DRAWING NO. 1546-01-E-2117	
REV.		5	

5	REV. PER CFC VENDOR'S DWG	L.L.	REV. PER CFC VENDOR'S DWG	L.L.	2	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.	REV. PER CFC VENDOR'S DWG	L.L.	2	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.
4	REV. PER CFC VENDOR'S DWG	L.L.	REV. PER CFC VENDOR'S DWG	L.L.	1	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.	REV. PER CFC VENDOR'S DWG	L.L.	1	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.
3	REV. PER CFC VENDOR'S DWG	L.L.	REV. PER CFC VENDOR'S DWG	L.L.	0	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.	REV. PER CFC VENDOR'S DWG	L.L.	0	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.
2	REV. PER CFC VENDOR'S DWG	L.L.	REV. PER CFC VENDOR'S DWG	L.L.	0	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.	REV. PER CFC VENDOR'S DWG	L.L.	0	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.
1	REV. PER CFC VENDOR'S DWG	L.L.	REV. PER CFC VENDOR'S DWG	L.L.	0	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.	REV. PER CFC VENDOR'S DWG	L.L.	0	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.
0	REV. PER CFC VENDOR'S DWG	L.L.	REV. PER CFC VENDOR'S DWG	L.L.	0	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.	REV. PER CFC VENDOR'S DWG	L.L.	0	ISSUED FOR PRELIMINARY APPROVAL	F.C.M.

FAN CONTROL BACK LIGHTED SELECTOR SWITCHES (SEE TABULATION)

NO. LIGHT	CONTACTS	POSITION
1	0-1-0-0-0	STOP
2	0-1-0-0-0	STOP
3	0-1-0-0-0	STOP
4	0-1-0-0-0	STOP

FAN MOTOR CONTROL CIRCUITS
03-430-FN-4A1 & 4A2
03-430-FN-4B1 & 4B2
03-430-FN-4C1 & 4C2
03-430-FN-4D1 & 4D2

NOTE: PREFIX "Q" FOR WIRE NOS. SHOWN IS FOR FN-4A1. FOR OTHER FANS PREFIX WIRE NOS. AS SHOWN BELOW DISCONNECT SWITCH IS-50 IS SHOWN FOR FN-4A1. SEE TABULATION FOR OTHER FAN DESIGNATIONS.

TABULATION OF AUXILIARY CONTACTS DESCRIPTION

FAN #	SLOW SPEED CONTROL RELAY	FAST FORWARD CONTROL RELAY	FIRE ALARM SHUTDOWN RELAY	WIRE NO. PREFIX	THERMO GUARD NO.	SPARE POINT NO.	TIMING RELAY TR.	SELECTOR SWITCH	ISOLATING SWITCH
03-430-FN-4A1	TC0310A-TR1	TC0310A-TR2	TC0310A-TR3	Q1	402	403	TR-1	03-4A1	IS-50
03-430-FN-4A2	TC0310A-TR1	TC0310A-TR2	TC0310A-TR3	Q2	402	403	TR-2	03-4A2	IS-50
03-430-FN-4B1	TC0310B-TR1	TC0310B-TR2	TC0310B-TR3	Q3	402	403	TR-3	03-4B1	IS-50
03-430-FN-4B2	TC0310B-TR1	TC0310B-TR2	TC0310B-TR3	Q4	402	403	TR-4	03-4B2	IS-50
03-430-FN-4C1	TC0310C-TR1	TC0310C-TR2	TC0310C-TR3	Q5	402	403	TR-5	03-4C1	IS-50
03-430-FN-4C2	TC0310C-TR1	TC0310C-TR2	TC0310C-TR3	Q6	402	403	TR-6	03-4C2	IS-50
03-430-FN-4D1	TC0310D-TR1	TC0310D-TR2	TC0310D-TR3	Q7	402	403	TR-7	03-4D1	IS-50
03-430-FN-4D2	TC0310D-TR1	TC0310D-TR2	TC0310D-TR3	Q8	402	403	TR-8	03-4D2	IS-50
03-430-FN-4E1	TC0310E-TR1	TC0310E-TR2	TC0310E-TR3	Q9	402	403	TR-9	03-4E1	IS-50
03-430-FN-4E2	TC0310E-TR1	TC0310E-TR2	TC0310E-TR3	Q10	402	403	TR-10	03-4E2	IS-50

CONTACTS #4 OF THE TIME DELAY RELAY OPEN AFTER AN ADJUSTABLE TIME DELAY FROM 30 SECONDS TO 14 MINUTES. CONTACTS 2 & 3 WILL CLOSE 5 SECONDS AFTER CONTACT 4 OPENS.

FUTURE

REGULATED VOLTAGE SUPPLY
110V. CONTROL POWER - CIRCUIT #M-5

CONTACT WITH TIME DELAY SHUTS OFF TO PERMIT PUMP TO CONTINUE TO RUN AFTER RETURN FROM EMERGENCY TO NORMAL POWER.

SELECTOR SWITCH 556

CONTACTS	POSITION
0-1-0-0-0	STOP
0-1-0-0-0	STOP
0-1-0-0-0	STOP
0-1-0-0-0	STOP

BACK-LIGHTED SELECTOR SWITCH 556G

CONTACTS	POSITION
0-1-0-0-0	STOP
0-1-0-0-0	STOP
0-1-0-0-0	STOP
0-1-0-0-0	STOP

PRIMARY FEED PUMP (24)
03-415-PU-11

COOLING TOWER PUMP (MAIN DRIVE)
03-415-PU-14

BACK-LIGHTED SELECTOR SWITCH 55-1

CONTACTS	POSITION
0-1-0-0-0	STOP
0-1-0-0-0	STOP
0-1-0-0-0	STOP
0-1-0-0-0	STOP

NOTES
1. FOR NOTES, SYMBOLS & OPERATING DESCRIPTIONS SEE DWGS. 1946-01-E-2113 & 2114.
2. FOR TYPICAL 440V MOTOR WIRING SEE DWG. #1946-01-E-2117.

DRAWING NO. 1946-05-E-2118
REV. 4

REFERENCE DRAWING	NO.
ELEM. CONT. DIAG. NOTES, SYM. (OPER. DES.)	1946-01-E-2113
ELEM. CONT. DIAG. OPERATING DESCRIPTIONS	1946-01-E-2114
ELEM. CONT. DIAG. PROCESS WATER EQUIP.	1946-01-E-2117

SPECIFICATION REF. SECTION #107

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
400 LEXINGTON AVE. NEW YORK 17, N.Y.

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED
SINGMASTER & BREYER

BY *[Signature]* DATE 3-31-61
UNION CARBIDE NUCLEAR COMPANY

BY C. E. WINTERS DATE 4-14-61
U. S. ATOMIC ENERGY COMMISSION

BY L. H. JACKSON DATE 4-19-61
HIGH FLUX ISOTOPE REACTOR

ELEMENTARY CONTROL DIAGRAMS
PROCESS WATER EQUIPMENT

DRAWN HJR/ERS
DATE 5-31-61
SCALE 1/8" = 1"

CONTRACT NO. 1946-05-E-2118
REV. 4

TIMER SHALL BE EAGLE SIGNAL MULTIFLEX TYPE CONSISTING OF 1 MOTOR DRIVING 3-7 CONTACT TIMERS OR EQUAL.

TIMER CONTACT DEVELOPMENT

BACK LIGHTED
PRIMARY COOLANT CLEAN UP
PUMP SWITCHES 55-100 & 55-101

IND. LT.	CONTACTS	POSITION	ON	OFF
55-100	1	X		
55-101	2		X

PRIMARY COOLANT CLEAN-UP PUMP 01-415-PU-2A

TO REACTOR PERMISSIVE
START-UP CIRCUIT
DWG. # 1946-09-E-2120

SHUTDOWN INTERLOCKS & AUX. CIRCUITS

PRIMARY COOLANT CLEAN-UP PUMP 01-415-PU-2B

TO REACTOR PERMISSIVE
START-UP CIRCUIT
DWG. # 1946-09-E-2120

TO ANNUNCIATOR '96'

(17) PRIMARY COOLANT CLEAN-UP PUMPS & PRIMARY LOOP DEAERATOR

TO REACTOR PERMISSIVE
START-UP CIRCUIT
DWG. # 1946-09-E-2120

LEADDOWN & PRESSURE SYSTEM
COOLANT PRESSURE CIRCUITS

PRESSURIZER PUMP SELECTOR SW. 552
SELECTS PUMP FOR AUTOMATIC SEQUENCE

CONTACT	PU-4B	PU-4A
1		X
2	X	
3		X
4	X	

NOTE: 1. FOR PUMP PU-4B PREFIX ALL WIRE NOS. BY IS INSTEAD OF A.
2. CONTACTS ETC. FOR 01-415-PU-4B
FOR PUMP PU-4B ISOLATION SWITCH IS IS-17, SAME CONTACT NUMBERS

VARIABLE SPEED DRIVE FOR PUMP 01-415-PU-4A
VARIABLE SPEED DRIVE FOR PUMP 01-415-PU-4B
SEE DWG. E-2121

- FOR SYMBOLS, NOTES & OPERATING DESCRIPTIONS
SEE DWG. # 1946-E-2119
- FOR TYPICAL 440V MOTOR WIRING SEE
DWG. # 1946-09-E-2117

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO. 1946-01-E-2119		REV. 5
REFERENCE DRAWING NO.		
ELEM. CONT. DIAG. NOTES, SYM. (OPER. DES.) 1946-E-2119		
ELEM. CONT. DIAGRAMS, PROCESS WATER EQUIP. 1946-09-E-2120		
SPECIFICATION REF. SECTION 107		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE., NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED BY SINGMASTER & BREYER DATE 3-31-61		
BY C. E. WINTER'S DATE 4-14-61		
BY L. H. JACKSON DATE 4-19-61		
HIGH FLUX ISOTOPE REACTOR		
ELEMENTARY CONTROL DIAGRAM PROCESS WATER EQUIPMENT		
DEPT. CHK. ARCH. ELEC. H & V. INST. MECH. STRUC. UTIL.	DRAWN BY J. E. CHYD DATE 3/29/61	
DATE 3/29/61		DRAWING NO. 1946-01-E-2119
SCALE		REV. 5

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
1	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61	1	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61
2	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61	2	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61
3	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61	3	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61
4	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61	4	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61
5	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61	5	REV. PER CDC VENDOR'S DWGS	JMC	JMC	3/29/61

13 INSTRUMENT AIR COMPRESSOR 01-420-C1A

14 INSTRUMENT AIR COMPRESSOR 01-420-C1B

INSTRUMENT AIR COMPRESSOR ASSOCIATE ALARMS

15 INSTRUMENT AIR COMPRESSOR 01-420-C3

INSTRUMENT AIR SYSTEM

DIESEL ENGINE JACKET WATER HEATER'S

DIESEL GENERATOR 2 AIR COMPRESSOR

DIESEL GENERATOR FUEL OIL PUMPS ASSOCIATE ALARMS

48 COMMUNICATOR 05-450-COM-1

SEWAGE TREATMENT SYSTEM

SEWAGE TREATMENT SYSTEM

N-16 MONITORING CIRCUITS

49 SEWAGE TREATMENT BLOWER 05-420-AB-1

49 SEWAGE TREATMENT BLOWER 05-420-AB-1

49 SEWAGE TREATMENT BLOWER 05-420-AB-1

49 SEWAGE TREATMENT BLOWER 05-420-AB-1

TYPICAL 440V MOTOR OPERATED DOORS POWER CIRCUIT

50 MOTOR OPERATED CANOPY DOOR #220 01-375-DR-1

51 MOTOR OPERATED VERTICAL LIFT DOOR #219 01-375-DR-2

51 MOTOR OPERATED VERTICAL LIFT DOOR #219 01-375-DR-2

INTERLOCK OVERRIDE SELECTOR SWITCH 5522 FOR MOTOR OPERATED DOORS 01-375-DR-1 01-375-DR-2

NOTES

- FOR SYMBOLS, NOTES OPERATING DESCRIPTIONS. SEE DWG 1546-01-E-203.
- FOR TYPICAL 440V MOTOR WIRING. SEE DWG 1546-01-E-2117.
- 51, 52, 53, 54 ARE CONTACTS ON THE MULTIPoint RECORDER. THE CONTACTS WILL OPERATE TO STOP THE RECORDER, AND SOLENOID VALVES FROM POINT TO POINT AN INTERNAL SWITCH ON THE RECORDER WILL PERMIT THE RECORDER TO STOP AT A SELECTED POINT WITHOUT STOPPING.

DRAWING NO. 1546-01-E-2124
REV. 7

REFERENCE DRAWING NO.

SPECIFICATION REF. SECTION 107

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
400 LEXINGTON AVE. NEW YORK 17, N. Y.

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED

SINGMASTER & BREYER DATE 4-28-61
U. S. ATOMIC ENERGY COMMISSION DATE 5-12-61
U. S. ATOMIC ENERGY COMMISSION DATE 5-17-61

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

ELEMENTARY CONTROL DIAGRAMS
MISCELLANEOUS EQUIPMENT

CERTIFIED FOR CONSTRUCTION

DATE 4-28-61
DRAWING NO. 1546-01-E-2124
REV. 7

- NOTES:
1. For notes, symbols, & operating descriptions see Dwg. #1546-01-E-2113.
 2. For typical 440 V motor wiring see Dwg. #1546-01-E-2117.
 3. FOR COMPLETE DESCRIPTION OF INSTRUMENTS SEE SPECIFICATION SECTION #12.

LISEND			
4-100000 10-1000000			
RECEIVED DATE PAGE	RECEIVED DATE PAGE	RECEIVED DATE PAGE	RECEIVED DATE PAGE
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16

EQUALIZING VALVE
CONTROL SWITCH
(SEE TABULATION)

CONTACTS		POSITIONS	
		CLOSED	OPEN
1		X
	2		

NON-SPRING RETURN

PRIMARY & SECONDARY COOLANT WATER, POOL SYSTEM & DEFECTIVE FUEL
ELEMENT STORAGE BLOCK VALVES & EQUALIZING VALVES

[illegible]

TYPICAL ANNUNCIATOR CIRCUIT

SEQUENCE OF OPERATION							
OPERATION	FIELD CONTACT	WHITE LIGHT	RED LIGHT	HORN	COIL "A"	COIL "B"	COIL "C"
NORMAL	CLOSED	ON	ON	OFF	ON	ON	OFF
ABNORMAL	OPEN	ON	ON	ON	OFF	ON	ON
ACKNOWLEDGED	OPEN	OFF	ON	OFF	OFF	OFF	ON
NORMAL BEFORE RESET	CLOSED	ON	OFF	OFF	ON	ON	ON
RESET	CLOSED	ON	ON	OFF	ON	ON	OFF

Note 13 If after step 2 normal condition returns before acknowledge button is operated the annunciator must remain in condition 2 until acknowledge button is operated, after which annunciator condition is erased.

Note 2: If after step 4 abnormal condition returns before the reset button is operated the annunciator should return to step 2.

▲ ACKNOWLEDGE & #1 FOR ANNUNCIATORS #1E, 2E, 3E, 4E
RESET BUTTON

▲ ACKNOWLEDGE #2 FOR ANNUNCIATORS "FG", "HI", "EXP#1", "EXP#2"
RESET BUTTON

▲ ACKNOWLEDGE #3 FOR ANNUNCIATORS "A, B, C, D"
RESET BUTTON

1	5	9	13	17	21
2	6	10	14	18	22
3	7	11	15	19	23
4	8	12	16	20	24

TYPICAL NUMBERING
OF ANNUNCIATOR POINTS

NO SCALE

L E G E N D									
ANNUNCIATOR	POWER CKT	BELL & BUZZER LOCATION	WIRE NUMBERS						
			H	K	C	R	N	P	M
1E, 2E, 3E, 4E	PIA-13	PANEL "E"	PIA-13 OR 1E	HK	EC	EC	EC	EC	PIA-13 OR 1E
F6, H1, EXP1, EXP2	PIA-14	PANEL "F-G"	PIA-14 OR H1	HK	HIC	HIC	HIC	HIC	PIA-14 OR H1
A, B, C, D	PIA-15	PANEL "C"	PIA-15	TODA	TODA	TODA	TODA	TODA	PIA-15

— SIZE AND STYLE OF
LETTERING SHOWN

ANNUNCIATORI E

ANNUNCIATOR 2E

ANNUNCIATOR 4E

ANNUNCIATOR 3F

GENERAL NOTES:

1. ACTUATING DEVICES SHOWN IN THEIR DE-ENERGIZED OR UNMOUNTED POSITIONS.
2. POINTS ON ANNUNCIATORS MARKED SPARE SHALL BE PROVIDED WITH PLAIN LABELS.
3. SLANTED LINES INDICATE THE NUMBER OF LINES IN ANNUNCIATOR ENGRAVING. THE ENGRAVING SHALL BE CENTERED BOTH HORIZONTALLY AND VERTICALLY.

PROCESS PANEL "E" CONSTRUCTION DETAILS	1546-01-E-14033
PROCESS PANEL "E" WIRING DIAGRAM SHEET 1,245	1546-01-E-2201 to 2202
ELEMENTARY CONTR. DIA'S ANNUNCIATORS	1546-01-E-2133

DRAWING NO.		REV.
1546-01-E-2129		4

REFERENCE DRAWING	NO.
ELEM. CONTR. DIA. - PROCESS WITH 200R	1846-01-2-001

ELEM. CONTR. DIA. - PROCESS WATER EQUIP.	1546-01-E-2117
ELEM. CONTR. DIA. - PROCESS WATER EQUIP.	1546-01-E-2118

ELEM. GEOTYP. DIA. PRODUCTS WATER EQUIP.	1546-01-E-2115
ELEM. CONTR. DIA. - PRODUCTS WATER EQUIP.	1546-01-E-2120

ELEM. CONTR'DIA.-PROCESS WATER EQUIP.	1946-01-E-212
SPECIFICATION	SECTION 108

SPECIFICATION	REF.	SECTION 108
SINGMASTER & BREYER <small>SINGMASTER & BREYER, INC. 1000 LEXINGTON AVENUE, NEW YORK, N.Y. 10017</small>		

METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK 17, N. Y.

U. S. ATOMIC ENERGY COMMISSIONOAK RIDGE, TENNESSEE

APPROVED
SINGMASTER & BREYER

BY L. C. Russell DATE 9/22/61
UNION CARBIDE NUCLEAR COMPANY

BY	C. E. WINTERS	DATE 10/4/61
U. S. ATOMIC ENERGY COMMISSION		

BY L. H. JACKSON DATE 10/13/61

	HIGH FLUX ISOTOPE REACTOR
--	----------------------------------

✓ ELEMENTARY CONTROL DIAGRAMS
ANNUNCIATORS IF TRUE IF

ANNUNCIATORS 1E THRU 4E

DRAWN FCM	CHKD D.M.O.	DATE 9/22	CONTRACT NO. AT-40-1-2688
DATE 9-22-61	DRAWING NO. 15-16		REV.

**CERTIFIED
FOR CONSTRUCTION**

	S. & B. S.	
	DEPT.	C
	ARCH.	
	ELECT.	CE
	H & V.	
	INST.	SI
468	MECH.	
	STRUC.	

DRAWN	PCM	CHKD	D.M.O.	DATE	9/22	CONTRACT	NO. AT-40-1-3088
DATE		9-22-61		DRAWING NO.		1546-01-E-2129	
						REV.	
						1

ANNUNCIATOR "F.G."
POWER SUPPLY CIR. PIA-14

ANNUNCIATOR "H.I."
POWER SUPPLY CIR. PIA-14

ANNUNCIATOR B
POWER SUPPLY CIR. PIA-15

ANNUNCIATOR "C"
POWER SUPPLY CIR. PIA-15

ANNUNCIATOR "D"
POWER SUPPLY CIR. PIA-15

Note:
FOR GENERAL NOTES & TYPICAL ANNUNCIATOR
CIRCUIT SEE DWG. 1546-01-E-2129.

CERTIFIED
FOR CONSTRUCTION

DRAWING NO. 1546-01-E-2130		REV. 4
REFERENCE DRAWING NO.		
ELEM. CONTROL DIAGRAMS - ANNUN. F.G. & H.I. 1546-01-E-2129		
INTERCON. WIP. DIAG. - PANELS "F.G." & "H.I." 1546-01-E-2129		
WIPING DIAGRAM - PANEL "I" 1546-01-E-2121		
WASTE SYSTEM - PANEL "F.G." WIP. DIAG. 1546-01-E-2129		
SPECIFICATION REF. SECTION 10.3		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 470 SPRINGFIELD AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY	<i>J. C. Singmaster</i>	DATE 9/22/64
SINGMASTER & BREYER		
UNION CARBIDE NUCLEAR COMPANY		
BY	C. E. WINTER	DATE 10/4/64
U. S. ATOMIC ENERGY COMMISSION		
BY	L. H. JACKSON	DATE 10/2/64
HIGH FLUX ISOTOPE REACTOR		
ELEMENTARY CONTROL DIAGRAMS		
ANNUNCIATORS "B.C.D.F.G. & H.I."		
DRAWN BY	J. S. P. O'DONOGHUE	DATE 9/21/64
DATE	9-21-64	DRAWING NO. 1546-01-E-2130
SCALE	None	REV. 4

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
4	REV'D PER PCO #172				2	MISC. REV.			
3	ADDED ALARM CURRENT FOR FOURTH COOLANT LOOP (W. JACKSON LETTER 1-5)				1A	ISSUED FOR PACKAGE APP.			
					0	CLARIFIED FOR CONSTRUCTION - PAGE #2			

SECONDARY WATER
TEMPERATURE AT
BASE OF COOLING TOWER

TEMPERATURE TRANSMISSION RECORDING & ALARM

SECONDARY WATER
TEMPERATURE
AFTER COOLING-TOWER
PUMPS

COOLING TOWER FANS SPEED CONTROL

COOLING TOWER FANS TEMPERATURE CONTROL
SIGNAL CONNECTION BLOCK DIAGRAM
SEE NOTE 1

TO FAN CONTROL CIRCUITS
SEE ELEMENTARY DIAGRAMS
DWG. NO. 1546-01-E-2118

PH SIGNAL CONNECTION BLOCK DIAGRAM
SEE NOTE 1

LLW TANK LEVEL
SIGNAL CONNECTION BLOCK DIAGRAM
SEE NOTE 1

PRIMARY COOLANT WATER
INLET AND OUTLET TEMP

PRIMARY COOLANT WATER
FLOW AND TEMPERATURE
TRANSMISSION

HEAT POWER CALCULATOR

TEMPERATURE
DIFFERENTIAL
TEMP. FLOW &
HEAT POWER
RECORDING

NUCLEAR SAFETY CONTROL

HEAT POWER SAFETY SYSTEM
SIGNAL CONNECTION BLOCK DIAGRAM
SEE NOTE 1

RECEPTACLE "A"

RECEPTACLE "B"

SYMBOL	#1	#2	#3	#4	#5	#6
CONDUIT "A"	C4019	C4097	C4129	C4068	C4061	C4158
CABLE "A"	W4057	W4087	W4094	W4034	W4082	W4031
WIRE NO. 41	CN4-1A	CN4-2A	CN4-3A	CN4-4A	CN4-5A	CN4-6A
WIRE NO. 42	CN4-1B	CN4-2B	CN4-3B	CN4-4B	CN4-5B	CN4-6B
CONDUIT "B"	C4018	C4096	C4128	—	—	—
CABLE "B"	W4118	W4086	W4093	—	—	—
CONDUIT "C"	—	—	—	CN2103	CN2102	CN2119
WIRE NO. 6A	CN6-1A	CN6-2A	CN6-3A	CN6-4A	CN6-5A	CN6-6A
WIRE NO. 6B	CN6-1B	CN6-2B	CN6-3B	CN6-4B	CN6-5B	CN6-6B
WIRE NO. 6C	CN6-1C	CN6-2C	CN6-3C	CN6-4C	CN6-5C	CN6-6C
WIRE NO. 6D	CN6-1D	CN6-2D	CN6-3D	CN6-4D	CN6-5D	CN6-6D
WIRE NO. 6E	CN6-1E	CN6-2E	CN6-3E	CN6-4E	CN6-5E	CN6-6E
WIRE NO. 6F	CN6-1F	CN6-2F	CN6-3F	CN6-4F	CN6-5F	CN6-6F
WIRE NO. L	PIAL18	PIAL16	PIAL15	PIAL17	PIAL17	PIAL17
WIRE NO. N	PIAN18	PIAN16	PIAN15	PIAN17	PIAN17	PIAN17

CONSTANT AIR MONITOR RECEPTACLES
TYPICAL CONNECTIONS

NOTES:

- FOR POWER SUPPLY CIRCUITS TO INSTRUMENTS
SEE INSTRUMENT POWER ONE LINE DIAGRAM,
DWG. NO. 1546-01-E-2026.
- IF SIGNAL INPUT IMPEDANCE IS LESS THAN
MAXIMUM ALLOWABLE IMPEDANCE SHOWN,
ADD REQUIRED LOAD BY ADJUSTING LOAD
POTENTIOMETER ON SIGNAL TRANSMITTER.
- RECOMMENDED INSTRUMENT SYSTEM
INSTRUMENTS ARE LOCATED, FOR
PANELS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,
RESPECTIVELY. OTHER INSTRUMENTS
ARE LOCATED AS SHOWN.
- APMR-1010 IS A 16 POINT RECORDER.
FOR ADDITIONAL POINTS NOT SHOWN
SEE DWG. 1546-01-E-2125.

SYMBOLS:

ARROW INDICATES DIRECTION OF
CURRENT.

DRAWING NO. 1546-01-E-2192
REV. 3

REFERENCE DRAWING	NO.
INTERCOM WIRING DIAG. - TRANS BOXES 10 (11)	1546-01-E-2194
ELEMENTARY CONT. DIAG. - MISC. EQUIPMENT	1546-01-E-2128
ELEMENTARY CONT. DIAG. - PROC. WATER EQUIP.	1546-01-E-2125
ELEMENTARY CONT. DIAG. - PROC. WATER EQUIP.	1546-01-E-2118
ONE LINE DIAGRAM - INSTRUMENT POWER	1546-01-E-2036
SPECIFICATION	REV. 10B 6/12

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
100 PARK AVE. NEW YORK 17, N. Y.

U. S. ATOMIC ENERGY COMMISSION
OXFORD, TENNESSEE

APPROVED
SINGMASTER & BREYER

BY *[Signature]* DATE 12-7-61
UNION CARBIDE NUCLEAR COMPANY

BY C. E. WILSTERS DATE 12/11/61
U. S. ATOMIC ENERGY COMMISSION

BY E. F. NEWMAN DATE 12/12/61
HIGH FLUX ISOTOPE REACTOR

SCHEMATIC BLOCK DIAGRAM
HEAT POWER CALCULATORS AND
MISCELLANEOUS INSTRUMENTATION

DRAWN BY *[Signature]* DATE 12-7-61
DATE 12-7-61
SCALE NONE

NO. 1546-01-E-2192
REV. 3

THE DIAG. NO 10419 FOR RADIATOR OBTAIL
THE DIAG. NO 1 FOR DRID CONN. OBTAIL
ABOVE DIAGRAMS ARE SHOWN ON DWE
NO 1046-00-WAY. 3025

SYMBOL	LEGEND
F.D.	FIRE DAMPER
SCW	SECONDARY CIRCULING WATER
C.C.	CARBON STEEL
SBE	SPECIAL BUILDING RESIST ENVELOPE
B.G.	BOTTOM GELLS
F.T.	FLOAT THERMOSTATIC TRAP
B.S.	BOTTOM SPLIT
C.D.	CEILING DIFFUSER
L	LOUVER DOOR
S.S.	STAINLESS STEEL DUCT
B.D.	BACK DRAFT DAMPER
X	ANCHOR & SEAL
AC	AIR CONDITIONING UNIT
CC	COOLING COIL
CD	CONDENSATE
CFM	CUBIC FEET OF AIR PER MIN.
CHR	CHILLED WATER RETURN.
CHS	CHILLED WATER SUPPLY
CR	CEILING REGISTER
DV	DISTRIBUTING VANES
B.D	FACE & BYPASS DAMPER
FC	FLEXIBLE CONNECTION
FU	FAN
LP6	LOW PRESSURE STEAM
PHC	PREHEAT COIL
PL	PLENUM
RA	RADIATOR
RC	REHEAT COIL
RD	ROOF DRAIN
TR	TOP REGISTER
TS	TOP SPLIT
UC	UNIT COOLER
UH	UNIT HEATER
UV	UNIT VENTILATOR
N	NECK
SD	SPLITTER DAMPER
VD	VOLUME DAMPER
FAI	FRESH AIR INTAKE
HP6	HIGH PRESSURE STEAM.

EQUIPMENT SCHEDULES	1546-00-HW-1
EQUIPMENT SCHEDULES	1546-00-HW-1
HOT OFF GAS SYSTEM	1546-01-HW-30
STEAM & WATER FLOW DIAGRAM	1546-01-HW-3
DUCTWORK DETAILS	1546-02-HW-34
PIPING DETAILS	1546-00-HW-4

DRAWING NO: 1546-01-W4V-0005		REV 4
REFERENCE DRAWING	NO.	
AIR FLOW DIAGRAM	1546-01-W4V-3	
CONTROL DIAGRAMS	1546-01-W4V-3028	
FIRST FLOOR PLAN	1546-01-W4V-3	
SECOND FLOOR PLAN	1546-01-W4V-3	
THIRD FLOOR PLAN	1546-01-W4V-3	
APPROPRIATION	REV.	

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
428 LEXINGTON AVE. NEW YORK 17, N. Y.

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED		
SINGMASTER & BREYER		
BY	<i>P. CSR</i>	DATE 3-24-61
UNION CARBIDE NUCLEAR COMPANY		
BY	C. E. WINTERS	DATE 2-14-61
U. S. ATOMIC ENERGY COMMISSION		
BY	R. B. SOMERS	DATE 3-28-61

REACTOR BUILDING
HEATING & VENTILATING.
GROUND FLOOR PLAN

294	DRAWN BY: S.W.A.	CHECKED: <i>[Signature]</i>	DATE: 3/26/1	CONTRACT NO. AT - 100-1-21
	DATE: 3-7-01	DRAWING NO. 1546-01-H&V-3005		4
	SCALE 1/8" = 1'-0"			

**CERTIFIED
FOR CONSTRUCTION**

SECONDARY COOLANT SYSTEMS	SECTION 4
HOT & CHILLED WATER DISTRI. SYSTEMS	SECTION 5
STEAM DISTRIBUTING SYSTEMS	SECTION 6
CONDENSATE DRAIN SYSTEMS	SECTION 7
H.V. & A.C. SYSTEMS	SECTION 8

E. & B. S.	
DEPT.	C
ARCH.	27
ELECT.	BA
H & V.	R
INST.	ca

																				<div><div> </div><div>REVISED DUCTWORK AT COL. 1, 24562 A.P. CHANGED TO 24562 BITE-0 WAS ZERO, 0 WAS 12" ADDING 4" STIFF BRANCH TO S.B.H.E. DUCT REMAINING EXACTLY THE SAME AT 0.50 A.C. 1. ADDING MANHOLE 1 (ACCESS PANELS TO DRAIN SYSTEM AND PUMP E.C.O. BE</div></div>										<div><div>ARM.</div><div> </div><div>A.M. 11/8/82 1/2 - 1/2 -</div></div>										<div><div> </div><div>REVISED S.B.H.E. DUCT.</div><div> </div><div>ADD DUCT SILENCE DUCTWORK TO NEW DRAIN RELAY 1 REPAIRS. AVOID NOTE ELIMINATE 0</div><div> </div><div>CERTIFIED FOR CONSTRUCTION</div><div> </div><div>ISSUED FOR TITLE 1 APPROVAL</div></div>									
REVISIONS										REVISIONS										REVISIONS																													
NO.	BY	CHK.	APPR.	DATE	APPR.	DATE	APPR.	DATE	NO.	BY	CHK.	APPR.	DATE	APPR.	DATE	APPR.	DATE	NO.	BY	CHK.	APPR.	DATE	APPR.	DATE	APPR.	DATE

- NOTE: 73
1. FOR UNIT HEATER PIPING SEE PIPING DIAGRAM #6.
 2. FOR CONVECTIVE PIPING SEE PIPING DIAGRAM #10 & 11. EXCEPT TO BE 3/4" IPS. UNLESS OTHERWISE NOTED
 3. CONVECTIVE SUPPLY ROUNDS TO BE FITTED 1/4" UP FLOW, 1/2" PER FOOT.
 4. FOR AIR-CONDITIONING UNIT PIPING SEE PIPING DIAGRAMS #2 & #3.
 5. FOR STEAM DRIPS SEE PIPING DIAGRAM #

SYMBOL	LEGEND
DN	DISTRIBUTING VALVES
TS	TOP SPLIT
AC	AIR CONDITIONER
CO	COOLING COIL
COND	CONDENSATE
CFM	CEILING DUCTWORK PER MINUTE
CHG	CUBIC FEET PER MINUTE
CHR	CHILLED WATER SUPPLY
CHW	CHILLED WATER RETURN
FDD	FLOOR DAMPER
FR	FLEXIBLE CONNECTION
RA	RAIL
LPS	LOW PRESSURE STEAM
PHG	PREHEAT COIL
PHG	PREHEAT COIL
RA	RAIL
RA	RAIL
TR	TOP REGISTER
UC	UNIT COILS
UH	UNIT HEATER
UV	UNIT VENTILATOR
DD	BACK DRAFT DAMPER
PN	PEOPLE WAY
SD	SPLITTER DAMPER
SCW	SECONDARY COOLING WATER
GV	GATE VALVE
N	NECK
L	LOUVER DOOR
FD	FIRE DAMPER
AD	ACCESS DOOR
T	ROOM THERMOSTAT
V	VOLUME DAMPER
D	REDUCER
U	UNION

SPECIFICATION-HTG, VENTG & AIR COND'G		SECTION 100
10	CONDENSATE DRAIN SYS.	74
11	STEAM DISTRIBUTING SYS.	75
12	HOT & CHILLED WATER DIST SYS.	76
13	SECONDARY COOLANT SYS.	66

EQUIPMENT SCHEDULE	1546-00-146-3025
EQUIPMENT SCHEDULE	1546-00-146-3027
HOT OFF GAS SYSTEM	1546-01-146-3021
DUCTWORK DETAILS	1546-00-146-3024
STEAM & WATER FLOW DIAGRAMS	1546-01-146-3001

	DRAWING NO. 1946-01-HV-9006	REV. 4
REFERENCE DRAWING		NO.
AIR FLOW DIAGRAM		1946-01-HV-9007
CONTROL VALVE SCHEMATS		1946-01-HV-9008 & 9009
GROUND FLOOR PLAN		1946-01-HV-9009
SECOND FLOOR PLAN		1946-01-HV-9007
PIPING DETAILS		1946-01-HV-9008

SPIFICATION	REF.
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEAFHURST AVE. NEW YORK 17, N. Y.	
FOR	
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE	
APPROVED	
SINGMASTER & BREYER <i>(Signature)</i>	
BY	DATE 4-27-61
UNION CARBIDE NUCLEAR COMPANY C. E. WINTERS	
BY	DATE 6-28-61
U. S. ATOMIC ENERGY COMMISSION J. M. JACKSON	
BY	DATE 6-28-61

**CERTIFIED
FOR CONSTRUCTION**

[illegible]

DATE 4-4-61	DRAWING NO.	REVISION
SCALE 1/8" = 1'-0"	1546-01-H+V-3007	3

**CERTIFIED
FOR CONSTRUCTION**

054

H.V.E.A.C.	SECTION 100
CONDENSATE DRAIN SYSTEMS	" 74
STEAM DISTRIBUTING SYSTEMS	" 73
HOT & CHILLED WATER DISTR. SYS.	" 72

EQUIPMENT SCHEDULES	1544-00-H4V-3026
EQUIPMENT SCHEDULES	1544-00-H4V-3027
AIR FLOW DIAGRAM	1546-01-H4V-3001
CONTROL DIAGRAMS	1546-00-H4V-3002-3009
PIPEWORK DETAILS	1546-00-H4V-3028
DUTING DETAILS	1546-00-H4V-3029

DRAWING NO. 1546-01-H&V-3008	REV. 1
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REFERENCE DRAWING	NO.
SECOND FLOOR PLAN	1546-01-H4V-3007
ROOF PLAN	1546-01-H4V-3009
REFLECTED CEILING PLANS & DETAILS	1546-01-S-1015
FIRST FLOOR PLAN	1546-01-H4V-3006
STEAM & WATER FLOW DIAGRAM	1546-01-H4V-3008
SPECIFICATION	SEE

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK 17, N. Y.

