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APPENDIX B

MOBILE SWITCHING UNIT

The total consumption of the MSU was measured at the MSU in the main substation of each section. The MSU supply power to the section conveyor belts as well as all the equipment used in the production section. Measurements were made on the supply to the MSU for a number of shifts as can be seen in Table B-1.

Table B-1: Measuring period for a CM at each section.

		17-May-2005	18-May-2005	19-May-2005	23-May-2005	24-May-2005	25-May-2005
Section 21	Morning shift	X	X	X	-	-	-
	tonnes/CM/shift	858	1320	1716	1320	1650	1749
	Afternoon shift	X	X	X	-	-	-
	tonnes/CM/shift	2145	2112	2013	2310	1980	1980
Section 61	Morning shift	-	-	-	X	X	X
	tonnes/CM/shift	1740	2175	2233	1740	1450	2320
	Afternoon shift	-	-	-	X	X	X
	tonnes/CM/shift	1682	2552	2320	2030	2320	1160

X - measurements made for shift, at specific section.

MSU's are supplied with power from the main distribution network of the mine with either a 95 mm² or 185 mm² XLPE (PEX) cable. The 95 mm² cable is rated for a current of 290 A and the 185 mm² cable is rated for a current of 410 A at an ambient temperature of 25 °C. The MSU are rated for a current of 630 A at 11 kV.

B.1 LOAD PROFILE

The next section focuses on the load profiles of the MSU. Each graph shows the line voltage and the voltage limits, the load current of the MSU. The morning shifts and afternoon shifts are separated as well as the measurements made at the different sections.

B.1.1 SECTION 21

B.1.1.1 Morning shifts

Table B-2: Reasons for breakdowns and absent data.

Date	Time start	Time stop	Reason for breakdown or no data
17-May-2005	SOS	09:30	Section belt electrical fault.
	12:35	14:05	CM trailing cable faulty.
18-May-2005	SOS	08:50	CM trailing cable faulty.
19-May-2005	07:20	08:30	CM trailing cable faulty.

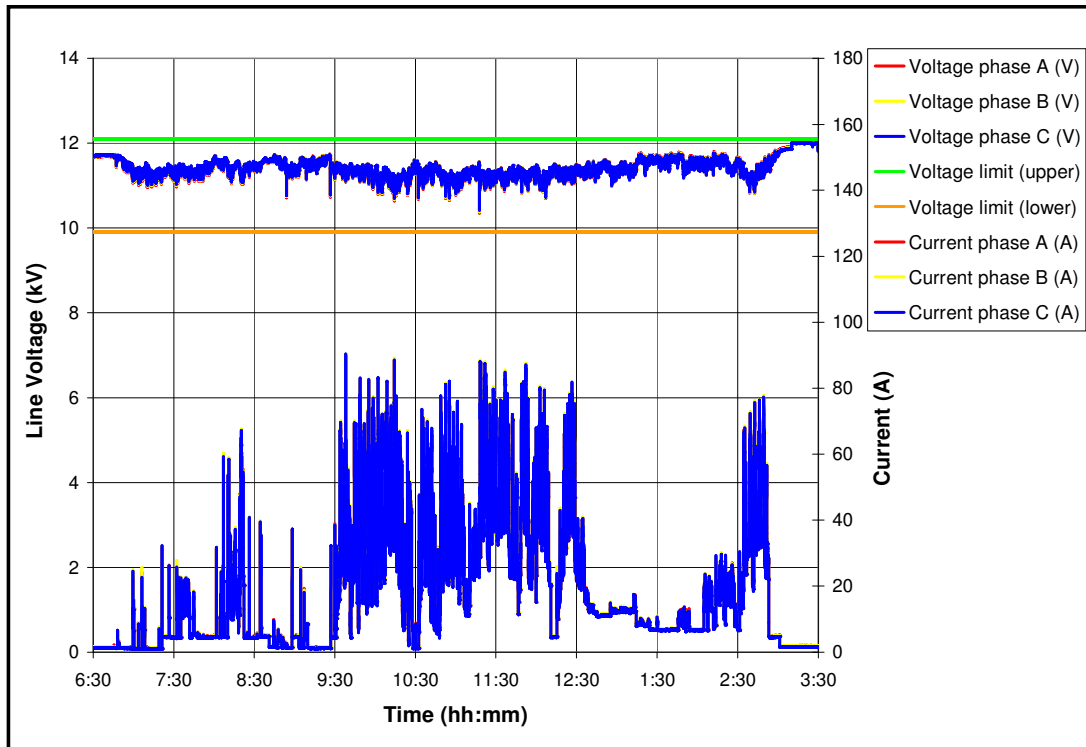


Figure B.1-1: Load current and voltage for a MSU – 17 May 2005.

