

<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
23. Environmental Radiological Monitors	N.A.	A(1)	M(1)	(1) Flow
24. Logic Channels	N.A.	N.A.	M ⁺	
25. Emer. Portable Survey Instruments	N.A.	A	M	
26. Seismograph	N.A.	N.A.	Q	Make trace. Test battery (change semi-annually)
27. Auxiliary Feedwater Flow Rate	M+	R	N.A.	
28. RCS Subcooling Margin Monitor	M+	R	N.A.	
29. PORV Position Indicator (Primary Detector)	M+	N.A.	R	Check consists of monitoring indicator
30. Safety Valve Position Indicator	M+	N.A.	R	position and verifying by observation
31. Safety Valve Position Indicator	M+	R	N.A.	of related parameters
32.a.Loss of Voltage (both 4kv busses)	N.A.	N.A.	R	For AFW actuation at Power Only
b.Undervoltage (both 4kv busses and 480 volt load centers)**	S	R	M	These tests are not required when in cold or refueling shut-down
33. Trip of both Main Feedwater Pump Breakers	N.A.	N.A.	R	For AFW actuation at power only

** This item does not apply on Unit 3 until after implementation of PC/M 79-116 and on Unit 4 until after implementation of PC/M 80-44.



TABLE 3.5-2
ENGINEERED SAFETY FEATURES ACTUATION

NO.	FUNCTIONAL UNIT	1 MIN. OPERABLE CHANNELS	2 MIN. DEGREE OF REDUNDANCY	3 OPERATOR ACTION IF CONDITIONS OF COLUMN 1 OR 2 CANNOT BE SET
1.	SAFETY INJECTION			
1.1	Manual	1	0	Cold Shutdown
1.2	High Containment Pressure	2	1	Cold Shutdown
1.3	High Differential Pressure between any Steam Line and the Steam Line Header	2	1	Cold Shutdown
1.4	Pressurizer Low Pressure*	2	1	Cold Shutdown
1.5	High Steam Flow in 2/3 Steam Lines with Low T_{avg} or Low Steam Line Pressure	1/line in each of 2 lines	1	Cold Shutdown
2.	CONTAINMENT SPRAY			
2.1	High Containment Pressure and High-High Containment Pressure (Coincident)	2 per set	1/set	Cold Shutdown
3.	AUXILIARY FEEDWATER			
3.1	Low-Low Steam Generator Level	2	1	Hot Shutdown
3.2	Loss of Power			
	a. 4.16kV Emergency Bus undervoltage (Loss of Voltage)	2	0	Cold Shutdown
	b. 480 v Load Centers (2 instantaneous relays per load center)**	2	0	Cold Shutdown
	c. 480 v Load Centers (2 inverse time relays per load center)**	2	0	Cold Shutdown
3.3	Safety Injection		(---See 1 above---)	
3.4	Trip of both Main Feedwater Pump Breakers	2	0	Cold Shutdown

*This signal may be manually bypassed, when the reactor is shutdown and pressure is below 2000 psig.

** These items do not apply on Unit 3 until after implementation of PC/M 79-116 and on Unit 4 until after implementation of PC/M 80-44.

TABLE 3.5-4 (Sheet 2)
ENGINEERED SAFETY FEATURE SETPOINTS (CON'D)

7c.	Degraded Voltage**	Auxiliary Fedwater	All with tolerance of <u>±15</u> volts
<u>LOAD CENTER/RELAY NO.</u>			<u>SETPOINT</u>
3A	327H/3A1** # 327H/3A2** # (tag no. later)** (tag no. later)**		431V (10 sec. delay) 431V (10 sec. delay) 419V (60 sec. <u>+30</u> sec delay) 419V (60 sec. <u>+30</u> sec delay)
3B	327H/3B1** # 327H/3B2** # (tag no. later)** (tag no. later)**		411V (10 sec. delay) 411V (10 sec. delay) 426V (60 sec. <u>+30</u> sec delay) 426V (60 sec. <u>+30</u> sec delay)
3C	327H/3C1** # 327H/3C2** # (tag no. later)** (tag no. later)**		412V (10 sec. delay) 412V (10 sec. delay) 427V (60 sec. <u>+30</u> sec delay) 427V (60 sec. <u>+30</u> sec delay)
3D	327H/3D1** # 327H/3D2** # (tag no. later)** (tag no. later)**		423V (10 sec. delay) 423V (10 sec. delay) 436V (60 sec. <u>+30</u> sec delay) 436V (60 sec. <u>+30</u> sec delay)
4A	327H/4A1** # 327H/4A2** # (tag no. later)** (tag no. later)**		410V (10 sec. delay) 410V (10 sec. delay) 427V (60 sec. <u>+30</u> sec delay) 427V (60 sec. <u>+30</u> sec delay)
4B	327H/4B1** # 327H/4B2** # (tag no. later)** (tag no. later)**		409V (10 sec. delay) 409V (10 sec. delay) 424V (60 sec. <u>+30</u> sec delay) 424V (60 sec. <u>+30</u> sec delay)
4C	327H/4C1** # 327H/4C2** # (tag no. later)** (tag no. later)**		396V (10 sec. delay) 396V (10 sec. delay) 413V (60 sec. <u>+30</u> sec delay) 413V (60 sec. <u>+30</u> sec delay)
4D	327H/4D1** # 327H/4D2** # (tag no. later)** (tag no. later)**		398V (10 sec. delay) 398V (10 sec. delay) 412V (60 sec. <u>+30</u> sec. dela 412V (60 sec. <u>+30</u> sec. dela
8.	Safety Injection	Auxiliary Feedwater	All SI setpoints
9.	Trip of both Main Feedwater Pump Breakers	Auxiliary Feedwater	N.A.