FOR
U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED
SINGMASTER & BREYER
BY *[Signature]* DATE 4-27-61

BY	UNION CARBIDE NUCLEAR COMPANY	DATE 4-7-61
BY	C.E. WINTERS	DATE 5-18-61
	U. S. ATOMIC ENERGY COMMISSION	

EC OS 1	BY	L.H. JACKSON	DATE	5-24-61
	HIGH FLUX ISOTOPE REACTOR			

REACTOR BUILDING
HEATING & VENTILATING.
THIRD FLOOR PLAN.

DRAWING NO.	CHFD	DATE	1/25/64	CONTRACT NO.	AT - (10-1) - 3440
DATE	4/7/61	DRAWING NO.	1546-01-H&V-5008	REV.	1
SCALE	1/8" = 1'-0"				

[illegible]

SYMBOL	LEGEND
C.F.M.	CUBIC FEET OF AIR PER MINUTE
B.S.	BOTTOM SPLIT
N	NECK
D.V.	DIRECTING VANES
SST	STAINLESS STEEL
DN	DOWN
EXH. REG.	EXHAUST REGISTER
WN. FLG.	WELDING NECK FLANGE

SCHEDULE FOR DUCTWORK EMBEDDED IN CONCRETE	THICKNESS
4" x 14" POOL DUCT RISERS	1/8"
14" x 14" OR LESS	1/8"
22" x 25" & 25" x 28"	1/4"
ALL OTHER DUCTWORK EMBEDDED IN CONCRETE (UNLESS OTHERWISE NOTED)	5/16"

DRAWING NO. 1546-01-HV-301B		REV. 4
REFERENCE DRAWING NO.		
SPECIAL BUILDING HOT EXHAUST SYSTEM 1546-01-HV-301B		
SPECIFICATION 3480 DUCT & EXHAUST SYSTEM, SECT. 67		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY	SINGMASTER & BREYER	DATE 5-5-61
BY	UNION CARBIDE NUCLEAR COMPANY	DATE 5-10-61
BY	C. E. WINTERS	DATE 5-10-61
BY	U. S. ATOMIC ENERGY COMMISSION	DATE 5-20-61
BY	L. M. JACKSON	DATE 5-20-61
HIGH FLUX ISOTOPE REACTOR		
REACTOR BUILDING		
HEATING & VENTILATING		
SPECIAL BUILDING HOT EXHAUST SYSTEM		
DRAWN BY	SAVAS	DATE 5-2-61
SCALE	1/8" = 1'-0"	NO. 27 (10/11) 1000

DRAWING NO.		REV.	
1546-01-H4V-3020		3	
REFERENCE DRAWING NO.			
1546-01-H4V-3023 1546-01-H4V-3007 1546-01-H4V-3021 1546-01-H4V-3022			
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y.			
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
APPROVED			
BY SINGMASTER & BREYER		DATE 2-23-61	
BY UNION CARBIDE NUCLEAR COMPANY		DATE 2-2-61	
BY U. S. ATOMIC ENERGY COMMISSION		DATE 2-2-61	
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING HOT OFF GAS SYSTEM			
DRAWN BY		DATE 2-2-61	
CHECKED BY		DATE 2-2-61	
DRAWING NO.		REV.	
1546-01-H4V-3020		3

SECTION "A-A" (1546-01-H4V-3020 & 3021)

DETAIL "T"
SCALE: 1/2" = 1'-0"

SECTION "T1-T1"
SCALE: 1/2" = 1'-0"

NOTE
1 - FOR GENERAL NOTES & LEGEND SEE
DWG. NO. 1546-01-H4V-3021

SECTION "B-B" (1546-01-H4V-3020 & 3021)

CERTIFIED
FOR CONSTRUCTION

DRAWING NO. 1546-01-H4V-3023		REV. 3
REFERENCE DRAWING		NO.
REACTOR BUILDING HOT OFF GAS SYSTEM		1546-01-H4V-3020
REACTOR BUILDING HOT OFF GAS SYSTEM		1546-01-H4V-3021
SPECIFICATION HOT OFF GAS SYSTEMS		SECTION 62
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED SINGMASTER & BREYER DATE 3-28-61		
BY C. E. WINTERS	DATE 4-4-61	
BY L. H. JACKSON	DATE 4-6-61	
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING HOT OFF GAS SYSTEM		
DRAWN BY SAVVS		CHECKED BY J. H. JACKSON
DATE 3-10-61		DATE 4-6-61
SCALE 1/16" = 1'-0"		DWG. NO. 1546-01-H4V-3023
		REV. 3

SEQUENCE OF OPERATION - AC SYST. NO. 1
SEQUENCE THE SAME FOR SYST. NO. 2 EXCEPT FOR CORRE-
SPONDING CONTROL ITEM NOS. SEE SCHEDULE BELOW.

100% F.A.I. AC UNIT NO. 01-391-AC-2

THIS UNIT SHALL HAVE A START-STOP SWITCH AND SHALL THRU PRESSURE SWITCHES
FS-003A-2, FS-003A-3, FS-004A-2 OR FS-004A-3 BE DE-ENERGIZED WHEN THE FLOW IN EITHER
EXHAUST MAIN UPSTREAM OF THE 50 PSI PRESSURE PIPES CAN NOT BE MAINTAINED
BY NORMAL WITH THE 50 PSI EXHAUST FANS FS-001-FN-1 AND FS-001-FN-2
OR WHEN SAME FANS ARE NOT OPERATING. WHEN THE A.C. UNIT FAN BECOMES
DEREGULATED THE F.A.I. DAMPER 01-001-0 SHALL CLOSE, MODULATING WATER VALVE 01-WV-1
SHALL OPEN, MODULATING STEAM VALVE 01-SV-2 SHALL CLOSE, STATIC PRESS-
URE REGULATOR 01-PR-1 SHALL CONTROL THE MODULATING DAMPER MOTOR
01-DM-1 TO MAINTAIN +0.2 W.G. PRESSURE IN THE ROOM BEYOND THE ADJUSTABLE
GRAVITY RELIEF DAMPER. WHEN A NEGATIVE PRESSURE GREATER THAN -0.4 W.G.
TEMPERATURE CONTROLLER 01-TC-2 SHALL THRU PNEUMATIC RELAYS 01-PR-1
AND 01-PR-2 SELECT SUMMER OR WINTER OPERATION.

WINTER OPERATION:

TEMPERATURE CONTROLLER 01-TC-1 SHALL THRU ELECTRIC PNEUMATIC RELAY
01-EP-19 CONTROL THE MODULATING STEAM VALVE 01-SV-1 TO MAINTAIN THE
SET POINT HEAT COIL LEAVING AIR TEMPERATURE. ROOM THERMOSTAT 01-RT-1
SHALL IN CONJUNCTION WITH THE LOW LIMIT TEMPERATURE CONTROLLER 01-TC-2
CONTROL MODULATING STEAM VALVE 01-SV-2 TO MAINTAIN THE ROOM SET TEMP.
FEATURE AND SUPPLY AIR MINIMUM TEMPERATURE RESPECTIVELY. FREEZE
PROTECTION THERMOSTAT 01-FT-1 SHALL ACTUATE THE LOCAL ALARM WHEN
THE TEMPERATURE FALLS BELOW ITS SET POINT AND THRU RELAY 01-EP-19
OPEN FULLY STEAM VALVE 01-SV-1.

SUMMER OPERATION:

ROOM THERMOSTAT 01-RT-1 SHALL IN SEQUENCE THRU PNEUMATIC RELAY
01-PR-3, CONTROL THE MODULATING WATER VALVE 01-WV-1 AND THE MOD-
ULATING STEAM VALVE 01-SV-2 TO MAINTAIN THE ROOM SET TEMPERATURE. THE
LOW LIMIT TEMPERATURE CONTROLLER 01-TC-3 SHALL THRU RELAY 01-PR-2
BECOME IN OPERATIVE. HUMIDISTAT 01-RH-1 SHALL ON A RISE IN HUMIDITY
ABOVE THE SET POINT, CONTROL THE BY-PASS DAMPER MOTOR 01-DM-2
TO CLOSE THE BY-PASS DAMPER AND ON A CONTINUED RISE IN HUMIDITY
SHALL OVERRIDE ROOM THERMOSTAT 01-RT-1 AND CONTROL THE MOD-
ULATING WATER VALVE TO MAINTAIN THE RELATIVE HUMIDITY AT ITS SET
POINT. AT THIS TIME THE ROOM THERMOSTAT 01-RT-1 SHALL OPEN THE
STEAM VALVE 01-SV-2 TO PROVIDE REHEAT AND MAINTAIN RELATIVE
HUMIDITY. A CALL FOR OPENING WATER VALVE 01-WV-1 THRU RELAY
01-PR-26 SHALL START THE CHILLED WATER PUMP (SEE CHILLED WATER
PUMP CONTROL DIAGRAM).

100% RETURN AIR AC UNIT NO. 01-391-AC-1

THIS UNIT SHALL HAVE A START-STOP SWITCH. TEMPERATURE CONT-
ROLLER 01-TC-4 IN THE RETURN AIR SHALL CONTROL IN SEQUENCE
THE MODULATING STEAM VALVE 01-SV-3 AND THE MODULATING WATER
VALVE 01-WV-2 TO MAINTAIN THE SET TEMP. HUMIDISTAT 01-RH-2 IN THE
RETURN AIR SHALL ON A RISE ABOVE THE SET POINT, CONTROL THE BY-
PASS DAMPER MOTOR TO CLOSE THE BY-PASS DAMPER AND ON A CONTIN-
UED RISE SHALL OVERRIDE THE TEMPERATURE CONTROLLER 01-TC-4 THRU
RELAY 01-PR-4 AND CONTROL THE MODULATING WATER VALVE TO MAINTAIN THE
RELATIVE HUMIDITY. A CALL FOR OPENING WATER VALVE 01-WV-2
THRU RELAY 01-PR-27, START THE CHILLED WATER PUMP
(SEE CHILLED WATER PUMP CONTROL DIAGRAM).

SEQUENCE OF OPERATION - CHILLED WATER SYSTEM

CHILLED WATER PUMPS 01-392-PU-1 AND 01-392-PU-2 SHALL EACH HAVE
A START-STOP SWITCH. THE PUMP 01-392-PU-2 (NORMALLY ON LINE) SHALL
THRU RELAY 01-PR-1 AND THRU ANY OR ALL A.C. UNIT CHS THREE WAY VALVES
AND THEIR RESPECTIVE RELAYS BE ENERGIZED. TEMPERATURE CONTROL-
LER 01-TC-2 SHALL RECEIVE MAIN AIR THRU 01-EP-17 AND OR 01-EP-18
AND SHALL CONTROL THE OPERATION OF THE RECIRCULATION
MACHINE TO MAINTAIN THE SET CHILLED WATER SUPPLY (CHS) TEMP-
ERATURE.

SYSTEM	UNIT	TEMPERATURE	ST. PRESS.	PNEUMATIC	DAMPER	STEAM	WATER	HUMIDISTAT	FREEZE	ELECT. PNEUMAT.	OPPOSED	PHYS.
AC SYST. 1	01-391-AC-1	01-TC-1	01-TC-2	01-TC-3	01-PR-1	01-PR-2	01-PR-3	01-PR-4	01-PR-5	01-PR-6	01-PR-7	01-PR-8
AC SYST. 2	01-391-AC-2	01-TC-4	01-TC-5	01-TC-6	01-PR-9	01-PR-10	01-PR-11	01-PR-12	01-PR-13	01-PR-14	01-PR-15	01-PR-16
AC SYST. 3	01-391-AC-3	01-TC-7	01-TC-8	01-TC-9	01-PR-17	01-PR-18	01-PR-19	01-PR-20	01-PR-21	01-PR-22	01-PR-23	01-PR-24
AC SYST. 4	01-391-AC-4	01-TC-10	01-TC-11	01-TC-12	01-PR-25	01-PR-26	01-PR-27	01-PR-28	01-PR-29	01-PR-30	01-PR-31	01-PR-32
AC SYST. 5	01-391-AC-5	01-TC-13	01-TC-14	01-TC-15	01-PR-33	01-PR-34	01-PR-35	01-PR-36	01-PR-37	01-PR-38	01-PR-39	01-PR-40
AC SYST. 6	01-391-AC-6	01-TC-16	01-TC-17	01-TC-18	01-PR-41	01-PR-42	01-PR-43	01-PR-44	01-PR-45	01-PR-46	01-PR-47	01-PR-48
AC SYST. 7	01-391-AC-7	01-TC-19	01-TC-20	01-TC-21	01-PR-49	01-PR-50	01-PR-51	01-PR-52	01-PR-53	01-PR-54	01-PR-55	01-PR-56
AC SYST. 8	01-391-AC-8	01-TC-22	01-TC-23	01-TC-24	01-PR-57	01-PR-58	01-PR-59	01-PR-60	01-PR-61	01-PR-62	01-PR-63	01-PR-64
AC SYST. 9	01-391-AC-9	01-TC-25	01-TC-26	01-TC-27	01-PR-65	01-PR-66	01-PR-67	01-PR-68	01-PR-69	01-PR-70	01-PR-71	01-PR-72
AC SYST. 10	01-391-AC-10	01-TC-28	01-TC-29	01-TC-30	01-PR-73	01-PR-74	01-PR-75	01-PR-76	01-PR-77	01-PR-78	01-PR-79	01-PR-80

* 100% F.A.I. AC UNITS. (ALL OTHERS 100% RETURN AIR UNITS)

SYSTEM	UNIT	TEMPERATURE	ST. PRESS.	PNEUMATIC	DAMPER	STEAM	WATER	HUMIDISTAT	FREEZE	ELECT. PNEUMAT.	OPPOSED	PHYS.
AC SYST. 1	01-391-AC-1	01-TC-1	01-TC-2	01-TC-3	01-PR-1	01-PR-2	01-PR-3	01-PR-4	01-PR-5	01-PR-6	01-PR-7	01-PR-8
AC SYST. 2	01-391-AC-2	01-TC-4	01-TC-5	01-TC-6	01-PR-9	01-PR-10	01-PR-11	01-PR-12	01-PR-13	01-PR-14	01-PR-15	01-PR-16
AC SYST. 3	01-391-AC-3	01-TC-7	01-TC-8	01-TC-9	01-PR-17	01-PR-18	01-PR-19	01-PR-20	01-PR-21	01-PR-22	01-PR-23	01-PR-24
AC SYST. 4	01-391-AC-4	01-TC-10	01-TC-11	01-TC-12	01-PR-25	01-PR-26	01-PR-27	01-PR-28	01-PR-29	01-PR-30	01-PR-31	01-PR-32
AC SYST. 5	01-391-AC-5	01-TC-13	01-TC-14	01-TC-15	01-PR-33	01-PR-34	01-PR-35	01-PR-36	01-PR-37	01-PR-38	01-PR-39	01-PR-40
AC SYST. 6	01-391-AC-6	01-TC-16	01-TC-17	01-TC-18	01-PR-41	01-PR-42	01-PR-43	01-PR-44	01-PR-45	01-PR-46	01-PR-47	01-PR-48
AC SYST. 7	01-391-AC-7	01-TC-19	01-TC-20	01-TC-21	01-PR-49	01-PR-50	01-PR-51	01-PR-52	01-PR-53	01-PR-54	01-PR-55	01-PR-56
AC SYST. 8	01-391-AC-8	01-TC-22	01-TC-23	01-TC-24	01-PR-57	01-PR-58	01-PR-59	01-PR-60	01-PR-61	01-PR-62	01-PR-63	01-PR-64
AC SYST. 9	01-391-AC-9	01-TC-25	01-TC-26	01-TC-27	01-PR-65	01-PR-66	01-PR-67	01-PR-68	01-PR-69	01-PR-70	01-PR-71	01-PR-72
AC SYST. 10	01-391-AC-10	01-TC-28	01-TC-29	01-TC-30	01-PR-73	01-PR-74	01-PR-75	01-PR-76	01-PR-77	01-PR-78	01-PR-79	01-PR-80

SYSTEM	UNIT	TEMPERATURE	ST. PRESS.	PNEUMATIC	DAMPER	STEAM	WATER	HUMIDISTAT	FREEZE	ELECT. PNEUMAT.	OPPOSED	PHYS.
AC SYST. 1	01-391-AC-1	01-TC-1	01-TC-2	01-TC-3	01-PR-1	01-PR-2	01-PR-3	01-PR-4	01-PR-5	01-PR-6	01-PR-7	01-PR-8
AC SYST. 2	01-391-AC-2	01-TC-4	01-TC-5	01-TC-6	01-PR-9	01-PR-10	01-PR-11	01-PR-12	01-PR-13	01-PR-14	01-PR-15	01-PR-16
AC SYST. 3	01-391-AC-3	01-TC-7	01-TC-8	01-TC-9	01-PR-17	01-PR-18	01-PR-19	01-PR-20	01-PR-21	01-PR-22	01-PR-23	01-PR-24
AC SYST. 4	01-391-AC-4	01-TC-10	01-TC-11	01-TC-12	01-PR-25	01-PR-26	01-PR-27	01-PR-28	01-PR-29	01-PR-30	01-PR-31	01-PR-32
AC SYST. 5	01-391-AC-5	01-TC-13	01-TC-14	01-TC-15	01-PR-33	01-PR-34	01-PR-35	01-PR-36	01-PR-37	01-PR-38	01-PR-39	01-PR-40
AC SYST. 6	01-391-AC-6	01-TC-16	01-TC-17	01-TC-18	01-PR-41	01-PR-42	01-PR-43	01-PR-44	01-PR-45	01-PR-46	01-PR-47	01-PR-48
AC SYST. 7	01-391-AC-7	01-TC-19	01-TC-20	01-TC-21	01-PR-49	01-PR-50	01-PR-51	01-PR-52	01-PR-53	01-PR-54	01-PR-55	01-PR-56
AC SYST. 8	01-391-AC-8	01-TC-22	01-TC-23	01-TC-24	01-PR-57	01-PR-58	01-PR-59	01-PR-60	01-PR-61	01-PR-62	01-PR-63	01-PR-64
AC SYST. 9	01-391-AC-9	01-TC-25	01-TC-26	01-TC-27	01-PR-65	01-PR-66	01-PR-67	01-PR-68	01-PR-69	01-PR-70	01-PR-71	01-PR-72
AC SYST. 10	01-391-AC-10	01-TC-28	01-TC-29	01-TC-30	01-PR-73	01-PR-74	01-PR-75	01-PR-76	01-PR-77	01-PR-78	01-PR-79	01-PR-80

SYSTEM	UNIT	TEMPERATURE	ST. PRESS.	PNEUMATIC	DAMPER	STEAM	WATER	HUMIDISTAT	FREEZE	ELECT. PNEUMAT.	OPPOSED	PHYS.
AC SYST. 1	01-391-AC-1	01-TC-1	01-TC-2	01-TC-3	01-PR-1	01-PR-2	01-PR-3	01-PR-4	01-PR-5	01-PR-6	01-PR-7	01-PR-8
AC SYST. 2	01-391-AC-2	01-TC-4	01-TC-5	01-TC-6	01-PR-9	01-PR-10	01-PR-11	01-PR-12	01-PR-13	01-PR-14	01-PR-15	01-PR-16
AC SYST. 3	01-391-AC-3	01-TC-7	01-TC-8	01-TC-9	01-PR-17	01-PR-18	01-PR-19	01-PR-20	01-PR-21	01-PR-22	01-PR-23	01-PR-24
AC SYST. 4	01-391-AC-4	01-TC-10	01-TC-11	01-TC-12	01-PR-25	01-PR-26	01-PR-27	01-PR-28	01-PR-29	01-PR-30	01-PR-31	01-PR-32
AC SYST. 5	01-391-AC-5	01-TC-13	01-TC-14	01-TC-15	01-PR-33	01-PR-34	01-PR-35	01-PR-36	01-PR-37	01-PR-38	01-PR-39	01-PR-40
AC SYST. 6	01-391-AC-6	01-TC-16	01-TC-17	01-TC-18	01-PR-41	01-PR-42	01-PR-43	01-PR-44	01-PR-45	01-PR-46	01-PR-47	01-PR-48
AC SYST. 7	01-391-AC-7	01-TC-19	01-TC-20	01-TC-21	01-PR-49	01-PR-50	01-PR-51	01-PR-52	01-PR-53	01-PR-54	01-PR-55	01-PR-56
AC SYST. 8	01-391-AC-8	01-TC-22	01-TC-23	01-TC-24	01-PR-57	01-PR-58	01-PR-59	01-PR-60	01-PR-61	01-PR-62	01-PR-63	01-PR-64
AC SYST. 9	01-391-AC-9	01-TC-25	01-TC-26	01-TC-27	01-PR-65	01-PR-66	01-PR-67	01-PR-68	01-PR-69	01-PR-70	01-PR-71	01-PR-72
AC SYST. 10	01-391-AC-10	01-TC-28	01-TC-29	01-TC-30	01-PR-73	01-PR-74	01-PR-75	01-PR-76	01-PR-77	01-PR-78	01-PR-79	01-PR-80

SYSTEM	UNIT	TEMPERATURE	ST. PRESS.	PNEUMATIC	DAMPER	STEAM	WATER	HUMIDISTAT	FREEZE	ELECT. PNEUMAT.	OPPOSED	PHYS.
AC SYST. 1	01-391-AC-1	01-TC-1	01-TC-2	01-TC-3	01-PR-1	01-PR-2	01-PR-3	01-PR-4	01-PR-5	01-PR-6	01-PR-7	01-PR-8
AC SYST. 2	01-391-AC-2	01-TC-4	01-TC-5	01-TC-6	01-PR-9	01-PR-10	01-PR-11	01-PR-12	01-PR-13	01-PR-14	01-PR-15	01-PR-16
AC SYST. 3	01-391-AC-3	01-TC-7	01-TC-8	01-TC-9	01-PR-17	01-PR-18	01-PR-19	01-PR-20	01-PR-21	01-PR-22	01-PR-23	01-PR-24
AC SYST. 4	01-391-AC-4	01-TC-10	01-TC-11	01-TC-12	01-PR-25	01-PR-26	01-PR-27	01-PR-28	01-PR-29	01-PR-30	01-PR-31	01-PR-32
AC SYST. 5	01-391-AC-5	01-TC-13	01-TC-14	01-TC-15	01-PR-33	01-PR-34	01-PR-35	01-PR-36	01-PR-37	01-PR-38	01-PR-39	01-PR-40
AC SYST. 6	01-391-AC-6	01-TC-16	01-TC-17	01-TC-18	01-PR-41	01-PR-42	01-PR-43	01-PR-44	01-PR-45	01-PR-46	01-PR-47	01-PR-48
AC SYST. 7	01-391-AC-7	01-TC-19	01-TC-20	01-TC-21	01-PR-49	01-PR-50	01-PR-51	01-PR-52	01-PR-53	01-PR-54	01-PR-55	01-PR-56
AC SYST. 8	01-391-AC-8	01-TC-22	01-TC-23	01-TC-24	01-PR-57	01-PR-58	01-PR-59	01-PR-60	01-PR-61	01-PR-62	01-PR-63	01-PR-64
AC SYST. 9	01-391-AC-9	01-TC-25	01-TC-26	01-TC-27	01-PR-65	01-PR-66	01-PR-67	01-PR-68	01-PR-69	01-PR-70	01-PR-71	01-PR-72
AC SYST. 10	01-391-AC-10	01-TC-28	01-TC-29	01-TC-30	01-PR-73	01-PR-74	01-PR-75	01-PR-76	01-PR-77	01-PR-78	01-PR-79	01-PR-80

PRESSURE SWITCHES							BARKSDALE CO.	
SYSTEM	SWITCH NO.	SETS CONT.	MAX. MIN. PSI	SERVICE	SET POINT PRESS. (PSIG)	MODEL NO.	ORDER NO.	
S.B.H.E.	PS-303-204, 213, 244-2	1	1	NO OFF-ON SET P.	2.7	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
S.B.H.E.	PS-303-204, 213, 244-2	1	1	NO OFF-ON SET P.	2.7	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
S.B.H.E.	PS-303-204, 213, 244-2	1	1	NO OFF-ON SET P.	2.7	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
S.B.H.E.	PS-303-204, 213, 244-2	1	1	NO OFF-ON SET P.	2.7	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
S.B.H.E.	PS-303-204, 213, 244-2	1	1	NO OFF-ON SET P.	2.7	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.	2.1	40" W.G.P. (88%)	0.4 TO 0.5 PSI	
C.H.O.G.	PS-305-1	1	1	NO OFF-ON SET P.

A.C. SYSTEM NO. 4 (CLEAN AREA)

SEQUENCE OF OPERATION A.C. SYSTEM NO. 4

A.C. UNIT NO. 01-391-AC-15 AND RETURN AIR FAN NO. 01-391-FN-5
THIS UNIT AND FAN SHALL HAVE A COMMON START AND STOP SWITCH
EXHAUST FANS 01-391-FN-7, 01-391-FN-8 AND 01-391-FN-9
THESE FANS SHALL EACH HAVE A START AND STOP SWITCH
MANUAL SWITCH 01-SW-1 SHALL HAVE SUMMER-WINTER-AUTOMATIC
(SUMMER-WINTER) POSITION.
AUTOMATIC (SUMMER-WINTER) SELECTION:
TEMPERATURE CONTROLLER 01-TC-55 SHALL SET THE SYSTEM INTO THE
SUMMER CYCLE WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE THE
SET POINT AND SHALL SET THE SYSTEM INTO THE WINTER CYCLE WHEN
THE OUTSIDE AIR TEMPERATURE IS BELOW THE SET POINT.
WINTER CYCLE:
THE MINIMUM OUTSIDE AIR DAMPER 01-PD-1 THRU RELAY 01-EP-15 AND
CONTROL DAMPER MOTOR 01-DM-20 SHALL BE OPEN. TEMPERATURE
CONTROLLER 01-TC-54 SHALL CONTROL THE MODULATING DAMPER MOTORS
01-DM-27, 01-DM-28 AND 01-DM-29 TO POSITION THE OUTSIDE AIR
DAMPERS 01-OD-3, 01-OD-6 AND THE RETURN AIR DAMPER 01-OD-7 TO
MAINTAIN THE MIXED AIR SET TEMPERATURE. SUB-MASTER CONTROLLER
01-ETC-1 SHALL BE RESET BY THE OUTDOOR MASTER THERMOSTAT 01-OMT-1
AND SHALL MODULATE THE STEAM VALVE 01-SV-19 TO MAINTAIN THE HOT
DECK PLENUM SET TEMPERATURE ACCORDING TO AN ADJUSTABLE
SCHEDULE. THE CHILLED WATER VALVE 01-WV-15 SHALL BE CLOSED.
FREEZE PROTECTION THERMOSTAT 01-FT-5 ON A DROP BELOW ITS SET POINT SHALL
DEENERGIZE THE A.C. UNIT 01-391-AC-15, FAN 01-391-FN-5 AND ACTUATE THE LOCAL ALARM
SUMMER CYCLE:
THE MINIMUM OUTSIDE AIR DAMPER 01-PD-1 THRU RELAY 01-EP-15 AND
CONTROL DAMPER MOTOR 01-DM-20 SHALL BE OPEN. TEMPERATURE
CONTROLLER 01-TC-54 SHALL BE INOPERATIVE. THE HOT DECK STEAM
VALVE 01-SV-19 SHALL OPERATE (AS IN WINTER). CHILLED WATER VALVE 01-WV-15 SHALL
BE OPENED FULLY AND CHILLED WATER PUMP (SEE CH. WATER SYST) SHALL THRU SWITCH 01-40-1 START.
ZONE CONTROL:
ZONE THERMOSTATS 01-RT-5, 01-RT-6, 01-RT-7, 01-RT-8 AND 01-RT-9 SHALL
MODULATE THEIR RESPECTIVE ZONE (HOT-COLD) DAMPERS THRU DAMPER
MOTORS 01-DM-19, 01-DM-20, 01-DM-21, 01-DM-22 AND 01-DM-23
RESPECTIVELY, TO MAINTAIN THE SET ZONE TEMPERATURE.
SUMMER HUMIDITY CONTROL (ZONE 4 ONLY):
HUMIDISTAT 01-RH-15 SHALL THRU RELAY 01-PR-25 OVERIDE ZONE
THERMOSTAT 01-RT-5 TO CONTROL THE ZONE (HOT-COLD) DAMPERS AND
SHALL OPERATE REHEAT COIL STEAM VALVE 01-SV-20 TO MAINTAIN THE
THE HUMIDITY SET POINT.
FIRE ALARM WILL SHUT DOWN UNITS 01-391-AC-15 AND 01-391-FN-5

VENT. SYSTEM NO. 1 (WATER TREATMENT AREA)

SEQUENCE OF OPERATION VENTILATION SYSTEM NO. 1

SUPPLY UNIT 01-391-FN-1 AND EXHAUST FANS 01-391-FN-2, 3 & 4
THESE FANS SHALL HAVE A COMMON START-STOP SWITCH. WHEN THE SUPPLY
FAN 01-391-FN-1 IS ENERGIZED THE OUTSIDE AIR DAMPER 01-PD-2 SHALL
THRU SWITCH 01-EP-16 AND DAMPER MOTOR 01-DM-24 SHALL OPEN.
TEMPERATURE CONTROLLER 01-TC-35 SHALL MODULATE THE PREHEAT COIL STEAM
VALVE 01-SV-21 TO MAINTAIN THE LEAVING AIR TEMPERATURE AT THE SET POINT.
FREEZE PROTECTION THERMOSTAT (DOWNSTREAM OF THE PREHEAT COIL) SHALL
ACTUATE THE LOCAL ALARM WHEN THE TEMPERATURE DROPS BELOW THE SET
POINT. TEMPERATURE CONTROLLER 01-TC-36 SHALL MODULATE THE REHEAT
COIL STEAM VALVE 01-SV-22 TO MAINTAIN THE SUPPLY AIR TEMPERATURE
SET POINT. WHEN FAN 01-391-FN-1 IS DEENERGIZED STEAM VALVE
01-SV-22 SHALL CLOSE.

VENTILATION SYSTEM NO. 2 (ELECT. RMS.)

SEQUENCE OF OPERATION VENTILATION SYSTEM NO. 2

VENTILATION UNIT 01-391-UV-1 AND EXHAUST FAN 01-391-FN-5
THIS UNIT AND FAN SHALL HAVE A COMMON START-STOP SWITCH. THE
FRESH AIR INTAKE DAMPER 01-PD-3 SHALL THRU SWITCH 01-EP-25
AND DAMPER MOTOR 01-DM-25 OPEN WHEN THE SYSTEM IS
ENERGIZED. TEMPERATURE CONTROLLER 01-TC-37 SHALL MODULATE
STEAM VALVE 01-SV-23 TO MAINTAIN THE SUPPLY AIR TEMPERATURE
AT THE SET POINT. FREEZE PROTECTION THERMOSTAT 01-FT-7
(DOWNSTREAM) OF THE HEATING COIL SHALL SHUT DOWN 01-391-UV-1
WHEN THE TEMPERATURE DROPS BELOW THE SET POINT.
UPON A DROP BELOW THE SET POINT SWITCH 01-PS-1 OR A FIRE ALARM SHALL
DEENERGIZE EXH. FAN 01-391-FN-5 (01-391-FN-1).
UPON ELECTRICAL FAILURE OF EITHER 01-391-UV-1 OR
01-391-FN-5 THE OTHER SHALL BE DEENERGIZED AND THE
AUDIBLE AND VISUAL ALARM IN THE MAIN CONTROL ROOM SHALL
BE ACTUATED.

