MANUAL TRAVERSE

HIGH SPEED — LOW SPEED

DETECTOR IN CHAMBER SHIELD — LIMIT SWITCH — LOCAL

TIP MODE SWITCH IN "MANUAL" POSITION — RMS — ZONE D8

CHOOSE MACHINE "A", A, B, C, D OR E

GUIDE TUBE SELECTOR SWITCH IN "A" POSITION — RMS — CR

PERMISSIVE IF PROBE IS NOT IN INDEXER — AUXILIARY DEVICE — LOCAL

INDEXING MACHINE HOMES IN & LOCKS ON SELECTED POSITION — J002 — LOCAL — ZONE G4

"READY FOR TRAVERSE" SIGNAL

17 / 7 / G6, G7, G8

C — TYPICAL OF 5 — C860, C863, C861, C864, C862

18 / 7 / B7 — RECYCLE

(TYPICAL OF 5)

SCAN SWITCH IN "SCAN" POSITION — RMS — CR

CR W SCAN PERMISSIVE

COMPUTER OUTPUTS L532, L533, L534, L535, L536

PERMISSIVE IF COMPUTER HAS NOT ABORTED THE TRAVERSE

PERMISSIVE IF DETECTOR MOVING IN REVERSE — J020 — LOCAL

COMPUTER INITIALIZES & DETERMINES THAT THE TRAVERSE IS PERMISSIBLE

PERMISSIVE WHEN DETECTOR MOVING FROM CORE TOP TO CORE BOTTOM — J020 — CR

COMPUTER OPERATOR SELECTS MACHINE WITH A PRESCRIBED PERMISSIBLE TRAVERSE AS INPUT TO COMPUTER

MACHINE "I" OUTPUT SWITCHED AS INPUT TO RECORDER

CR W READY — MONITOR NOT IN USE OR NOT IN SELECTED FUEL TUBE — J007 — LOCAL — ZONE F5

CR W IN SHIELD — DETECTOR IN SHIELD — J008 — LOCAL

CR W CORE TOP — DETECTOR IN TOP OF CORE POSITION — J001 — LOCAL — ZONES G7, F6

CR W IN CORE — DETECTOR "IN CORE" — J001 — LOCAL

ISOLATION COMMAND RECEIVED — REF 3 — FROM PRIMARY CONTAINMENT ISOLATION SYSTEM 612090-2 ZONE E4

CR A PILOT LIGHT ON VALVE CONTROL MONITOR

NOT PERMISSIVE WHEN ISOLATION COMMAND RECEIVED — AUXILIARY DEVICE — LOCAL

CONTAINMENT ISOLATION NOT REACHED — REF 3

CR W SPEED LOW — DETECTOR MOVING AT LOW SPEED — J022 — CR

CR W FORWARD — CR W REVERSE

AUTO FORWARD — AUXILIARY DEVICE — TR

AUTO REVERSE — AUXILIARY DEVICE — CR — ZONE D8

PERMISSIVE WHEN MANUAL SWITCH IN "FORWARD" POSITION — RMS — ZONE F6

PERMISSIVE WHEN MANUAL SWITCH IN "REVERSE" POSITION — RMS — ZONE F6

TIP MODE SWITCH IN "MANUAL" POSITION — RMS — ZONE G8

CR W (BALL VALVE IS OPEN)

