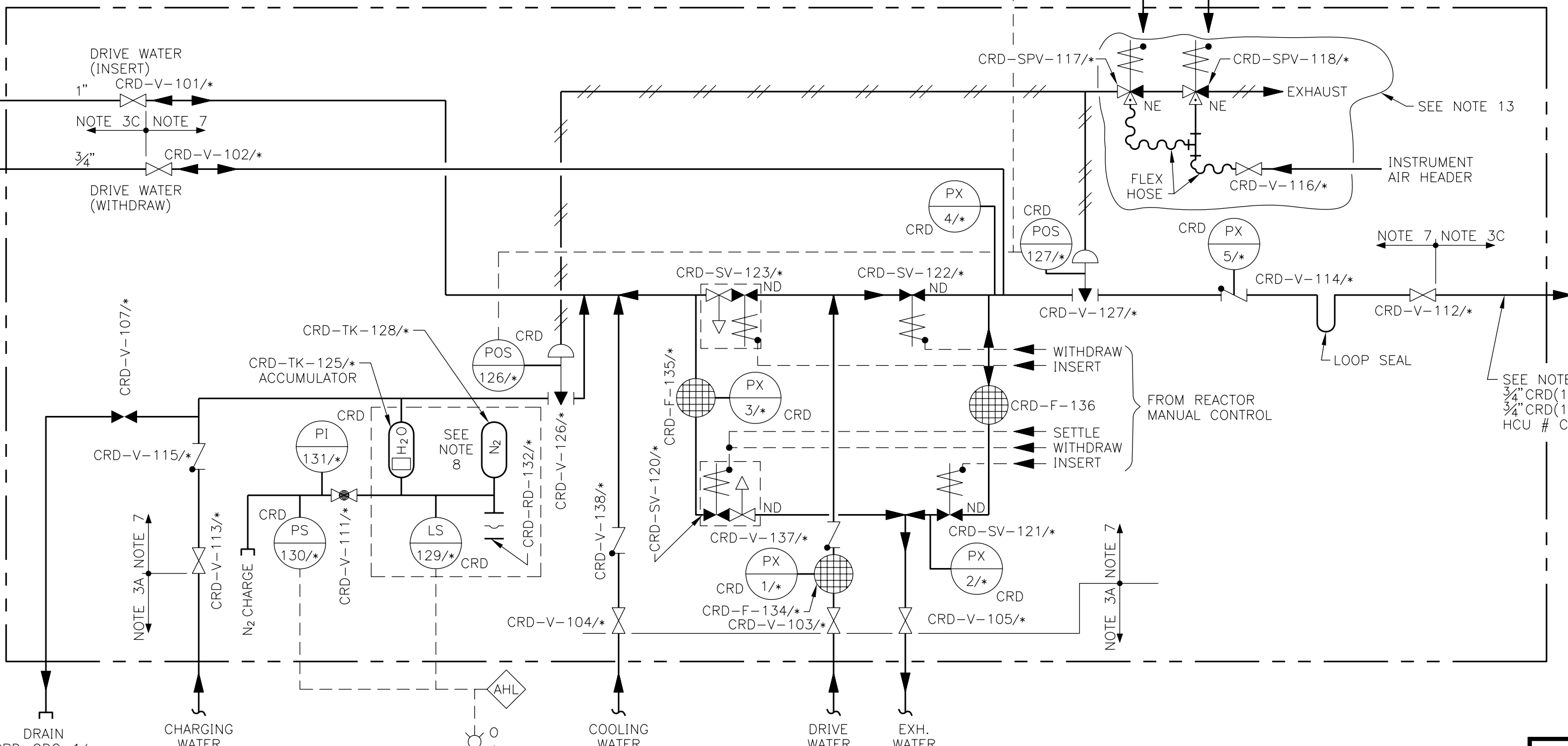


- NOTES:**
- ALL PRESSURE AND FLOW INSTRUMENT ROOT VALVES NOT LABELED WILL BE 3/4" GLOBE UNLESS SPECIFICALLY NOTED OTHERWISE.
 - THESE COMPONENTS ARE SUPPLIED WITH THE ASSOCIATED EQUIPMENT
 - PIPING VALVES AND ASSOCIATED COMPONENTS ON THIS DRAWING SHALL BE CLASSIFIED AS FOLLOWS (BREAK POINTS ARE INDICATED ON THE FLOW DIAGRAM)
 - ALL PIPING AND VALVES, EXCEPT AS NOTED
 - SEISMIC CATEGORY II QUALITY CLASS II
 - CODE GROUP B
 - HANGERS TO BE DESIGNED TO SEISMIC CATEGORY I LOADS
 - PIPING AND VALVES OF SUBSYSTEM (10), (11), (12), (50), (53), (55), AND (60) AS NOTED
 - SEISMIC CATEGORY I QUALITY CLASS I
 - CODE GROUP B
 - INSTRUMENTS AS NOTED
 - SEISMIC CATEGORY I QUALITY CLASS I
 - CODE GROUP E
 - INSTRUMENT IMPULSE LINES AND VALVES AS NOTED
 - SEISMIC CATEGORY I QUALITY CLASS I
 - CODE GROUP B
 - UNIQUE LINE NUMBERS 1 THRU 185 ARE DIRECTLY RELATED TO THE HYDRAULIC CONTROL UNIT (HCU) MPL NUMBERS ASSIGNED BY G.E. THE 185 UNIQUE EPVs ARE DENOTED BY "*" (CRD-V-105/XXXX).
 - SEE BREAK DEFINITIONS FOR THERMOWELLS ARE SHOWN ON M510. INSTALLATION OF THERMOWELLS AND SAMPLE PROBES.
 - HCU PIPING AND VALVES AS NOTED SEISMIC CATEGORY I QUALITY CLASS I CODE GROUP D
 - HCU ACCUMULATORS AND NITROGEN BOTTLES DESIGNED TO ASME VIII STANDARDS
 - MANUAL HANDHELD LOCKED IN THE NEUTRAL POSITION.
 - THE LOOSE FAST DETECTION SENSORS (EPV) ARE ON FLOOR (BY CRD DRIVE) SENSORS ARE ON ROOF (BY CRD DRIVE)
 - EPV 100 - CRD DRIVE 1450
 - EPV 101 - CRD DRIVE 1450
 - EPV 102 - CRD DRIVE 1450
 - EPV 103 - CRD DRIVE 1450
 - EPV 104 - CRD DRIVE 1450
 - EPV 105 - CRD DRIVE 1450
 - EPV 106 - CRD DRIVE 1450
 - EPV 107 - CRD DRIVE 1450
 - EPV 108 - CRD DRIVE 1450
 - EPV 109 - CRD DRIVE 1450
 - EPV 110 - CRD DRIVE 1450
 - EPV 111 - CRD DRIVE 1450
 - EPV 112 - CRD DRIVE 1450
 - EPV 113 - CRD DRIVE 1450
 - EPV 114 - CRD DRIVE 1450
 - EPV 115 - CRD DRIVE 1450
 - EPV 116 - CRD DRIVE 1450
 - EPV 117 - CRD DRIVE 1450
 - EPV 118 - CRD DRIVE 1450
 - EPV 119 - CRD DRIVE 1450
 - EPV 120 - CRD DRIVE 1450
 - EPV 121 - CRD DRIVE 1450
 - EPV 122 - CRD DRIVE 1450