SEQUENCE OF OPERATION
CELL COOLING SYSTEM (PUMP EXCHANGER CELLS)

A DUAL THERMOSTAT IN EACH ROOM SHALL ENERGIZE THE UNIT COOLER FANS
WHEN THE SPACE TEMPERATURE REACHES 80°F; AND ACTUATE THE AUDIBLE
AND VISUAL ALARM ON THE PANEL IN THE MAIN CONTROL ROOM WHEN
AND IF TEMPERATURE REACHES 104°F.

TYPICAL CELL COOLING SYSTEM
(PUMP & HEAT EXCHANGER CELLS NO. 11, 12, 13 & 14)

SEQUENCE OF OPERATION
HEAT EXCHANGER CELLS EXHAUST STATIC
PRESSURE CONTROL DAMPER

UPON A DROP IN STATIC PRESSURE BELOW ITS SET POINT
STATIC PRESSURE REGULATOR 01-SPR-5 SHALL OPERATE
DAMPER MOTOR 01-DM-26 TO FULLY OPEN DAMPER 01-PD-4
TO BY PASS THE MANUAL BALANCE DAMPER.
DAMPER 01-PD-4 SHALL THRU DAMPER MOTOR 01-DM-26
OPEN ON FAILURE OF CONTROL AIR.

SYMBOL	LEGEND
DM	DAMPER MOTOR
OD	OPPOSED BLADE DAMPER
PD	PARALLEL BLADE DAMPER
EP	ELECTRIC PNEUMATIC RELAY
PE	PNEUMATIC ELECTRIC RELAY
SV	STEAM VALVE (PNEUMATIC)
WV	1 WAY VALVE (PNEUMATIC)
TC	TEMPERATURE CONTROLLER
BT	BOOM THERMOSTAT
PR	PNEUMATIC RELAY
SPR	STATIC PRESSURE REGULATOR
RH	HUMIDISTAT
SW	SUMMER-WINTER SWITCH
FN	FAN
ETC	SUBMASTER TEMPERATURE CONTROLLER
RA	DIRECT ACTING
RA	REVERSE ACTING
M	MAIN AIR
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
SBWE	SPECIAL BUILDING HOT EXHAUST
HOOG	OPEN HOT OFF GAS
CHOG	CLOSED HOT OFF GAS
HC	REHEAT COIL
WC	COOLING COIL
W	WINTER
S	SUMMER
PI	PRESSURE INDICATOR
AF	ABSOLUTE FILTER
F	FILTER
CF	CHARCOAL FILTER
RI	RADIOACTIVE INDICATOR
LL	LOW LIMIT
ET	ELECTRIC WIRING
ET	PNEUMATIC PIPING
FAI	FRESH AIR INTAKE
UC	UNIT COOLER
AC	AIR CONDITIONING UNIT
UV	HEATING & VENTILATING UNIT
PS	PRESSURE INDICATOR (WITH SWITCH)
RE	REFRIGERATION UNIT
STC	SUBMASTER THERMOSTAT
OMT	OUTDOOR MASTER THERMOSTAT
CU	CHILLED WATER SUPPLY
CR	CHILLED WATER RETURN
HC	HEATING COIL
ST	STATIC TIP
BD	BACK DRAFT DAMPER OR ADJUSTABLE RELIEF DAMPER
UH	UNIT HEATER
MD	MANUAL DAMPER
WG	WATER GAGE
POS	POSITION

- NOTES
- THIS DWG. IN CONJUNCTION WITH DWG. 1546-01-HV-3028 SUPERSEDES
VOID DWG. 1546-01-3001.
 - FOR INSTRUMENT AIR TIE-IN SEE DWG. 1546-05-U-7144
 - PRESSURE INDICATORS AT FILTERS SHALL INDICATE THE PRESS-
URE DIFFERENTIAL ACROSS THE CORRESPONDING FILTER.

UNIT HEATER	UNIT HEATER	UNIT HEATER	QUANTITY OF QUANT.	SET
NO.	NO.	NO.	NO.	TEMP.
01-390-UH-1	01-RT-15	G-1	1	60°
01-390-UH-2	01-RT-14	G-1	1	78°
01-390-UH-3	01-RT-15	101	1	60°
01-390-UH-4	01-RT-14	114	1	78°
01-390-UH-5	01-RT-17	103	1	60°
01-390-UH-6	01-RT-18	103	1	60°
01-390-UH-7	01-RT-19	211	1	60°
01-390-UH-8	01-RT-20	102	1	60°
01-390-UH-1	04-ET-1	GERM #1	1	70°
01-390-UH-2	04-ET-2	GERM #2	1	70°
01-390-UH-3	04-ET-3	SWITCH GERM	1	60°
01-390-UH-4	04-ET-4	"	1	60°
01-390-UH-5	04-ET-5	"	1	60°

UNIT HEATER
SEQUENCE OF OPERATION

ALL UNIT HEATERS AS SCHEDULED ABOVE.
EACH UNIT HEATER (FAN) SHALL HAVE A LOCAL START-STOP
SWITCH.
AUTOMATIC OPERATION:
UPON A DROP IN TEMPERATURE BELOW THE SET POINT
THE FAN WILL START. UPON A RISE IN TEMPERATURE ABOVE
THE SET POINT THE FAN SHALL STOP.

CERTIFIED
FOR CONSTRUCTION

S. & S. 346
DEPT. CHK.
ARCH. <i>[Signature]</i>
ELECT. <i>[Signature]</i>
H. & V. <i>[Signature]</i>
MECH. <i>[Signature]</i>
STRUC. <i>[Signature]</i>
UTIL. <i>[Signature]</i>
PROD. <i>[Signature]</i>

DRAWING NO. 1546-01-HV-3029		REV. 2
REFERENCE DRAWING	NO.	
REACTOR BLDG. MTG. & VENT. CONTROL DIAG.	1546-01-HV-3028	
REACTOR BLDG. ELEM. CONTROL DIAGS. HEV EQUIP.	1546-01-E-211C	
REACTOR BLDG. ELEM. CONTROL DIAGS. HEV EQUIP.	1546-01-E-211S	
REACTOR BLDG. STEAM & WATER FLOW DIAG.	1546-01-HV-3005	
REACTOR BLDG. AIR FLOW DIAGRAM	1546-01-HV-3001	
SPECIFICATION HEATING, VENT. & AIR COND. REF.	SECTION 100	
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY <i>[Signature]</i>	DATE 7-14-61	
UNION CARBIDE NUCLEAR COMPANY BY W.L. MORGAN DATE 7-26-61 U. S. ATOMIC ENERGY COMMISSION BY L.H. JACKSON DATE 7-28-61		
HIGH FLUX ISOTOPE REACTOR HEATING & VENTILATING REACTOR BUILDING CONTROL DIAGRAM		
DRAWN E.G. (A.E.M.) CHKD A.E.M. DATE 7-14-61		CONTRACT NO. 1546-01-HV-3029
DATE 7-14-61		REV.
SCALE 1/8"=1'-0"

FOR FAN COIL UNIT CABINET OR CONCEALED TYPE
TYPICAL DETAIL SEE DWG 1546-02-HV-3044

GROUND FLOOR PLAN
SCALE 1/8"=1'-0"

FOR FRESH AIR INTAKE DETAIL
SEE DETAIL NO. 1 DWG 1546-02-HV-3024

ROOF PLAN
SCALE 1/8"=1'-0"

SYMBOLS

- FAI FRESH AIR INTAKE
- R.F. ROOF EXHAUST FAN
- CR CEILING REGISTER
- TR TOP REGISTER
- BV BALANCING VALVE
- SCW SECONDARY COOLANT WATER
- HWS HOT WATER SUPPLY
- HWR HOT WATER RETURN
- H&CWS HOT & CHILLED WATER SUPPLY
- H&CWR HOT & CHILLED WATER RETURN
- P IN PIPE
- T IN PIPE TRENCH
- X ANCHORS
- PG PIPE GUIDE
- EJ EXPANSION JOINT

**CERTIFIED
FOR CONSTRUCTION**

OFFICE & MAINTENANCE BUILDING		1546-02-HV-3043
EQUIPMENT SCHEDULE		
DRAWING NO.	1546-02-HV-3043	REV.
REFERENCE DRAWING	NO.	
DUCTWORK DETAILS	1546-02-HV-3043	
OFFICE & MAINTENANCE BUILDING	1546-02-HV-3043	
SECTIONS & DETAILS	1546-02-HV-3043	
GROUND FLOOR & ROOF PLANS	1546-02-HV-3043	
ROOM FRAMING	1546-02-HV-3043	
OFFICE & MAINTENANCE BUILDING	1546-02-HV-3043	
GROUND FLOOR & ROOF PLANS	1546-02-HV-3043	
SPECIFICATION	HVAC	
SINGMASTER & BREYER		
METALLURGISTS & CHEMICAL ENGINEERS		
430 LEXINGTON AVE. NEW YORK 17, N. Y.		
[]		
U. S. ATOMIC ENERGY COMMISSION		
OAK RIDGE, TENNESSEE		
APPROVED		
BY	SINGMASTER & BREYER	DATE 3-9-61
BY	UNION CARBIDE NUCLEAR COMPANY	DATE 3-27-61
BY	C. E. WINTERS	DATE 3-27-61
BY	U. S. ATOMIC ENERGY COMMISSION	DATE 3-31-61
BY	R. B. SOMERS	DATE 3-31-61
HIGH FLUX ISOTOPE REACTOR		
OFFICE & MAINTENANCE BUILDING		
HEATING & VENTILATION		
GROUND FLOOR & ROOF PLAN		
DRAWN BY	AKC	DATE 3-9-61
CHECKED BY	M. M.	DATE 3-9-61
DATE	3-3-61	DRAWING NO.
SCALE	AS SHOWN	1546-02-HV-3043
REV.	1

REACTOR BLDG EQUIPMENT SCHEDULE	1546-00-HV-3026
REACTOR BLDG EQUIPMENT SCHEDULE	1546-00-HV-3027
STANDARD DUCTWORK DETAILS	1546-00-HV-3024
OPEN HOT OFF GAS	SECTION 62
CLOSED HOT OFF GAS	SECTION 62
SPECIAL BLDG. HOT EXHAUST SYST.	SECTION 67
EXHAUST STACK	SECTION 101
SHED OVER STACK BREECHING & FANS	1546-05-S-6073

DRAWING NO.	1546-05-HV-3052	REV.	3
REFERENCE DRAWING	NO.		
AIR FLOW DIAGRAMS	1546-01-HV-3001		
CONTROL DIAGRAMS	1546-01-HV-3018		
GENERAL ARRANGEMENT EXHAUST SYSTEM	1546-05-HV-3051		
EXHAUST STACK BREECHING & FANS	1546-05-HV-3053		
AREA NO. 5 FILTER PIT DETAILS	1546-05-HV-3054		

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
430 LEXINGTON AVE. NEW YORK 17, N.Y.

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED
BY J. C. SINGMASTER & BREYER DATE 3-9-61
BY C. E. WINTERS DATE 3-17-61

U. S. ATOMIC ENERGY COMMISSION
BY L. H. JACKSON DATE 3-21-61

HIGH FLUX ISOTOPE REACTOR
HEATING & VENTILATING
EXHAUST STACK BREECHING
& FANS

DRAWN	AKC	CHECKED	MM	DATE	4/1/61	NO.	3
DATE	3/10/61	DRAWING NO.	1546-05-HV-3052				
SCALE	3/8" = 1'-0"						

CERTIFIED
FOR CONSTRUCTION

1/4" STAINLESS STEEL PLATE CAP

1/2" ANCHOR BOLT

STACK CAP DETAIL

SEE DETAIL

SAT CAP

REFERENCE DWGS & SPECIFICATIONS	
SPECIAL BLDG. HOT EXH. SYSTEM	SECTION 67
EXHAUST STACK & BREECHING	SECTION 10

SHED OVER STACK BRESCING & FANS	1546-05-5
AIR FLOW DIAGRAMS	1546-01-4

DRAWING NO.	
1546-05-H&V-3053	
REFERENCE DRAWING	NO.

REFERENCE DRAWING	NO.
CONTROL DIAGRAMS	0546-01-REV-3028
	0546-01-000-1028

GENERAL ARRANGEMENT EXHAUST SYSTEM	1546-05-NLV
AREA NO 5 EXHAUST STACK BREACHING & FANG	1546-05-NLV

AREA NO 5 FILTER PIT DETAILS	1546-05-N4
OPEN & CLOSED HOT OFF GAS	SECTION 62

SPECIFICATION	REF.
SINGMASTER & BREYER	

420 LEXINGTON AVE. NEW YORK 17, N. Y.

U. S. ATOMIC ENERGY COMMISSIONOAK RIDGE, TENNESSEE

APPROVED
SINGMASTER & BREYER

BY J. C. Fennell DATE 3-7
UNION CARBIDE NUCLEAR COMPANY

46	BY	C. E. WINTERS	DATE 3-17
ENC.	U. S. ATOMIC ENERGY COMMISSION		

BY	L. H. JACKSON	DATE 8-21
HIGH FLUX ISOTOPE REACTOR		

1.7	HEATING & VENTILATING
-----	-----------------------

EXHAUST STACK

BREECHING FANS				
✓	DRAWN J.A.M.	CHKD M.M.	DATE 3/6/61	CONTRACT NO. AT-1011

DATE	1/12/61	DRAWING NO. 1546-05-H&V 3053
SCALE	AS NOTED	

S. & B. 546	
DEPT.	CHK.
ARCH.	<i>[Signature]</i>
ELECT.	<i>[Signature]</i>
H & V.	<i>[Signature]</i>

[illegible]

SIZE	PORT	A	B	C	D	E	F	FLANGE ANGLE
30"	14	29"	30"	36"	40"	30"	1 1/2"	5" x 3/8" x 1/2" STEEL
48"	4	47"	48"	56"	60"	48"	1 1/2"	6" x 4" x 1/2" STEEL

SPECIFICATION	SPECIAL BLDG. HOT EXHAUST	SECTION 67
SPECIFICATION	OPEN ENCLOSED HOT OFF GAS	SECTION 67
DRAWING NO.	1546-05-HV-3054	REV.
REFERENCE DRAWING	NO.	
FLOW EXHAUST	1546-05-U-7149	
LIQUID WASTE (PROCESS WASTE & ILW)	1546-05-S-6064	
SOLID WASTE & RESIN DISPOSAL	1546-05-HV-3051	
GENERAL ARRANGEMENT EXHAUST SYS.	1546-05-HV-3051	
FILTER PIT DETAILS	1546-05-HV-3051	
FILTER PIT DETAILS	1546-05-HV-3054	
SPECIFICATION	REF.	
SINGMASTER & BREYER		
METALLURGISTS & CHEMICAL ENGINEERS		
430 LEONOTON AVE.	NEW YORK 17, N. Y.	
U. S. ATOMIC ENERGY COMMISSION		
OAK RIDGE, TENNESSEE		
APPROVED		
BY	SINGMASTER & BREYER	DATE 6-2-61
BY	C. E. WINTERS	DATE 6-19-61
BY	U. S. ATOMIC ENERGY COMMISSION	
BY	R. B. SOMERS	DATE 6-20-61
H. A. V.		
HEATING & VENTILATING FILTER PIT DETAILS		
DRAWN A. T.	CHD	DATE 6-5-61
DATE 4-27-61	DRAWING NO.	1546-05-HV-3054
SCALE 3/8" = 1'-0"

NOTES:
1. FOR EMBEDDED PLATES SEE DRAWINGS
1546-05-5-004 & 1546-05-5-005

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO. 1546-05-H&V-3055		REV. 3
REFERENCE DRAWING NO.		
FILTER PITS & VENTILATING HEATING & VENTILATING FILTER PIT DETAILS		
AREA NO. 5 FILTER PIT DETAILS SPECIFICATION-OPEN & CLOSED HOT OFF GAS UTILITY PLAN - YARD PIPING		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED BY SINGMASTER & BREYER DATE 6-2-61		
BY C. S. WINTERS U. S. ATOMIC ENERGY COMMISSION DATE 6-20-61		
BY E. B. SOMERS DATE 6-20-61		
HIGH FLUX ISOTOPE REACTOR HEATING & VENTILATING FILTER PIT DETAILS		
DRAWN A.T. CHD DATE 4-18-61 SCALE AS NOTED		

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
1					1				
2					2				
3					3				
4					4				
5					5				
6					6				
7					7				
8					8				
9					9				
10					10

GENERAL NOTES

1- FOR INSTRUMENT APPLICATION NUMBER CONSTRUCTION, REFER TO SPECIFICATION SECTION 102.

2- FOR HOT WATER INJECTION SYSTEM AT TE-100-1A, 1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K, 1L, 1M, 1N, 1O, 1P, 1Q, 1R, 1S, 1T, 1U, 1V, 1W, 1X, 1Y, 1Z, 2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I, 2J, 2K, 2L, 2M, 2N, 2O, 2P, 2Q, 2R, 2S, 2T, 2U, 2V, 2W, 2X, 2Y, 2Z, 3A, 3B, 3C, 3D, 3E, 3F, 3G, 3H, 3I, 3J, 3K, 3L, 3M, 3N, 3O, 3P, 3Q, 3R, 3S, 3T, 3U, 3V, 3W, 3X, 3Y, 3Z, 4A, 4B, 4C, 4D, 4E, 4F, 4G, 4H, 4I, 4J, 4K, 4L, 4M, 4N, 4O, 4P, 4Q, 4R, 4S, 4T, 4U, 4V, 4W, 4X, 4Y, 4Z, 5A, 5B, 5C, 5D, 5E, 5F, 5G, 5H, 5I, 5J, 5K, 5L, 5M, 5N, 5O, 5P, 5Q, 5R, 5S, 5T, 5U, 5V, 5W, 5X, 5Y, 5Z, 6A, 6B, 6C, 6D, 6E, 6F, 6G, 6H, 6I, 6J, 6K, 6L, 6M, 6N, 6O, 6P, 6Q, 6R, 6S, 6T, 6U, 6V, 6W, 6X, 6Y, 6Z, 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, 7I, 7J, 7K, 7L, 7M, 7N, 7O, 7P, 7Q, 7R, 7S, 7T, 7U, 7V, 7W, 7X, 7Y, 7Z, 8A, 8B, 8C, 8D, 8E, 8F, 8G, 8H, 8I, 8J, 8K, 8L, 8M, 8N, 8O, 8P, 8Q, 8R, 8S, 8T, 8U, 8V, 8W, 8X, 8Y, 8Z, 9A, 9B, 9C, 9D, 9E, 9F, 9G, 9H, 9I, 9J, 9K, 9L, 9M, 9N, 9O, 9P, 9Q, 9R, 9S, 9T, 9U, 9V, 9W, 9X, 9Y, 9Z, 10A, 10B, 10C, 10D, 10E, 10F, 10G, 10H, 10I, 10J, 10K, 10L, 10M, 10N, 10O, 10P, 10Q, 10R, 10S, 10T, 10U, 10V, 10W, 10X, 10Y, 10Z, 11A, 11B, 11C, 11D, 11E, 11F, 11G, 11H, 11I, 11J, 11K, 11L, 11M, 11N, 11O, 11P, 11Q, 11R, 11S, 11T, 11U, 11V, 11W, 11X, 11Y, 11Z, 12A, 12B, 12C, 12D, 12E, 12F, 12G, 12H, 12I, 12J, 12K, 12L, 12M, 12N, 12O, 12P, 12Q, 12R, 12S, 12T, 12U, 12V, 12W, 12X, 12Y, 12Z, 13A, 13B, 13C, 13D, 13E, 13F, 13G, 13H, 13I, 13J, 13K, 13L, 13M, 13N, 13O, 13P, 13Q, 13R, 13S, 13T, 13U, 13V, 13W, 13X, 13Y, 13Z, 14A, 14B, 14C, 14D, 14E, 14F, 14G, 14H, 14I, 14J, 14K, 14L, 14M, 14N, 14O, 14P, 14Q, 14R, 14S, 14T, 14U, 14V, 14W, 14X, 14Y, 14Z, 15A, 15B, 15C, 15D, 15E, 15F, 15G, 15H, 15I, 15J, 15K, 15L, 15M, 15N, 15O, 15P, 15Q, 15R, 15S, 15T, 15U, 15V, 15W, 15X, 15Y, 15Z, 16A, 16B, 16C, 16D, 16E, 16F, 16G, 16H, 16I, 16J, 16K, 16L, 16M, 16N, 16O, 16P, 16Q, 16R, 16S, 16T, 16U, 16V, 16W, 16X, 16Y, 16Z, 17A, 17B, 17C, 17D, 17E, 17F, 17G, 17H, 17I, 17J, 17K, 17L, 17M, 17N, 17O, 17P, 17Q, 17R, 17S, 17T, 17U, 17V, 17W, 17X, 17Y, 17Z, 18A, 18B, 18C, 18D, 18E, 18F, 18G, 18H, 18I, 18J, 18K, 18L, 18M, 18N, 18O, 18P, 18Q, 18R, 18S, 18T, 18U, 18V, 18W, 18X, 18Y, 18Z, 19A, 19B, 19C, 19D, 19E, 19F, 19G, 19H, 19I, 19J, 19K, 19L, 19M, 19N, 19O, 19P, 19Q, 19R, 19S, 19T, 19U, 19V, 19W, 19X, 19Y, 19Z, 20A, 20B, 20C, 20D, 20E, 20F, 20G, 20H, 20I, 20J, 20K, 20L, 20M, 20N, 20O, 20P, 20Q, 20R, 20S, 20T, 20U, 20V, 20W, 20X, 20Y, 20Z, 21A, 21B, 21C, 21D, 21E, 21F, 21G, 21H, 21I, 21J, 21K, 21L, 21M, 21N, 21O, 21P, 21Q, 21R, 21S, 21T, 21U, 21V, 21W, 21X, 21Y, 21Z, 22A, 22B, 22C, 22D, 22E, 22F, 22G, 22H, 22I, 22J, 22K, 22L, 22M, 22N, 22O, 22P, 22Q, 22R, 22S, 22T, 22U, 22V, 22W, 22X, 22Y, 22Z, 23A, 23B, 23C, 23D, 23E, 23F, 23G, 23H, 23I, 23J, 23K, 23L, 23M, 23N, 23O, 23P, 23Q, 23R, 23S, 23T, 23U, 23V, 23W, 23X, 23Y, 23Z, 24A, 24B, 24C, 24D, 24E, 24F, 24G, 24H, 24I, 24J, 24K, 24L, 24M, 24N, 24O, 24P, 24Q, 24R, 24S, 24T, 24U, 24V, 24W, 24X, 24Y, 24Z, 25A, 25B, 25C, 25D, 25E, 25F, 25G, 25H, 25I, 25J, 25K, 25L, 25M, 25N, 25O, 25P, 25Q, 25R, 25S, 25T, 25U, 25V, 25W, 25X, 25Y, 25Z, 26A, 26B, 26C, 26D, 26E, 26F, 26G, 26H, 26I, 26J, 26K, 26L, 26M, 26N, 26O, 26P, 26Q, 26R, 26S, 26T, 26U, 26V, 26W, 26X, 26Y, 26Z, 27A, 27B, 27C, 27D, 27E, 27F, 27G, 27H, 27I, 27J, 27K, 27L, 27M, 27N, 27O, 27P, 27Q, 27R, 27S, 27T, 27U, 27V, 27W, 27X, 27Y, 27Z, 28A, 28B, 28C, 28D, 28E, 28F, 28G, 28H, 28I, 28J, 28K, 28L, 28M, 28N, 28O, 28P, 28Q, 28R, 28S, 28T, 28U, 28V, 28W, 28X, 28Y, 28Z, 29A, 29B, 29C, 29D, 29E, 29F, 29G, 29H, 29I, 29J, 29K, 29L, 29M, 29N, 29O, 29P, 29Q, 29R, 29S, 29T, 29U, 29V, 29W, 29X, 29Y, 29Z, 30A, 30B, 30C, 30D, 30E, 30F, 30G, 30H, 30I, 30J, 30K, 30L, 30M, 30N, 30O, 30P, 30Q, 30R, 30S, 30T, 30U, 30V, 30W, 30X, 30Y, 30Z, 31A, 31B, 31C, 31D, 31E, 31F, 31G, 31H, 31I, 31J, 31K, 31L, 31M, 31N, 31O, 31P, 31Q, 31R, 31S, 31T, 31U, 31V, 31W, 31X, 31Y, 31Z, 32A, 32B, 32C, 32D, 32E, 32F, 32G, 32H, 32I, 32J, 32K, 32L, 32M, 32N, 32O, 32P, 32Q, 32R, 32S, 32T, 32U, 32V, 32W, 32X, 32Y, 32Z, 33A, 33B, 33C, 33D, 33E, 33F, 33G, 33H, 33I, 33J, 33K, 33L, 33M, 33N, 33O, 33P, 33Q, 33R, 33S, 33T, 33U, 33V, 33W, 33X, 33Y, 33Z, 34A, 34B, 34C, 34D, 34E, 34F, 34G, 34H, 34I, 34J, 34K, 34L, 34M, 34N, 34O, 34P, 34Q, 34R, 34S, 34T, 34U, 34V, 34W, 34X, 34Y, 34Z, 35A, 35B, 35C, 35D, 35E, 35F, 35G, 35H, 35I, 35J, 35K, 35L, 35M, 35N, 35O, 35P, 35Q, 35R, 35S, 35T, 35U, 35V, 35W, 35X, 35Y, 35Z, 36A, 36B, 36C, 36D, 36E, 36F, 36G, 36H, 36I, 36J, 36K, 36L, 36M, 36N, 36O, 36P, 36Q, 36R, 36S, 36T, 36U, 36V, 36W, 36X, 36Y, 36Z, 37A, 37B, 37C, 37D, 37E, 37F, 37G, 37H, 37I, 37J, 37K, 37L, 37M, 37N, 37O, 37P, 37Q, 37R, 37S, 37T, 37U, 37V, 37W, 37X, 37Y, 37Z, 38A, 38B, 38C, 38D, 38E, 38F, 38G, 38H, 38I, 38J, 38K, 38L, 38M, 38N, 38O, 38P, 38Q, 38R, 38S, 38T, 38U, 38V, 38W, 38X, 38Y, 38Z, 39A, 39B, 39C, 39D, 39E, 39F, 39G, 39H, 39I, 39J, 39K, 39L, 39M, 39N, 39O, 39P, 39Q, 39R, 39S, 39T, 39U, 39V, 39W, 39X, 39Y, 39Z, 40A, 40B, 40C, 40D, 40E, 40F, 40G, 40H, 40I, 40J, 40K, 40L, 40M, 40N, 40O, 40P, 40Q, 40R, 40S, 40T, 40U, 40V, 40W, 40X, 40Y, 40Z, 41A, 41B, 41C, 41D, 41E, 41F, 41G, 41H, 41I, 41J, 41K, 41L, 41M, 41N, 41O, 41P, 41Q, 41R, 41S, 41T, 41U, 41V, 41W, 41X, 41Y, 41Z, 42A, 42B, 42C, 42D, 42E, 42F, 42G, 42H, 42I, 42J, 42K, 42L, 42M, 42N, 42O, 42P, 42Q, 42R, 42S, 42T, 42U, 42V, 42W, 42X, 42Y, 42Z, 43A, 43B, 43C, 43D, 43E, 43F, 43G, 43H, 43I, 43J, 43K, 43L, 43M, 43N, 43O, 43P, 43Q, 43R, 43S, 43T, 43U, 43V, 43W, 43X, 43Y, 43Z, 44A, 44B, 44C, 44D, 44E, 44F, 44G, 44H, 44I, 44J, 44K, 44L, 44M, 44N, 44O, 44P, 44Q, 44R, 44S, 44T, 44U, 44V, 44W, 44X, 44Y, 44Z, 45A, 45B, 45C, 45D, 45E, 45F, 45G, 45H, 45I, 45J, 45K, 45L, 45M, 45N, 45O, 45P, 45Q, 45R, 45S, 45T, 45U, 45V, 45W, 45X, 45Y, 45Z, 46A, 46B, 46C, 46D, 46E, 46F, 46G, 46H, 46I, 46J, 46K, 46L, 46M, 46N, 46O, 46P, 46Q, 46R, 46S, 46T, 46U, 46V, 46W, 46X, 46Y, 46Z, 47A, 47B, 47C, 47D, 47E, 47F, 47G, 47H, 47I, 47J, 47K, 47L, 47M, 47N, 47O, 47P, 47Q, 47R, 47S, 47T, 47U, 47V, 47W, 47X, 47Y, 47Z, 48A, 48B, 48C, 48D, 48E, 48F, 48G, 48H, 48I, 48J, 48K, 48L, 48M, 48N, 48O, 48P, 48Q, 48R, 48S, 48T, 48U, 48V, 48W, 48X, 48Y, 48Z, 49A, 49B, 49C, 49D, 49E, 49F, 49G, 49H, 49I, 49J, 49K, 49L, 49M, 49N, 49O, 49P, 49Q, 49R, 49S, 49T, 49U, 49V, 49W, 49X, 49Y, 49Z, 50A, 50B, 50C, 50D, 50E, 50F, 50G, 50H, 50I, 50J, 50K, 50L, 50M, 50N, 50O, 50P, 50Q, 50R, 50S, 50T, 50U, 50V, 50W, 50X, 50Y, 50Z, 51A, 51B, 51C, 51D, 51E, 51F, 51G, 51H, 51I, 51J, 51K, 51L, 51M, 51N, 51O, 51P, 51Q, 51R, 51S, 51T, 51U, 51V, 51W, 51X, 51Y, 51Z, 52A, 52B, 52C, 52D, 52E, 52F, 52G, 52H, 52I, 52J, 52K, 52L, 52M, 52N, 52O, 52P, 52Q, 52R, 52S, 52T, 52U, 52V, 52W, 52X, 52Y, 52Z, 53A, 53B, 53C, 53D, 53E, 53F, 53G, 53H, 53I, 53J, 53K, 53L, 53M, 53N, 53O, 53P, 53Q, 53R, 53S, 53T, 53U, 53V, 53W, 53X, 53Y, 53Z, 54A, 54B, 54C, 54D, 54E, 54F, 54G, 54H, 54I, 54J, 54K, 54L, 54M, 54N, 54O, 54P, 54Q, 54R, 54S, 54T, 54U, 54V, 54W, 54X, 54Y, 54Z, 55A, 55B, 55C, 55D, 55E, 55F, 55G, 55H, 55I, 55J, 55K, 55L, 55M, 55N, 55O, 55P, 55Q, 55R, 55S, 55T, 55U, 55V, 55W, 55X, 55Y, 55Z, 56A, 56B, 56C, 56D, 56E, 56F, 56G, 56H, 56I, 56J, 56K, 56L, 56M, 56N, 56O, 56P, 56Q, 56R, 56S, 56T, 56U, 56V, 56W, 56X, 56Y, 56Z, 57A, 57B, 57C, 57D, 57E, 57F, 57G, 57H, 57I, 57J, 57K, 57L, 57M, 57N, 57O, 57P, 57Q, 57R, 57S, 57T, 57U, 57V, 57W, 57X, 57Y, 57Z, 58A, 58B, 58C, 58D, 58E, 58F, 58G, 58H, 58I, 58J, 58K, 58L, 58M, 58N, 58O, 58P, 58Q, 58R, 58S, 58T, 58U, 58V, 58W, 58X, 58Y, 58Z, 59A, 59B, 59C, 59D, 59E, 59F, 59G, 59H, 59I, 59J, 59K, 59L, 59M, 59N, 59O, 59P, 59Q, 59R, 59S, 59T, 59U, 59V, 59W, 59X, 59Y, 59Z, 60A, 60B, 60C, 60D, 60E, 60F, 60G, 60H, 60I, 60J, 60K, 60L, 60M, 60N, 60O, 60P, 60Q, 60R, 60S, 60T, 60U, 60V, 60W, 60X, 60Y, 60Z, 61A, 61B, 61C, 61D, 61E, 61F, 61G, 61H, 61I, 61J, 61K, 61L, 61M, 61N, 61O, 61P, 61Q, 61R, 61S, 61T, 61U, 61V, 61W, 61X, 61Y, 61Z, 62A, 62B, 62C, 62D, 62E, 62F, 62G, 62H, 62I, 62J, 62K, 62L, 62M, 62N, 62O, 62P, 62Q, 62R, 62S, 62T, 62U, 62V, 62W, 62X, 62Y, 62Z, 63A, 63B, 63C, 63D, 63E, 63F, 63G, 63H, 63I, 63J, 63K, 63L, 63M, 63N, 63O, 63P, 63Q, 63R, 63S, 63T, 63U, 63V, 63W, 63X, 63Y, 63Z, 64A, 64B, 64C, 64D, 64E, 64F, 64G, 64H, 64I, 64J, 64K, 64L, 64M, 64N, 64O, 64P, 64Q, 64R, 64S, 64T, 64U, 64V, 64W, 64X, 64Y, 64Z, 65A, 65B, 65C, 65D, 65E, 65F, 65G, 65H, 65I, 65J, 65K, 65L, 65M, 65N, 65O, 65P, 65Q, 65R, 65S, 65T, 65U, 65V, 65W, 65X, 65Y, 65Z, 66A, 66B, 66C, 66D, 66E, 66F, 66G, 66H, 66I, 66J, 66K, 66L, 66M, 66N, 66O, 66P, 66Q, 66R, 66S, 66T, 66U, 66V, 66W, 66X, 66Y, 66Z, 67A, 67B, 67C, 67D, 67E, 67F, 67G, 67H, 67I, 67J, 67K, 67L, 67M, 67N, 67O, 67P, 67Q, 67R, 67S, 67T, 67U, 67V, 67W, 67X, 67Y, 67Z, 68A, 68B, 68C, 68D, 68E, 68F, 68G, 68H, 68I, 68J, 68K, 68L, 68M, 68N, 68O, 68P, 68Q, 68R, 68S, 68T, 68U, 68V, 68W, 68X, 68Y, 68Z, 69A, 69B, 69C, 69D, 69E, 69F, 69G, 69H, 69I, 69J, 69K, 69L, 69M, 69N, 69O, 69P, 69Q, 69R, 69S, 69T, 69U, 69V, 69W, 69X, 69Y, 69Z, 70A, 70B, 70C, 70D, 70E, 70F, 70G, 70H, 70I, 70J, 70K, 70L, 70M, 70N, 70O, 70P, 70Q, 70R, 70S, 70T, 70U, 70V, 70W, 70X, 70Y, 70Z, 71A, 71B, 71C, 71D, 71E, 71F, 71G, 71H, 71I, 71J, 71K, 71L, 71M, 71N, 71O, 71P, 71Q, 71R, 71S, 71T, 71U, 71V, 71W, 71X, 71Y, 71Z, 72A, 72B, 72C, 72D, 72E, 72F, 72G, 72H, 72I, 72J, 72K, 72L, 72M, 72N, 72O, 72P, 72Q, 72R, 72S, 72T, 72U, 72V, 72W, 72X, 72Y, 72Z, 73A, 73B, 73C, 73D, 73E, 73F, 73G, 73H, 73I, 73J, 73K, 73L, 73M, 73N, 73O, 73P, 73Q, 73R, 73S, 73T, 73U, 73V, 73W, 73X, 73Y, 73Z, 74A, 74B, 74C, 74D, 74E, 74F, 74G, 74H, 74I, 74J, 74K, 74L, 74M, 74N, 74O, 74P, 74Q, 74R, 74S, 74T, 74U, 74V, 74W, 74X, 74Y, 74Z, 75A, 75B, 75C, 75D, 75E, 75F, 75G, 75H, 75I, 75J, 75K, 75L, 75M, 75N, 75O, 75P, 75Q, 75R, 75S, 75T, 75U, 75V, 75W, 75X, 75Y, 75Z, 76A, 76B, 76C, 76D, 76E, 76F, 76G, 76H, 76I, 76J, 76K, 76L, 76M, 76N, 76O, 76P, 76Q, 76R, 76S, 76T, 76U, 76V, 76W, 76X, 76Y, 76Z, 77A, 77B, 77C, 77D, 77E, 77F, 77G, 77H, 77I, 77J, 77K, 77L, 77M, 77N, 77O, 77P, 77Q, 77R, 77S, 77T, 77U, 77V, 77W, 77X, 77Y, 77Z, 78A, 78B, 78C, 78D, 78E, 78F, 78G, 78H, 78I, 78J, 78K, 78L, 78M, 78N, 78O, 78P, 78Q, 78R, 78S, 78T, 78U, 78V, 78W, 78X, 78Y, 78Z, 79A, 79B, 79C, 79D, 79E, 79F, 79G, 79H, 79I, 79J, 79K, 79L, 79M, 79N, 79O, 79P, 79Q, 79R, 79S, 79T, 79U, 79V, 79W, 79X, 79Y, 79Z, 80A, 80B, 80C, 80D, 80E, 80F, 80G, 80H, 80I, 80J, 80K, 80L, 80M, 80N, 80O, 80P, 80Q, 80R, 80S, 80T, 80U, 80V, 80W, 80X, 80Y, 80Z, 81A, 81B, 81C, 81D, 81E, 81F, 81G, 81H, 81I, 81J, 81K, 81L, 81M, 81N, 81O, 81P, 81Q, 81R, 81S, 81T, 81U, 81V, 81W, 81X, 81Y, 81Z, 82A, 82B, 82C, 82D, 82E, 82F, 82G, 82H, 82I, 82J, 82K, 82L, 82M, 82N, 82O, 82P, 82Q, 82R, 82S, 82T, 82U, 82V, 82W, 82X, 82Y, 82Z, 83A, 83B, 83C, 83D, 83E, 83F, 83G, 83H, 83I, 83J, 83K, 83L, 83M, 83N, 83O, 83P, 83Q, 83R, 83S, 83T, 83U, 83V, 83W, 83X, 83Y, 83Z, 84A, 84B, 84C, 84D, 84E, 84F, 84G, 84H, 84I, 84J, 84K, 84L, 84M, 84N, 84O, 84P, 84Q, 84R, 84S, 84T, 84U, 84V, 84W, 84X, 84Y, 84Z, 85A, 85B, 85C, 85D, 85E, 85F, 85G, 85H, 85I, 85J, 85K, 85L, 85M, 85N, 85O, 85P, 85Q, 85R, 85S, 85T, 85U, 85V, 85W, 85X

GENERAL NOTES
1. FOR GENERAL NOTES & LEGEND, SEE DWG
#1546-I-4001

**CERTIFIED
FOR CONSTRUCTION**

[illegible]

1. FOR GENERAL NOTES & LEGEND,
SEE DWG. NO. 1546-I-4001.

NOTE:
THIS DRAWING IS FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL MAKE REFERENCE TO RELATED INSTRUMENTATION LAYOUT, EQUIPMENT DRAWINGS AND SPECIFICATIONS FOR ACTUAL EXTENT, SIZE, AND LOCATIONS OF SERVICES OR WORK TO BE FURNISHED AND INSTALLED UNDER THE CONTRACT.