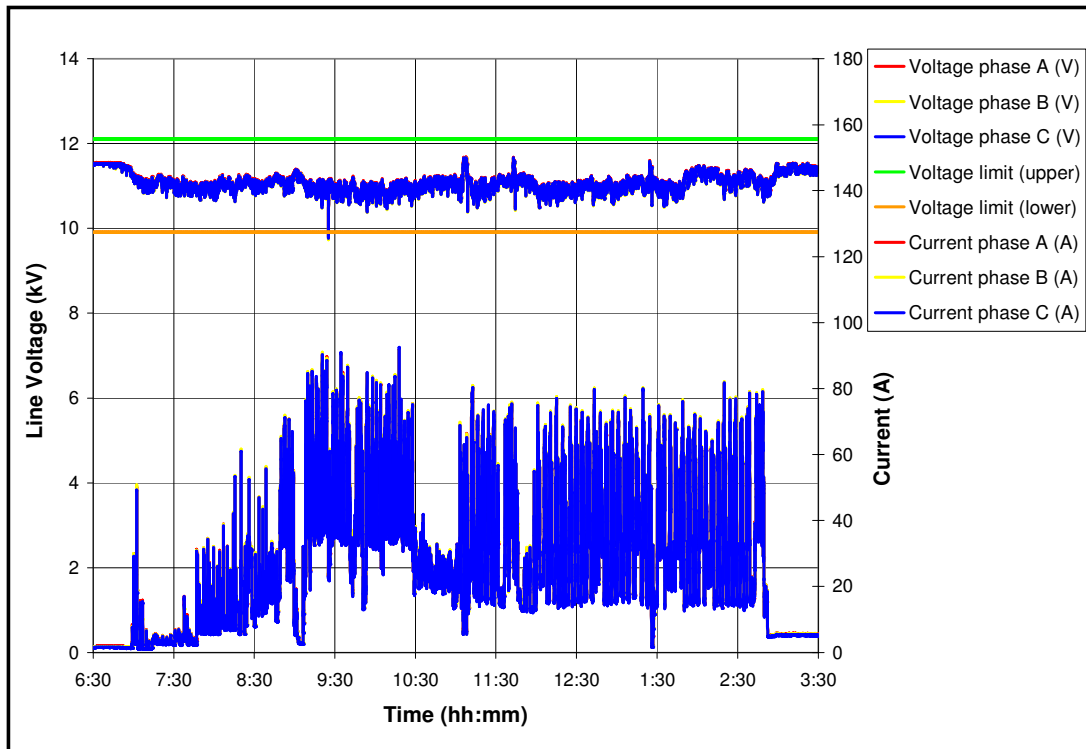


Figure B.1-2: Load current and voltage for a MSU – 18 May 2005.