PERMISSIVE 5 SECONDS AFTER DETECTOR MOVES OUT OF SHIELD — ±DS — LOCAL — ZONE F5

DETECTOR MOVES OUT OF SHIELD — PBS SW — LOCAL

CR P PURGE ON

PERMISSIVE WHEN CONTAINMENT IS NOT ISOLATED — AUXILIARY DEVICE — CR

PURGE SWITCH IN "ON" POSITION — RMS — CR

AUTOMATIC TRAVERSE

TIP MODE SWITCH IN "AUTO" POSITION — RMS — ZONES B6, G1, B7

"READY FOR TRAVERSE" SIGNAL

17 / 7 / F6

PERMISSIVE WHEN AUTO SIGNAL IS PRESENT — AUXILIARY DEVICE — LOCAL

RECYCLE

16 / 7 / B7

START PUSHBUTTON HAS BEEN DEPRESSED — PB — CR

DETECTOR MOVES FORWARD AT LOW SPEED

LIMIT SWITCH — J002 — LOCAL — ZONE G7

DETECTOR MOVES FORWARD AT HIGH SPEED

"READY FOR TRAVERSE" SIGNAL

17 / 7 / F6

PERMISSIVE WHEN AUTO SIGNAL IS PRESENT — AUXILIARY DEVICE — LOCAL

MANUAL SWITCH IN "FORWARD" POSITION — RMS — CR — ZONES B7, D6, G2, G1

PERMISSIVE WHEN LOW SPEED SWITCH IN "OFF" POSITION — RMS — CR — ZONES F6, B5

INDEXER CABLE LIMIT SWITCH — J002 — LOCAL — ZONE G5

DETECTOR IN "BOTTOM OF CORE" POSITION — J021 — LOCAL — ZONE F4

DETECTOR PROCEEDS FORWARD AT SLOW SPEED

DETECTOR IN "TOP OF CORE" POSITION — J001 — LOCAL — ZONE D6

DETECTOR STOPS

"READY FOR TRAVERSE" SIGNAL

17 / 7 / F6

PERMISSIVE WHEN LOW SPEED SWITCH IN "ON" POSITION — RMS — ZONE F7

PERMISSIVE AFTER TIME DELAY OF 5 SECONDS — ±DS — LOCAL — ZONE G1

PERMISSIVE IF BALL VALVE IS CLOSED (+HYDRAULIC) — LIMIT SWITCH — LOCAL

RECYCLE

START PUSHBUTTON HAS BEEN DEPRESSED — PB — CR

DETECTOR STOPS

MANUAL SWITCH IN "REVERSE" POSITION — RMS — ZONE F6

DETECTOR IN "BOTTOM OF CORE" POSITION — J021 — LOCAL — ZONE E6

DETECTOR PROCEEDS OUT AFTER SHIFTING TO HIGH SPEED

INDEXER CABLE LIMIT SWITCH — J022 — LOCAL — ZONE E8

DETECTOR PROCEEDS OUT AFTER SHIFTING TO LOW SPEED

DETECTOR IN "2000" POSITION — J031 — LOCAL — ZONE F4

DETECTOR STOPS

18 / 7 / G8 — RECYCLE SAME POSITION OR SELECT NEW MACHINE AND/OR NEW INDEXER POSITION AT ZONE H5

TIP MODE SWITCH IN "MANUAL" POSITION — RMS — ZONE G8

MANUAL SWITCH IN "REVERSE" POSITION — RMS — ZONE F6

DETECTOR PROCEEDS OUT AT LOW SPEED

DETECTOR IN CHAMBER SHIELD — LOCAL — ZONES E5, A7, A6, A4

DETECTOR STOPS

DETECTOR IN CHAMBER SHIELD — J025 — ZONE AA

DETECTOR STOPS

DETECTOR IN CHAMBER SHIELD — J025 — ZONE AA

DETECTOR STOPS

TYPICAL FOR EACH TIP CHANNEL

INPUT FROM COMPUTER MOD (REF 5)

L516 — PERMISSIVE WHEN DETECTOR AT CORE TOP (TIME DURATION SEE NOTE 9) — LIMIT SWITCH — LOCAL — A

L517 — PERMISSIVE WHEN DETECTOR AT CORE TOP (TIME DURATION SEE NOTE 9) — LIMIT SWITCH — LOCAL — B

L518 — PERMISSIVE WHEN DETECTOR AT CORE TOP (TIME DURATION SEE NOTE 9) — LIMIT SWITCH — LOCAL — C

L519 — PERMISSIVE WHEN DETECTOR AT CORE TOP (TIME DURATION SEE NOTE 9) — LIMIT SWITCH — LOCAL — D

L520 — PERMISSIVE WHEN DETECTOR AT CORE TOP (TIME DURATION SEE NOTE 9) — LIMIT SWITCH — LOCAL — E

PROC C

AUX. TUBE ADDRESS SELECTED ON MACHINE A — RMS — CR — C923, C924, C925, C926

GUIDE TUBE ADDRESS IS FITTED ON MACHINE B — RMS — CR — C827, C828, C829, C830

GUIDE TUBE ADDRESS SELECTED ON MACHINE C — RMS — CR — C831, C832, C833, C834

AUX. TUBE ADDRESS SELECTED ON MACHINE D — RMS — CR — C835, C836, C837, C838

GUIDE TUBE ADDRESS SELECTED ON MACHINE E — RMS — CR — C839, C840, C841, C842

4 INPUTS PER MACHINE TIP GUIDE TUBE ADDRESS

▲ LSD - LEAST SIGNIFICANT DIGIT

▲▲ MSD - MOST SIGNIFICANT DIGIT

INPUT FROM COMPUTER MOD (REF 5)

L500 — PERMISSIVE WHEN DETECTOR AT OR ABOVE CORE BOTTOM — LIMIT SWITCH — LOCAL

L501 — PERMISSIVE WHEN DETECTOR AT OR ABOVE CORE BOTTOM — LIMIT SWITCH — LOCAL

L502 — PERMISSIVE WHEN DETECTOR AT OR ABOVE CORE BOTTOM — LIMIT SWITCH — LOCAL

L503 — PERMISSIVE WHEN DETECTOR AT OR ABOVE CORE BOTTOM — LIMIT SWITCH — LOCAL

L504 — PERMISSIVE WHEN DETECTOR AT OR ABOVE CORE BOTTOM — LIMIT SWITCH — LOCAL

PERMISSIVE WHEN DETECTOR AT EVEN OR ODD COUNTER NUMBER — AUXILIARY DEVICE — LOCAL

TIP PROBE POSITION — C — P501

INDICATION & COMPUTER INPUTS TO NEUTRON MONITORING SYSTEM

AMS

LOSS OF CONTINUITY IN PRIMER MONITOR — J004 — LOCAL

SHEAR VALVE SQUIB FIRED VALVE CLOSED — J024 — LOCAL

SHEAR VALVE MONITOR CIRCUIT ABNORMAL — J024 — LOCAL

J1 — 612090-2 E4 — NOTE 8 — RETURN DETECTOR TO SHIELD FROM ANY POINT IN CHAMBER VIA MOM SPEED MANUAL MODE OR LOW SPEED MANUAL MODE (IF SELECTED) — RMS — ZONE F7

