ISR-VA/NH/bm

18th December 1981

ISR PERFORMANCE REPORT

Vacuum tests in Ring 1 (50.2 A)

Run 1239 MD, 11th December 1981

Summary and conclusions

50.2 A were stacked with a very low decay rate (14 ppm/min in average during 5h.30). The vacuum limits (short and long term) have not been reached in ring 1 and no trace of genuine ion induced pressure bump has been detected.

The experiment

After many difficulties 50.2 A were stacked and kept circulating for vacuum observations during 5h.30. The initial decay rate was low (6 ppm/min) and 50.11 were dumped at 22h.53 (final loss rate (16 ppm/min)

Observations

Ring 1 was definitely stable at 50.2 A, the vacuum limit not being reached during this run. The former weak point 501.6 has been sucessfully treated by bake out during the last shutdown. The following list of observations is more relevant to situate beam losses around the ring than to evaluate the vacuum situation.

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Sector	Gauge	ΔP picotorr	
11	149.1	- 1	Beam pumping
	149.7	- 1	Ditto 149.1
	157	+ 0.5	Slow gauge reading increase likely due to beam losses
20	165.1	+ 0.6	Continuous beam losses
	165.4	+ 0.2	Ditto 165.1
	205	+ 0.6	Slow pressure increase of doubtful origin (probably beam loss)
21	245	100 pT	At the end of the staching period due to beam losses (aperture full). The pressure was decreasing during the run. (Fig. 1)
	249	+500	Vertical collimator ditto 245
30.5	309	+ 3	Slow pressure increase during the run due to continuous losses
31.2	333.3	+200	High loss during the stable period recovering during the remaining of the run (Fig. 2)
	333.5	+ 20	Same loss during the stable period
41	433	+ 3	Gauge reading increase at end of stacking period. Likely due to beam losses
50.3	501.2	- 0.5	Beam pumping
50.4	501.6	0	Previous weak point. Stable now after the bake out without exposure to air of sector 50.5 (Fig. 3)
61	645	+ 21	Gauge reading spike due to beam losses at the end of stacking period. Pressure stable otherwise.
	649	+100	Large pressure increase during the last stacking period due to a beam loss. In spite of this event which is known as able to trigger pressure runaway in critical places, the vacuum remained stable. The sudden pressure variation visible as the beam was dumped was very likely due to beam losses as the decay of the pressure signal did not show up any time constant. (Fig. 4)

Sector	Gauge	ΔP picotorr	
	653	+ 20	Ditto 645. No pressure variation as the beam was dumped
61	661	+ 1.5	Slow increase of the gauge reading during the stable beam period due to beam losses. (Fig. 5)
70	701.5	- 1	Beam pumping
	705	- 0.3	"
71	749.1	+ 0.8	Beam losses causing slow increase of gauge reading