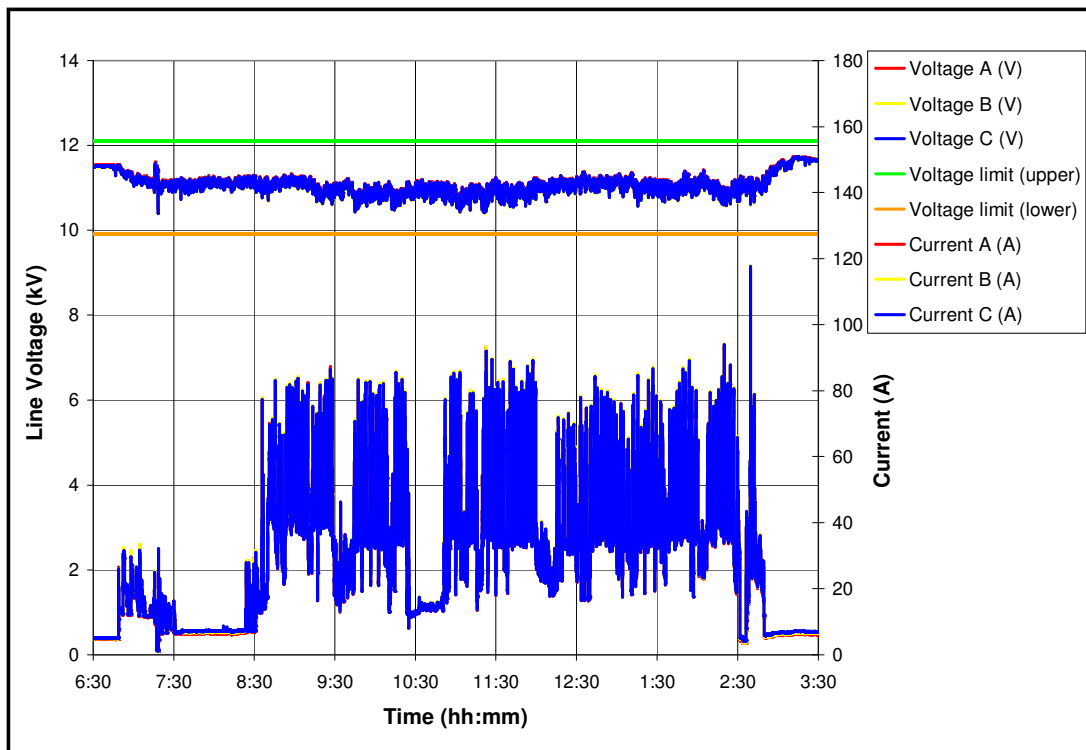


Figure B.1-3: Load current and voltage for a MSU – 19 May 2005.

B.1.1.2 Afternoon shifts

Table B-3: Reasons for breakdowns and absent data.

Date	Time start	Time stop	Reason for breakdown or no data
17-May-2005	-	-	-
18-May-2005	-	-	-
19-May-2005	-	-	-