CERTIFIED
 FOR CONSTRUCTION

EMG FLOW DIA. HIGH PRESSURE REACTOR DI. ORIENT. BYST.		1546-BLM-561	
DRAWING NO.		REV.	
1546-I-4003		1	
REFERENCE DRAWING	NO.		
WATER APPLICATION DIAGRAM	1546-I-4001		
PRIMARY COOLANT LOOP	1546-I-4005		
WATER SUB-COOLANT DIA. REACTOR	1546-I-4005		
WATER SUB-COOLANT DIA. REACTOR	1546-I-4005		
SECONDARY COOLING SYSTEM	1546-I-4009		
WATER SUB-COOLANT DIA. REACTOR	1546-I-4009		
TEMPERATURE LOG DIAGRAM	1546-TEMP-004		
DI. ORIENT. BYST. OR PRESSURE SYST.	102, 100, 8, 8, 100		
SPECIFICATION	REV.		
SINGMASTER & DRYER			
METALLURGISTS & CHEMICAL ENGINEERS			
420 LEONHART AVE. NEW YORK 17, N. Y.			
[FOR]			
U. S. ATOMIC ENERGY COMMISSION			
OAK RIDGE, TENNESSEE			
APPROVED			
SINGMASTER & DRYER			
BY	DATE 3-1-61		
UNION CARBIDE NUCLEAR COMPANY			
C. E. WINTERS			
DATE 3-30-61			
U. S. ATOMIC ENERGY COMMISSION			
BY	DATE 4-8-61		
L. H. JACKSON			
HIGH FLUX ISOTOPE REACTOR			
INSTRUMENT APPLICATION DIAGRAM			
REACTOR PRIMARY COOLANT			
CLEANUP SYSTEM			
DRAWN BY	CHECKED BY	DATE	NO. OF SHEETS
DATE 8-3-60	DRAWING NO.		
SCALE NONE	1546-I-4003		
			2

DRAWN <i>WACHSMAN</i>	CHECKED <i>ARW</i>	DATE <i>8-6-60</i>	CONTRACT NO. <i>47-100-1-1000</i>
DATE <i>8-2-60</i>	DRAWING NO. <i>1546-J-4005</i>		REV <i>2</i>
SCALE <i>NONE</i>

NOTE:
THIS DRAWING IS FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL MAKE REFERENCE TO RELATED INSTRUMENTATION, LAYOUT, EQUIPMENT DRAWINGS AND SPECIFICATIONS FOR ACTUAL EXISTENT SIZES AND LOCATIONS OF SERVICES OR WORK TO BE PURCHASED AND INSTALLED UNDER THE CONTRACT.

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO.		REV.
1546-T-4008		3
REFERENCE DRAWING		NO.
PROCESS WASTE T-710 T-715	1546-T-710	710
WASTEWATER TREATMENT SYSTEM	1546-T-715	715
EFFLUENT TREATMENT	1546-T-716	716
WASTEWATER TREATMENT	1546-T-717	717
INSTRUMENT LIST AND INDEX	1546-T-4008	
FLOW DIAGRAM - PROCESS WASTE T-710	1546-T-716	
SPECIFICATION SECTION	REV.	108, 109, 110, 111

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED
SINGMASTER & BREYER
DATE 3-1-64

BY *Don Russell* DATE *2-23-61*
UNION CARBIDE NUCLEAR COMPANY
BY *C. E. WINTERS* DATE *4-17-61*
U. S. ATOMIC ENERGY COMMISSION

BY L. H. JACKSON DATE 4-19-61
HIGH FLUX ISOTOPE REACTOR

INSTRUMENT APPLICATION DIAGRAM
INTERMEDIATE LEVEL & PROCESS
WASTE SYSTEMS

OWN ARN	OFFD GCF	DATE 1/6/61	CONTRACT NO. 1008
E 12/27/60	DRAWING NO.		1546-T-1008

NOTE:
FOR PAINT COLORS SEE DWG. RC11-S-2A & 2B & SPECIFICATIONS - SEC. 112

BILL OF MATERIAL

ITEM MARK NO.	QUAN.	DESCRIPTION
(1) 26		Indicating lamp with engraved lens for 115V operation. Lens to have word "OPEN" engraved in black letters on a green translucent background.
		H.B. Kirkland Co. Model # 150 with type CE lens engraving code No.7 and type 56 150 Bulb.
(2) 26		Indicating lamp same as item mark 1 except with word "CLOSED" engraved on a red translucent lens.
(3) 21		ONE Type 3B1-control switch, 1 stage, no escutcheon plate required, installed on panel so that only pilot grip handle extends beyond face of panel. Switch to have 3 positions, non-spring return with contact arrangement as shown in elementary #27 Dwg. #E-2125. Special mounting required. See DWG. RCH-1-B
(4) 4		ONE Type 3B1-control switch, 1 stage, no escutcheon plate required, installed on panel so that only pilot grip handle extends beyond face of panel. Switch to have 2 positions, non-spring return with contact arrangement as shown on elementary #27 Dwg. #E-2125. Special mounting required. See Dwg. RCH-1-B
(5) 1		One unit pushbutton station, momentary contact, one normally closed, one normally open contact, 115V operation, "STOP" flash lead, black button, Allen Bradley Bulletin 800T Cat. #A2A. Engraving to be black letters 3/16" high, white filled.
(6) 4		2 position backlighted Selector switch, escutcheon plate marked OFF-RESET-ON, Amber color lens, non-spring return 115V operation, contact arrangement to be as shown in elementary diagrams #6, #7, #89 Dwg. No. E-2117 furnished by Company.
(7) 6		3 position, backlighted selector switch, escutcheon plate marked STOP-R-START, spring return to "R" position from either START or STOP position, Amber color lens, 115V operation, contact arrangement as shown in elementary #19 & #22 Dwg. No. E-2117 furnished by Company.
(8) 3		Same as item mark 7 except contact arrangement as shown in elementary #6 Dwg. No. E-2117 & elementary #22 Dwg. No. E-2118 furnished by Company
(9) 4		Illuminated pushbutton station, 115V operation, 1 set of 1 normally open contact & 1 normally closed contact, lens 1/8" high marked STANDBY, Blue lens Daylight Corp. Sw. 152-11. Name Plate Shell Be 1/8" Lencoid, (Back facings 6 White Corol 1/8" x 1/8" With 1/8" Letters. Dwg. Rev. 1/8" x 1/8"
(10) 4		Same as item mark 5 except legend plate marked "TEST". See elementary #19, Dwg. E-2120
(11) 1		3 position, 2 stage selector switch, non-spring return, escutcheon plate marked "FU-A,B - FU-B,C - FU-C,C" - FU-C,C, A, pilot grip, contact arrangement as shown in elementary #23 Dwg. No. E-2120. General Electric Co. type 58-1.
(12) 2		Same as item mark 6 except escutcheon plate marked OFF-ON, contact arrangement as shown in elementary #17, Dwg. No. E-2119 Furnished by Company
(13) 1		Same as item mark 6 except escutcheon plate marked STOP-REMOTE CONTROL contact arrangement as shown in elementary #23 Dwg. No. E-2118 Furnished by Company
(14) 2		Same as item mark 7 except contact arrangement as shown in elementary #18 Dwg. No. E-2119. Furnished by Company.
(15) 1		Same as item mark 11 except 2 position, escutcheon plate marked FU-A-FU-B, contact arrangement as shown in elementary #18 Dwg. E-2119
(16) 1		Same as item mark 11 except 6 position, escutcheon plate marked FU-A,B,C - FU-B,C,D - FU-B,D,A - FU-D,A,B, contact arrangement as shown in elementary #19 Dwg. No. E-2120.
(17) 4		Same as item mark 7 except escutcheon plate marked OFF-AUTO-RUN, non-spring return, contact arrangement as shown in elementary #23 Dwg. No. E-2118. Furnished by company
(18) 2		Same as item mark 7 except escutcheon plate marked STANDBY-STOP-START, non-spring return, contact arrangement as shown in elementary #11 & #12 Dwg. No. E-2117.
(19) 8		Illuminated P.B. station, 115V operation, built in transformer for use with 6 volt bulb, 2 sets of tandem operated contact blocks, each contact block to have one normally open and one normally closed contact, legend plate marked "FAST-FORWARD" (Amber lens, CAT. #10250T-411-C23-11P36X, Outer-Hammer
(20) 8		Same as item mark 19 except legend plate marked SLOW-FORWARD, green lens, Outer-Hammer Cat. #10250T-411-C22-11P36X.
(21) 8		Same as item mark 19 except legend plate marked SLOW-REVERSE white lens, Outer-Hammer Cat. #10250T-411-C25-11P36X.
(22) 5		Same as item mark 7 except escutcheon plate marked OFF-AUTO-RUN contact arrangement as shown in elementary #16 Dwg. No. E-2118.
(23) 2		Voltmeter for pressurizer pump speed indication furnished to the Company by the pressurizer pump seller and furnished by the Company to the panel seller.
(24) 2		Potentiometer for pressurizer pump speed control furnished to the Company by pressurizer pump seller and furnished by the Company to the panel seller.

DIMENSIONS

* These switches to be installed so that when the pointer on the pistol grip is pointed in direction of green "OPEN" indicating light the valve controlled by the switch will open, And to operate similarly for the closed position.

NOTES:
1. For front view of annunciators which are located on top of this panel see DWG. # 1546-01-2-4039.

**CERTIFIED
FOR CONSTRUCTION**

← TAG
← QUANTITY & SCALE
← INSCRIPTION LEFT
← NAMEPLATE SIZE

NAME PLATE INSCRIPTION
(SHADED AREAS OR SYMBOLS)

S. & S. 546		BY	C. E. WINTERS	DATE 10-9-61
DEPT.	CHK.	U. S. ATOMIC ENERGY COMMISSION		
ARCH.		BY	L. H. JACKSON	DATE 10-6-61
ELECT.		HIGH FLUX ISOTOPE REACTOR		
H & V.				

PROCESS PANELBOARD "E"
GENERAL ARRANGEMENT & B/M

[illegible]

CUTOUT DETAIL
HALF SIZE
ITEM NO 35A

PLATE "E"
SCALE 1/8"=1'-0"
MAT'L. 10 ga. Sh. St.

- NOTES:
1. Provide 1/2" clearance between edges of all plates & console body.
 2. All plates fastened to console as shown in detail # 4 dng. I-9090.
 3. Cutout details are shown for reference only. Exact cutout dimensions to be verified by panel vendor.

CERTIFIED
FOR CONSTRUCTION

DRAWING NO. 1546-01-1-4023		REV. 2
REFERENCE DRAWING		NO.
REACTOR CONSOLE EQUIPMENT LIST		1546-01-1-4041
REACTOR CONSOLE CONSTRUCTION DETS.		1546-01-1-4090
REACTOR CONSOLE LAYOUT & DETAILS		1546-01-1-4022
SPECIFICATION REACTOR CONSOLE REF. SECTION 112		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY	SINGMASTER & BREYER	DATE 10/8/61
BY	UNION CARBIDE NUCLEAR COMPANY	DATE 10/9/61
BY	C.E. WINTERS	DATE 10/9/61
BY	U. S. ATOMIC ENERGY COMMISSION	DATE 10/23/61
BY	L.H. JACKSON	DATE 10/23/61
HIGH FLUX ISOTOPE REACTOR REACTOR CONSOLE INSTRUMENT ARRANGEMENT & CUTOUT DETAILS		
DRAWN BY	CHKD BY	DATE
DATE 10/27/61	DRAWING NO.	CONTRACT NO.
SCALE AS NOTED	1546-01-1-4023	2

NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.	DATE	APPR.	NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.	DATE	APPR.
1	ISSUED FOR BIDS											1	ISSUED FOR BIDS										
2	ORNL REVISIONS											2	ORNL REVISIONS										
3	CERTIFIED FOR CONSTRUCTION											3	CERTIFIED FOR CONSTRUCTION										
4	REVISIONS											4	REVISIONS										

Item	Equipment No.	Function	Manufacturer	Lens Type	Background	Engraving	Engraving Code No.	Name Plate
1A	FCPM1	No. 1 F.C. Position	G.E. Meter, Cat. No. 544X38					
1B	FCPM2	No. 2 F.C. Position	G.E. Meter, Cat. No. 544X38					
1C	FCPh13	No. 3 F.C. Position	G.E. Meter, Cat. No. 544X38					
2A	TH602, 603	No. 1 Shim Rod Position	Scientific-Atlanta, Inc. Model TU-6 Synchro Indicator					
2B	TH612, 613	No. 2 Shim Rod Position	Scientific-Atlanta, Inc. Model TU-6 Synchro Indicator					
2C	TH622, 623	No. 3 Shim Rod Position	Scientific-Atlanta, Inc. Model TU-6 Synchro Indicator					
2D	TH632, 633	No. 4 Shim Rod Position	Scientific-Atlanta, Inc. Model TU-6 Synchro Indicator					
2E	TH642, 643	No. 5 Shim Rod Position	Scientific-Atlanta, Inc. Model TU-6 Synchro Indicator					
3A	RRVM1	No. 1 Reg. Rod Velocity	International Instruments Inc., Meter Model 11A5 MC 100 DC UA					
3B	RRVM2	No. 2 Reg. Rod Velocity	International Instruments Inc., Meter Model 11A5 MC 100 DC UA					
3C	RRVM3	No. 3 Reg. Rod Velocity	International Instruments Inc., Meter Model 11A5 MC 100 DC UA					
4A	DLM1	No. 1 Demand Level	G.E. Meter, Cat. No. 544X38					
4B	DLM2	No. 2 Demand Level	G.E. Meter, Cat. No. 544X38					
4C	DLM3	No. 3 Demand Level	G.E. Meter, Cat. No. 544X38					
5	M422	Reg. Rod Position	G.E. Meter, Cat. No. 544X38					
6A	S-12	No. 1 Fission Chamber Insert-Mdr. Sv.	G.E. Type SB-10 Switch					
6B	S-13	No. 2 Fission Chamber Insert-Mdr. Sv.	G.E. Type SB-10 Switch					
6C	S-14	No. 3 Fission Chamber Insert-Mdr. Sv.	G.E. Type SB-10 Switch					
7	S-5	Shim Rod Drive Selector Sv.	G.E. Type SBM Switch					
8	S-7	Shim Rod Drive Switch	G.E. Type SBM Switch					
9	S-9	Shim Rod Test Switch	G.E. Type SBM Switch					
10	S-11	Group Servo Demand Sv.	G.E. Type SBM Switch					
11A	S-4B	Lower Servo Demand Switch No. 1	Allen Bradley Co., Cat. No. BCB					Lower Demand
11B	S-5B	Lower Servo Demand Switch No. 2	Allen Bradley Co., Cat. No. BCB					Lower Demand
11C	S-6B	Lower Servo Demand Switch No. 3	Allen Bradley Co., Cat. No. BCB					Lower Demand
12A	S-4A	Raise Servo Demand Switch No. 1	Allen Bradley Co., Cat. No. BCB					Raise Demand
12B	S-5A	Raise Servo Demand Switch No. 2	Allen Bradley Co., Cat. No. BCB					Raise Demand
12C	S-6A	Raise Servo Demand Switch No. 3	Allen Bradley Co., Cat. No. BCB					Raise Demand
13	I121	No. 1 Fission Chamber Insert Limit Ia.	H. R. Kirkland Co., No. 150 Unit	CE	White	Insert Limit	7	
13	I221	No. 2 Fission Chamber Insert Limit Ia.	H. R. Kirkland Co., No. 150 Unit	CE	White	Insert Limit	7	
13	I321	No. 3 Fission Chamber Insert Limit Ia.	H. R. Kirkland Co., No. 150 Unit	CE	White	Insert Limit	7	
14	I122	No. 1 Fission Chamber Wdr. Limit Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
14	I222	No. 2 Fission Chamber Wdr. Limit Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
14	I322	No. 3 Fission Chamber Wdr. Limit Lt.	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
14	I566	No. 1 Shim Rod Wdr. Limit Lt.	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
14	I567	No. 2 Shim Rod Wdr. Limit Lt.	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
14	I568	No. 3 Shim Rod Wdr. Limit Lt.	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
14	I569	No. 4 Shim Rod Wdr. Limit Lt.	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
14	I570	No. 5 Shim Rod Wdr. Limit Lt.	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
14	I421	Reg. Rod Wdr. Limit Lt.	H. R. Kirkland Co., No. 150 Unit	CE	White	Wdr. Limit	7	
15	I124	No. 1 Fission Chamber Auto Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Auto	7	
15	I224	No. 2 Fission Chamber Auto Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Auto	7	
15	I324	No. 3 Fission Chamber Auto Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Auto	7	
17	I416	No. 1 Shim Rod Seat Light	H. R. Kirkland Co., No. 150 Unit	CE	Green	Seat	7	
17	I417	No. 2 Shim Rod Seat Light	H. R. Kirkland Co., No. 150 Unit	CE	Green	Seat	7	

Item	Equipment No.	Function	Manufacturer	Lens Type	Background	Engraving	Engraving Code No.	Name Plate
17	I418	No. 3 Shim Rod Seat Light	H. R. Kirkland Co., No. 150 Unit	CE	Green	Seat	7	
17	I419	No. 4 Shim Rod Seat Light	H. R. Kirkland Co., No. 150 Unit	CE	Green	Seat	7	
18	I574	No. 1 Shim Rod Clutch Light	H. R. Kirkland Co., No. 150 Unit	CE	Red	Clutch	7	
18	I575	No. 2 Shim Rod Clutch Light	H. R. Kirkland Co., No. 150 Unit	CE	Red	Clutch	7	
18	I576	No. 3 Shim Rod Clutch Light	H. R. Kirkland Co., No. 150 Unit	CE	Red	Clutch	7	
18	I577	No. 4 Shim Rod Clutch Light	H. R. Kirkland Co., No. 150 Unit	CE	Red	Clutch	7	
19	I130	No. 1 Servo M. Light	H. R. Kirkland Co., No. 150 Unit	CE	White	M. Light	N-12, L-10	
19	I230	No. 2 Servo M. Light	H. R. Kirkland Co., No. 150 Unit	CE	White	M. Light	N-12, L-10	
19	I330	No. 3 Servo M. Light	H. R. Kirkland Co., No. 150 Unit	CE	White	M. Light	N-12, L-10	
20	I131	No. 1 Servo M. Light	H. R. Kirkland Co., No. 150 Unit	CE	White	M. Light	N-12, L-10	
20	I231	No. 2 Servo M. Light	H. R. Kirkland Co., No. 150 Unit	CE	White	M. Light	N-12, L-10	
20	I331	No. 3 Servo M. Light	H. R. Kirkland Co., No. 150 Unit	CE	White	M. Light	N-12, L-10	
21	I571	Auto Shim Insert Limit Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Shim Insert Limit	7	
22	I573	Auto Shim Wdr. Limit Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Shim Wdr. Limit	7	
23	S-1	Operate Switch (key)	G. E. Type SBM Switch					
24	S-5B	Auto Shim Computer By-pass Switch	G.E. Type SBM Switch					
25	S-10	Scram Switch	G.E. Type SBM Switch					
26	S-15	Scram Reset Switch	Allen Bradley Co., Cat. No. BCB					Scram Reset
27	S-50	Stop Auto Process Start Switch	Allen Bradley Co., Cat. No. BCB					Stop Auto Process Start
28	S-17	Annum. Reset Switch	Allen Bradley Co., Cat. No. BCB					Annum. Reset
29	S-16	Annum. Acknowledge Switch	Allen Bradley Co., Cat. No. BCB					Annum. Ack.
30	S-51	Start All Vital Pump Switch and Light	G.E. Type SBM Switch					Auto Process Start
31	S-2	Start Request Switch and Light	Dialight Corp., No. SW50-2					Start Request
32	S-3	Run Switch and Light	Dialight Corp., No. SW50C-3					Run
33	I579	Start Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Start	7	
34	I581	Servo On Light	H. R. Kirkland Co., No. 150 Unit	CE	White	Servo On	7	
35	TI-1040	Temperature Indicator	Hewlett Instrument Co., Inc.					
36	S-18	No. 1 Channel That Permit Switch	G.E. Type SBM					
37	S-20	No. 2 Channel That Permit Switch	G.E. Type SBM					
38	S-21	No. 3 Channel That Permit Switch	G.E. Type SBM					
39	MS-100-1A	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Inlet Temp.
40	MS-100-2A	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Outlet Temp.
41	MS-100-1	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Pri. Flow
42	MS-100-2	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Pri. Press.
43	MS-100-3	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Spare
44	MS-100-4	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Spare
45	MS-100-5A	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Inlet Temp.
46	MS-100-2B	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Outlet Temp.
47	MS-100-2	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Pri. Flow
48	MS-100-2A	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Pri. Press.
49	MS-100-2	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Spare
50	MS-100-2	Safety Test Switch	Allen Bradley Co., Cat. No. AAB					Spare

NO.	REVISIONS	BY	CHK	DATE	APP. DATE	DATE	DATE	NO.	REVISIONS	BY	CHK	DATE	APP. DATE	DATE	DATE	NO.

NO.	REVISIONS	BY	CHK	DATE	APP. DATE	DATE	DATE	NO.	REVISIONS	BY	CHK	DATE	APP. DATE	DATE	DATE	NO.

NO.	REVISIONS	BY	CHK	DATE	APP. DATE	DATE	DATE	NO.	REVISIONS	BY	CHK	DATE	APP. DATE	DATE	DATE	NO.

DRAWING NO.		1546-01-1-4041		REV.	4
REFERENCE DRAWING		NO.			
REACTOR CONSOLE-CONST. DETAILS 1546-01-1-4040 REACTOR CONSOLE INST. REPT. (CURRENT) 1546-01-1-4023 SPECIFICATION REACTOR CONTROL CONSOLE REF. SECTION 118					
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.					
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE					
APPROVED					
BY		DATE		DATE	
BY		DATE		DATE	
BY		DATE		DATE	
HIGH FLUX ISOTOPE REACTOR REACTOR CONSOLE EQUIPMENT LIST					
DRAWN C. B.		CHECKED J. B.		DATE	
DATE		DATE		DATE	
SCALE		DRAWING NO.		REV.	
1546-01-1-4041				4

CERTIFIED
FOR CONSTRUCTION

P	POOL LININGS- PLAN & ELEV.	1546-01-M-5015
Q	SPECIAL BLDG HOT EXHAUST SYSTEM	1546-01-M-5018
R	SERVICE STATION	1546-01-M-5025
S	CRITICAL FACILITY POOL GATE ASSY	1546-01-M-5026
T	EXP. FACILITIES-HORIZONTAL SECTION	1546-01-M-5022
U	EXP. FACILITIES-VERTICAL SECTION	1546-01-M-5021
V	DEFECTIVE FUEL ELEMENT STATION	1546-01-M-5019

SPECIFICATION		REF.	1
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.			
FOR			
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
APPROVED			
BY	SINGMASTER & BREYER <i>P. C. Winters</i>		DATE 6-11-61
BY	UNION CARBIDE NUCLEAR COMPANY C. E. WINTERS		DATE 6-28-61
BY	U. S. ATOMIC ENERGY COMMISSION L. H. JACKSON		DATE 6-30-61
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING			
ISOMETRIC OF POOL AREA			
DRAWN H. J. KENNEDY		CHECKED B. C. F.	DATE 12-20-60
SCALE 1/4" = 1'-0"		DRAWING NO.	1546-01-M-5011
		REV.	0

NOTE:
1. SEE DWG. NO. 1546-01-M-5023 FOR
DETAILS OF FABRICATION.

**CERTIFIED
FOR CONSTRUCTION**

COVER "A" - TAG. NO. 01-470-PC-15
COVER "B" - TAG. NO. 01-470-PC-16

DRAWING NO. 1546-01-M-5012		REV. 0
REFERENCE DRAWING		NO.
BRIDGE & COVER CONTROL DIAGRAM		1546-01-M-5023
POOL COVER - SECT. & DETAILS		1546-01-M-5023
PERSONNEL BRIDGE GENL. ARR'Y		1546-01-M-5014
SPECIFICATION		REF. SECTION 350
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEONINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED SINGMASTER & BREYER DATE 2-24-61		
BY C. E. WINTERS DATE 3-13-61		
U. S. ATOMIC ENERGY COMMISSION R. B. SOMERS DATE 3-15-61		
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING POOL COVER ASSEMBLY		
DRAWN G.C.F. CHECKED H.W. DATE 11-21-60		DRAWING NO. 1546-01-M-5012
DATE 11-21-60		SCALE AS NOTED

GENERAL NOTES:

1. WELDED CONSTRUCTION UNLESS OTHERWISE NOTED.
2. ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE NOTED.
3. MATERIAL SHALL BE CARBON STEEL IN ACCORDANCE WITH SPECIFICATION SECTION 32.
4. ALL EXPOSED CARBON STEEL SURFACES SHALL BE PREPARED, CLEANED & PAINTED IN ACCORDANCE WITH SPECIFICATION SECTION 32 UNLESS OTHERWISE NOTED.
5. TOLERANCES UNLESS OTHERWISE NOTED SHALL BE 1/16".
6. FOR ELECTRICAL POWER & CONTROL CIRCUIT SEE DWG. 1546-OI-M-2044.
7. FOR BRIDGE & COVER TRAVEL CONTROL DIAGRAM SEE DWG. 1546-OI-M-5052.
8. ALL WELDS TO BE GROUND SMOOTH.

POWER & CONTROL LAYOUT PERSONNEL BRIDGE 1546-OI-M-2044

DRAWING NO. 1546-OI-M-5014 REV. 1

REFERENCE DRAWING	NO.
PERSONNEL BRIDGE & COVER TRAVEL CONTROL DIAG.	1546-OI-M-5052
PERSONNEL BRIDGE - TOOL CARRIAGE ASSY & DET.	1546-OI-M-5026
PERSONNEL BRIDGE - PLATFORM ASSY & DET.	1546-OI-M-5027
PERSONNEL BRIDGE - TRUCK ASSY & DET.	1546-OI-M-5028
PERSONNEL BRIDGE - DRIVE ASSY & DET.	1546-OI-M-5030
SPECIFICATION	REF. SECTION 32

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK 17, N. Y.

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED

BY SINGMASTER & BREYER DATE 4-13-61

BY C. E. WINTERS DATE 4-24-61

BY L. H. JACKSON DATE 4-26-61

HIGH FLUX ISOTOPE REACTOR

REACTOR BUILDING

PERSONNEL BRIDGE

GENERAL ARRANGEMENT

DRAWN M. J. P. CHECKED J. P. DATE 3-1-61

SCALE 1/8"=1'-0"

DRAWING NO. 1546-OI-M-5014

REV. 1

CERTIFIED
FOR CONSTRUCTION

NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.	NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.	NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.	NO.
1	ADDED NOTE #B										1	ADDED NOTE #B										1	ADDED NOTE #B							
2	CERTIFIED FOR CONSTRUCTION										2	CERTIFIED FOR CONSTRUCTION										2	CERTIFIED FOR CONSTRUCTION							
3	ISSUED FOR TITLE II APPROVAL										3	ISSUED FOR TITLE II APPROVAL										3	ISSUED FOR TITLE II APPROVAL

- GENERAL NOTES:
1. WELDED CONSTRUCTION UNLESS OTHERWISE NOTED.
 2. ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE NOTED.
 3. TOLERANCES UNLESS OTHERWISE NOTED SHALL BE ± .015.
 4. BOLTING SPECIFICATIONS:
 - a) ALL BOLTS & STUDS SHALL CONFORM TO ASTM A 193-60T, GR. B8, TYPE 304 S.S.T.
 - b) ALL NUTS SHALL CONFORM TO ASTM A 193-60T, GR. B8, TYPE 304 S.S.T.
 5. ALL WELDS TO BE GROUND SMOOTH

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO. 1546-M-10-5015		REV. 2
REFERENCE DRAWING NO.		
FUEL ELEMENT SEAT FOR REACTOR POOL		1546-01-M-5026
SPECIFICATION		SECTION 35
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY	SINGMASTER & BREYER	DATE 4-30-61
BY	C. E. WINTERS	DATE 5-5-61
BY	U. S. ATOMIC ENERGY COMMISSION	DATE 5-13-61
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING FUEL ELEMENT SEATS FOR CLEAN POOLS		
DRAWN BY		DATE 8-29-66
SCALE 1/4\"/>		1546-M-10-5015

1. FOR SECTIONS & DETAILS SEE DWG.
154G-01-M-5040
2. SEE SECTION 34 OF THE CONTRACT
SPECIFICATION FOR MATERIALS,
FABRICATION, WELDING, INSTALLATION,
& TESTING.