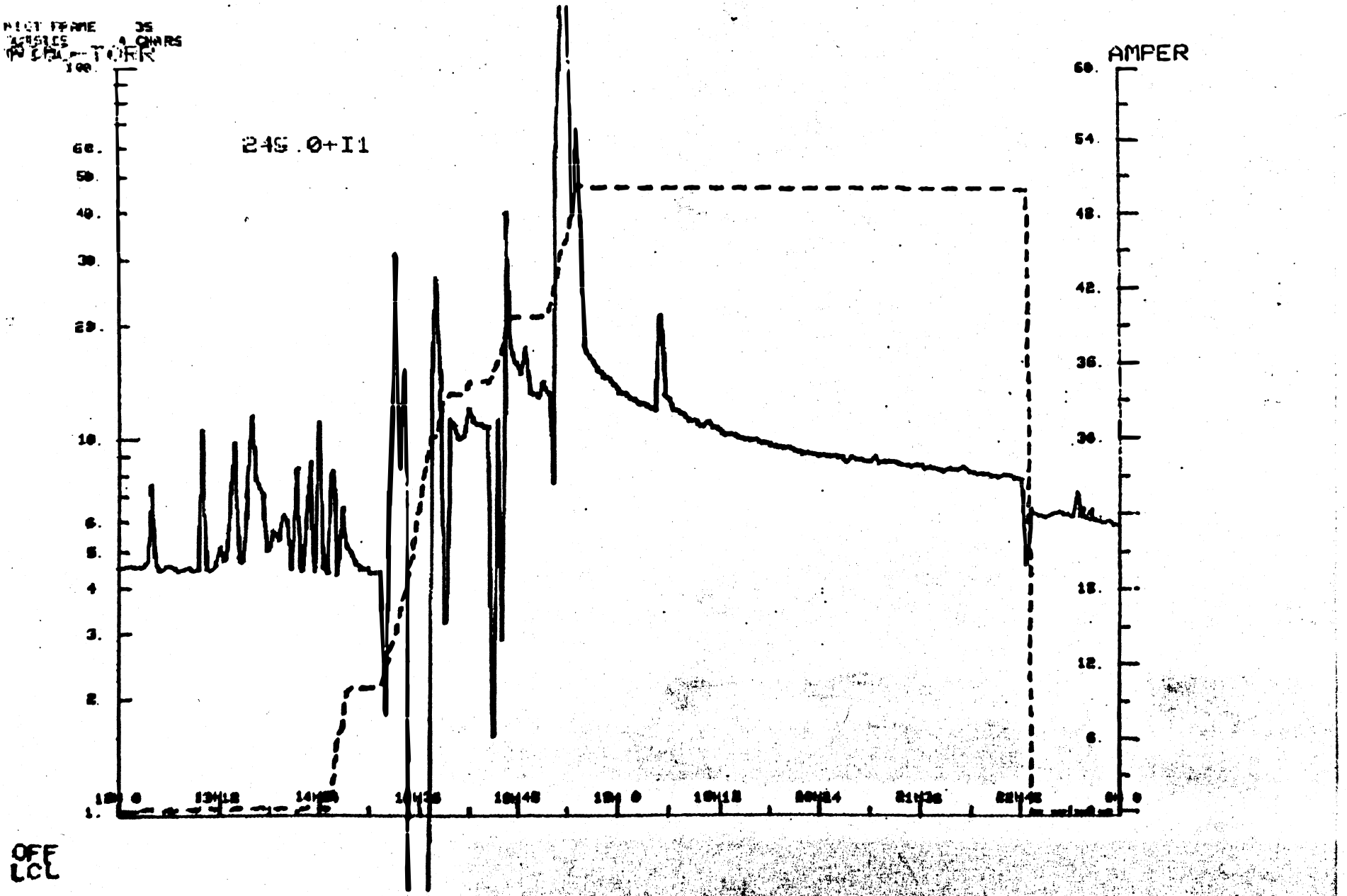

Figure 1
fig

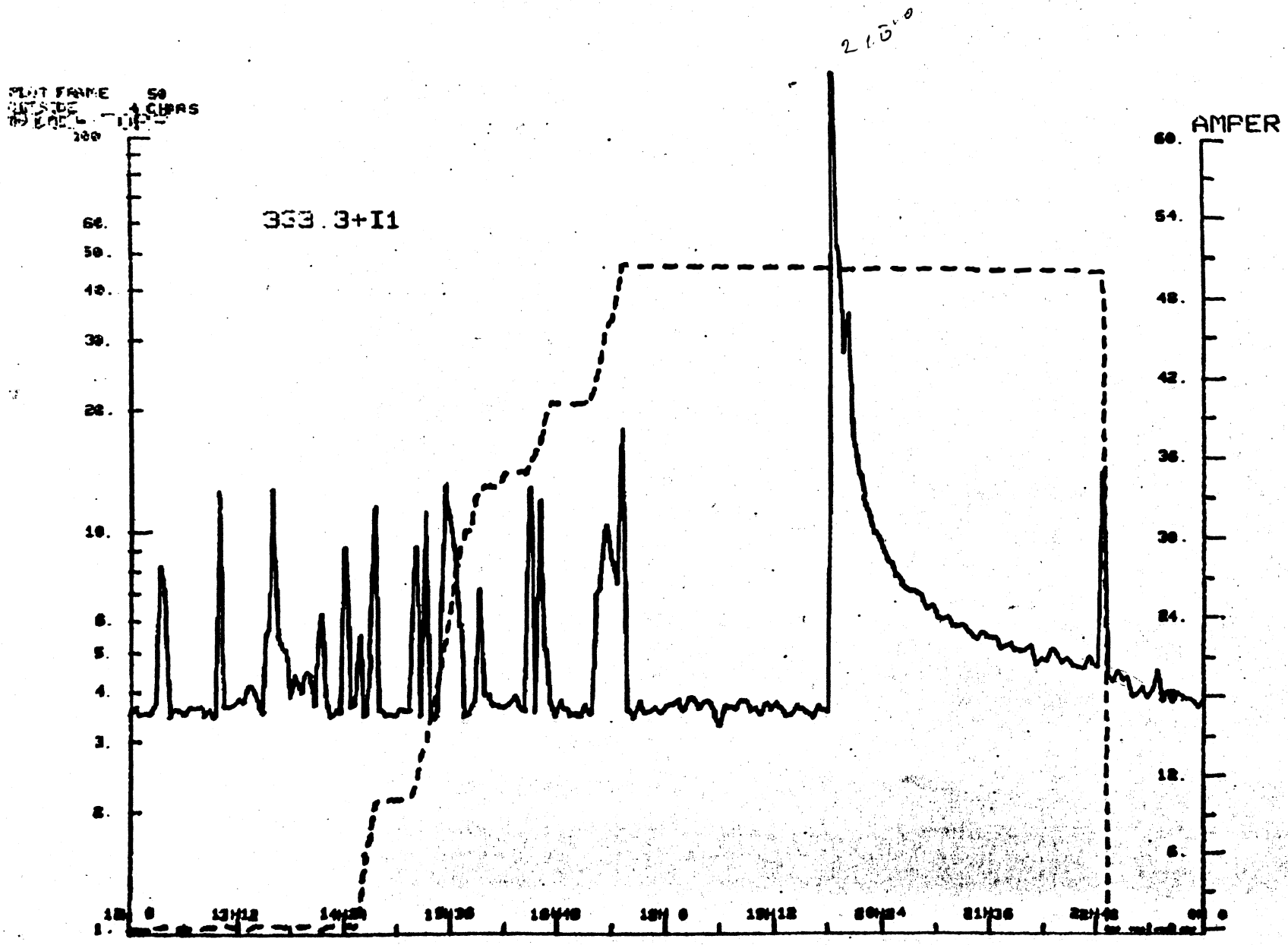

Figure 2