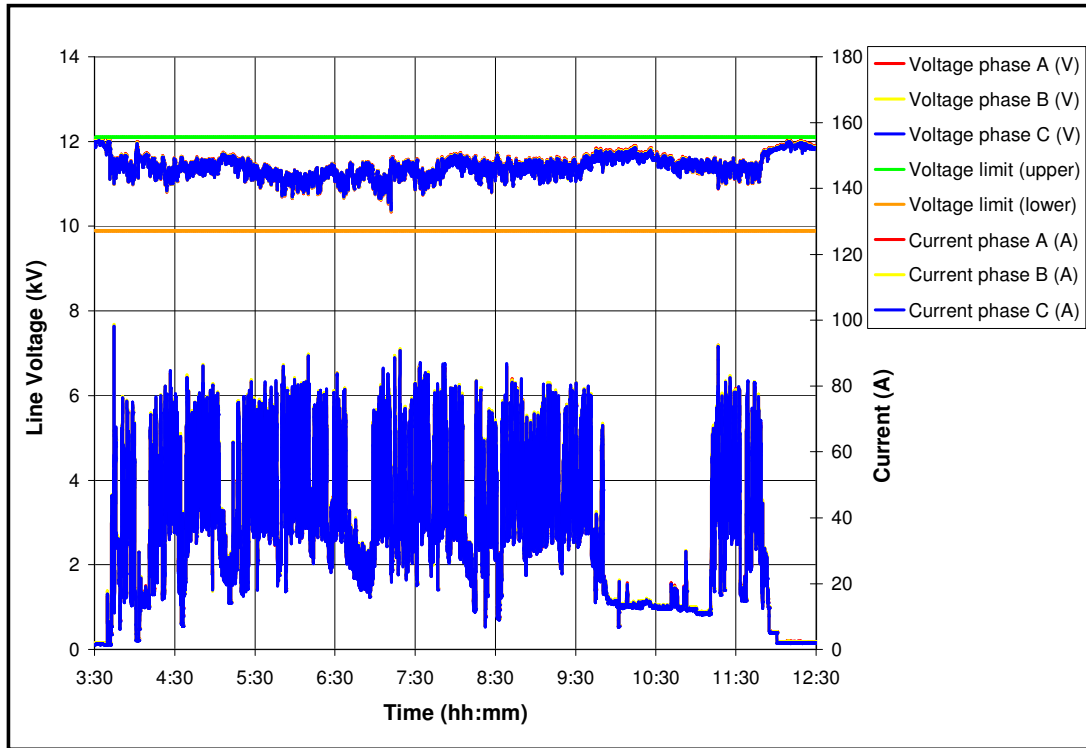


Figure B.1-4: Load current and voltage for a MSU – 17 May 2005.

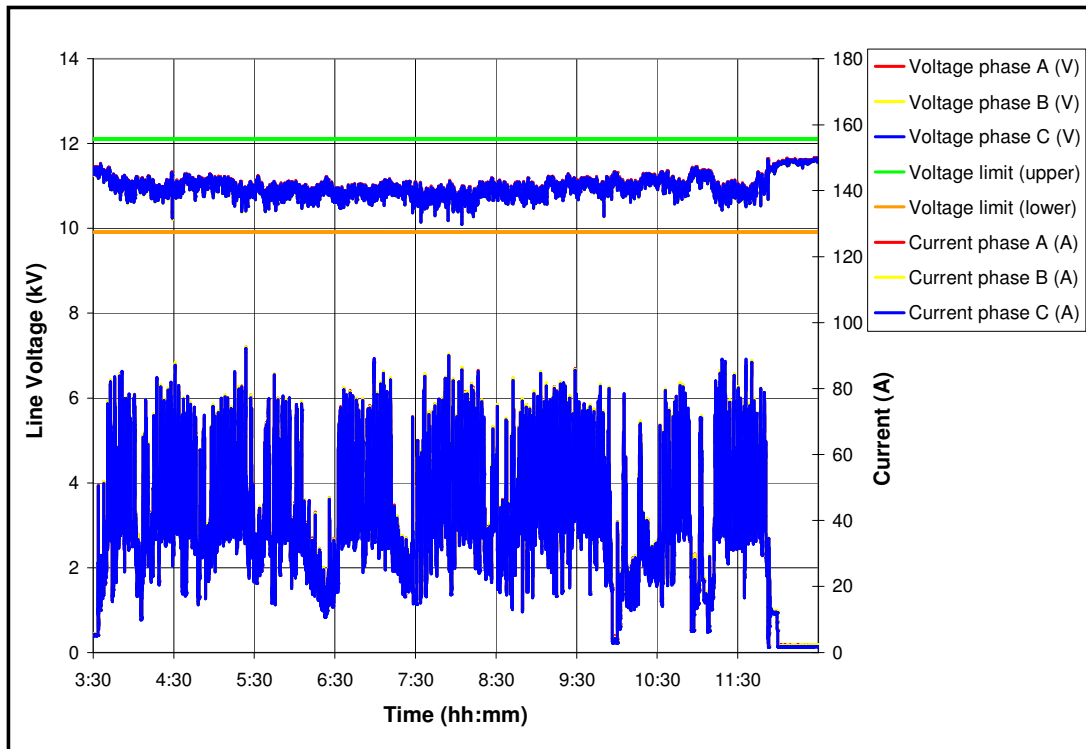


Figure B.1-5: Load current and voltage for a MSU – 18 May 2005.