PLATFORM "A" - TAG NO 01-470-TP-21
PLATFORM "B" - TAG NO 01-470-TP-22

[illegible]

KEY PLAN

NOTE: TWO (2) SEPARATION GATES
 GATE "A" - ONE (1) REQ'D AS SHOWN
 GATE "B" - ONE (1) REQ'D WITHOUT 3'-6" x 3'-6" SLIDE GATE IN BOTTOM SECTION

POOL SEPARATION GATE "A" TAG NO. 01-470-PG-23
 POOL SEPARATION GATE "B" TAG NO. 01-470-PG-24
 CRITICAL FACILITY POOL GATE TAG NO. 01-470-PG-25

NOTES:
 1. OVERALL GATE TOLERANCES TO BE $\pm \frac{1}{4}$ ".
 CLEARANCE BETWEEN GATE AND ABUTMENT GUIDE TO BE HELD TO $\frac{1}{8}$ " AS SHOWN ON SECTION "C-C" DWG. NO. 1546-01-M-5029.
 2. FOR MATERIAL & INSTALLATION SEE SPECIFICATION SECTION 31 POOL GATES

CRITICAL FACILITY POOL GATE ASSY 1546-01-M-5025	
POOL SEPARATION GATES-UPPER GATE SECTION 1546-01-M-5049	
" " " " LOWER GATES 1546-01-M-5048	
DRAWING NO.	REV.
1546-01-M-5018	1
REFERENCE DRAWING	
POOL SEPARATION GATES-AUX. SLIDE GATE 1546-01-M-5047	
" " " " AUX. SLIDE GATE 1546-01-M-5046	
" " " " SECTIONS & DETAILS 1546-01-M-5029	
" " " " ABUTMENT GUIDE ASSY 1546-01-M-5020	
POOL SEPARATION GATES-AUX. SLIDE GATE 1546-01-M-5039	
SPECIFICATION REF. SECTION 31	
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N. Y.	
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE	
APPROVED	
BY SINGMASTER & BREYER DATE 5-4-61	
BY C. E. WINTERS DATE 5-19-61	
BY U. S. ATOMIC ENERGY COMMISSION DATE 6-2-61	
BY L. H. JACKSON DATE 6-2-61	
HIGH FLUX ISOTOPE REACTOR REACTOR BLDG. POOL SEPARATION GATES GENERAL ARRANGEMENT	
DRAWN C.C.F. CHKD H.R. DATE 12-6-60	
DATE 12-6-60	
SCALE 1" = 1'-0"	
1546-01-M-5018	
1	

NO.	REVISIONS	BY	CHK.	DATE	APP.	DATE	APP.	DATE	APP.	DATE	NO.	REVISIONS	BY	CHK.	DATE	APP.	DATE	APP.	DATE	APP.	DATE	NO.
1	ADDED CRITICAL FACILITY POOL GATE	DB	OLF	3-1-61	H.R.							2	ISSUED FOR TITLE II APPROVAL	W.W.	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61
3	ISSUED FOR TITLE I APPROVAL	W.W.	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	ISSUED FOR TITLE I PRELIMINARY PROPOSAL	W.W.	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61
4	RE-ISSUED FOR TITLE I APPROVAL	W.W.	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	RE-ISSUED FOR TITLE I APPROVAL	W.W.	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61	W.R.	7-5-61

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO. 1546-01-M-5020		REV. 1
REFERENCE DRAWING	NO.	
POOL SEPARATION GATES - UPPER SECTIONS	1546-01-M-5019	
POOL SEPARATION GATES - LOWER SECTIONS	1546-01-M-5048	
POOL SEPARATION GATES SECT. & DETLS	1546-01-M-5029	
POOL SEPARATION GATES GEN'L. ARRGT.	1546-01-M-5018	
SPECIFICATION	REF. SECTION 31	
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED SINGMASTER & BREYER		
BY <i>P. C. RUSSELL</i>	DATE 5-4-61	
BY C. E. WINTERS	DATE 5-26-61	
BY L. H. JACKSON	DATE 5-29-61	
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING POOL SEPARATION GATES ABUTMENT GUIDE ASSEMBLY & DETAILS		
DRAWN J.F.	CHECKED OLP	DATE 4-14-61
DATE 3-10-61	DRAWING NO.	1546-01-M-5020
		REV. 1

- GENERAL NOTES
- 1 SEE DWG. NO. 1546-01-M-5011 FOR MECHANICAL EQUIPMENT.
 - 2 SEE DWG. NO. 1546-01-M-5536 FOR PIPING, MEV AND ELECTRICAL SERVICES.
 - 3 THIS DWG. VALID ONLY FOR SERVICES TO EXPERIMENTAL BEAM HOLE PORTS.

CERTIFIED
FOR CONSTRUCTION

1546-01-M-5021	
DRAWING NO.	
1546-01-M-5021	
REV.	
0	
REFERENCE DRAWING	
NO.	
HORIZONTAL BEAM PLUG	
1546-01-M-5056	
ION CHAMBER TUBE ASSEMBLY	
1546-01-M-5059	
ENGINEERING FACILITY TUBE	
LINERS & PLUGS ASSEMBLY	
1546-01-M-5032	
HOR. BEAM HOLE LINER ASSEMBLY	
1546-01-M-5080	
REACTOR TEMPERATURE FACILITY LAYER	
1546-01-M-5032	
HORIZONTAL SECTION	
REF. SECTION 33	
SYMBOLIZATION	
SINGMASTER & BREYER	
METALLURGISTS & CHEMICAL ENGINEERS	
430 LEXINGTON AVE. NEW YORK 17, N. Y.	
OAK RIDGE, TENNESSEE	
APPROVED	
SINGMASTER & BREYER	
DATE 5-24-61	
BY C. E. WINTERS	
DATE 6-6-61	
U. S. ATOMIC ENERGY COMMISSION	
DATE 6-28-61	
BY L. H. JACKSON	
DATE 6-28-61	
HIGH FLUX ISOTOPE REACTOR	
REACTOR EXPERIMENTAL	
FACILITY LAYOUT	
VERTICAL SECTION A-A	
DRAWN BY C. E. WINTERS	
CHECKED BY L. H. JACKSON	
DATE 9-26-60	
DRAWING NO.	
1546-01-M-5021	
SCALE 3/4" = 1'-0"

TAG NO. 01-470-FES-19
(ONE ASSEMBLY REQD.)

	REFERENCE DRAWING	NO.
FUEL ELEMENT SEAT FOR CLEAN POOL		1546-01-M-50
SPECIFICATION	REV.	SECTION 3.5
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N. Y.</p>		
<p align="center">[REV.]</p>		
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p>		
<p align="center">OAK RIDGE, TENNESSEE</p>		
<p align="center">APPROVED</p>		
	<p align="center">SINGMASTER & BREYER</p>	
BY	<i>J. Russell</i>	DATE 4-26-54
	<p align="center">UNION CARBIDE NUCLEAR COMPANY</p>	
BY	C. E. WINTERS	DATE 4-28-54
	<p align="center">U. S. ATOMIC ENERGY COMMISSION</p>	
BY	L. H. JACKSON	DATE 5-8-54
<p align="center">HIGH FLUX ISOTOPE REACTOR</p>		
<p align="center">REACTOR BUILDING</p>		
<p align="center">FUEL ELEMENT SEAT</p>		
<p align="center">FOR REACTOR POOL.</p>

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO.	1546-01-M-5050	REV.	2
REFERENCE DRAWING	NO.		
HEV FIRST FLOOR PLAN	1546-01-M-3006		
ELECTRICAL CIRCUIT & JUNCTION BOX DETAILS	1546-01-E-2052		
ION CHAMBER TUBE DETAILS & SECTION A	1546-01-M-5051		
SPECIFICATION	REV. SECTION 33		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y.			
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
APPROVED SINGMASTER & BREYER			
BY	<i>[Signature]</i>	DATE	5-4-61
BY	C. E. WINTERS	DATE	5-29-61
BY	U. S. ATOMIC ENERGY COMMISSION	DATE	6-5-61
BY	L. H. JACKSON	DATE	6-5-61
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING ION CHAMBER TUBE ASSEMBLY.			
DRAWN	J. F.	CHECKED	<i>[Signature]</i>
DATE	4-13-61	DRAWING NO.	1546-01-M-5050
SCALE	1/2" = 1'-0"	REV.	2

S. & B. 546	
DEPT.	CHK.
ARCH.	
ELECT.	
H & V.	
INST.	
MECH.	<i>del</i>
STRUC.	M.L.S.

095

NO.	REVISIONS	BY	CHK.	DATE	DESCRIPTION
1	AS SHOWN	W. J. B.	W. J. B.	12/10/59	ISSUED FOR CONSTRUCTION
2	ADD TO 1	W. J. B.	W. J. B.	1/14/60	ADD TO 1
3	ADD TO 2	W. J. B.	W. J. B.	1/14/60	ADD TO 2
4	ADD TO 3	W. J. B.	W. J. B.	1/14/60	ADD TO 3
5	ADD TO 4	W. J. B.	W. J. B.	1/14/60	ADD TO 4
6	ADD TO 5	W. J. B.	W. J. B.	1/14/60	ADD TO 5

CERTIFIED
FOR CONSTRUCTION

LEGEND

- CHECK VALVE
- GATE VALVE
- PLUG VALVE
- GLOBE VALVE
- CONTROL VALVE
- DIAPHRAGM VALVE
- RELIEF VALVE
- STRAINER
- TRAP
- EJECTOR
- ROTOMETER
- MOTOR CONTROL VALVE
- HAND CONTROL VALVE
- LINE BLIND
- ORIFICE
- BUTTERFLY VALVE

NOTE
FOR ADDITIONAL INSTRUMENT LEGEND
REFER TO INSTRUMENT APPLICATION
SPEC.

REFERENCE DRAWINGS

1546-01-M-5501	1546-01-M-5502	1546-01-M-5503	1546-01-M-5504
1546-01-M-5505	1546-01-M-5506	1546-01-M-5507	1546-01-M-5508
1546-01-M-5509	1546-01-M-5510	1546-01-M-5511	1546-01-M-5512
1546-01-M-5513	1546-01-M-5514	1546-01-M-5515	1546-01-M-5516
 
1546-01-M-5585	1546-01-M-5586	1546-01-M-5587	1546-01-M-5588
1546-01-M-5589	1546-01-M-5590	1546-01-M-5591	1546-01-M-5592
1546-01-M-5593	1546-01-M-5594	1546-01-M-5595	1546-01-M-5596
1546-01-M-5597	1546-01-M-5598	1546-01-M-5599	1546-01-M-5600

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
400 LEXINGTON AVE. NEW YORK 17, N. Y.

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED
BY *[Signature]* DATE 3-3-61
BY *[Signature]* DATE 4-4-61
BY *[Signature]* DATE 4-10-61

ENGINEERING FLOW DIAGRAM
SECONDARY COOLANT PLANT DEMINERALIZER
WATER SYSTEMS

DRAWING NO. 1546-01-M-5502
DATE 11-30-60
SCALE 1/8" = 1'-0"

No.	REVISIONS						BY	CHEKED	APPROVED	DATE	APPROVED	DATE	NO.

KEY PLAN
SCALE 1"=50'-0"

S. & S. 546	
DEPT.	CIN
ARCH.	2F
FICT.	73
H & V.	2A
INST.	104
MECH.	2A/2
STRUC.	103-1
UTIL.	2F
	26

- GENERAL NOTES**
1. FOR DETAILS SEE DWG. 1546-01-M-5518
 2. FLOOR DRAINS ON GROUND, FIRST & SECOND FLOORS SHALL BE FURNISHED WITH BACKWATER VALVES.
 3. TOP OF ROOF DE. TO BE 1/2" BELOW FINISHED FLOOR UNLESS OTHERWISE NOTED.
 4. HORIZONTAL DRAINAGE PIPING TO BE INSTALLED WITH A SLOPE OF 1/8" PER FT. UNLESS OTHERWISE NOTED.
 5. ALL PND PIPING MATERIAL TO BE EXTRA HEAVY G.I. SOIL PIPE & FITTINGS. BURIED PIPING TO BE DURABLE UNLESS OTHERWISE NOTED.
 6. ALL I.L.W. PIPING MATERIAL TO BE STAINLESS STEEL.
 7. FOR DETAIL OF VENT STACK PIPING ABOVE ROOF SEE DWG. 1546-01-M-5518.
 8. HORIZONTAL SOIL DRAINAGE PIPING NOT BURIED SHALL BE SUPPORTED USING PIPE SUPPORT PS-8 WITH TYPE NO. 3 TOP CONNECTION SHOWN ON DWG. 1546-01-M-5518.
 9. SUPPORT EVERY BRANCH JUNCTION, CHANGE IN LINE DIRECTION & BRANCH TERMINALS. SPACING OF SUPPORTS SHALL NOT EXCEED 3 FEET.
 10. VERTICAL LINES PASSING THRU FLOOR SHALL BE SUPPORTED BY MEANS OF PIPE SUPPORT PS-12 SHOWN ON DWG. 1546-01-M-5518.
 11. USE PS-3 FOR VERTICAL GUIDANCE, AT INTERVALS NOT EXCEEDING 10 FEET.
 12. DRAINAGE PIPING, BURIED IN SOIL TO BE TRENCHED & BACKFILLED AS PER SPEC. SECTION NO. 3.
 13. LINE NO. INDICATES PIPE CUTTING THROUGH STEEL BEAM.

- LEGEND**
- FLOOR DRAIN (INTERNAL G.I. UNLESS OTHERWISE NOTED)
 - ⊗ INSPECTION PORT
 - 1" TRAP OR FUNNEL DRAIN
 - C.O.D. CONTINUED ON DWG.
 - C.O. CLEANOUT
 - CON-157-6-64 INDICATES LINE NO. SHOWN ON CONTINUING DWG.

NOTE

1- 2ND FLOOR SLAB EL. 851'-3" UNLESS OTHERWISE NOTED.
5ND FLOOR SLAB EL. 865'-2"

**CERTIFIED
FOR CONSTRUCTION**

PUMPING - GROUND FLOOR - PLAN		1546-01-P-5501
PIPING ARRANGEMENT - 2ND FLOOR		1546-01-M-5518
SUB FILE & PRIMARY PUMP UNIT		1546-01-M-5518
DRAWING NO.		1546-01-M-5518
REFERENCE DRAWING		NO.
2ND FLOOR SLAB - SOUTH PART		1546-01-S-6021
DETAILS TOILETS & LOCKER ROOMS		1546-01-A-1018
REACTOR BUILDING - 2ND FLOOR PLAN		1546-01-M-1008
REACTOR BUILDING - PIPING ARRANGEMENT		1546-01-M-5518
PIPING ARRANGEMENT - 2ND FLOOR		1546-01-M-5518
SPECIFICATION		SECTION
SINGMASTER & BREYER		NO.
METALLURGISTS & CHEMICAL ENGINEERS		NO.
420 LEXINGTON AVE. NEW YORK 17, N.Y.		NO.
U. S. ATOMIC ENERGY COMMISSION		NO.
OAK RIDGE, TENNESSEE		NO.
APPROVED		DATE
SINGMASTER & BREYER		DATE 3-19-61
BY		DATE 6-7-61
C. C. WINTERS		DATE 6-7-61
U. S. ATOMIC ENERGY COMMISSION		DATE 6-7-61
BY		DATE 6-7-61
R. B. JAMES		DATE 6-7-61
HIGH FLUX ISOTOPE REACTOR		DATE 6-7-61
REACTOR BUILDING		DATE 6-7-61
PIPING ARRANGEMENT - PND/ILW		DATE 6-7-61
DRAINAGE SYSTEM - 2ND & 3RD FLOORS		DATE 6-7-61
DRAWN BY		DATE 6-7-61
CHYK		DATE 6-7-61
DATE 5-9-61		DATE 6-7-61
SCALE 1/8" = 1'-0"		DATE 6-7-61

CERTIFIED
FOR CONSTRUCTION

- NOTES:-
1. FOR LEAD AND GALLIUM USE ENG. 1546-01-M-5518
 2. LINE INDICATES PIPE CUTTING THROUGH STEEL MEMBER
 3. FURNACE DRAINS LOCATED ABOVE COLUMN'S AND FOR H.V. UNITS: SEE ENG. 1546-01-M-5508
 4. FIRST FLOOR SLAB L.A. EACH, 8.33'-0"
 5. FOR DETAILS SEE DWG'S 1546-01-M-5521 & 5522

PIPING ARRANGEMENT PLAN FOR PUMP ROOM	1546-01-M-5507
FIRST FLOOR FURNACE - NORTH PART	1546-01-M-5508
FIRST FLOOR SLAB - SOUTH PART	1546-01-M-5509
PIPE SUPPORTS	1546-01-M-5511

DRAWING NO.	REV.
1546-01-M-5510	4
REFERENCE DRAWING	NO.
PIPING ARRANGEMENT PLAN FOR PUMP ROOM	1546-01-M-5507
FIRST FLOOR FURNACE - NORTH PART	1546-01-M-5508
FIRST FLOOR SLAB - SOUTH PART	1546-01-M-5509
PIPE SUPPORTS	1546-01-M-5511

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
400 UNIVERSITY AVE. NEW YORK 17, N.Y.

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED
BY SINGMASTER & BREYER
DATE 6-15-61
BY C.E. WINTERS
DATE 6-15-61
BY P.B. JONES
DATE 6-15-61

HIGH FLUX ISOTOPE REACTOR
PIPING ARRANGEMENT
DRAINAGE SYSTEM
1ST FLOOR

DRAWN T.J.G. CHKD P.B. DATE 6-15-61
DATE 1-24-61
SCALE 1/8" = 1'-0"

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
4	REVISED 2" DIA LINE IN LECTURE HALL FIELD CHANGE FROM 1 1/2" TO 2" (SEE DETAIL "J")	W.K.	W.K.	6-15-61	3	REVISED 2" DIA LINE IN LECTURE HALL FIELD CHANGE FROM 1 1/2" TO 2" (SEE DETAIL "J")	W.K.	W.K.	6-15-61	2	REVISED 2" DIA LINE IN LECTURE HALL FIELD CHANGE FROM 1 1/2" TO 2" (SEE DETAIL "J")	W.K.	W.K.	6-15-61	1	REVISED 2" DIA LINE IN LECTURE HALL FIELD CHANGE FROM 1 1/2" TO 2" (SEE DETAIL "J")	W.K.	W.K.	6-15-61	0	CERTIFIED FOR CONSTRUCTION	W.K.	W.K.	6-15-61

PARTIAL PLAN
SUB PILE ROOM

SUB PILE ROOM & PRIMARY EXCHANGE PIT PLAN
(PIPING SHOWN BELOW FL. LEVEL)

GROUND FLOOR PLAN
(PIPING SHOWN BELOW FL. LEVEL)

NOTES
FOR GENERAL NOTES & LEGEND SEE
DWG. 1546-01-M-5518
FOR DETAILS SEE DWG. 1546-01-M-5521, 5522

**CERTIFIED
FOR CONSTRUCTION**

PIPING ARRANGEMENT PLAN SHOWING FACILITIES & PRIMARY LOOP SLEEVES	1546-01-M-5511
DETAILS THRU REACTOR POOL WALL	1546-01-M-5516
DETAILS OF REACTOR DISPOSAL UNIT ASSEMBLY	1546-01-M-5517
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5522
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5521
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5524
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5525
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5526
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5527
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5528
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5529
REACTOR BLDG. PIPING ARRANGEMENT	1546-01-M-5530

DRAWING NO.	1546-01-M-5520	REV.	3
REFERENCE DRAWING	NO.		
GROUND FL. PLAN - HEATING & VENT.	1546-01-M-5505		
UTILITY PLAN - YARD PIPING	1546-01-M-5513		
PIPING ARRANGEMENT SYSTEM - 1ST FLOOR	1546-01-M-5519		
UTILITY PLAN - YARD PIPING	1546-01-M-5512		
UTILITY PLAN - YARD PIPING	1546-01-M-5515		
SPECIFICATION	SECTION	REF.	NO. 21 & 75
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y.			
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
APPROVED SINGMASTER & BREYER			
BY	DATE	6-5-61	
BY	DATE	6-15-61	
BY	DATE	6-19-61	
HIGH FLUX ISOTOPE REACTOR			
PIPING ARRANGEMENT - PWD & ILWD			
DRAINAGE SYSTEM - GROUND FLOOR			
SUB PILE ROOM & PRIMARY EXCH. PIT			
DRAWN	DATE	6-5-61	
DATE	1-25-61		
SCALE	1/8" = 1'-0"		

REVISIONS	BY	CHK.	DATE	REVISIONS	BY	CHK.	DATE
1				1			
2				2			
3				3

CERTIFIED
FOR CONSTRUCTION

PG-101	1-REQ'D
PG-102	2-REQ'D

GENERAL NOTES:
1) FOR GENERAL STRUCT. STL NOTED SEE DWG.
1546-03-M-5524
2) FOR GENERAL CONCRETE NOTES SEE DWG. 1546-03-M-5524
3) PS-3 & PS-4 TO BE CARBON STEEL COATED WITH (2) COATS EPOXY RESIN IN ACCORDANCE WITH SECT. 7

DRAWING NO.	1546-03-M-5524	REV.	4
REFERENCE DRAWING	NO.		
COOLING TOWER EQUIP. BLDG. P&ID	1546-05-U-790		
UTILITY PLAN YARD PIPING	1546-05-U-710		
FLOOR PLAN	1546-03-M-5508		
PLOT PLAN	1546-05-U-701		
P&ID ACCT. SECTIONS	1546-05-U-701		
SPECIFICATION SECONDARY COOLANT SYSTEM	SECT. 66, 67, 68		

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
430 LEXINGTON AVE. NEW YORK 17, N.Y.

U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED
SINGMASTER & BREYER
BY: *[Signature]* DATE: 4/1/61
BY: C. E. WATERS DATE: 5/1/61
BY: L. H. JACKSON DATE: 5/1/61

HIGH FLUX ISOTOPE REACTOR
COOLING ARR'GT - PLAN
COOLING TOWER

DRAWN	JFC	CHKD	P.T.	DATE	4/1/61	SCALE	5'-10"
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REVISIONS	BY	CHK.	DATE	REVISIONS	BY	CHK.	DATE
1	JFC	JFC	4/1/61	1	JFC	JFC	4/1/61
2	JFC	JFC	4/1/61	2	JFC	JFC	4/1/61
3	JFC	JFC	4/1/61	3	JFC	JFC	4/1/61
4	JFC	JFC	4/1/61	4	JFC	JFC	4/1/61
5	JFC	JFC	4/1/61	5	JFC	JFC	4/1/61
6	JFC	JFC	4/1/61	6	JFC	JFC	4/1/61
7	JFC	JFC	4/1/61	7	JFC	JFC	4/1/61
8	JFC	JFC	4/1/61	8	JFC	JFC	4/1/61
9	JFC	JFC	4/1/61	9	JFC	JFC	4/1/61
10	JFC	JFC	4/1/61	10	JFC	JFC	4/1/61

DRAWING NO. 15 46-03-M-5525		REV. 3
REFERENCE DRAWING	NO.	
PIPING ARRGT PLAN <i>COOLING TOWER</i>		1546-03-M-5525
SPECIFICATION		REV.
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LONGFORTH AVE. NEW YORK 17, N. Y.		
U. S. ATOMIC ENERGY COMMISSION		
OAK RIDGE, TENNESSEE		
APPROVED		
SINGMASTER & BREYER		
BY	<i>J. H. Smith</i>	DATE <i>4-14-55</i>
UNION CARBIDE NUCLEAR COMPANY		
BY	C. E. WINTERS	DATE <i>5/10/55</i>
U. S. ATOMIC ENERGY COMMISSION		
BY	L. H. JACKSON	DATE <i>5/10/55</i>
HIGH FLUX ISOTOPE REACTOR		
PIPING ARRGT. SECTION		
COOLING TOWER		
DRAWN	J. F. C.	CHKD <i>AT</i>
DATE	DRAWING NO.	
<i>4-14-55</i>	15 46-03-M-5525	
DATE <i>4-14-55</i>		REV. 3

[illegible]

NOTE: THIS Dwg SUPERSEDES Dwg NO. 1546-OI-M-5501 FOR LOW PRESSURE SYSTEM ONLY

FOR LEGEND SEE Dwg. 1546-OI-M-5541

NOTE: THIS DRAWING IS FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL MAKE REFERENCE TO RELATED PIPING AREAS, SPECIFICATIONS, AND REQUIREMENTS FOR MATERIALS, SIZES, LOCATIONS OF SERVICES OR WORK TO BE FURNISHED OR INSTALLED UNDER CONTRACT.

CERTIFIED FOR CONSTRUCTION

NO.	REVISIONS	BY	CHK.	DATE	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
7	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61	1	WJ	WJ	5-19-61	1	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61
6	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61	2	WJ	WJ	5-19-61	2	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61
5	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61	3	WJ	WJ	5-19-61	3	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61
4	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61	4	WJ	WJ	5-19-61	4	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61
3	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61	5	WJ	WJ	5-19-61	5	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61
2	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61	6	WJ	WJ	5-19-61	6	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61
1	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61	7	WJ	WJ	5-19-61	7	CHANGED OI-415-PU-11 TO OI-415-PU-18A	WJ	WJ	5-19-61

**CERTIFIED
FOR CONSTRUCTION**

NOTE: THIS DRAWING IS FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL MAKE REFERENCE TO RELATED PIPING AREA'S DRAWINGS, EQUIPMENT DRAWINGS & SPECIFICATIONS FOR ACTUAL EXTENT, SIZES & LOCATIONS OF SERVICES OR WORK TO BE FURNISHED & INSTALLED UNDER CONTRACT.

FLOW DIAGRAM COMPRESSED AIR		1546-08-U-7168	REV.	4
DRAWING NO.		1546-01-M-5535		
REFERENCE DRAWING		NO.		
ENGINEERING FLOW DIAG. PLANT DETERMINING HIGH PRESS. SYSTEM		1546-01-M-5531		
PLANT CONDENSATE SYSTEM		do = 5301		
HOT WATER HEATING SYSTEM		do = 5302		
STEAM CONDENSATION WATER SYSTEMS		do = 5303		
CONDENSATE COOLING UNIT WATER SYSTEM		do = 5334		
PLANT CONDENSATE UNIT WATER SYSTEMS		1546-08-U-7161		
A PROCESS WATER				
SPECIFICATION SECTION		REF.	C-8	
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEONINGTON AVE. NEW YORK 27, N.Y. [NEW]</p>				
U. S. ATOMIC ENERGY COMMISSION				
OAK RIDGE, TENNESSEE				
APPROVED				
SINGMASTER & BREYER				
BY	<i>E. Russell</i>	DATE 6-1-61		
UNION CHARGE NUCLEAR COMPANY				
BY	C. E. WINTERS	DATE 6-13-61		
U. S. ATOMIC ENERGY COMMISSION				
BY	L. S. JACKSON	DATE 6-28-61		
HIGH FLUX ISOTOPE REACTOR				
ENGINEERING FLOW DIAGRAM				
PROCESS WATER SYSTEM				
DRAWN AJAH	CHECKED XZ	DATE 6-9-61	NO. OF SHEETS	100
DATE 5-12-61	DRAWING NO.	1546-01-M-5535		REV.
SCALE NONE				4

PLUMBING 2ND FL.	1546-01-A-5002
PLUMBING 1ST FL.	1546-01-A-5001
DRAINAGE SYSTEM GR. FL.	1546-01-M-5520
DRAINAGE SYSTEM 1ST FL.	1546-01-M-5519
DRAINAGE SYSTEM 2ND FL.	1546-01-M-5518
PIPING & SHIELD FACE FACILITIES	1546-01-M-5511
PIPING & SHIELD FACE FACILITIES	1546-01-M-5505
NOT OFF GAS SYSTEM GR. FL.	1546-01-M-5501
NOT OFF GAS SYSTEM 1ST FL.	1546-01-M-5500
HEAT & VENT. SPEC. BUILDING HOT EXH. SYS.	1546-01-M-5508
HEATING & VENT. 1ST FL.	1546-01-M-5506

DRAWING NO.	REV.
1546-01-M-5536	0
REFERENCE DRAWING	NO.
HEATING & VENT. GR. FL.	1546-01-M-5505
POWER LAYOUT 1ST FL.	1546-01-E-2034
POWER LAYOUT GR. FL.	1546-01-E-2032
LIGHTING LAYOUT 1ST FL.	1546-01-E-2013
LIGHTING LAYOUT GR. FL.	1546-01-E-2012

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
430 LEXINGTON AVE. NEW YORK 17, N. Y.
FOR
U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE

APPROVED
BY *[Signature]* SINGMASTER & BREYER DATE 6-1-61
BY C. E. WINTERS DATE 6-19-61
U. S. ATOMIC ENERGY COMMISSION
BY J. H. JOHNSON DATE 6-18-61

HIGH FLUX ISOTOPE REACTOR
REACTOR BUILDING
COMPOSITE
LOOKING NORTH
THRU EXPERIMENTAL & BEAM ROOMS
DRAWN BY *[Signature]* CHECKED BY *[Signature]* DATE 6-1-61
DATE 6-1-61 DRAWING NO. 1546-01-M-5536
SCALE 3/8" = 1'-0" REV. 0

**CERTIFIED
FOR CONSTRUCTION**

NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	APPR.	DATE	NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE	NO.	REVISIONS	BY	CHK.	DATE	APPR.	DATE	APPR.	DATE

**CERTIFIED
FOR CONSTRUCTION**

PLUMBING 720 FL.	1560-014502
PLUMBING 197 FL.	1560-014500
DRAINAGE SYSTEMS 20 FL.	1560-014503
DRAINAGE SYSTEM 197 FL.	1560-014504
DRAINAGE SYSTEM 720 FL.	1560-014505
PIPING SHIELD PLAC FACILITIES	1560-014501
PIPING ACCESS PLANTER BOX AREA	1560-014506
HOT OFF GAS SYSTEM 20 FL.	1560-014507
HOT OFF GAS SYSTEM 197 FL.	1560-014508
HEAT & VENT SYSTEM 197 FL.	1560-014509
HEATING & VENT 197 FL.	1560-014510

DRAWING NO. 1546-01-M-5537		REV. 0
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REFERENCE DRAWING	NO.
HEATING & VENT GE. PL.	1546-01-01-V3005
POWER LAYOUT 1ST FL.	1546-01-01-2004
POWER LAYOUT GE. PL.	1546-01-01-2002
LIGHTING LAYOUT 1ST FL.	1546-01-01-2013
LIGHTING LAYOUT GE. PL.	1546-01-01-2012

SPECIFICATION	REF.
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 430 LEXINGTON AVE. NEW YORK 17, N. Y.	
FOR	
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE	

APPROVED		
SINGMASTER & BREYER		
BY	<i>[Signature]</i>	DATE 6-5-61
UNION CARBIDE NUCLEAR COMPANY		
BY	C.E. WINTERS	DATE 6-13-61
U. S. ATOMIC ENERGY COMMISSION		
BY	L. H. JACOBSON	DATE 6-28-61
HIGH FLUX REACTOR		

REACTOR BUILDING
COMPOSITE
LOOKING WEST THRU EXPERIMENTAL
& BEAM ROOMS

[illegible]

**CERTIFIED
FOR CONSTRUCTION**

NOTE:
THIS DWG SUPersedes DWG
1546-01-M-5500 (FOR HIGH
PRESSURE SYSTEM ONLY)

U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE APPROVED SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 400 LEXINGTON AVE. NEW YORK 17, N. Y. DATE 5-24-61 BY C. E. WINTERS U. S. ATOMIC ENERGY COMMISSION DATE 7-5-61 BY L. M. JACKSON U. S. ATOMIC ENERGY COMMISSION DATE 7-5-61	ENGINEERING FLOW DIAGRAM PRIMARY REACTOR COOLANT HIGH PRESSURE SYSTEM DRAWN J.A.H. CHK J.Y. DATE 5-15-61 SCALE NONE 1546-01-M-5541
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NOTE:
THIS DWG. SUPERSEDES
DWG. 1546-01-M-5514.

**CERTIFIED
FOR CONSTRUCTION**

NOTE:

1. NO ALLOWANCE MADE FOR GASKET THICKNESS.
2. CHANGES IN DIRECTION, WHERE NOT INDICATED AS FITTINGS, SHALL BE MADE BY MEANS OF 5 DIAMETER BENDS.
3. FOR ALL PIPE SLEEVES SEE DET. "E" ON DWG. 1546-01-M-5530.
4. FOR TEMPORARY STRAINER DETAIL SEE DWG 1546-01-M-5530

DRAWING NO.		REV.	
REFERENCE DRAWING		NO.	
PIPING AREA/ SECTION 1 & 2		1546	01-14-5520
PIPING AREA/ SECTION 2		1546	01-M-5512
SUPPORT PLANT DEMINERALIZER SECT		1546	01-M-5540
PIPING AREA/ DEMIN GR. SECT		1546	01-M-5525
REACTOR BLOC MISC. SECT		1546	01-M-5550
SPECIFICATION SECTION		REF.	01-17-5517
<p align="center">SINGMASTER & BREYER METALLURGISTS & CHEMISTS 430 LINGMAYER AVE. NEW YORK 17, N. Y. (212) 691-1100</p>			
<p align="center">U. S. ATOMIC ENERGY COMMISSION</p> <p align="center">OAK RIDGE, TENNESSEE</p>			
APPROVED			
<p align="center">SINGMASTER & BREYER 1546 UNION CARBIDE CORP. COMPANY</p>			
BY	DATE		5-18-61
BY	DATE		6-7-61
BY	DATE		5-2-61
<p align="center">HIGH FLUX ISOTOPE REACTOR</p> <p align="center">PIPING ARRANGEMENT</p> <p align="center">PLAN & SECTS OF DEMINERALIZERS</p> <p align="center">GROUND FLOOR</p>			
DRAWN	RGW	CHECKED	RGW
DATE	7/10/63	DATE	7/16/63
SCALE	DRAWING NO.		1546-01-M-5565
CONTENTS			NO. AT (10-11) SHEETS
			3

BEAM ROOM LEVEL - (GROUND FLOOR)
PLAN AT ELEVATION 817'-0"
2,500 LBS./SQ. FT. LOAD, (WITH PROVISION FOR HEAVY ROLLING LOADS FROM BEAM PLATES AND EXPERIMENTAL OPERATIONS), EXCEPT AS NOTED.

EXPERIMENTAL FLOOR LEVEL - (FIRST FLOOR)
PLAN AT ELEVATION 833'-0"
750 LBS./SQ. FT. EXCEPT AS NOTED

REACTOR BAY LEVEL - (SECOND FLOOR)
PLAN AT ELEVATION 851'-2"
500 LBS./SQ. FT. PLUS 10 TONS MOVING LOAD ON 6.0 SQ. FT. EXCEPT AS NOTED.

CONTROL ROOM LEVEL - (THIRD FLOOR)
PLAN AT ELEVATION 865'-2"
100 LBS./SQ. FT.