333.1 Trip

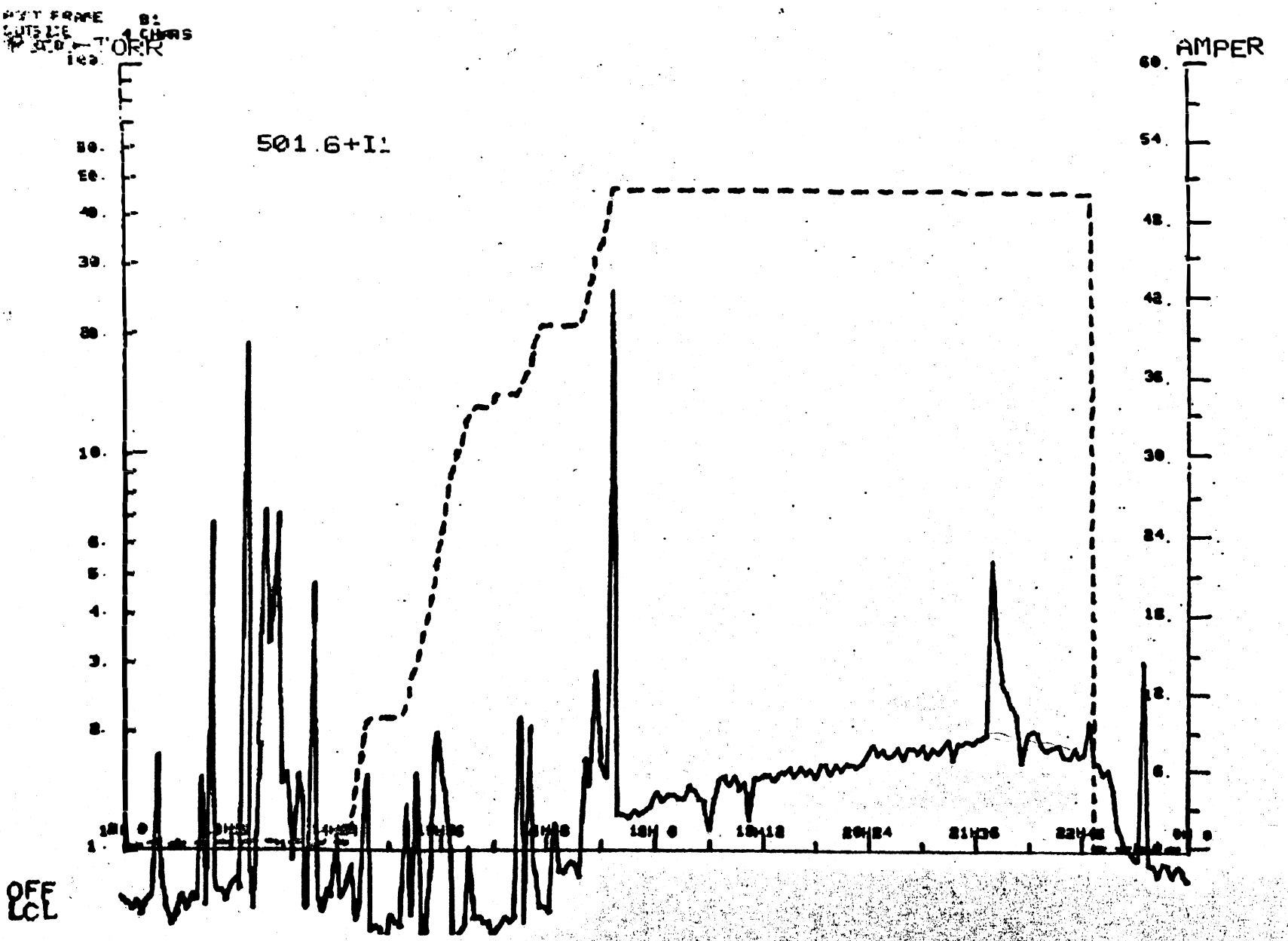

Figure 3

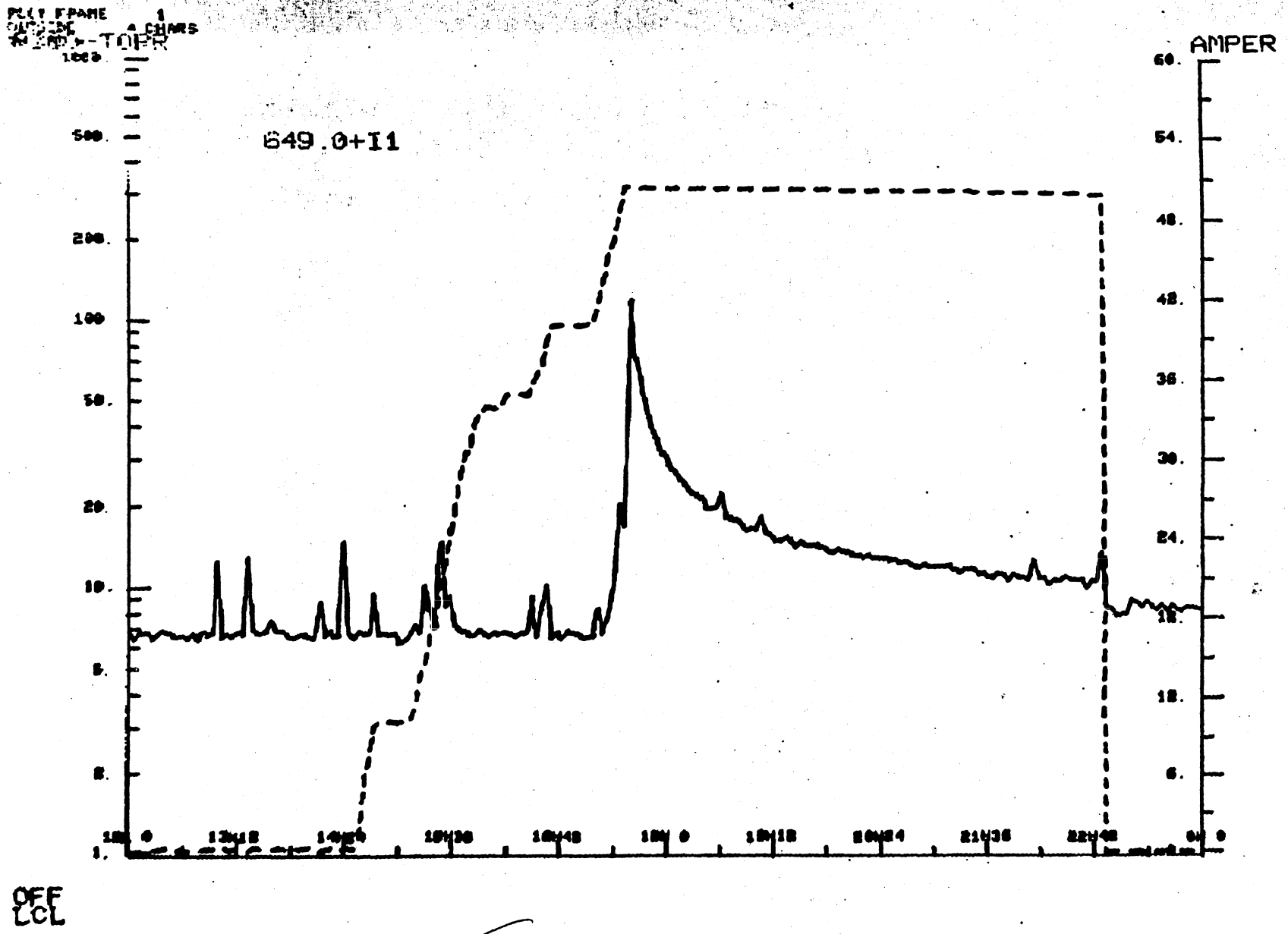
AMPER
649.0+I1
TORR
500.
200.
100
50.
20.
10.
5.
2.
1.
60.
54.
48.
42.
36.
30.
24.
18.
12.
6.
OFF
LCL