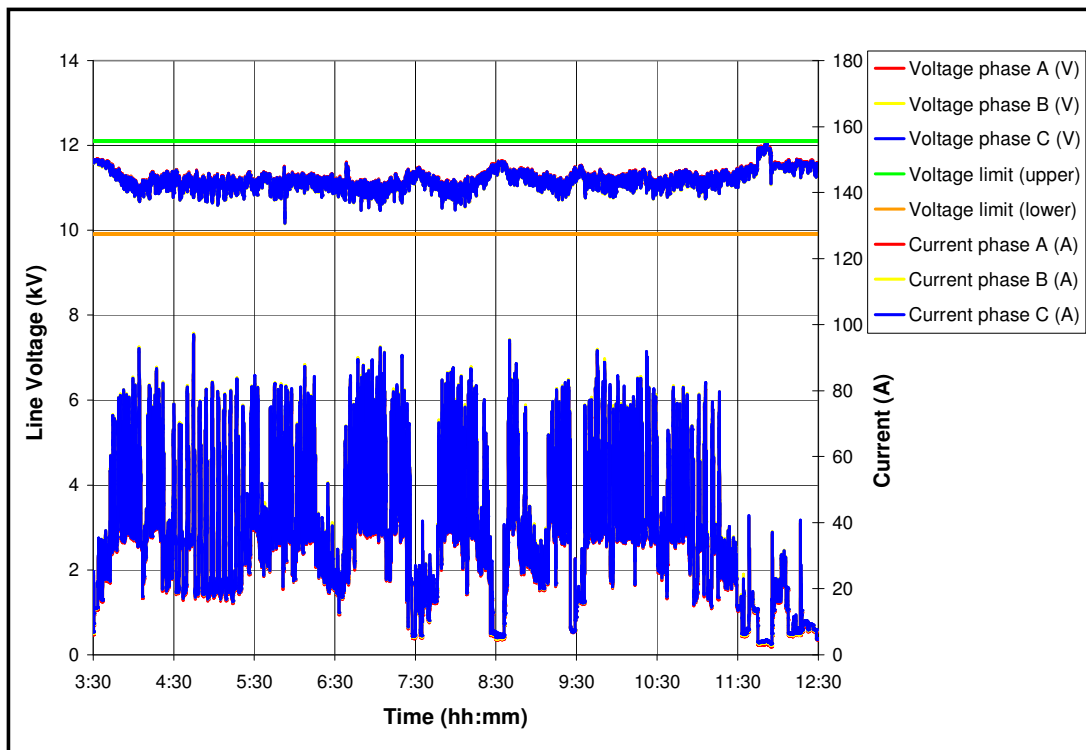


Figure B.1-6: Load current and voltage for a MSU – 19 May 2005.

B.1.2 SECTION 61

B.1.2.1 Morning shifts

Table B-4: Reasons for breakdowns and absent data.

Date	Time start	Time stop	Reason for breakdown or no data
23-May-2005	14:40	EOS	Conveyor belt lockout.
24-May-2005	SOS	09:10	GEB - Earth fault.
	09:10	10:50	No service water.
25-May-2005	14:45	EOS	Conveyor belt torn - 12 m.