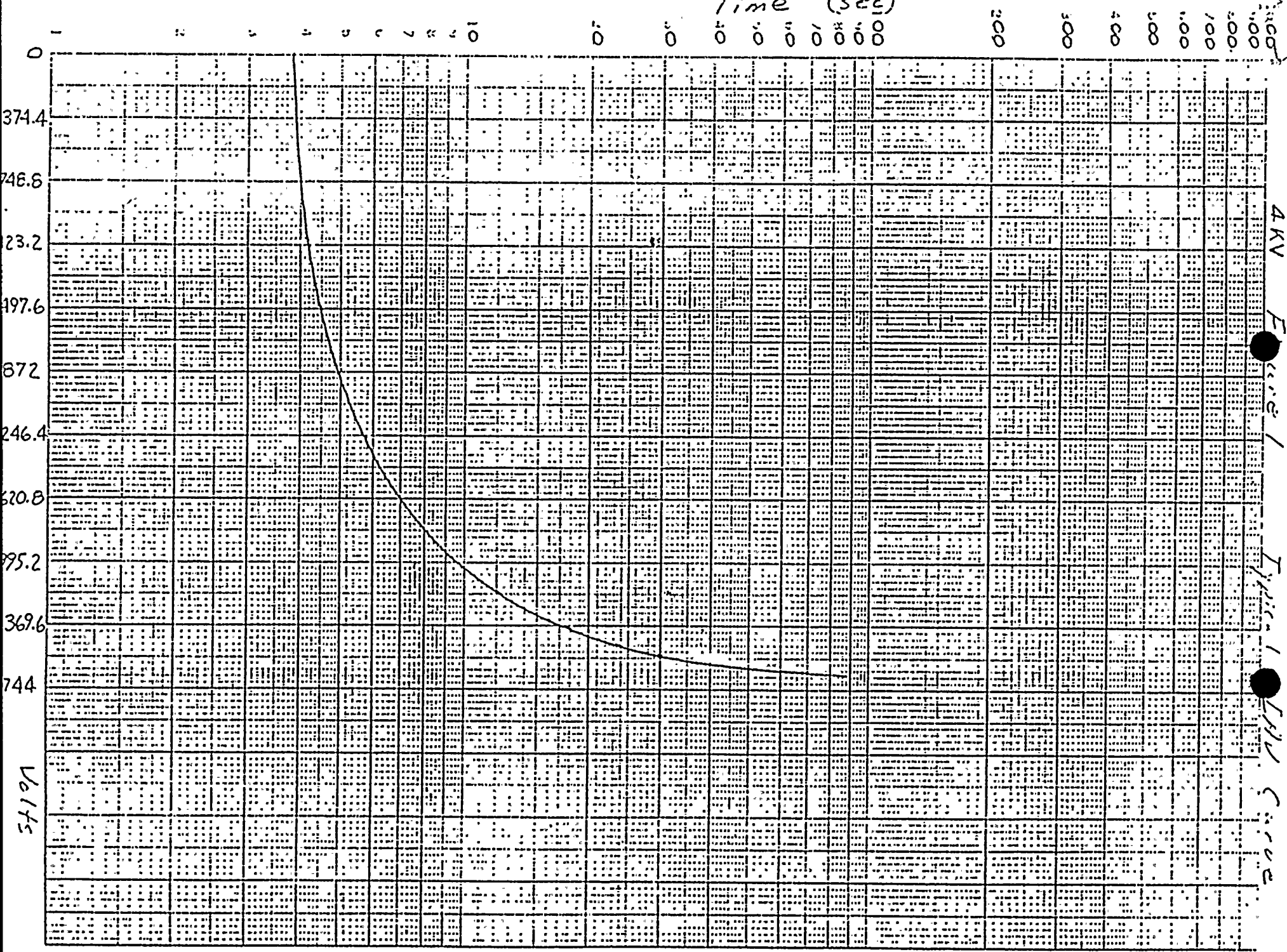
** These items do not apply on Unit 3 until after implementation of PC/M 79-116 and on Unit 4 until after implementation of PC/M 80-44.