Figure 4

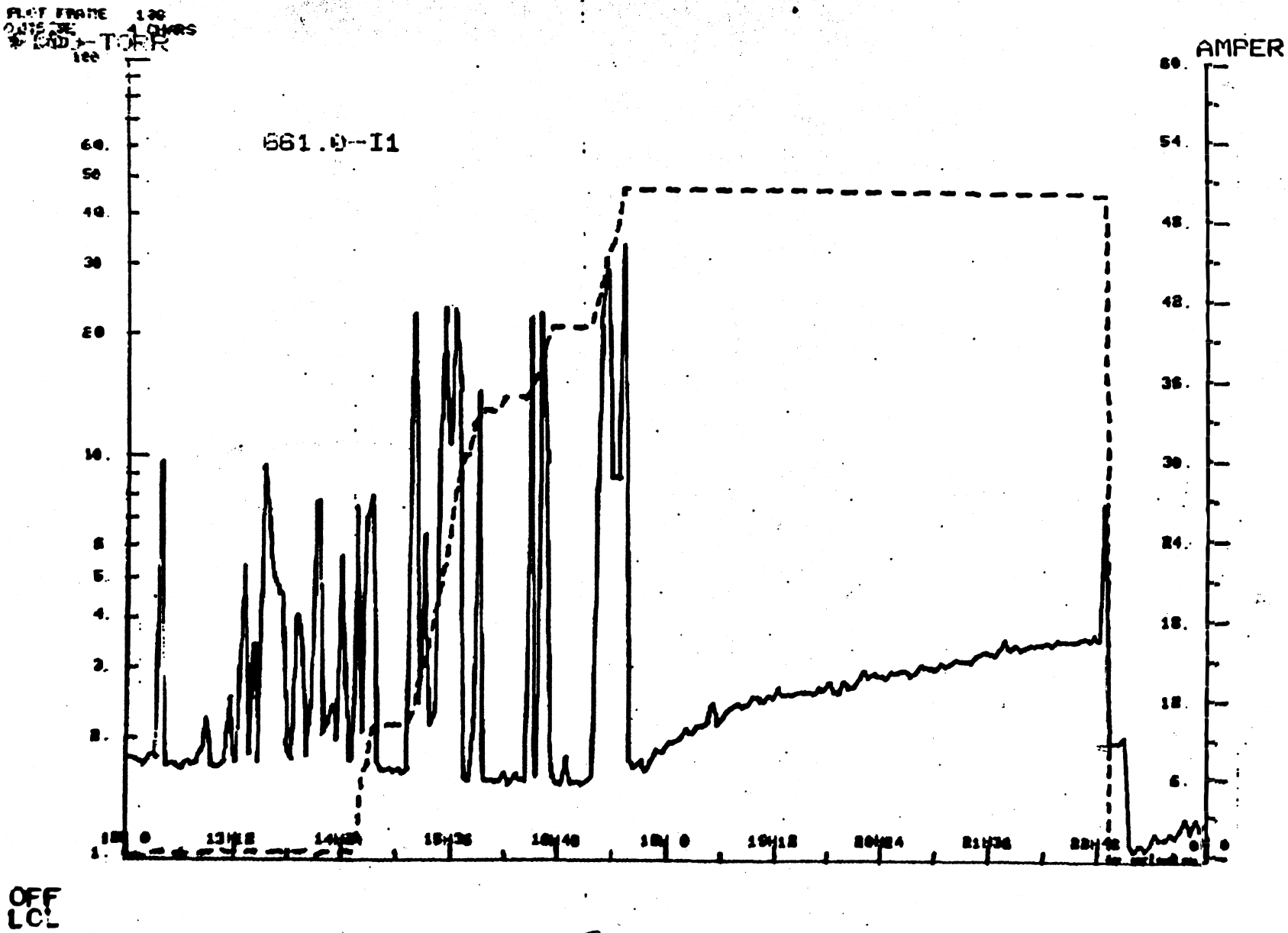

Figure 5