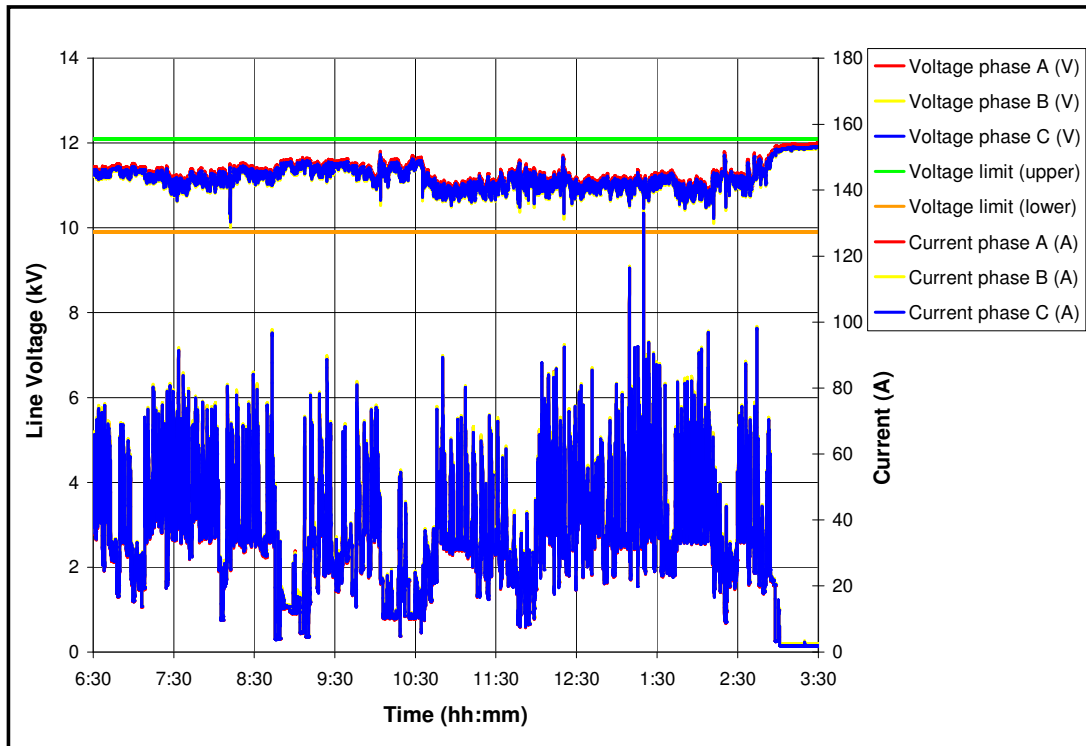


Figure B.1-7: Load current and voltage for a MSU – 23 May 2005.

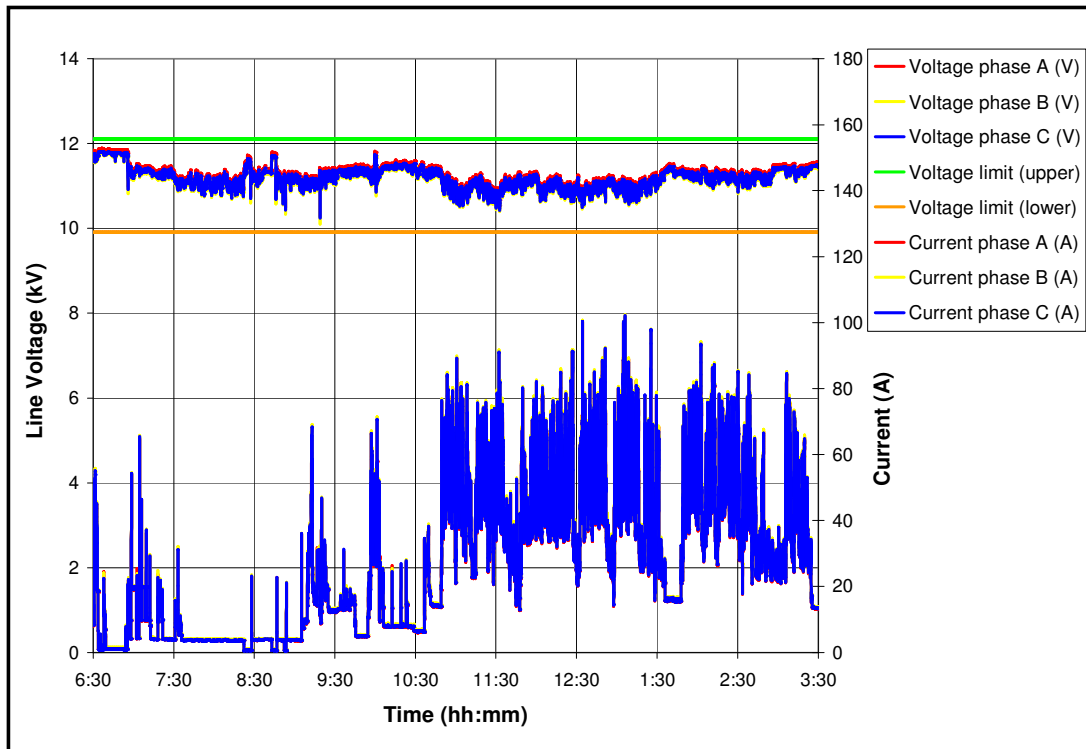


Figure B.1-8: Load current and voltage for a MSU – 24 May 2005.