- NOTES:**
1. ROOF LIVE LOADING 20 P.S.F.
 2. ALL COLUMN LINES ARE ON G. OF COLUMNS EXCEPT LINES 1, 4, 5, 10, A, A₁, A₂, F₁; SEE ARCHITECTURAL DRAWINGS.
 3. IN EQUIPMENT AREA, LOCAL FLOOR IS DESIGNED FOR 200 P.S.F. OR EQUIPMENT LOADS, IF GREATER THAN 200 P.S.F.
 4. WIND LOADING 20 P.S.F.
 5. MAX. CRANE CAPACITY 50 T.
 6. FLOOR AREAS SHOWN THUS ARE DESIGNED FOR 5TON. ROLLING LOAD ON DOLLY WITH WHEEL SPACING 4 FT. WIDTH BY 6 FT. FROM AXLE TO AXLE (ROOMS: G, G₅ G, B IN GROUND FL., 103 & 105 ON 1ST FL. & 201 ON 2ND FL. NORTH PART. SEE ARCH. DWGS.)

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO. 1546-01-5-6010

REFERENCE DRAWING		NO.	
SPECIFICATION		REF.	
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 440 LEASAVILLE AVE. NEW YORK 17, N. Y.			
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE			
APPROVED			
BY SINGMASTER & BREYER		DATE 12-10-60	
BY C. E. WINTERS		DATE 12-15-60	
BY L. H. JACKSON		DATE	
BY U. S. ATOMIC ENERGY COMMISSION		DATE	
HIGH FLUX ISOTOPE REACTOR REACTOR BUILDING FLOOR LIVE LOADINGS			
DRAWN: G. D.		CHKD: A. M.	
DATE 12-1-1960		DATE 12-1-1960	
SCALE 1/4" = 1'-0"		1546-01-5-6010	

NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE	NO.	REVISIONS	BY	CHK.	DATE
1					1					1					1				
2					2					2					2				
3					3					3					3				
4					4					4					4				
5					5					5					5				
6					6					6					6				
7					7					7					7				
8					8					8					8				
9					9					9					9				
10					10					10					10

BOTTOM SLAB PLAN
SCALE: 1/4"=1'-0"

PLAN OF WALL REINF.
SCALE: 1/4"=1'-0"

TOP SLAB PLAN
SCALE: 1/4"=1'-0"

SECTION A-A
SCALE: 1/4"=1'-0"

SECTION C-C
SCALE: 1/4"=1'-0"

SECTION B-B
SCALE: 1/4"=1'-0"

SECTION D-D
SCALE: 1/4"=1'-0"

SECTION H-H
SCALE: 1/4"=1'-0"

SECTION K-K
SCALE: 1/4"=1'-0"

**CERTIFIED
FOR CONSTRUCTION**

DRAWING NO.	1546-05-6066	REV.	2
REFERENCE DRAWING	NO.	NO.	NO.
POOL WATER STORAGE TANK	1546-05-6066		
PIPE DETAIL	1546-05-6066		
TYPE	TYPE 304	TYPE 304	TYPE 304
PIPE	PIPE 1/2"	PIPE 1/2"	PIPE 1/2"
WATERPROOFING	WATERPROOFING	WATERPROOFING	WATERPROOFING
SPECIFICATION	SPECIFICATION	SPECIFICATION	SPECIFICATION
NORMAL CONCRETE	NORMAL CONCRETE	NORMAL CONCRETE	NORMAL CONCRETE
SECTION	SECTION	SECTION	SECTION
SECTION 4	SECTION 4	SECTION 4	SECTION 4
SINGMASTER & BREYER	SINGMASTER & BREYER	SINGMASTER & BREYER	SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS	METALLURGISTS & CHEMICAL ENGINEERS	METALLURGISTS & CHEMICAL ENGINEERS	METALLURGISTS & CHEMICAL ENGINEERS
430 LEXINGTON AVE.	430 LEXINGTON AVE.	430 LEXINGTON AVE.	430 LEXINGTON AVE.
NEW YORK 17, N.Y.	NEW YORK 17, N.Y.	NEW YORK 17, N.Y.	NEW YORK 17, N.Y.
U. S. ATOMIC ENERGY COMMISSION	U. S. ATOMIC ENERGY COMMISSION	U. S. ATOMIC ENERGY COMMISSION	U. S. ATOMIC ENERGY COMMISSION
OAK RIDGE, TENNESSEE	OAK RIDGE, TENNESSEE	OAK RIDGE, TENNESSEE	OAK RIDGE, TENNESSEE
APPROVED	APPROVED	APPROVED	APPROVED
BY	BY	BY	BY
SINGMASTER & BREYER	SINGMASTER & BREYER	SINGMASTER & BREYER	SINGMASTER & BREYER
DATE	DATE	DATE	DATE
3-7-61	3-7-61	3-7-61	3-7-61
BY	BY	BY	BY
C. E. WINTERS	C. E. WINTERS	C. E. WINTERS	C. E. WINTERS
DATE	DATE	DATE	DATE
3-28-61	3-28-61	3-28-61	3-28-61
BY	BY	BY	BY
L. H. JACKSON	L. H. JACKSON	L. H. JACKSON	L. H. JACKSON
DATE	DATE	DATE	DATE
4-4-61	4-4-61	4-4-61	4-4-61
U. S. ATOMIC ENERGY COMMISSION	U. S. ATOMIC ENERGY COMMISSION	U. S. ATOMIC ENERGY COMMISSION	U. S. ATOMIC ENERGY COMMISSION
HIGH FLUX ISOTOPE REACTOR	HIGH FLUX ISOTOPE REACTOR	HIGH FLUX ISOTOPE REACTOR	HIGH FLUX ISOTOPE REACTOR
CONCRETE POOL WATER STORAGE TANK	CONCRETE POOL WATER STORAGE TANK	CONCRETE POOL WATER STORAGE TANK	CONCRETE POOL WATER STORAGE TANK
DRAWN	DRAWN	DRAWN	DRAWN
DATE	DATE	DATE	DATE
3-7-61	3-7-61	3-7-61	3-7-61
SCALE	SCALE	SCALE	SCALE
AS SHOWN	AS SHOWN	AS SHOWN	AS SHOWN
1546-05-6066	1546-05-6066	1546-05-6066	1546-05-6066
REV.	REV.	REV.	REV.
2	2	2	2

Technical drawing of a circular structure, likely a well or a large container, showing dimensions and components. The drawing includes a vertical centerline and a horizontal line passing through the center. Key dimensions and labels are as follows:

- Top Dimension:** A vertical dimension line on the left side of the top section, labeled "5' 2\"".
- Radius/Offset:** A dimension line from the center to the top edge of the inner circle, labeled "1' 0\"".
- Inner Circle:** A dashed circle with a diameter dimension line labeled "OD 12' 0\"".
- Outer Circle:** A solid circle with a diameter dimension line labeled "OD 12' 0\"".
- Handrail:** A label pointing to a shaded rectangular area on the left side of the inner circle.
- 2 BRACKETS:** A label pointing to two small rectangular components on the left side of the inner circle.
- SAFETY CARRIER RAIL (TYP.) FOR SPECIFICATIONS SEE SECTION N-101 & LADDER:** A label pointing to a horizontal line segment on the right side of the inner circle.
- Bottom Dimension:** A vertical dimension line on the right side of the bottom section, labeled "1' 0\"".
- Angle:** An angle dimension line at the bottom center, labeled "10°".
- Bottom Component:** A small rectangular component at the bottom center, labeled "B".

NOTE:

DIMENSIONS OF EQUIPMENT FOUNDATIONS, ANCHOR BOLT LOCATIONS AND PLATFORM DETAILS TO BE VERIFIED BY THE CONTRACTOR WITH APPROVED SHOP DRAWINGS OF EQUIPMENT. SHOP DRAWINGS OF EQUIPMENT FOUNDATIONS INCLUDING ANCHOR BOLT LOCATIONS TO BE SUBMITTED FOR APPROVAL.

NOTES

1. FOR GENERAL CONC. NOTES SEE DWG. 1546-01-5-6001
2. FOR PLOT PLAN LOCATION, SEE DWG. 1546-08-01-7002
3. FOR GENERAL STEEL NOTES SEE DWG. 1546-01-5-6029

COPIES
FOR COMMISSION

SECTION B-B
SCALE 1"=10'

[illegible]

BORING TABULATION

BORING NO.	LOCATION NORTH EAST	DEPTH OF BORING	TOP OF ROCK APPROX. ELEV.	TYPE OF BORING
C-1	16780 32545	48.3'	808.7	FISHTAIL & CORE
C-2	17025 32590	71.8'	818.4	FISHTAIL & CORE
C-3	17080 32645	54.2'	811.4	FISHTAIL & CORE
C-4	17290 32560	99.4'	831.0	DRIVE & CORE
C-15	17080 32520	80.0'	817.3	DRIVE & CORE
C-23	17180 32550	26.1'	823.1	DENNISON
C-24	17180 32570	31.2'	825.0	DRIVE SAMPLE
DC-13	17030 32470	10.3'	810.5	DRIVE SAMPLE
DC-22	17180 32470	24.1'	820.4	FISHTAIL
DC-26	17340 32485	32.1'	828.7	DRIVE & CORE
D-1	16980 32595	19.5'	799.5	DRIVE SAMPLE
D-2	17030 32435	12.4'	813.2	DRIVE SAMPLE
D-3	17130 32455	10.6'	817.3	DRIVE SAMPLE
D-4	17180 32445	24.5'	824.5	DENNISON
D-5	17180 32195	11.2'	835.2	DRIVE SAMPLE
D-6	17030 32195	17.6'	817.7	DRIVE SAMPLE
D-7	16930 32145	25.4'	802.6	DENNISON
D-11	16850 32550	19.0'	788.9	DRIVE SAMPLE
D-12	16745 32115	21.9'	780.3	DRIVE SAMPLE
S-2	17150 32210	19.5'	809.4	DRIVE SAMPLE
S-4	17295 32310	16.3'	823.8	DRIVE SAMPLE
S-6	17210 32160	25.9'	810.1	DRIVE SAMPLE

LEGEND

- ASPHALT CONC. ROADWAY
- CRUSHED STONE ROADWAY
- EXISTING CONTOUR
- FINISH GRADE CONTOUR
- 7 FT. HIGH CHAIN LINK FENCE
- CHAIN FENCE (1 STRAND)
- 6 INCH ASPHALT CURB
- CONCRETE CAR STOP
- SPOT GRADE (FINISH GRADE)
- TRANSFORMER
- EXISTING DITCH
- NEW DITCH
- RIPRAP
- SOIL BORING
- POWER POLE-EXISTING
- POWER POLE-NEW
- R.C. HEADWALL
- R.C. ENDWALL
- KECP OR C.M.R. CULVERT
- TOP SOIL & SEEDING AREAS

NOTES

- 1- PREVAILING WINDS ARE EAST-WEST IN RELATION TO PLANT NORTH.
- 2- NEW AND EXISTING CONTOUR INTERVAL 3 FT.
- 3- FOR STORM DRAINAGE OTHER THAN CULVERTS REFER TO DWG 1546-05-U-7011.
- 4- COORDINATES & DIMENSIONS APPLY TO OUTSIDE FACE OF STRUCTURE UNLESS OTHERWISE NOTED.
- 5- FOR BORING LOG INFORMATION REFER TO DWG 1546-05-U-7004.
- 6- ACCESS TO THE ECOLOGY AREA SHALL BE LIMITED TO WORK REQUIRED BY THE CONTRACT.
- 7- FENCE ALIGNMENT THRU ECOLOGY AREA, AS SHOWN ON DWG SHALL BE ADJUSTED IN FIELD TO PRESERVE ANY EXISTING TREES.
- 8- FOR ELEVATIONS AFFECTED BY STORM SEWER DRAINAGE SEE DWG 1546-05-U-7012, 1546-05-U-7013, 1546-05-U-7014, 1546-05-U-7015, 1546-05-U-7016, 1546-05-U-7017, 1546-05-U-7018, 1546-05-U-7019, 1546-05-U-7020, 1546-05-U-7021, 1546-05-U-7022, 1546-05-U-7023, 1546-05-U-7024, 1546-05-U-7025, 1546-05-U-7026, 1546-05-U-7027, 1546-05-U-7028, 1546-05-U-7029, 1546-05-U-7030, 1546-05-U-7031, 1546-05-U-7032, 1546-05-U-7033, 1546-05-U-7034, 1546-05-U-7035, 1546-05-U-7036, 1546-05-U-7037, 1546-05-U-7038, 1546-05-U-7039, 1546-05-U-7040, 1546-05-U-7041, 1546-05-U-7042, 1546-05-U-7043, 1546-05-U-7044, 1546-05-U-7045, 1546-05-U-7046, 1546-05-U-7047, 1546-05-U-7048, 1546-05-U-7049, 1546-05-U-7050, 1546-05-U-7051, 1546-05-U-7052, 1546-05-U-7053, 1546-05-U-7054, 1546-05-U-7055, 1546-05-U-7056, 1546-05-U-7057, 1546-05-U-7058, 1546-05-U-7059, 1546-05-U-7060, 1546-05-U-7061, 1546-05-U-7062, 1546-05-U-7063, 1546-05-U-7064, 1546-05-U-7065, 1546-05-U-7066, 1546-05-U-7067, 1546-05-U-7068, 1546-05-U-7069, 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1546-05-U-7132, 1546-05-U-7133, 1546-05-U-7134, 1546-05-U-7135, 1546-05-U-7136, 1546-05-U-7137, 1546-05-U-7138, 1546-05-U-7139, 1546-05-U-7140, 1546-05-U-7141, 1546-05-U-7142, 1546-05-U-7143, 1546-05-U-7144, 1546-05-U-7145, 1546-05-U-7146, 1546-05-U-7147, 1546-05-U-7148, 1546-05-U-7149, 1546-05-U-7150, 1546-05-U-7151, 1546-05-U-7152, 1546-05-U-7153, 1546-05-U-7154, 1546-05-U-7155, 1546-05-U-7156, 1546-05-U-7157, 1546-05-U-7158, 1546-05-U-7159, 1546-05-U-7160, 1546-05-U-7161, 1546-05-U-7162, 1546-05-U-7163, 1546-05-U-7164, 1546-05-U-7165, 1546-05-U-7166, 1546-05-U-7167, 1546-05-U-7168, 1546-05-U-7169, 1546-05-U-7170, 1546-05-U-7171, 1546-05-U-7172, 1546-05-U-7173, 1546-05-U-7174, 1546-05-U-7175, 1546-05-U-7176, 1546-05-U-7177, 1546-05-U-7178, 1546-05-U-7179, 1546-05-U-7180, 1546-05-U-7181, 1546-05-U-7182, 1546-05-U-7183, 1546-05-U-7184, 1546-05-U-7185, 1546-05-U-7186, 1546-05-U-7187, 1546-05-U-7188, 1546-05-U-7189, 1546-05-U-7190, 1546-05-U-7191, 1546-05-U-7192, 1546-05-U-7193, 1546-05-U-7194, 1546-05-U-7195, 1546-05-U-7196, 1546-05-U-7197, 1546-05-U-7198, 1546-05-U-7199, 1546-05-U-7200, 1546-05-U-7201, 1546-05-U-7202, 1546-05-U-7203, 1546-05-U-7204, 1546-05-U-7205, 1546-05-U-7206, 1546-05-U-7207, 1546-05-U-7208, 1546-05-U-7209, 1546-05-U-7210, 1546-05-U-7211, 1546-05-U-7212, 1546-05-U-7213, 1546-05-U-7214, 1546-05-U-7215, 1546-05-U-7216, 1546-05-U-7217, 1546-05-U-7218, 1546-05-U-7219, 1546-05-U-7220, 1546-05-U-7221, 1546-05-U-7222, 1546-05-U-7223, 1546-05-U-7224, 1546-05-U-7225, 1546-05-U-7226, 1546-05-U-7227, 1546-05-U-7228, 1546-05-U-7229, 1546-05-U-7230, 1546-05-U-7231, 1546-05-U-7232, 1546-05-U-7233, 1546-05-U-7234, 1546-05-U-7235, 1546-05-U-7236, 1546-05-U-7237, 1546-05-U-7238, 1546-05-U-7239, 1546-05-U-7240, 1546-05-U-7241, 1546-05-U-7242, 1546-05-U-7243, 1546-05-U-7244, 1546-05-U-7245, 1546-05-U-7246, 1546-05-U-7247, 1546-05-U-7248, 1546-05-U-7249, 1546-05-U-7250, 1546-05-U-7251, 1546-05-U-7252, 1546-05-U-7253, 1546-05-U-7254, 1546-05-U-7255, 1546-05-U-7256, 1546-05-U-7257, 1546-05-U-7258, 1546-05-U-7259, 1546-05-U-7260, 1546-05-U-7261, 1546-05-U-7262, 1546-05-U-7263, 1546-05-U-7264, 1546-05-U-7265, 1546-05-U-7266, 1546-05-U-7267, 1546-05-U-7268, 1546-05-U-7269, 1546-05-U-7270, 1546-05-U-7271, 1546-05-U-7272, 1546-05-U-7273, 1546-05-U-7274, 1546-05-U-7275, 1546-05-U-7276, 1546-05-U-7277, 1546-05-U-7278, 1546-05-U-7279, 1546-05-U-7280, 1546-05-U-7281, 1546-05-U-7282, 1546-05-U-7283, 1546-05-U-7284, 1546-05-U-7285, 1546-05-U-7286, 1546-05-U-7287, 1546-05-U-7288, 1546-05-U-7289, 1546-05-U-7290, 1546-05-U-7291, 1546-05-U-7292, 1546-05-U-7293, 1546-05-U-7294, 1546-05-U-7295, 1546-05-U-7296, 1546-05-U-7297, 1546-05-U-7298, 1546-05-U-7299, 1546-05-U-7300, 1546-05-U-7301, 1546-05-U-7302, 1546-05-U-7303, 1546-05-U-7304, 1546-05-U-7305, 1546-05-U-7306, 1546-05-U-7307, 1546-05-U-7308, 1546-05-U-7309, 1546-05-U-7310, 1546-05-U-7311, 1546-05-U-7312, 1546-05-U-7313, 1546-05-U-7314, 1546-05-U-7315, 1546-05-U-7316, 1546-05-U-7317, 1546-05-U-7318, 1546-05-U-7319, 1546-05-U-7320, 1546-05-U-7321, 1546-05-U-7322, 1546-05-U-7323, 1546-05-U-7324, 1546-05-U-7325, 1546-05-U-7326, 1546-05-U-7327, 1546-05-U-7328, 1546-05-U-7329, 1546-05-U-7330, 1546-05-U-7331, 1546-05-U-7332, 1546-05-U-7333, 1546-05-U-7334, 1546-05-U-7335, 1546-05-U-7336, 1546-05-U-7337, 1546-05-U-7338, 1546-05-U-7339, 1546-05-U-7340, 1546-05-U-7341, 1546-05-U-7342, 1546-05-U-7343, 1546-05-U-7344, 1546-05-U-7345, 1546-05-U-7346, 1546-05-U-7347, 1546-05-U-7348, 1546-05-U-7349, 1546-05-U-7350, 1546-05-U-7351, 1546-05-U-7352, 1546-05-U-7353, 1546-05-U-7354, 1546-05-U-7355, 1546-05-U-7356, 1546-05-U-7357, 1546-05-U-7358, 1546-05-U-7359, 1546-05-U-7360, 1546-05-U-7361, 1546-05-U-7362, 1546-05-U-7363, 1546-05-U-7364, 1546-05-U-7365, 1546-05-U-7366, 1546-05-U-7367, 1546-05-U-7368, 1546-05-U-7369, 1546-05-U-7370, 1546-05-U-7371, 1546-05-U-7372, 1546-05-U-7373, 1546-05-U-7374, 1546-05-U-7375, 1546-05-U-7376, 1546-05-U-7377, 1546-05-U-7378, 1546-05-U-7379, 1546-05-U-7380, 1546-05-U-7381, 1546-05-U-7382, 1546-05-U-7383, 1546-05-U-7384, 1546-05-U-7385, 1546-05-U-7386, 1546-05-U-7387, 1546-05-U-7388, 1546-05-U-7389, 1546-05-U-7390, 1546-05-U-7391, 1546-05-U-7392, 1546-05-U-7393, 1546-05-U-7394, 1546-05-U-7395, 1546-05-U-7396, 1546-05-U-7397, 1546-05-U-7398, 1546-05-U-7399, 1546-05-U-7400, 1546-05-U-7401, 1546-05-U-7402, 1546-05-U-7403, 1546-05-U-7404, 1546-05-U-7405, 1546-05-U-7406, 1546-05-U-7407, 1546-05-U-7408, 1546-05-U-7409, 1546-05-U-7410, 1546-05-U-7411, 1546-05-U-7412, 1546-05-U-7413, 1546-05-U-7414, 1546-05-U-7415, 1546-05-U-7416, 1546-05-U-7417, 1546-05-U-7418, 1546-05-U-7419, 1546-05-U-7420, 1546-05-U-7421, 1546-05-U-7422, 1546-05-U-7423, 1546-05-U-7424, 1546-05-U-7425, 1546-05-U-7426, 1546-05-U-7427, 1546-05-U-7428, 1546-05-U-7429, 1546-05-U-7430, 1546-05-U-7431, 1546-05-U-7432, 1546-05-U-7433, 1546-05-U-7434, 1546-05-U-7435, 1546-05-U-7436, 1546-05-U-7437, 1546-05-U-7438, 1546-05-U-7439, 1546-05-U-7440, 1546-05-U-7441, 1546-05-U-7442, 1546-05-U-7443, 1546-05-U-7444, 1546-05-U-7445, 1546-05-U-7446, 1546-05-U-7447, 1546-05-U-7448, 1546-05-U-7449, 1546-05-U-7450, 1546-05-U-7451, 1546-05-U-7452, 1546-05-U-7453, 1546-05-U-7454, 1546-05-U-7455, 1546-05-U-7456, 1546-05-U-7457, 1546-05-U-7458, 1546-05-U-7459, 1546-05-U-7460, 1546-05-U-7461, 1546-05-U-7462, 1546-05-U-7463, 1546-05-U-7464, 1546-05-U-7465, 1546-05-U-7466, 1546-05-U-7467, 1546-05-U-7468, 1546-05-U-7469, 1546-05-U-7470, 1546-05-U-7471, 1546-05-U-7472, 1546-05-U-7473, 1546-05-U-7474, 1546-05-U-7475, 1546-05-U-7476, 1546-05-U-7477, 1546-05-U-7478, 1546-05-U-7479, 1546-05-U-7480, 1546-05-U-7481, 1546-05-U-7482, 1546-05-U-7483, 1546-05-U-7484, 1546-05-U-7485, 1546-05-U-7486, 1546-05-U-7487, 1546-05-U-7488, 1546-05-U-7489, 1546-05-U-7490, 1546-05-U-7491, 1546-05-U-7492, 1546-05-U-7493, 1546-05-U-7494, 1546-05-U-7495, 1546-05-U-7496, 1546-05-U-7497, 1546-05-U-7498, 1546-05-U-7499, 1546-05-U-7500, 1546-05-U-7501, 1546-05-U-7502, 1546-05-U-7503, 1546-05-U-7504, 1546-05-U-7505, 1546-05-U-7506, 1546-05-U-7507, 1546-05-U-7508, 1546-05-U-7509, 1546-05-U-7510, 1546-05-U-7511, 1546-05-U-7512, 1546-05-U-7513, 1546-05-U-7514, 1546-05-U-7515, 1546-05-U-7516, 1546-05-U-7517, 1546-05-U-7518, 1546-05-U-7519, 1546-05-U-7520, 1546-05-U-7521, 1546-05-U-7522, 1546-05-U-7523, 1546-05-U-7524, 1546-05-U-7525, 1546-05-U-7526, 1546-05-U-7527, 1546-05-U-7528, 1546-05-U-7529, 1546-05-U-7530, 1546-05-U-7531, 1546-05-U-7532, 1546-05-U-7533, 1546-05-U-7534, 1546-05-U-7535, 1546-05-U-7536, 1546-05-U-7537, 1546-05-U-7538, 1546-05-U-7539, 1546-05-U-7540, 1546-05-U-7541, 1546-05-U-7542, 1546-05-U-7543, 1546-05-U-7544, 1546-05-U-7545, 1546-05-U-7546, 1546-05-U-7547, 1546-05-U-7548, 1546-05-U-7549, 1546-05-U-7550, 1546-05-U-7551, 1546-05-U-7552, 1546-05-U-7553, 1546-05-U-7554, 1546-05-U-7555, 1546-05-U-7556, 1546-05-U-7557, 1546-05-U-7558, 1546-05-U-7559, 1546-05-U-7560, 1546-05-U-7561, 1546-05-U-7562, 1546-05-U-7563, 1546-05-U-7564, 1546-05-U-7565, 1546-05-U-7566, 1546-05-U-7567, 1546-05-U-7568, 1546-05-U-7569, 1546-05-U-7570, 1546-05-U-7571, 1546-05-U-7572, 1546-05-U-7573, 1546-05-U-7574, 1546-05-U-7575, 1546-05-U-7576, 1546-05-U-7577, 1546-05-U-7578, 1546-05-U-7579, 1546-05-U-7580, 1546-05-U-7581, 1546-05-U-7582, 1546-05-U-7583, 1546-05-U-7584, 1546-05-U-7585, 1546-05-U-7586, 1546-05-U-7587, 1546-05-U-7588, 1546-05-U-7589, 1546-05-U-7590, 1546-05-U-7591, 1546-05-U-7592, 1546-05-U-7593, 1546-05-U-7594, 1546-05-U-7595, 1546-05-U-7596, 1546-05-U-7597, 1546-05-U-7598, 1546-05-U-7599, 1546-05-U-7600, 1546-05-U-7601, 1546-05-U-7602, 1546-05-U-7603, 1546-05-U-7604, 1546-05-U-7605, 1546-05-U-7606, 1546-05-U-7607, 1546-05-U-7608, 1546-05-U-7609, 1546-05-U-7610, 1546-05-U-7611, 1546-05-U-7612, 1546-05-U-7613, 1546-05-U-7614, 1546-05-U-7615, 1546-05-U-7616, 1546-05-U-7617, 1546-05-U-7618, 1546-05-U-7619, 1546-05-U-7620, 1546-05-U-7621, 1546-05-U-7622, 1546-05-U-7623, 1546-05-U-7624, 1546-05-U-7625, 1546-05-U-7626, 1546-05-U-7627, 1546-05-U-7628, 1546-05-U-7629, 1546-05-U-7630, 1546-05-U-7631, 1546-05-U-7632, 1546-05-U-7633, 1546-05-U-7634, 1546-05-U-7635, 1546-05-U-7636, 1546-05-U-7637, 1546-05-U-7638, 1546-05-U-7639, 1546-05-U-7640, 1546-05-U-7641, 1546-05-U-7642, 1546-05-U-7643, 1546-05-U-7644, 1546-05-U-7645, 1546-05-U-7646, 1546-05-U-7647, 1546-05-U-7648, 1546-05-U-7649, 1546-05-U-7650, 1546-05-U-7651, 1546-05-U-7652, 1546-05-U-7653, 1546-05-U-7654, 1546-05-U-7655, 1546-05-U-7656, 1546-05-U-7657, 1546-05-U-7658, 1546-05-U-7659, 1546-05-U-7660, 1546-05-U-7661, 1546-05-U-7662, 1546-05-U-7663, 1546-05-U-7664, 1546-05-U-7665, 1546-05-U-7666, 1546-05-U-7667, 1546-05-U-7668, 1546-05-U-7669, 1546-05-U-7670, 1546-05-U-7671, 1546-05-U-7672, 1546-05-U-7673, 1546-05-U-7674, 1546-05-U-7675, 1546-05-U-7676, 1546-05-U-7677, 1546-05-U-7678, 1546-05-U-7679, 1546-05-U-7680, 1546-05-U-7681, 1546-05-U-7682, 1546-05-U-7683, 1546-05-U-7684

**CERTIFIED
FOR CONSTRUCTION**

[illegible]

LEGEND

SERVICE DESIGNATION	SPEC SECTION	SERVICE
SCW	66	SECONDARY COOLANT WATER
PCW	71	POOL COOLANT WATER
PROW	64	REACTOR PRIMARY COOLANT WATER
FW	68	PROCESS WATER
FW	70	FIRE WATER
SW	69	POTABLE WATER
SPW	70	SPRINKLER WATER
STW	70	STANDPIPE WATER
HPS	73	HIGH PRESSURE STEAM
MPS	73	MEDIUM PRESSURE STEAM
LPS	73	LOW PRESSURE STEAM
SD	76	SEWAGE DRAIN
SWD	77	STORM WATER DRAIN
RD	77	ROOF DRAIN
PWD	75	PROCESS WASTE DRAIN
IWD	61	INTERMEDIATE LEVEL WASTE DRAIN
IA	79	INSTRUMENT AIR
CHG	62	OPEN HOT OFF GAS
CHG	63	CLOSED HOT OFF GAS
SBH	67	SPECIAL BUILDING HOT BEARER
FO	80	FUEL OIL
CHL	76	CHLORINE & HYPOCHLORITE
BT	77	BEAM TUBE ENCASMENT
DW	65	DIMENSIONED WATER
SA	81	SULFURIC ACID
NA	81	NITRIC ACID
GA	81	GASEOUS AMMONIA
CD	81	CONDENSABLE PHOSPHATE
UNDERGROUND PIPE LINE		
--- ABOVE GROUND PIPE LINE		
+ GATE VALVE WITH VALVE BOX		
+ GATE VALVE WITH INDICATOR POST		
+ MANHOLE		
+ 1.5M INLET MANHOLE		
+ C.I. CURB INLET		
+ HYDRANT		
+ RADIOACTIVITY MONITOR		
+ ANCHOR		
+ EXISTING CONTOURS		
+ REDUCER		
+ BT BEAM TUBE ENCASMENT		
+ MOV MOTOR OPERATED VALVE		
+ CORPORATION COCK		

NOTES:

- 1- MATCH LINES FOR YARD PIPING THRU AT 5'0" FROM OUTSIDE BUILDING
- 2- FOR SITE GRADING, DRAINAGE DITCHES AND CULVERTS SEE DWG NO. 1546-05-U-7002
- 3- FOR DETAILS OF POST INDICATOR VALVES SEE DWG NO. 1546-05-U-7112
- 4- CONTOURS SHOWN REPRESENT EXISTING GRADING

CERTIFIED
FOR CONSTRUCTION

NO.	REVISIONS	BY	CHK.	DATE	APP.	DATE	NO.	REVISIONS	BY	CHK.	DATE	APP.	DATE	NO.	REVISIONS	BY	CHK.	DATE	APP.	DATE	NO.	REVISIONS	BY	CHK.	DATE	APP.	DATE	NO.	REVISIONS	BY	CHK.	DATE	APP.	DATE
1	CHANGED 1/4" IN P. 12-1A	FG	LDW	12-15-60			2	CERTIFIED FOR CONSTRUCTION	J.P.	BL	12-15-60			3	ISSUED FOR TITLE II APPROVAL	SD	J.R.	12-15-60			4	ISSUED FOR TITLE II APPROVAL	SD	J.R.	12-15-60			5	ISSUED FOR TITLE II APPROVAL	SD	J.R.	12-15-60		

DRAWING NO. 1546-05-U-7101		REV. 4
REFERENCE DRAWING NO.		
AREA UTILITY PLAN - NORTH PART 1546-05-U-7102		
AREA UTILITY PLAN - SOUTH PART 1546-05-U-7103		
UTILITY PROFILES - STEAM DISTRIBUTION 1546-05-U-7104		
UTILITY PLAN - YARD PIPING 1546-05-U-7111		
UTILITY PLAN - YARD PIPING 1546-05-U-7112		
UTILITY PLAN - YARD PIPING 1546-05-U-7113		
UTILITY PLAN - YARD PIPING 1546-05-U-7114		
UTILITY PLAN - YARD PIPING 1546-05-U-7115		
UTILITY PLAN - YARD PIPING 1546-05-U-7116		
SINGMASTER & BREYER METALLURGISTS & CHEMICAL ENGINEERS 420 LEXINGTON AVE. NEW YORK 17, N.Y.		
U. S. ATOMIC ENERGY COMMISSION OAK RIDGE, TENNESSEE		
APPROVED		
BY	SINGMASTER & BREYER	DATE 4-16-61
BY	BRION CARBIDE NUCLEAR COMPANY	DATE 5-9-61
BY	C. R. WINTER	DATE 5-13-61
BY	U. S. ATOMIC ENERGY COMMISSION	DATE 5-13-61
BY	L. M. JACKSON	DATE 5-13-61
HIGH FLUX ISOTOPE REACTOR		
AREA UTILITY PLAN		
SOUTH PART		
DEPT.	CHK.	DATE 12-15-60
ARCH.	CHK.	DATE 12-15-60
ELECT.	CHK.	DATE 12-15-60
H.A.V.	CHK.	DATE 12-15-60
INST.	CHK.	DATE 12-15-60
MECH.	CHK.	DATE 12-15-60
STRUC.	CHK.	DATE 12-15-60
UTIL.	CHK.	DATE 12-15-60
PROG.	CHK.	DATE 12-15-60
DRAWN BY: J.P. CHKD BY: BL DATE: 12-15-60		
DATE: 12-15-60		
SCALE: 1" = 50'		
DRAWING NO. 1546-05-U-7101		
REV. 4

OFFICE & MAINTENANCE BUILDING

REACTOR BLDG

ELECTRICAL BLDG.

- NOTES**
1. NO OPEN FLOOR DRAINS ARE TO BE CONNECTED TO THE ILW SYSTEM. ALL CONNECTIONS TO THE ILW SYSTEM WILL BE CAPPED OR SOLIDLY PIPED.
 2. NORMAL FLOOR DRAINS IN SHIELDED COMPARTMENTS ARE TO BE CONNECTED TO THE P.W.D. SYSTEM.
 3. ON ALL MAJOR BRANCHES OF THE P.W.D. & ILWD SYSTEMS A THE CONNECTION WALL, BE PROVIDED WITH EXTENSION TO THE BLDG FLOOR LEVEL WITH CAP FOR PURPOSES OF VISUAL FLOW CHECK & SAMPLING.