DETECTOR IN CHAMBER SHIELD — J025 — ZONE AB

(DETECTOR STOPS PRIMARY CONTAINMENT ISOLATION DETECTOR RECALL)

CR G — ALL BALL VALVES OR ASSOCIATED SHEAR VALVES CLOSED — J024 — LOCAL

CR R — ANY BALL VALVE & ASSOCIATED SHEAR VALVE OPEN — J024 — LOCAL

CR A — LOSS OF CONTINUITY IN PRIMER MONITOR — J004 — LOCAL

DETECTOR OUT OF CHAMBER SHIELD — J025 — ZONE AB

DETECTOR IN CHAMBER SHIELD — J025 — ZONE AB

MONITOR FIRE SWITCH IN "FIRE" POSITION — RMS — CR

CR R — ENERGIZE SOLENOID OPEN BALL VALVE

CR G — DE-ENERGIZE SOLENOID CLOSE BALL VALVE

CR A — SHEAR VALVE SQUIB FIRED VALVE CLOSED OR SHEAR VALVE MONITOR CIRCUIT ABNORMAL — J024 — LOCAL

SQUIB FIRES

SHEAR VALVE OPEN

BALL VALVE — SHEAR VALVE

VALVE ASSEMBLY (GUIDE TUBE)

TRANSITIONS IN CORE PROBE (TIP)

NOTES: (CONTINUED FROM 6I721-2140-1)

B. IN THE EVENT THAT POWER IS LOST, THE FOLLOWING ACTIONS WILL BE INITIATED AFTER POWER IS RESTORED:

A. IN AUTOMATIC MODE DETECTOR RETURNS TO "0000" VIA AUTOMATIC MODE PATH. DETECTOR MUST THEN BE RETURNED TO CHAMBER SHIELD TO REPROGRAM DETECTOR.

B. IN MANUAL MODE MUST RESTART VIA MANUAL SWITCH IN REVERSE AND RETURN TO CHAMBER SHIELD TO REPROGRAM DETECTOR.

C. THE TIME DURATION OF THE PERMISSIVE SHALL BE SUCH THAT IT IS COMPATIBLE WITH THE ASSOCIATED COMPUTER.

NOTE: SEE 6I721-2140-1 FOR NOTES, REFERENCES AND LEGEND.

NOTE: THIS IS AN IGS PRODUCED DRAWING. ALL CHANGES OR REVISIONS TO THIS DRAWING SHALL BE COMPLETED THROUGH THE IGS SYSTEM. CONTACT THE IGS COORDINATOR TO ENSURE THAT THIS FILE IS UPDATED.

6I721-2140-7 — LATEST REVISION R

THIS DRAWING SUPERSEDES EDISON'S SITE MASTER (VENDOR DRAWING 729E631AB SH7 REV 4) OF EDISON FILE NO. R1-186

ARMS/INFORMATION SYSTEMS — DTC DDSENC — DSN 6I721-2140-07 — PAGE — REV — PIS — November 1, 1985 — PIS C51000 — RECIPIENT — APPROVAL REQ'D YES — NO

CERTIFIED TRUE COPY: Sharon Straub — SIGNATURE

NUCLEAR SAFETY RELATED
ITEMS ARE SHOWN ON THIS DRAWING
(FOR SAFETY CLASSIFICATION SEE PIPING, EQUIPMENT, VALVE OR INSTRUMENT LISTS.)

OTHER APPROVALS	DATE
SBF Pilot	4-9-85
REF. DWGS.	REF. MISC.

DRAWN BY	DATE
INTERACTIVE GRAPHICS	
ANNE HALLECK	6/24/85
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	5-23-85
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PROJECT DIRECTOR	DATE
S K Shaw for D W Smith	5/23/85
DIVISION DIRECTOR	DATE
D W Smith	5/23/85

The Detroit Edison Co. — Engineering

TITLE

LOGIC DIAGRAM
NEUTRON MONITORING
SYSTEM (PART 7)
DOCUMENT CONTROL NO. C51-00

APERTURE CARD TITLE: LOGIC DIAG NM SYSTEM PART 7

LOCATION NAME: FERMI 2 POWER PLANT — UNIT NUMBER: 2

ORIGINATING AGENCY: GENERATION ENGINEERING DEPARTMENT

DRAWING NUMBER: 6I721-2140-7 — REV