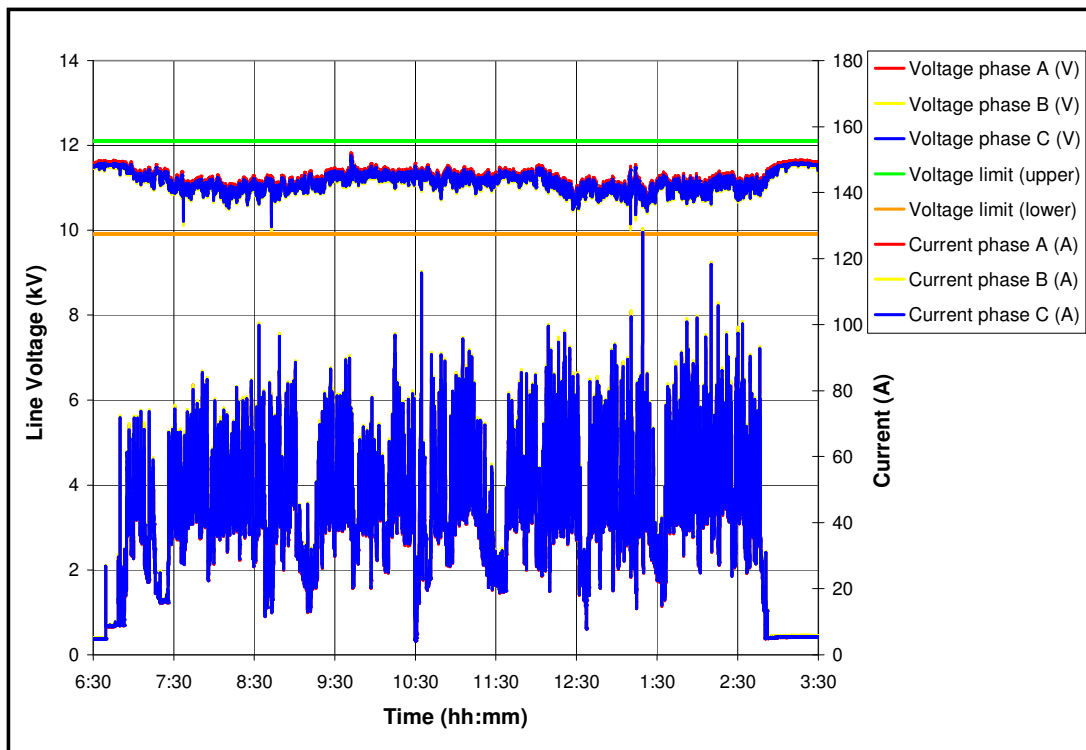


Figure B.1-9: Load current and voltage for a MSU – 25 May 2005.

B.1.2.2 Afternoon shifts

Table B-5: Reasons for breakdowns and absent data.

Date	Time start	Time stop	Reason for breakdown or no data
23-May-2005	-	-	-
24-May-2005	-	-	-
25-May-2005	19:20 21:10	20:45 EOS	Conveyor belt torn - 15 m. Conveyor belt torn - 50 m.