Channel action is subject to condition being concurrent with Safety Injection signal.



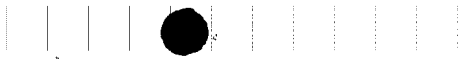
11

Time (sec)



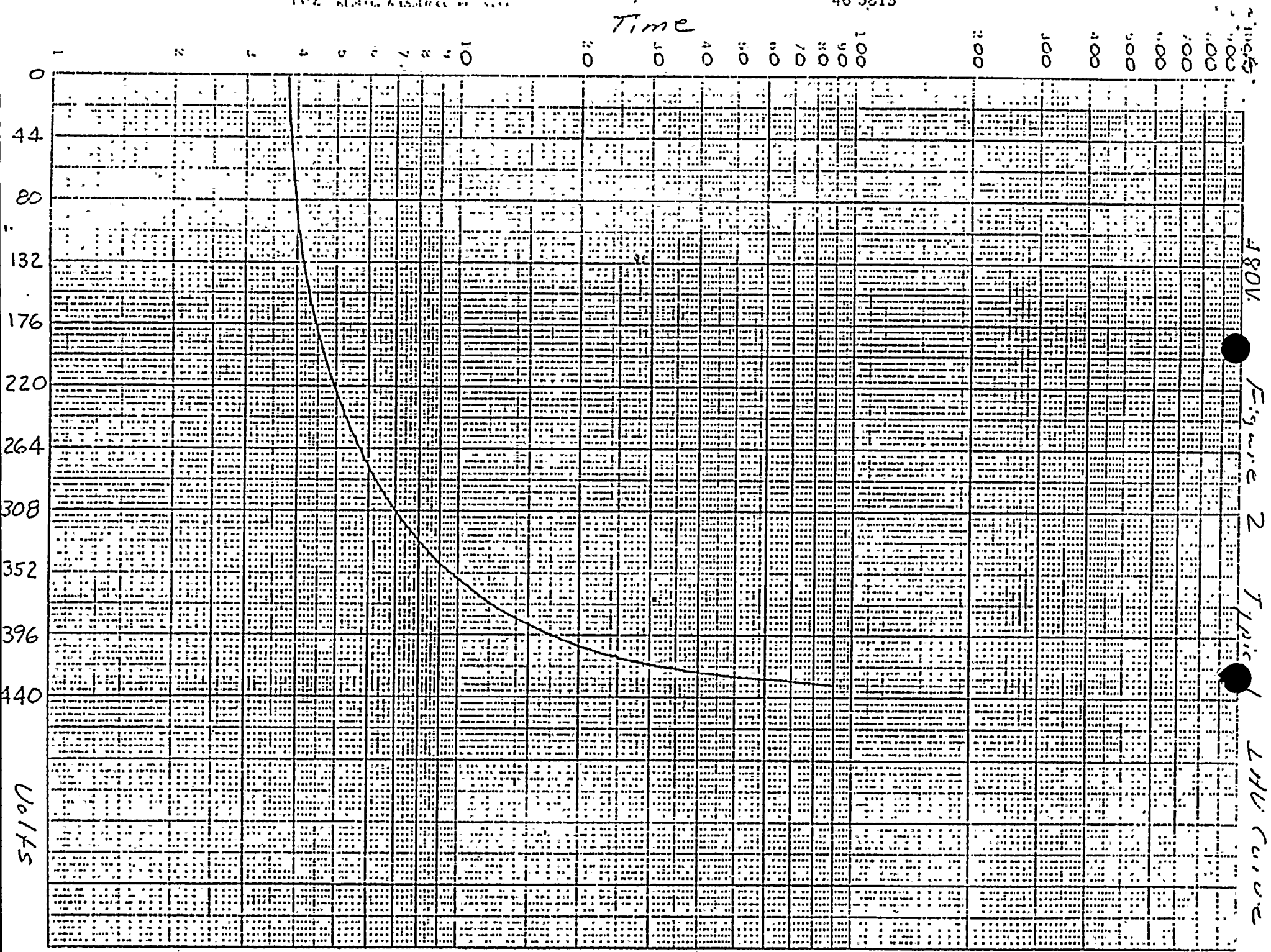
AKV
F
Typical
MLL
Curve

Volts



4 11

Time



180V

Figure 2

Typical

LHV Curve

No 175