**CERTIFIED
FOR CONSTRUCTION**

REFERENCE DRAWING		NO.
PROCESS WASTE & ILW DETAILS		1546-01-M-5501
FLOW DIAGRAM - STEAM DISTRIBUTION		1546-01-M-5502
FLOW DIAGRAM - FINE & POTABLE WATER		1546-01-M-5534
INSTRUMENT APPROVAL DRAWING		1546-01-M-5535
HYDROGRAPHIC LEVEL PROGRESS WASTE TREATMENT INSTALLATION DETAILS		1546-01-M-5541
SPECIFICATION		REF. G1, 75
DRAWING NO.		1546-05-U-7145
REV.		4
REFERENCE DRAWING		NO.
PROCESS WASTE & ILW DETAILS		1546-05-U-7128
FLOW DIAGRAM - STEAM DISTRIBUTION		1546-05-U-7140
FLOW DIAGRAM - FINE & POTABLE WATER		1546-05-U-7141
INSTRUMENT APPROVAL DRAWING		1546-01-M-5508
HYDROGRAPHIC LEVEL PROGRESS WASTE TREATMENT INSTALLATION DETAILS		1546-01-M-5541
SPECIFICATION		REF. G1, 75
DRAWING NO.		1546-05-U-7145
REV.		4
DRAWN BY		CHKD BY
DATE 9-30-60		DATE 10-10-60
SCALE 1/8"=1'-0"		DRAWING NO. 1546-05-U-7145
		REV. 4

DISCHARGE TO MILETON BRANCH														MILETON BRANCH														POST.															
														3 RELOCATED LINE 45-3012 BT ADDED 2-3012 AND LINE 3012-78 70-70														F4	ELW	10/1/60	NR	-	NR	-	0	ISSUED FOR TITLE II APPROVAL	RF	EGC	JGR	10/1/60	ELW	10/1/60	7-6-61
														2 RELOCATED PL 70-70 BT ADDED 2-3012 AND LINE 3012-78 70-70														JR	OK	10/1/60	NR	-	NR	-	0	ISSUED FOR TITLE I PRELIMINARY/REPROVAL	GH	EGC	JR	2/19/61	-	-	-
														1 WORD "RELOCATED" WAS ADDED. ADDED LINE 2-3012 AND 2-3012-78 70-70														EGC	OK	10/1/60	NR	-	NR	-	0	ISSUED FOR TITLE I APPROVAL	WD	EGC	JR	2/19/61	ELW	10/1/60	7-6-61
														4 RELOCATED PL-711 & ADDED LS-710														RSW	ELW	10/1/60	NR	-	NR	-	0	ISSUED FOR INFORMATION ONLY	ET	EGC	JR	10/1/60	ELW	10/1/60	7-6-61
														1 CERTIFIED FOR CONSTRUCTION														RF	EGC	10/1/60	NR	-	NR	-	0	ISSUED FOR INFORMATION ONLY	ET	EGC	JR	10/1/60	ELW	10/1/60	7-6-61
REVISIONS														REVISIONS														REVISIONS														PROG	
NO.	REVISIONS	BY	CHK	DATE	NO.	REVISIONS	BY	CHK	DATE	NO.	REVISIONS	BY	CHK	DATE	NO.	REVISIONS	BY	CHK	DATE	NO.	REVISIONS	BY	CHK	DATE	NO.	REVISIONS	BY	CHK	DATE

ELEMENTARY DIAGRAM (SHOWN IN NORMAL OPERATING CONDITION)

NOTE:
THIS CIRCUIT IS BASED ON Q-2240-1,
MODIFIED FOR REMOTE TAPE ADVANCE
FOR INCLUSION IN THE HIGH FLUX
ISOTOPE REACTOR MONITORING SYSTEM.

1 MISC REVISIONS		7-12-63	18
NO.	REVISIONS	DATE	APPROD
1	REVISIONS	DATE	APPROD
2	REVISIONS	DATE	APPROD
3	REVISIONS	DATE	APPROD
4	REVISIONS	DATE	APPROD
5	REVISIONS	DATE	APPROD
6	REVISIONS	DATE	APPROD
7	REVISIONS	DATE	APPROD
8	REVISIONS	DATE	APPROD
9	REVISIONS	DATE	APPROD
10	REVISIONS	DATE	APPROD

COUNT RATE METER	Q-2310-2
FILTER TAPE DRIVE	Q-2118-1
REFERENCE DRAWINGS	DWG. NO.
DESIGN RESPONSIBILITY	L. C. DAKES
CONSTANT AIR MONITOR FOR HIGH FLUX ISOTOPE REACTOR	
BETA-GAMMA	
OPERATIONAL SCHEMATIC - ELEMENTARY DIAGRAM - PUMP, FILTER TAPE DRIVE CONTROL & ALARM PANEL CIRCUITS	
INSTRUMENTATION AND CONTROLS DIVISION OAK RIDGE NATIONAL LABORATORY	
OPERATED BY UNION CARBIDE NUCLEAR COMPANY	
DATE	7-12-63
BY	18
Q-2310-1	18

Q-2351-2
BETA GAMMA PARTICULATE MONITOR JB101 ON STACK PLATFORM

Q-2351-2
GASEOUS WASTE MONITOR AUXILIARY CONTROL ROOM

Q-2351-2
STACK INSTRUMENTATION BLOCK DIAGRAM & WIRING

Q-2351-2
ELECTRICAL WIRING DIAGRAM

NO.	REVISIONS	DATE	APPD	APPD
1	10-5-62			
2	10-1-62			
3	10-6-62			

JB. 103 AT DUCT MONITOR

ELECTRICAL WIRING DIAGRAM

- Notes:
- 11 RG59U cable in one continuous length.
 - 104 is 10'x24" pull box located under 14.1 form.

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED

FRACTIONS: ±

DECIMALS: ±

ANGLES: ±

SCALE: NONE

Aux Control Room Front & Rear of Panel	Q-2351-11
Stack Platform-Instruments & Power	Q-2351-2
REFERENCE DRAWINGS	DWG. NO.
DESIGN RESPONSIBILITY	D. J. Knowles
H.F.I.R. GASEOUS WASTE MONITOR SYSTEM	
STACK INSTRUMENTATION BLOCK DIAGRAM & WIRING	
INSTRUMENTATION AND CONTROLS DIVISION	
OAK RIDGE NATIONAL LABORATORY	
OPERATED BY	
UNION CARBIDE NUCLEAR COMPANY	
SUBMITTED	10/1/62
APPROVED	10/1/62
DATE	10/1/62
Q-2351-3	Ro.

2	P20 was P18, add Cn20 & res. mfg. bd.	11-23-60	12
1	Add C-100, Change Cn 10 wiring	5-26-60	12
NO.	REVISIONS	DATE	APPROD
DESIGNED	DATE	APPROVED	DATE
D.J. Knowles	10-62

This dwg. derived from Q-2325-2 RO

Stack Instrumentation Block Diagram & Wiring	Q-2351-3
Filter Tape Drive Control Chassis	Q-2351-7
REFERENCE DRAWINGS	DWG. NO.
DESIGN RESPONSIBILITY	D.J. Knowles
HFIR GASEOUS WASTE MONITORING SYSTEMS	
PARTICULATE MONITOR	
ELEMENTARY DIAGRAM	
INSTRUMENTATION AND CONTROLS DIVISION	
OAK RIDGE NATIONAL LABORATORY	
OPERATED BY	
UNION CARBIDE NUCLEAR COMPANY	
SUBMITTED	APPROVED
DATE	DATE
10-62

1	Added Cts. 407-414, 423, 424 Revised Ckt. 422	6/1/61	20	
NO.	REVISIONS	DATE	APPD	APPD
DRAWN	DATE	SUBMITTED	DATE	APPROVED
HERRELL	8-25-61	8-25-61		
DESIGNED	DATE	DATE	APPROVED	DATE
	8/1/61			
CHECKED	DATE	APPROVED	DATE	APPROVED

REFERENCE DRAWINGS		DWG. NO.
DESIGN RESPONSIBILITY		
H. F. I. R.		
ELEMENTARY DIAGRAM ROD CONTROLS ON "D" BUS		
INSTRUMENTATION AND CONTROLS DIVISION OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY		
SUBMITTED	ACCEPTED	DATE
8/1/61	8/1/61	8/1/61
RC 11-1-2D REV 1

SHIM-SAFETY ROD #1 DRIVE

SHIM-SAFETY ROD #2 DRIVE

SHIM-SAFETY ROD #3 DRIVE

SHIM-SAFETY ROD #4 DRIVE

SHIM-REGULATING ROD #5 DRIVE

2	Added Ckts. 644, 645, 646 Rev. Ckts. 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700	4/1/61	1/4
1	Added Note 1.	9-25-61	1/4
NO.	REVISIONS	DATE	APPT.
1	Added Note 1.	9-25-61	1/4
2	Added Ckts. 644, 645, 646 Rev. Ckts. 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700	4/1/61	1/4
3	Added Note 1.	9-25-61	1/4
4	Added Ckts. 644, 645, 646 Rev. Ckts. 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700	4/1/61	1/4
5	Added Note 1.	9-25-61	1/4
6	Added Ckts. 644, 645, 646 Rev. Ckts. 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700	4/1/61	1/4
7	Added Note 1.	9-25-61	1/4
8	Added Ckts. 644, 645, 646 Rev. Ckts. 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700	4/1/61	1/4
9	Added Note 1.	9-25-61	1/4
10	Added Ckts. 644, 645, 646 Rev. Ckts. 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700	4/1/61	1/4

REFERENCE DRAWINGS		DWG. NO.
DESIGN RESPONSIBILITY		
H.F.I.R.		
ELEMENTARY DIAGRAM		
SHIM ROD DRIVES		
INSTRUMENTATION AND CONTROLS DIVISION		
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
SUBMITTED	APPROVED	DATE
8/25/61	8/25/61	8/25/61
RC11-1-2G REV. 2		

RELAYS ON 32VDC 'A' BUS See Note 1

RELAY NO.	CONTACT NO.	A	B	C	D
K101	101	141	704	641	
K102	503	503	Sp	Sp	
K103	503	550	550	Sp	
K104	514	514	713	Sp	
K105	503	Sp	Sp	Sp	
K106	514	514	Sp	Sp	
K107	520	707	Sp	Sp	
K108	121	125	Sp	Sp	
K109	122	125	Sp	Sp	
K110	113	502	130	Sp	
K111	112	131	Sp	Sp	
K112	126	126	126	Sp	
K113	112	126	126	126	

RELAYS ON 32VDC 'B' BUS See Note 1

RELAY NO.	CONTACT NO.	A	B	C	D
K201	201	241	719	641	
K202	503	503	Sp	Sp	
K203	503	550	550	Sp	
K204	514	514	732	Sp	
K205	503	Sp	Sp	Sp	
K206	514	514	Sp	Sp	
K207	521	723	Sp	Sp	
K208	221	225	Sp	Sp	
K209	222	225	Sp	Sp	
K210	213	502	230	Sp	
K211	212	231	Sp	Sp	
K212	226	226	226	Sp	
K213	212	226	226	226	

RELAYS ON 32VDC 'C' BUS See Note 1

RELAY NO.	CONTACT NO.	A	B	C	D
K301	301	341	739	641	
K302	503	503	Sp	Sp	
K303	503	550	550	Sp	
K304	514	514	748	Sp	
K305	503	Sp	Sp	Sp	
K306	514	514	Sp	Sp	
K307	522	742	Sp	Sp	
K308	321	325	Sp	Sp	
K309	322	325	Sp	Sp	
K310	313	502	330	Sp	
K311	312	331	Sp	Sp	
K312	326	326	326	Sp	
K313	312	326	326	326	

RELAYS ON 120VDC 'D' BUS See Note 1

RELAY NO.	CONTACT NO.	A	B	C	D	E	F	G	H
K401	416	141	241	341	515	524	411	N.C.	
K402	417	142	242	342	516	525	412	N.C.	
K403	418	143	243	343	517	526	413	N.C.	
K404	419	144	244	344	518	527	414	N.C.	
K405	140	240	340	420	Sp	Sp	Sp	Sp	
K406	140	240	340	421	502	503	514	Sp	
K411	407	Sp	Sp	Sp					
K412	408	Sp	Sp	Sp					
K413	409	Sp	Sp	Sp					
K414	410	Sp	Sp	Sp					
K423	411	412	413	414	Sp	Sp	Sp	Sp	
K424	411	412	413	414	Sp	Sp	Sp	Sp	

RELAYS ON 115VAC BUS See Note 1

RELAY NO.	CONTACT NO.	A	B	C	D	E	F	G	H	J	K	L	M
K501	501	502	504	518	Sp	Sp	Sp	Sp	Sp				
K502	501	503	504	502	514	579	560	Sp					
K503	502	504	514	515	511	Sp	580	503	Sp	Sp	Sp	Sp	Sp
K504	140	240	340	511	581	Sp	Sp	Sp					
K505	501	Sp	Sp	Sp									
K506	511	512	Sp	Sp									
K507	141	241	341	515	411	574	Sp	Sp					
K508	142	242	342	516	412	575	Sp	Sp					
K509	143	243	343	517	413	576	Sp	Sp					
K510	144	244	344	518	414	577	Sp	Sp					
K511	718	Sp	Sp	Sp									
K512	512	514	Sp	Sp									
K513	513	523	Sp	Sp									
K514	515	516	517	518	519	515	Sp	Sp					
K515	601	Sp	Sp	Sp									
K516	611	Sp	Sp	Sp									
K517	621	Sp	Sp	Sp									
K518	631	Sp	Sp	Sp									
K519	641	Sp	Sp	Sp									
K520	523	523	705	Sp									
K521	523	523	720	Sp									
K522	523	523	740	Sp									
K523	524	525	526	527	528	Sp	Sp	Sp					
K524	515	601	Sp	Sp									
K525	516	611	Sp	Sp									
K526	517	621	Sp	Sp									
K527	518	631	Sp	Sp									
K528	519	641	Sp	Sp									
K533	513	Sp	571	Sp									
K534	512	513	Sp	Sp									
K535	511	573	Sp	Sp									
K536	524	Sp	561	Sp									
K537	525	Sp	562	Sp									
K538	526	Sp	563	Sp									
K539	527	Sp	564	Sp									
K540	528	Sp	565	140	240	340							
K541	515	566	Sp	Sp									
K542	516	567	Sp	Sp									
K543	517	568	Sp	Sp									
K544	518	569	Sp	Sp									
K545	519	570	Sp	140	240	340							
K546	736	Sp	Sp	Sp									
K547	140	140											
K548	240	240											
K549	340	340											
K550	503	Sp	Sp	Sp									
K644	641	641	Sp	Sp									
K645	641	641	Sp	Sp									
K646	641	641	Sp	Sp									
K8503	112	113	709	520	711	N.O.	Sp	Sp					
K8503	212	213	726	521	729	N.O.	Sp	Sp					
K8503	312	313	744	522	746	N.O.	Sp	Sp					
K8503	515	523	514	Sp									
TIMER T560													

Save X.C. Contacts For Shim Rod Flight Test Circuits.

S1 - Operate

CONTACTS	POSITION (REAR VIEW)	CIRC. NO.
A(1) X	OPERATE	501
B(2) X	OFF	503
C(3) X	OFF	141
D(4) X	OFF	241
E(5) X	OFF	341
F(6) X	OFF	515
G(7) X	OFF	101
H(8) X	OFF	201
J(9) X	OFF	301
K(10) X	OFF	Sp
L(11) X	OFF	Sp
M(12) X	OFF	Sp

Momentary P.B.'s

SWITCH NO.	CONTACT	N.O.	N.C.
S2	501	Sp	
S3	Sp	503	
S4A	112	Sp	
S4B	113	Sp	
S5A	212	Sp	
S5B	213	Sp	
S6A	312	Sp	
S6B	313	Sp	

Operated by lateral motion of switch handle while in "off" position only.

S1B-Shim Computer By-Pass

CONTACTS	POSITIONS (REAR VIEW)	CIRC. NO.
A(1) X	TEST	506
B(2) X	NORMAL	Sp
C(3) X	TEST	Sp
D(4) X	NORMAL	Sp

S7 - Shim Rod Actuate

CONTACTS	POSITIONS (REAR VIEW)	CIRC. NO.
A(1) X	TEST	514
B(2) X	NORMAL	Sp
C(3) X	TEST	560
D(4) X	NORMAL	X 523
E(5) X	TEST	523
F(6) X	NORMAL	Sp
G(7) X	TEST	515
H(8) X	NORMAL	515

Spring Returns
X - Denotes closed in "pushed" position, open in "pulled" position.
NOTE - Switch shall not turn to work pos. while pulled

S9 - Raise - Test

CONTACTS	POSITIONS (REAR VIEW)	CIRC. NO.
A(1) X	TEST	515
B(2) X	NORMAL	515
C(3) X	TEST	516
D(4) X	NORMAL	516
E(5) X	TEST	517
F(6) X	NORMAL	517
G(7) X	TEST	518
H(8) X	NORMAL	518
J(9) X	TEST	519
K(10) X	NORMAL	515
L(11) X	TEST	529
M(12) X	NORMAL	101
N(13) X	TEST	201
P(14) X	NORMAL	301
Q(15) X	TEST	Sp
R(16) X	NORMAL	Sp

Spring Returns
X - Denotes closed in "pushed" position, open in "pulled" position.

S10 - Scram

CONTACTS	POSITIONS (REAR VIEW)	CIRC. NO.
A(1) X	SCRAM	Sp
B(2) X	NORMAL	101
C(3) X	SCRAM	201
D(4) X	NORMAL	301
E(5) X	SCRAM	141
F(6) X	NORMAL	241
G(7) X	SCRAM	341
H(8) X	NORMAL	Sp
J(9) X	SCRAM	Sp
K(10) X	NORMAL	Sp

S11 - Group Servo Demand

CONTACTS	POSITIONS (REAR VIEW)	CIRC. NO.
A(1) X	RAISE	112
B(2) X	OFF	113
C(3) X	LOWER	212
D(4) X	OFF	213
E(5) X	RAISE	312
F(6) X	OFF	313
G(7) X	LOWER	Sp
H(8) X	OFF	Sp

S12, S13, S14 - #1, #2 & #3 Fission Chamber Auto-Manual Drive (Pull for Manual)

CONTACTS	POSITIONS (REAR VIEW)	CIRC. NO.
A(1) X	WDR	104
B(2) X	NEUTRAL	204
C(3) X	INSERT	304
D(4) X	WDR	124
E(5) X	NEUTRAL	224
F(6) X	INSERT	324
G(7) X	WDR	125
H(8) X	NEUTRAL	225
J(9) X	INSERT	325
K(10) X	WDR	125
L(11) X	NEUTRAL	225
M(12) X	INSERT	325
N(13) X	WDR	Sp
P(14) X	NEUTRAL	Sp
Q(15) X	INSERT	Sp
R(16) X	WDR	Sp

S15, S16, S17 Momentary 3-gang P.B.'s

SWITCH NO.	CONTACT	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.
S15	101	Sp	201	Sp	301	Sp	701
S16	Sp	701	Sp	701	Sp	701	701
S17	Sp	702	Sp	702	Sp	702	702

NOTES:
1. Relay Tabulations show circuit numbers in which contacts are used. Underlined numbers denote normally closed contact, while others are normally open. "Sp" denotes spare contact.
2. All switch contacts shall be "break-before-make", unless otherwise noted.

REVISIONS

NO.	REVISIONS	DATE	APPROVED	DATE	APPROVED
5	Added: IC6B-75, K411-44, K423, K424, K547-550, K644-646, K8503-552, Misc. Minor Revisions	11/6/61	JCB		
4	Changed S7 to Type SB-10 Switch. Changed K540 & K545 to 6-pole relays.	6-11-62	FCD		
3	Used 6 Contacts On Relays K401, 2, 3 & 4	5-29-62	ICD		
2	Added Sw. S18	10-26-61	JCB		
1	Minor revisions to S4, S10 and I.C. tabulation. Revised for rearrangement of "Run" relays. Added K546. Added spring return to S12 on S12, S13 & S14.	9-15-61	JCB		

DESIGNED BY: HERRELL DATE: 8-28-61 CHECKED BY: DATE: 8-28-61

INSTRUMENT CONTACT TABULATION (CONT'D)

I.C. NO.	LOCATION	OPERATION AND SETPOINT	CIRCUIT NO.
1051	No. 2 Safety Channel	Closes Heat Power > 8 MW	203
1052	"	Opens N > 1.1 N _L (P _H)	735
1053	"	Opens N > 1.1 N _L (P _H)	729
1054	No. 3 Safety Channel	Closes Heat Power > 8 MW	303
1055	"	Opens N > 1.1 N _L (P _H)	744
1056	"	Opens N > 1.1 N _L (P _H)	745
1057	Shim Computer	Closes on Shim Permit	505
IC6B	Servo Channels A, B & C	2 of 3 Servo Insert Error	423
IC69	No. 1 Safety Channel	Low Ion Chamber Voltage & Module Continuity	101
IC70	No. 2 Safety Channel	Low Ion Chamber Voltage & Module Continuity	201
IC71	No. 3 Safety Channel	Low Ion Chamber Voltage & Module Continuity	301
IC72	Servo Channels A, B, & C	Opens < 5 MW/Sec. 2 of 3	514
IC73	No. 1 Safety Channel	Opens Low Ion Chamber Voltage	737
IC74	No. 2 Safety Channel	Opens Low Ion Chamber Voltage	735
IC75	No. 3 Safety Channel	Opens Low Ion Chamber Voltage	764

SAFETY TEST SWITCHES 1-57
MOMENTARY 2-GANG P. B.'s.

SAFETY TEST SWITCH No.	CONTACT			
	A	B	C	D
1	M160	Sp	Sp	Sp
2	M160	Sp	Sp	Sp
3	M160	Sp	Sp	Sp
4	M170	Sp	Sp	Sp
5	M170	Sp	Sp	Sp
6	M170	Sp	Sp	Sp
7	M180	Sp	Sp	Sp
8	M180	Sp	Sp	Sp
9	M180	Sp	Sp	Sp
10	M157	Sp	Sp	Sp
11	M158	Sp	Sp	Sp
12	M159	Sp	Sp	Sp
13	M167	Sp	Sp	Sp
14	M168	Sp	Sp	Sp
15	M169	Sp	Sp	Sp
16	M177	Sp	Sp	Sp
17	M178	Sp	Sp	Sp
18	M179	Sp	Sp	Sp
19	M156	Sp	M157	Sp
20	M156	Sp	M158	Sp
21	M156	Sp	M159	Sp
22	M156	Sp	M157	Sp
23	M156	Sp	M158	Sp
24	M156	Sp	M159	Sp
25	M156	Sp	M157	Sp
26	M156	Sp	M158	Sp
27	M156	Sp	M159	Sp
28	M153	Sp	Sp	Sp
29	M153	Sp	Sp	Sp
30	M163	Sp	Sp	Sp
31	M163	Sp	Sp	Sp
32	M173	Sp	Sp	Sp
33	M173	Sp	Sp	Sp
34	M152	Sp	Sp	Sp
35	M152	Sp	Sp	Sp
36	M162	Sp	Sp	Sp
37	M162	Sp	Sp	Sp
38	M172	Sp	Sp	Sp
39	M172	Sp	Sp	Sp
40	M155	Sp	Sp	Sp
41	M165	Sp	Sp	Sp
42	M175	Sp	Sp	Sp
43	M154	Sp	Sp	Sp
44	M154	Sp	Sp	Sp
45	M164	Sp	Sp	Sp
46	M164	Sp	Sp	Sp
47	M174	Sp	Sp	Sp
48	M174	Sp	Sp	Sp
49	M150	Sp	M150	Sp
50	M150	Sp	M150	Sp
51	M160	Sp	M160	Sp
52	M160	Sp	M160	Sp
53	M170	Sp	M170	Sp
54	M170	Sp	M170	Sp
55	644	Sp	Sp	Sp
56	645	Sp	Sp	Sp
57	646	Sp	Sp	Sp

S22-MODE SW.

CONTACTS HANDLE END	POSITIONS (REAR VIEW)			CKT. NO.
	MODE 3	MODE 2	MODE 1	
1-225	A (1) X	X		M11
	B (2) X	X		M12
	C (3) X			M13
	D (4) X	X		Sp.
	E (5) X	X		Sp.
	F (6) X			M17
	G (7) X	X		M18
	H (8) X			M19
2-225	A (1) X	X		M21
	B (2) X	X		M22
	C (3) X			M23
	D (4) X	X		Sp.
	E (5) X	X		Sp.
	F (6) X			M27
	G (7) X	X		M28
	H (8) X			M29
	J (9) X	X		501
	K (10) X	X		514
	L (11) X	X		515
	M (12) X	X		Sp.
	N (13) X	X		503
	P (14) X			511
	Q (15) X			Sp.
	R (16) X			Sp.
3-225	A (1) X	X		M31
	B (2) X	X		M32
	C (3) X			M33
	D (4) X	X		Sp.
	E (5) X	X		Sp.
	F (6) X			M37
	G (7) X	X		M38
	H (8) X			M39

INSTRUMENT CONTACT TABULATION

I.C. NO.	LOCATION	OPERATION AND SETPOINT	CIRCUIT NO.
IC76	No. 1 Safety Channel	Opens Heat Pwr. Trip > 120 MW	755
IC77	No. 2 Safety Channel	Opens Heat Pwr. Trip > 120 MW	784
IC78	No. 3 Safety Channel	Opens Heat Pwr. Trip > 120 MW	762
IC79	No. 1 Safety Channel	Opens Low Low Flow <	756
IC80	No. 2 Safety Channel	Opens Low Low Flow <	754
IC81	No. 3 Safety Channel	Opens Low Low Flow <	768
IC82	No. 1 Safety Channel	Opens Inhibit Rod #5 Withdrawal on Trip	644
IC83	No. 2 Safety Channel	Opens Inhibit Rod #5 Withdrawal on Trip	645
IC84	No. 3 Safety Channel	Opens Inhibit Rod #6 Withdrawal on Trip	646
IC85	No. 1 Safety Channel	Opens > 1/2 Scale FFED	759
IC86	No. 2 Safety Channel	Opens > 1/2 Scale FFED	737
IC87	No. 3 Safety Channel	Opens > 1/2 Scale FFED	766
IC88		Opens Asymmetry > 1/2 Inch	727
IC89	RE 200	Open Radiatio Hi	730

NO.	REVISIONS	DATE	APPD	APPD
1	DESIGNED	DATE	APPROVED	DATE
2	DESIGNED	DATE	APPROVED	DATE
3	DESIGNED	DATE	APPROVED	DATE

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED
FRACTIONS: ±
DECIMALS: ±
ANGLES: ±
SCALE:

REFERENCE DRAWINGS		DWG. NO.
DESIGN RESPONSIBILITY		
H. F. I. R.		
ELEMENTARY DIAGRAM		
CONTACT TABULATIONS-SHEET 2		
INSTRUMENTATION AND CONTROLS DIVISION		
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
SUBMITTED	APPROVED	DATE
6/1/64	[Signature]	6-1-64
RC11-1-2P		REV. 0

NOTE

1. All resistors $\frac{1}{2}$ W, 5% composition except as noted.
2. Zeners D1 & D2 and collectors of Q1 & Q2 are electrically connected to heat sinks.
3. Globe D.C. Motor Type MM-25A502-11 with a 60:1:1 gear reducer. Shaft speed is approximately 0.3 R.P.M. at 12 volts.
4. "Clockwise" and "counterclockwise" direction referred to herein are viewed from the shaft end of the device.

NO.	REVISIONS	DATE	APPD	APPD
DESIGNED	DATE	SUBMITTED	DATE	APPROVED
C.E. WAGGONER	3-29-63	J.L. Anderson	4-6-63	
CHECKED	DATE	APPROVED	DATE	APPROVED
R. NUTT	3-19-63			
		APPROVED	DATE	APPROVED
		D.P. Roney	6-14-63	

PARTS LIST	RC11-9-BF
ASSEMBLY	RC11-9-BE
PRINTED CIRCUIT BOARD	RC11-9-BD
METAL PHOTO PANEL	RC11-9-BC
DETAILS	RC11-9-BB
REFERENCE DRAWINGS	DWG. NO.
DESIGN RESPONSIBILITY	J.L. ANDERSON
MODULAR REACTOR INSTRUMENTATION	
FLUX RESET MECHANISM CIRCUIT	
INSTRUMENTATION AND CONTROLS DIVISION OAK RIDGE NATIONAL LABORATORY	
UNION CARBIDE NUCLEAR COMPANY	
SUBMITTED	DATE
ACCEPTED	DATE
APPROVED	DATE
RC11-9-BA	RO

6-25-67 RO RC-11-9-8A J.L.A.

2603-1

MATERIALS LIST				
ITEM NO.	DWG. NO.	QTY.	NAME	MATERIAL

NO.	REVISIONS	DATE	APPR.	APPR.
DRAWING NO. 1				
DRAWN	DATE	CHECKED	DATE	APPROVED
DESIGNED	DATE	SUBMITTED	DATE	APPROVED
HEALTH PHYSICS	MEDICAL	OPERATIONS	SAFETY	
FIRE PROTECTION	RESEARCH SHOP	MAINTENANCE		

REFERENCE DRAWINGS		DWG. NO.
HIGH FLUX ISOTOPE REACTOR		
SAFETY SYSTEM #1 CHANNEL (TYPICAL)		
CIRCUIT DIAGRAM		
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
A DIVISION OF UNION CARBIDE AND CARBON CORPORATION		
OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
SCALE:		RC11-9-53

PRELIMINARY

- NOTES:
1. Welding to be in accordance with S & B Spec. Section 99. Liquid penetrant check per S & B Spec. M-500-MP-165. Radiography per S & B Spec. M-500-MW-6.
 2. (Each) Assemblies required for the following:
TE-100-1A, -1B, -2A, -2B, 3A, 3B - A Spare & B Spare

TEST NOZZLE
Mat'l - 347 SS S & B Spec. M-400-X-24

1	Revised dimensions to agree with mfr. Increased no. of assemblies reqd.				7-15-63	P.D.	Leo
NO.	REVISIONS	DATE	APPD	APPD	DATE	APPD	APPD
DESIGNED	DATE	SUBMITTED	DATE	APPROVED	DATE		
T. A. Marshall	10 Jun 63						
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE		
F. Iguro	5-11-63						

LIMITS AND DIMENSIONS UNLESS OTHERWISE SPECIFIED	
FRACT. DIMS.	± 1/64"
DECIMALS.	± .005"
ANGLES	± 0° 30'
SCALE	FULL SIZE

REFERENCE DRAWINGS	DWG. NO.
DESIGN RESPONSIBILITY	
H. F. I. R.	
RESISTANCE BULB WITH TEST NOZZLE ASSEMBLY & DETAILS	
INSTRUMENTATION AND CONTROLS DIVISION OAK RIDGE NATIONAL LABORATORY	
OPERATED BY UNION CARBIDE NUCLEAR COMPANY	
SUBMITTED DATE 6-10-63	APPROVED DATE 6-10-63
RC11-11-3 RI

NO.	REVISIONS	DATE	APPD	APPD
1	DESIGNED	DATE	APPROVED	DATE
2	CHECKED	DATE	APPROVED	DATE

4-7-64	RC11-13-51	J.L.A.
4-7-64	RC11-13-51	J.L.A.
4-7-64	RC11-13-51	J.L.A.

REFERENCE DRAWINGS	DWG. NO.
DESIGN RESPONSIBILITY	J.L. ANDERSON
MODULAR REACTOR INSTRUMENTATION	
WIDE RANGE COUNTING INSTRUMENT	
BLOCK DIAGRAM	
INSTRUMENTATION AND CONTROLS DIVISION	
OAK RIDGE NATIONAL LABORATORY	
OPERATED BY	
UNION CARBIDE NUCLEAR COMPANY	
SUBMITTER	DATE
APPROVED	DATE
RC11-13-51	RD.

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION	MATERIAL
1	RC11-22-2	1	Yoke	Ferro-Nickel
2	RC11-22-2	1	Outer Pole	Ferro-Nickel
3	RC11-22-2	1	Inner Pole	Ferro-Nickel
4	RC11-22-3	1	Shunt	Ferro-Nickel
5	RC11-22-3	1	Pole Tip	Ferro-Nickel
6	RC11-22-3	1	Armature	Ferro-Nickel
7	RC11-22-3	1	Upper Shim	304 S.S.
8	RC11-22-3	1	Lower Shim	304 S.S.
9	RC11-22-4	1	Potted 3-Coil Assembly	
10	Stock	10	1/4-20 x 1 1/2 hex soc hd mach scr	304 S.S.
11	Stock	4	1/4-20 x 1 1/2 hex soc hd mach scr (Head to be drilled for safety wiring)	304 S.S.
12	Stock	2	1/2" o.d. x 1/8" i.d. flexible tubing	Polyethylene
13	Stock	1	Swagelok Straight Male Connector, 1/4" NPT x 1/2" o.d. tubing, non-magnetic. Crawford Fitting Co # 400-1-2-316	316 S.S.
14	Stock	3	Straight Connector Plug, 2-pin, Bendix Scinflex No. AN-3106E-10SL-4P, complete with cable clamp No. AN-3057-4B & grommet No. 10-4081-4	
15	Stock	1	O-Ring, 4 1/2" i.d. x 4 3/8" o.d. x 1/8"	Neoprene

NOTE:
At inspection, items ① thru ⑥ to be stamped with assembly serial number on surface designated by ⊗.