 - EPV 123 - CRD DRIVE 1450
 - EPV 124 - CRD DRIVE 1450
 - EPV 125 - CRD DRIVE 1450
 - EPV 126 - CRD DRIVE 1450
 - EPV 127 - CRD DRIVE 1450
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 - EPV 129 - CRD DRIVE 1450
 - EPV 130 - CRD DRIVE 1450
 - EPV 131 - CRD DRIVE 1450
 - EPV 132 - CRD DRIVE 1450
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 - EPV 136 - CRD DRIVE 1450
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 - EPV 138 - CRD DRIVE 1450
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 - EPV 171 - CRD DRIVE 1450
 - EPV 172 - CRD DRIVE 1450
 - EPV 173 - CRD DRIVE 1450
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 - EPV 175 - CRD DRIVE 1450
 - EPV 176 - CRD DRIVE 1450
 - EPV 177 - CRD DRIVE 1450
 - EPV 178 - CRD DRIVE 1450
 - EPV 179 - CRD DRIVE 1450
 - EPV 180 - CRD DRIVE 1450
 - EPV 181 - CRD DRIVE 1450
 - EPV 182 - CRD DRIVE 1450
 - EPV 183 - CRD DRIVE 1450
 - EPV 184 - CRD DRIVE 1450
 - EPV 185 - CRD DRIVE 1450
 - THE POSITION DETECTOR AND TEMPERATURE ELEMENT ARE PART OF THE DRIVE UNIT AND DO NOT HAVE SEPARATE EPVs.
 - THIS IS ACTUALLY A SWITCH BUT IS USED AS A DPI, WIRES AND DPIs ARE SPARED IN PLACE.
 - FLEX HOSE IS SHOWN BETWEEN CRD-SPV-117/A, CRD-SPV-118/A, & CRD-V-116/A. COPPER TUBING IS AN ACCEPTABLE ALTERNATIVE.

- LEGEND:**
- ALL VALVES SUFFIXED WITH A (TH) DENOTE A THROTTLED VALVE.



REV	DATE	DESCRIPTION	APP'D	CHK'D	APV'D	SIGNATURE	DATE	TITLE
69	8-7-00	REDRAWN PER 99-12-004-0003	ARF	JAA	REF	RE FULLER	8-7-00	
70	3/26/01	REVISED PER 00765-0003 (B/6, D/6.11, E/8, G/3.8, H/7.11, J/7.10).	HL	HL	SRP			
71	8-30-01	REVISED PER 00443-002 (H-J/6-8, 10-11)	HL	HL	SRP			
72	6-27-03	REVISED PER 01288-328 (G/1 & 9), 02108-011 (E-J/2, E/7-6 & 11-12, J/7-8 & 10-12, E-J/15)	CMO	KB	DRJ			
73	7-9-04	CORRECTED INCORPORATION OF TYPO FROM 99-12-004-0003 (C/9)	DMS	HL	SRP			

ENERGY NORTHWEST
People-Vision-Solutions

COLUMBIA GENERATING STATION

SCALE: N/A

DWG NO: M528-1

REV: 73

DATE: 8-7-00

DESIGNED BY: AR FULLER

CHECKED BY: JAA

APPROVED BY: RE FULLER

TITLE: FLOW DIAGRAM CONTROL ROD DRIVE SYSTEM

FSAR FIG.

TOP TIER