NO.	REVISIONS				DATE	APPD.	APPD.
1	DESIGNED	DATE	SUBMITTED	DATE	APPROVED	DATE	
1	DESIGNED	5-26-64					
2	CHECKED	5-26-64	APPROVED	5-27-64			
3	CHECKED	5-26-64	APPROVED				

REFERENCE DRAWINGS		DWG. NO.
DESIGN RESPONSIBILITY W.D. Brown		
HFIR 3-COIL MAGNET		
ASSEMBLY		
INSTRUMENTATION AND CONTROLS DIVISION OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY		
SUBMITTED RC11-22-1 J.R.M. Hite	ACCEPTED RC11-22-1 J.R.M. Hite	DATE 5/27/64
		RC11-22-1 Ro

PARTS LIST			
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)
12	D-42280	4	N ^o PROBE ASSY
13	E-42330	4	ENGAGEMENT MECHANISM
14	E-42330	1	INNER DRIVE ROD
16	E-42257	3	FISSION CHAMBER & DRIVE ASSY
43	E-42328	1	FUEL & REFLECTOR SUPPORT AND SLEEVE ASSEMBLY
44	E-42335-14	1	HFIR PRESSURE VESSEL
45	E-42335-14	4	SHOCK ABSORBER ASSY
57	E-42493-5	1	INNER DRIVE ROD SHIELD
58	E-42347-10	4	SEAT SWITCH ACTUATOR
59	E-42361-10	4	BOLT
60	E-42361-5	4	SPACER LUG
61	E-42328-13	4	BOLT, 1" SOCKET HEAD
62	E-42494	1	VESSEL EXTENSION SHIELD PLUG

REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		BLDG. NO. 1900
REACTOR ASSEMBLY		
VERTICAL SECTION Z-Z		ELEV 800'-0" TO 813'-3"
OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
JOB 505-3.0		E-42083

PARTS LIST			
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)
12	D-42280	4	N ^o PROBE ASSY
13	E-42330	4	ENGAGEMENT MECHANISM
14		1	INNER DRIVE ROD
16	E-42257	3	FISSION CHAMBER & DRIVE ASSY
65	E-423465	1	INNER CONTROL ROD SEAL HOUSING
66	E-423464	4	OUTER CONTROL ROD SEAL HOUSING
69	D-42365	4	PRIMARY SUPPORT COLUMN
73	E-423463	5	VALVE
74	E-42151	4	OUTER CONTROL ROD DRIVE MAGNET ACTUATOR
75	E-47638	1	SHIM DRIVE FOR INNER CONTROL ROD
76	E-47909	4	OUTER CONTROL ROD DRIVE

0 1 2 3 4 5 6
SCALE - INCHES

REVISIONS					
LTR.	DATE	SUBMITTED	DATE	APPROVED	DATE
DESIGNED					
CHECKED					

REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		BLDG. NO. 7900
REACTOR ASSEMBLY		
VERTICAL SECTION		REACTOR DIVISION
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
DIVISION OF UNION CARBIDE CORPORATION		
OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
	108 505-30	E-42085

PARTS LIST			
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)
16	E-42257	3	FISSION CHAMBER & DRIVE ASSY
69	D-42365	4	PRIMARY SUPPORT COLUMN
75	E-47638	1	SHIM DRIVE FOR INNER CONTROL ROD
76	E-47909	4	OUTER CONTROL ROD DRIVE
77	D-42168	1	GEMCO ROTATING CAM SWITCH
78	D-42394	1	REGULATING DRIVE POSITION INDICATOR
79	E-42342	4	OUTER CONTROL ROD POSITION INDICATOR
80	E-42366	4	LOWER SUPPORT COLUMN
81	E-42368	1	SUPPORT PLATFORM
82	E-42369	1	SERVO INPUT MECHANISM
83	E-42290	1	REGULATING DRIVE ASSY
84	E-42391	1	INNER CONTROL ROD POSITION INDICATOR
85	D-42390	1	LIMIT SWITCH ADJUSTABLE STAGE ASSY

0 1 2 3 4 5 6
SCALE - INCHES

LTR.	DATE	REVISIONS	DATE	APPD	APPD
DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE

REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		BLDG. 7900
REACTOR ASSEMBLY		
VERTICAL SECTION		REACTOR DIVISION
Oak Ridge National Laboratory OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
Joe 50530	E-42086

LTR.	REVISIONS				DATE	APPD	AI
DRAWN	DATE	SUBMITTED	DATE	APPROVED			
<i>CRUELE</i>	<i>02/26/93</i>						
DESIGNED	DATE	APPROVED	DATE	APPROVED			
CHECKED	DATE	APPROVED	DATE	APPROVED

PARTS LIST			
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)

0 1 2 3 4 5 6
SCALE - INCHES

LTR.	DATE	REVISIONS	DATE	APPROVED	DATE
DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE

REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		BLDG. NO. 7900
REACTOR ASSEMBLY		
VERTICAL SECTION		REACTOR DIVISION
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
DIVISION OF UNION CARBIDE CORPORATION		
SUBMITTED	ACCEPTED	APPROVED
DATE	DATE	DATE
Job 505-3.0	E-42088	REV

PARTS LIST			
ITEM	DWG. NO.	QTY	DESCRIPTION
1	THIS DWG	1	ADAPTER, OUTER
2	D-42115	1	TOP INSIDE COMB
3	D-42115	1	TOP OUTSIDE COMB
4	THIS DWG	1	ADAPTER, INNER
5	D-42113	171	FUEL PLATE, TRUE INVOLUTE CURVATURE
6	D-42112	1	SIDE PLATE, INNER
7	D-42117	1	SIDE PLATE, OUTER
8	THIS DWG	1	ADAPTER, INNER
9	D-42116	1	BOTTOM INSIDE COMB
10	D-42116	1	BOTTOM OUTSIDE COMB
11	D-42116	1	BOTTOM MIDDLE COMB

GENERAL NOTES-SEE DRAWING D-42119

*CONCENTRIC TO DIA "E" WITHIN .002 F.I.R.

NO.	REVISIONS	DATE	APPD	APPD
1	THRU 13 SEE DCN 2772	7-17-63	JRM	JRM
2	THRU 13 SEE DCN 2698	7-17-63	JRM	JRM
3	THRU 13 SEE DCN 2620	7-17-63	JRM	JRM
4	THRU 13 SEE DCN 2585	7-17-63	JRM	JRM
5	THRU 13 SEE DCN 2525	7-17-63	JRM	JRM

GENERAL SPECIFICATIONS:
1. Break all sharp edges 1/64 inch, unless otherwise specified.
2. The fabricator may show the type, grade or finish of material unless otherwise specified.
MACHINE FINISH SPECIFICATIONS:
1. Finish symbols are in accordance with ASA Standard B46.1-1958.
2. Roughness height values are the maximum arithmetical average deviation from the mean surface, expressed in microinches.
3. For surfaces not otherwise indicated, roughness height shall not exceed 63.

FUEL ELEMENTS GENERAL NOTES		D-42119
INNER FUEL ELEMENT OUTER SIDE PLATE		D-42117
" " " " BOTTOM COMBS		D-42116
" " " " TOP COMBS		D-42115
" " " " FUEL PLATE, TRUE INVOLUTE CURVATURE DESIGN METHOD		D-42113
" " " " INNER SIDE PLATE		D-42112
HFIR OUTER FUEL ELEMENT ASSEMBLY		D-42120
REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		BLDG. 7900 NO.
HFIR INNER FUEL ELEMENT ASSEMBLY		
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
DIVISION OF UNION CARBIDE CORPORATION		
OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED 7-17-63	APPROVED
J. R. Muller	J. R. Muller	J. R. Muller
JOB NO 503-1-1		D-42118

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	E42151-1	30	$\frac{3}{8}$ SPRING LOCKWASHER	302 SST.
2	E42151-2	14	$\frac{3}{8}$ -16 UNC-2A, HEX. SOC. HD. CAP SCR. $\times \frac{1}{4}$ LG.	303 SST.
3	E42151-3	16	$\frac{3}{8}$ -16 UNC-2A, HEX SOC. HD. CAP SCR. $\times \frac{1}{4}$ LG.	303 SST.
4	E42157-9	1	HOUSING	
5	E42151-5	1	$\frac{3}{8}$ PLAIN WASHER	302 SST.
6	E42151-6	1	$\frac{3}{8}$ -16 UNC-2B, HEX CASTLE NUT	303 SST.
7	E42151-7	1	$\frac{5}{16}$ COTTER PIN $\times 1"$ LG.	3006BRES.SS
8	E42158-5	1	CLAMP	
9	E42159-3	1	RECOCKING PLINGER	
10	E42159-2	1	RECOCKING SPRING	
11	E42159-1	1	SPRING HOUSING	
12	E42159-5	1	BOOT (WATER TIGHT)	
13	E42158-4	1	CLAMP	
14	E42161-20	1	SHOCK PAD	
15	E42153-27	1	SNUBBER ASSEMBLY	
16	E42156-7	1	UPPER HOUSING	
17	E42157-6	1	FLANGE	
18	E42159-4	1	RETAINER	
19	E42153-3	1	RELEASE SPRING	
20	E42158-1	1	BUSHING	
21	E42158-2	1	BUSHING HOUSING	
22	E42151-22	6	$\frac{3}{8}$ -16 UNC-2A, HEX. SOC. HD. CAP SCR. $\times \frac{1}{4}$ LG.	303 SST.
23	E42151-23	1	TEUROC RETAINING RING $\frac{1}{2}$ N5000-15 CODE 14	420 S. ST.
24	E42161-8	1	TRIP ROD	
25	E42161-21	2	ADJUSTMENT NUT	

NO.	REVISONS				DATE	APPD	APPD
DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE		
U.C. CABLE	5/2	W. Mello	6/5/63	E. Mello	6-3-63		
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE		
U.C. James	4/3/63	P. M. V. H.	6/5/63				
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE		
W. Mello	6/2/63						

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED: FRACTIONS $\pm .005$ DECIMALS $\pm .005$ ANGLES $\pm 1^\circ$ SCALE: FULL	GENERAL SPECIFICATIONS UNLESS OTHERWISE SPECIFIED: 1. BREAK ALL SHARP EDGES 1/64 MAX. 2. SURF. FINISH OR FINISH OF SURFACES MAY BE CHOSEN BY MANUFACTURER. 3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED .001 (FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASME B46.1-1995).
--	--

OUTER CONTROL ROD MAGNET ACTUATOR RELEASE ASSEMBLY	E-42159
OUTER CONTROL ROD MAGNET ACTUATOR UPPER ASSEMBLY	E-42156
REFERENCE DRAWINGS	NO.
<p>OAK RIDGE NATIONAL LABORATORY</p> <p>OPERATED BY</p> <p>UNION CARBIDE NUCLEAR COMPANY</p> <p>DIVISION OF UNION CARBIDE CORPORATION</p> <p>OAK RIDGE, TENNESSEE</p>	
HFIR MECHANICAL CONTROLS	BUILDG. NO. 7900
<p>OUTER CONTROL ROD DRIVE</p> <p>MAGNET ACTUATOR ASSEMBLY</p> <p>REACTOR DIVISION</p>	
SUBMITTED	APPROVED 3-6-63
	J.R. MCLESTER
APPROVED	APPROVED
404-50560	E 42151
	REV.

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1		1	TUBE 3/8 OD x .065 WALL x 14'-0" ASTM A 269 TYPE 304	
2	D-42281	1	CAP	
3	D-42281	1	PIPE	
4		1	CONNECTOR - SWAGELOK #400-1-OR-316 OR EQUAL	
5				
6	D-42281	1	ADAPTER	
7		3	O-RING 1.10 x 1.75 OD x .30 NOM 70 DUROMETER BUNA S	
8		3	O-RING 1.315 x 1.875 OD x .30 NOM TO DUROMETER BUNA S	
9	D-42281	1	PLUG	
10		3	1/2-11 UNC-2A x 1 1/2 LG SOC HD CAP SCREW SEE NOTE 1	
11	D-42281	1	FLANGE	
12		1	THERMOCOUPLE ASSEMBLY - BY UCNC 10C DIVISION	
13		1	1/2-11 UNC-2A x 1 LG SOC HD CAP SCREW SEE NOTE 1	
14		1	SPRING LOCKWASHER	STL
15	D-42281	1	LOCK	
16	D-42281	4	SPACER	

GENERAL NOTES

- Parts 10 and 13 - Standard Pressed Steel Company, "Unbrake" alloy steel or equal.
- All material, welding and fabrication shall conform to HFIR procurement notes SST-2 (Dwg. D-42014).

LOWER HEAD	E-42269
HFIR PROCUREMENT NOTES SST-2	D-42014
Ni6 PROBE DETAILS	D-42281
REFERENCE DRAWINGS	DWG. NO.
HFIR PROJECT	SLUR-T900
Ni6 PROBE ASSEMBLY	
REACTOR DIVISION	
OAK RIDGE NATIONAL LABORATORY	
OPERATED BY	
UNION CARBIDE NUCLEAR COMPANY	
DIVISION OF UNION CARBIDE CORPORATION	
OAK RIDGE, TENNESSEE	
SUBMITTED	APPROVED
DATE	DATE
3/15/63	7/15/63
DESIGNED	APPROVED
DATE	DATE
3/15/63	7/15/63
SCALE: FULL SIZE	JOB 905-2.8 D-42280

LTR	REVISIONS	DATE	APPRO	DATE	APPRO
1	AS SHOWN				
2	AS SHOWN				
3	AS SHOWN				
4	AS SHOWN				
5	AS SHOWN				
6	AS SHOWN				
7	AS SHOWN				
8	AS SHOWN				
9	AS SHOWN				
10	AS SHOWN				

REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		
CLASSIFICATION		
UNCLASSIFIED		
LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED		
FRACTIONS: 1/16" = 0.0625"		
DECIMALS: 1/10" = 0.1"		
ANGLES: 1/16" = 0.0625"		
SCALE: 1/8" = 1'		
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
DIVISION OF UNION CARBIDE CORPORATION		
OAK RIDGE, TENNESSEE		
SUBMITTED		APPROVED
DATE		DATE
F-42307

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	E-42352	1	INNER SHROUD	
2		1	INNER CONTROL ROD	
3		4	OUTER CONTROL ROD	
4	E-42381	1	UPPER PLENUM & OUTER SHROUD	
5	E-42348	16	1 1/2" VERTICAL EXPERIMENT FACILITIES PLUG ASSEMBLY	
6	E-42349	6	3" VERTICAL EXPERIMENT FACILITIES PLUG ASSEMBLY	
7	E-42386-24	4	COOLING WATER INLET NOZZLE	
8		1	CONTROL ROD BEARING & TRACK ASSEMBLY, UPPER	
9	E-42386-9	1	CLAMP RING ASSEMBLY	
10	E-42374	1	REFLECTOR CONTAINER AND PEDESTAL ASSY	
11	E-42387-4	1	BOLT RETAINING RING	
12	E-42387-10	20	SWING BOLT ASSEMBLY	

LTR.	DATE	REVISIONS	DATE	APPD.	APPD.
DESIGNED	3-23-59	SUBMITTED	DATE	APPROVED	DATE
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE

0 1 2 3 4 5 6
SCALE - INCHES

LIMITS ON DIMENSIONS, UNLESS OTHERWISE SPECIFIED:
FRACTIONS ± _____
DECIMALS ± _____
ANGLES ± _____
SCALE: _____

GENERAL SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES 1/64 MAX.
2. TYPE, GRADE, OR FINISH OF MATERIAL MAY BE CHOSEN BY FABRICATOR.
3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED .001 (FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASA B46.1-1955.)

REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		BLDG. 7900 NO. 1
PLAN SECTION THRU CONTROL ROD SHROUD AT ELEVATION 825' SECTION B-B		
OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
Job 505-30		E-42308

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	R42003E	3	ION CHAMBER SHIELD & SUPPORT ASSY	
2	D4774B	3	IONIZATION CHAMBER DRIVE VESSEL PENETRATION & TRAVEL MECHANISM	
3		1	HFIR PRESSURE VESSEL

LTR.	DATE	REVISIONS	DATE	APPD	APPD
DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:	
FRACTIONS	±
DECIMALS	±
ANGLES	±
SCALE:	

REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		BLDG. NO. 7900
PLAN SECTION AT VESSEL TOP FLANGE ELEVATION 829'9" SECTION A-A REACTOR DIVISION		
OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
Job 505-50		E-42309
		REV.

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	D-42110	1	FUEL ELEMENT INNER ANNULUS	
2	D-42126	1	FUEL ELEMENT OUTER ANNULUS	
3		1	INNER CONTROL ROD	
4		4	OUTER CONTROL ROD	
5		1	REMOVABLE REFLECTOR ASSEMBLY	
6	E-42380	4	CONTROL ROD ACCESS PLUG ASSEMBLY	
7	E-42388-12	4	SEMI-PERMANENT REFLECTOR PLENUM	
8	E-42017	1	PERMANENT AND SEMI-PERMANENT REFLECTOR ASSEMBLY	
9	E-42323	4	SEMI-PERMANENT REFLECTOR	
10	E-42381	1	UPPER PLENUM AND OUTER SHROUD ASSY	
11	E-42374	1	REFLECTOR CONTAINER AND PEDESTAL ASSY	
12	E-42133-4	16	1 1/2" VERTICAL EXPERIMENT HOLE LINER	
13	E-42133-1	6	3" VERTICAL EXPERIMENT HOLE LINER	
14	E-42388-24	4	COOLING WATER INLET NOZZLE	
15	E-42348	16	1 1/2" VERTICAL EXPERIMENT FACILITIES PLUG ASSEMBLY	
16	E-42349	6	3" VERTICAL EXPERIMENT FACILITIES PLUG ASSEMBLY	
17	E-42388-3	4	SEMI-PERMANENT PLENUM HOLD-DOWN	
18		16	OUTER SHROUD LOCATING KEY	

NO.	REVISIONS				DATE	APPD	APPD
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE		
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE		

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:
 FRACTIONS ± _____
 DECIMALS ± _____
 ANGLES ± _____
 SCALE: _____

GENERAL SPECIFICATIONS:
 1. BREAK ALL SHARP EDGES 1/64 MAX.
 2. TYPE, GRADE, OR FINISH OF MATERIAL MAY BE CHOSEN BY FABRICATOR.
 3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED .001 (FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASA B46.1-1955.)

REFERENCE DRAWINGS		NO.
OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE		
HFIR PROJECT		BLDG 7900
REACTOR ASSEMBLY PLAN SECTION ABOVE REFLECTOR AT ELEVATION 821'-6 1/2" - SECTION C-C		
SUBMITTED	APPROVED	APPROVED
APPROVED	100 505-9.0	E 42310

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	D-42118	1	FUEL ELEMENT INNER ANNULUS	
2	D-42126	1	FUEL ELEMENT OUTER ANNULUS	
3		1	INNER CONTROL ROD	
4		4	OUTER CONTROL ROD	
5		1	REMOVABLE REFLECTOR ASSEMBLY	
6	E-42380	4	CONTROL ROD ACCESS PLUG ASSEMBLY	
7	E-42018	1	PERMANENT REFLECTOR - 178 LITERS	
8	E-42017	1	PERMANENT AND SEMI-PERMANENT REFLECTOR ASSEMBLY	
9	E-42349	6	3" VERTICAL EXPERIMENT FACILITIES PLUG ASSEMBLY	
10	E-42348	16	1 1/2" VERTICAL EXPERIMENT FACILITIES PLUG ASSEMBLY	
11	E-42374	1	REFLECTOR CONTAINER AND PEDESTAL ASSY

LTR.	REVISIONS	DATE	APPD	APPD
DESIGNED	DATE	SUBMITTED	DATE	APPROVED
CHECKED	DATE	APPROVED	DATE	APPROVED
CHECKED	DATE	APPROVED	DATE	APPROVED

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:	
FRACTIONS ±	
DECIMALS ±	
ANGLES ±	
SCALE:	

REFERENCE DRAWINGS		DWG. NO.
HFIR PROJECT		BLDG. NO. 7900
PLAN SECTION AT REFLECTOR MIDPLANE		
ELEVATION 820' 6" SECTION D-D		
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
DIVISION OF UNION CARBIDE CORPORATION		
OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
	JOB 505.9.0	E-42311

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	E-42257	3	FISSION CHAMBER & DRIVE ASSEMBLY	
2	E-42374	1	REFLECTOR CONTAINER & PEDESTAL ASSEMBLY	
3	E-42380	4	CONTROL ROD ACCESS PLUG ASSEMBLY	
4	D-42280	4	N ¹⁶ PROBE ASSEMBLY	
5	E-42376	1	INNER CONTROL ROD DRIVE BRACKET	
6	E-42350	1	FUEL SUPPORT PEDESTAL	
7	D-42375	1	FUEL GRID ASSEMBLY	
8		4	OUTER CONTROL ROD	
9		1	INNER CONTROL ROD	
10	E-42017	1	PERMANENT & SEMI-PERMANENT REFLECTOR ASSEMBLY	
11	E-42373-3	4	KEY	
12	E-42323-10	4	LOCATING PLATE

LTR.	DATE	REVISIONS	DATE	APPD	APPD
DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:	
FRACTIONS ±	
DECIMALS ±	
ANGLES ±	
SCALE:	

GENERAL SPECIFICATIONS	
1. BREAK ALL SHARP EDGES 1/64 MAX.	
2. TYPE, GRADE, OR FINISH OF MATERIAL MAY BE CHOSEN BY FABRICATOR.	
3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED	
(FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASA B46.1-1955.)	

REFERENCE DRAWINGS		DWG. NO.
H.F.R. PROJECT		BLDG. 7900
PLAN SECTION BELOW REFLECTOR AT ELEVATION 819'5 1/2" SECTION E-E		REFLECTOR DIVISION
OAK RIDGE NATIONAL LABORATORY		UNIVERSITY OF
UNION CARBIDE NUCLEAR COMPANY		DIVISION OF UNION CARBIDE CORPORATION
OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
Job 505-30		E-42312

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	E-42257	3	FISSION CHAMBER & DRIVE ASSY	
2	D-42280	4	N ^o PROBE ASSY	
3		4	OUTER CONTROL DRIVE ASSY	
4	E-42335-14	4	SHOCK ABSORBER ASSY	
5	E-42327 E-42328	1	FUEL & REFLECTOR SUPPORT AND SLEEVE ASSY	
6	E-42350	1	FUEL SUPPORT PEDESTAL	
7	E-42374-3	1	GASKET, METALLIC O-RING	
8		1	INNER CONTROL ROD SLEEVE BEARING ASSY	
9		1	INNER CONTROL ROD DRIVE ASSY

0 1 2 3 4 5 6
SCALE-INCHES

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:
FRACTIONS ± _____
DECIMALS ± _____
ANGLES ± _____
SCALE: _____

GENERAL SPECIFICATIONS:
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES 1/64 MAX.
2. TYPE, GRADE, OR FINISH OF MATERIAL MAY BE CHOSEN BY FABRICATOR.
3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED .001 (FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASA B46.1-1955.)

REFERENCE DRAWINGS		NO.
OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE		
HFIR PROJECT		BLDG. NO. 7900
PLAN SECTION AT CORE SUPPORT UPPER FLANGE-ELEV 817'-0" SECTION F-F REACTOR DIVISION		
SUBMITTED	APPROVED	APPROVED
APPROVED	JOB 505-30	E-42313

NO.	DATE	REVISIONS	DATE	APPD	APPD
DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	E-42257	3	FISSION CHAMBER & DRIVE ASSY	
2	D-42280	4	N ^o PROBE ASSY	
3		1	INNER CONTROL DRIVE ASSY	
4	E-42361-5	4	SPACER LUG	
5	E-42361-10	4	BOLT	
6		1	HPIR PRESSURE VESSEL	
7	E-42328-13	4	BOLT, 1" SOCKET HEAD	
8	E-42335-14	4	SHOCK ABSORBER ASSY	
9	E-42328	1	FUEL & REFLECTOR SUPPORT AND SLEEVE ASSY

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:
 FRACTIONS $\pm$ _____
 DECIMALS $\pm$ _____
 ANGLES $\pm$ _____
 SCALE: _____

GENERAL SPECIFICATIONS:
 UNLESS OTHERWISE SPECIFIED:
 1. BREAK ALL SHARP EDGES 1/64 MAX.
 2. TYPE, GRADE, OR FINISH OF MATERIAL MAY BE CHOSEN BY FABRICATOR.
 3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED _____
 (FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASA B46.1-1955.)

LTR.	DATE	REVISIONS	DATE	APPD	APPD
DRAWN	DATE	SUBMITTED	DATE	APPROVED	DATE
DESIGNED	DATE	APPROVED	DATE	APPROVED	DATE
CHECKED	DATE	APPROVED	DATE	APPROVED	DATE

REFERENCE DRAWINGS		DWG. NO.
H.F.I.R. PROJECT		BLDG. NO. 7900
PLAN SECTION AT 4" WATER OUTLET - ELEV. 813'-6"		
SECTION G-G		
OAK RIDGE NATIONAL LABORATORY		
OPERATED BY		
UNION CARBIDE NUCLEAR COMPANY		
DIVISION OF UNION CARBIDE CORPORATION		
OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
JOB NO. 505-3-0	E-42314	REV.

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	D-42200	4	NIL DRIVE ASSY	
2	E-42257	8	FISSION CHAMBER & DRIVE ASSY	
3		1	INNER CONTROL ROD DRIVE ASSEMBLY	
4		4	OUTER CONTROL ROD DRIVE ASSEMBLY

0 1 2 3 4 5 6
SCALE - INCHES

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:
FRACTIONS ±
DECIMALS ±
ANGLES ±
SCALE:
GENERAL SPECIFICATIONS:
UNLESS OTHERWISE SPECIFIED:
1. BREAK ALL SHARP EDGES 1/64 MAX.
2. TYPE, GRADE, OR FINISH OF MATERIAL MAY BE CHOSEN BY FABRICATOR.
3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED (FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASA B46.1-1955.)

REACTOR ASSEMBLY, VERTICAL SECTION Z-Z		E-42084
REFERENCE DRAWINGS		DWG. NO.
H.E.I.R. PROJECT		BLDG. NO.
PLAN SECTION BELOW SHIELD PLUG-UP DOWN - AT ELEV. 806'		
SECTION H-H REACTOR DIVISION		
OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE		
SUBMITTED	ACCEPTED	APPROVED
Job # 205-30		E-42315

LTR.	REVISIONS	DATE	APPD	APPD
DESIGNED	DATE	SUBMITTED	DATE	APPROVED
DESIGNED	DATE	APPROVED	DATE	APPROVED
DESIGNED	DATE	APPROVED	DATE	APPROVED

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, QTY.)	MATERIAL
1	E-42330-0	1	BALL ENGAGEMENT MECHANISM ASSY.	
2	E-42330-2	1	1/4" DIA. PIN X 1/2" L.	304 S.S.T.
3	E-42331-4	1	PUSH ROD	
4	E-42329-1	1	DRIVE TUBE	
5	E-42330-5	1	O-RING, 1 1/2" X 1 1/2" X 1/4" PARKER #2-17	BUNN-N DUREMETER 70
6	E-42329-3	1	BACKUP SEAL HOUSING	
7	E-42330-7	3	NON EXTRUSION RING PALMETTO 1ST 6054	PHENOLIC
8	E-42330-8	2	GT PALMETTO RING NS 6054	BUNN-N DUREMETER 70
9	E-42330-9	2	O-RING, 1 1/2" X 1 1/2" X 1/4" PARKER #2-212	BUNN-N DUREMETER 70
10	E-42330-10	1	O-RING, 1 1/2" X 1 1/2" X 1/4" PARKER #2-11	BUNN-N DUREMETER 70
11	E-42330-11	1	O SEAL STRAIGHT THD CONN. SWAGelok #200-10R-316	316 S.S.T.
12	E-42329-2	1	PUSH ROD SEAL HOUSING	
13	E-42331-2	1	SPLIT RING RETAINER FLANGE	
14	E-42331-9	1	DRIVE TUBE SPLIT RING	
15	E-42331-3	1	BUSHING	
16	E-42331-5	1	RETAINER PLUG	
17	E-42331-1	1	DRIVE TUBE CONN. FLANGE	
18	E-42330-18	3	1/8"-16 UNC-2B 50C HD CAP SCREWS 1/2" L.	303 S.S.T.
19	E-42330-19	3	NOM. INTERNAL TOOTH LOCK WASHER 302 S.S.T.	
20	E-42330-20	1	O-RING, 1 1/2" O.D. X 1 1/2" I.D. X 1/4" PARKER #2-14	BUNN-N DUREMETER 70

LTR.	DATE	REVISIONS	DATE	APPROVED	APPROVED
DESIGNED	11/1/63	1	11/1/63	EMM	11/1/63
CHECKED	11/1/63				

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:
FRACTIONS ± 1/64
DECIMALS ± .005
ANGLES ± 0°-30'

GENERAL SPECIFICATIONS:
1. BREAK ALL SHARP EDGES 1/64 MAX.
2. SURF. GRADE: 60-80 RMS MAX.
3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED .001 (FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASA B46.1-1955.)

REFERENCE DRAWINGS	DWG. NO.
HFIR MECHANICAL CONTROLS	BLDG. NO. 7300
OUTER CONTROL ROD DRIVE ENGAGEMENT MECHANISM ASSEMBLY	REACTOR DIVISION
OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE	
SUBMITTED BY: M. J. JONES	APPROVED BY: J. R. JONES
100# 50540	E-42330

21 1/2" TO REACTOR MID-PLANE

CONTINUATION

PARTS LIST				
PART NO.	DWG. NO.	NO. REQD.	DESCRIPTION (NAME, SIZE, ETC.)	MATERIAL
1	E-49766-3	1	THIMBLE SUB-ASSEMBLY	
2	E-49766-4	1	FISSION CHAMBER & PRE-AMP ASSY	
3	E-49767-2	1	HOUSING SUB-ASSEMBLY	
4	E-49766-5	1	RACK SUB-ASSEMBLY	
5	E-49766-7	1	SLEEVE SUB-ASSEMBLY	
6	E-49767-5	1	DRIVE GEAR SUB-ASSEMBLY	
7	E-49767-10	1	POSITION TAKE OFF GEAR SUB-ASSEMBLY	
8	E-49765-8	1	SCREW, HEX SOCKET CAP-1/4 UNC-2A X 1 LG	STL 303 SS
9	E-49765-9	1	SCREW, HEX SOCKET CAP-3/8 UNC-2A X 1 LG	
10	E-49765-10	12	SCREW, HEX SOCKET CAP-1/2 UNC-2A X 1 LG	
11	E-49765-11	2	SCREW, HEX SOCKET CAP-1/2 UNC-2A X 1 LG	
12	E-49765-12	4	SCREW, HEX SOCKET CAP-1/2 UNC-2A X 1 LG	
13	E-49765-13	2	SCREW, HEX SOCKET CAP-1/2 UNC-2A X 1 LG	
14	E-49765-14	2	SCREW, HEX SOCKET CAP-1/2 UNC-2A X 1 LG	
15	E-49765-15	1	SCREW, HEX SOCKET SET SCREW-1/4 UNC-2A X 1 LG	
16	E-49765-16	8	SCREW, RD HD MACH-1/8 UNC-2A X 1 LG	
17	E-49765-17	12	SCREW, HEX SOCKET CAP-1/2 UNC-2A X 1 LG	
18	E-49765-18	2	O-RING, 1 1/2 X 1 1/2 X 1/4 NOM. TO DUROMETER	BUNA S
19	E-49765-19	2	O-RING, 1 1/2 X 1 1/2 X 1/4 NOM. TO DUROMETER	BUNA S
20	E-49765-20	2	SNAP RING-INDUSTRIAL EXTERNAL RING 1 1/2 X 1 1/2 X 1/4	STL 303 SS
21	E-49765-21	1	SNAP RING-INDUSTRIAL EXTERNAL RING 1 1/2 X 1 1/2 X 1/4	
22	E-49765-22	1	SNAP RING-INDUSTRIAL INTERNAL RING 1 1/2 X 1 1/2 X 1/4	
23	E-49765-23	1	SNAP RING-INDUSTRIAL EXTERNAL RING 1 1/2 X 1 1/2 X 1/4	SS
24	E-49765-24	3	BEARING-NEW DEPARTURE TYPE R 1 1/2 X 1 1/2 X 1/4	
25	E-49765-25	1	BEARING-NEW DEPARTURE TYPE R 1 1/2 X 1 1/2 X 1/4	
26	E-49765-26	1	MOTOR (SEE NOTE 2)	
27	E-49765-27	1	SHAFT COUPLING (SEE NOTE 2)	303 SS
28	E-49765-28	1	VERNASTAT MIL 18 FURNISHED BY ORNL 1&C DIVISION	
29	E-49765-29	1	POTENTIOMETER BECKMAN 107603 DOUBLE SHUNT 1000 OHMS	
30	E-49765-30	8	SYNCHRO MOUNTING CLAMP 1/2 X 1/2 X 1/4	303 SS
31	E-49767-14	3	SWITCH MOUNT	
32	E-49767-17	3	SWITCH MOUNT CLAMP	
33	E-49767-19	2	RING	
34	E-49767-15	1	COVER	
35	E-49767-20	1	FLANGE	
36	E-49767-17	1	SPACER	
37	E-49767-18	1	SPACER	
38	E-49767-16	1	BRACKET	
39	E-49765-39	3	LIMIT SWITCH (SEE NOTE 3)	
40	E-49765-40	2	SCREW, HEX SOCKET SET SCREW-1/4 UNC-2A X 1 LG	STL 303 SS
41	E-49765-41	2	SCREW, HEX SOCKET SET SCREW-1/4 UNC-2A X 1 LG	
42	E-49765-42	1	CONDUIT BUSHING 1 STD (NOT SHOWN)	303 SS
43	E-49765-43	4	SCREW, RD HD MACH-1/8 UNC-2A X 1 LG	STL 303 SS

NO.	REVISIONS	DATE	APPD	APPD
1	DESIGNED	DATE	APPROVED	DATE
2	CHECKED	DATE	APPROVED	DATE
3	CHECKED	DATE	APPROVED	DATE

LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED:		GENERAL SPECIFICATIONS:	
FRACTIONS ±	1/64 MAX.	1. BREAK ALL SHARP EDGES 1/64 MAX.	
DECIMALS ±	.005	2. TYPE, GRADE, OR FINISH OF MATERIAL: SHALL BE CHECKED BY FABRICATOR.	
ANGLES ±	0° 30'	3. ROUGHNESS HEIGHT OF MACHINED SURFACES SHALL NOT EXCEED .001.	
SCALE:	FULL	FINISH SYMBOLS AND HEIGHT VALUES ARE IN ACCORDANCE WITH ASA B46.1-1963.	

THIMBLE & RACK DETAILS	E-49766
GEAR HOUSING & GEAR DETAILS	E-49767
REFERENCE DRAWINGS	NO.
OAK RIDGE NATIONAL LABORATORY OPERATED BY UNION CARBIDE NUCLEAR COMPANY DIVISION OF UNION CARBIDE CORPORATION OAK RIDGE, TENNESSEE	
HEIR PROJECT	BLDG. 7900
FISSION CHAMBER & DRIVE ASSEMBLY	
REACTOR DIVISION	
SUBMITTED	APPROVED
DATE	DATE
BY	BY
APPROVED	APPROVED
DATE	DATE

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