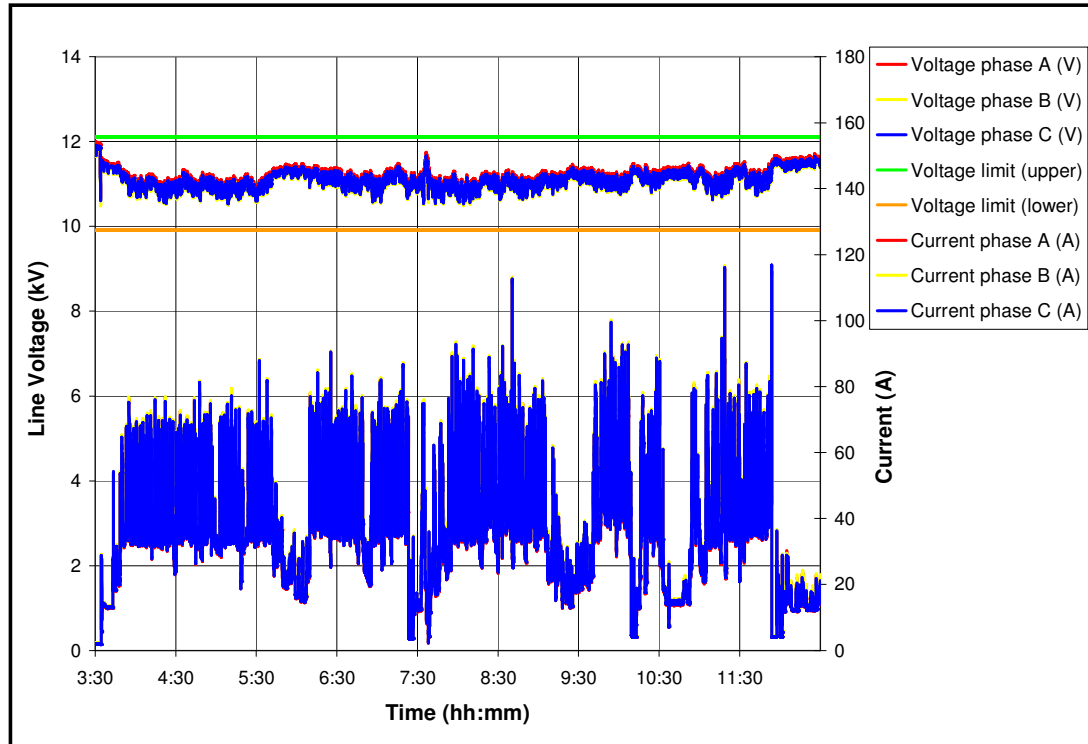


Figure B.1-10: Load current and voltage for a MSU – 23 May 2005.

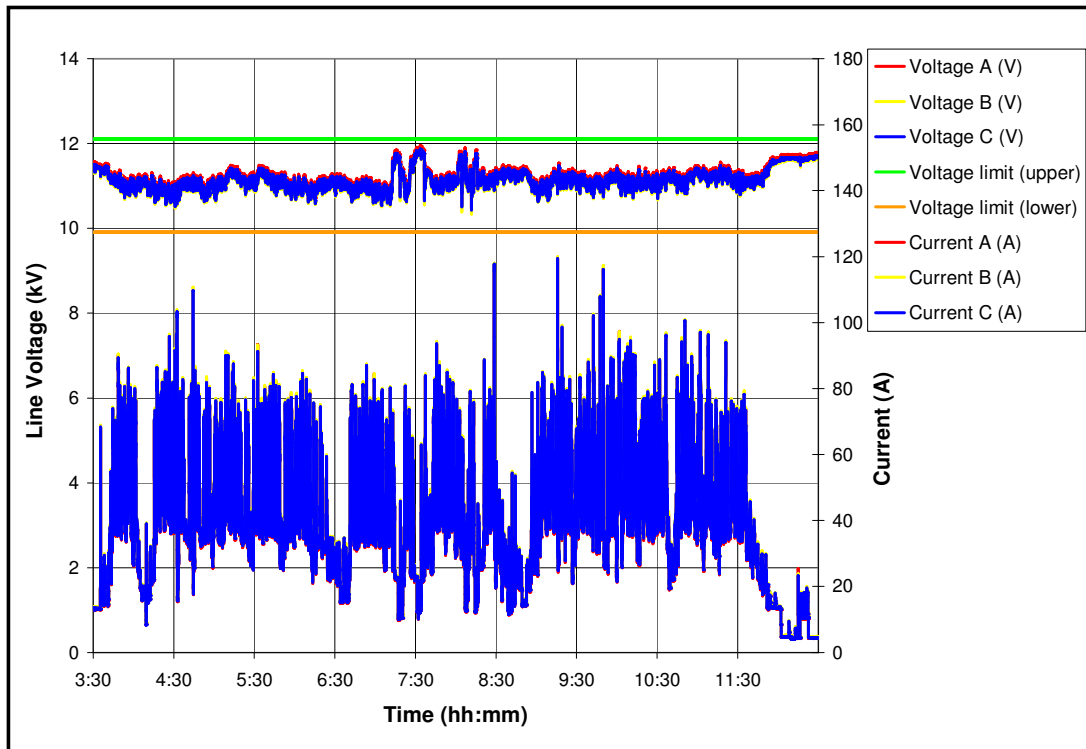


Figure B.1-11: Load current and voltage for a MSU – 24 May 2005.

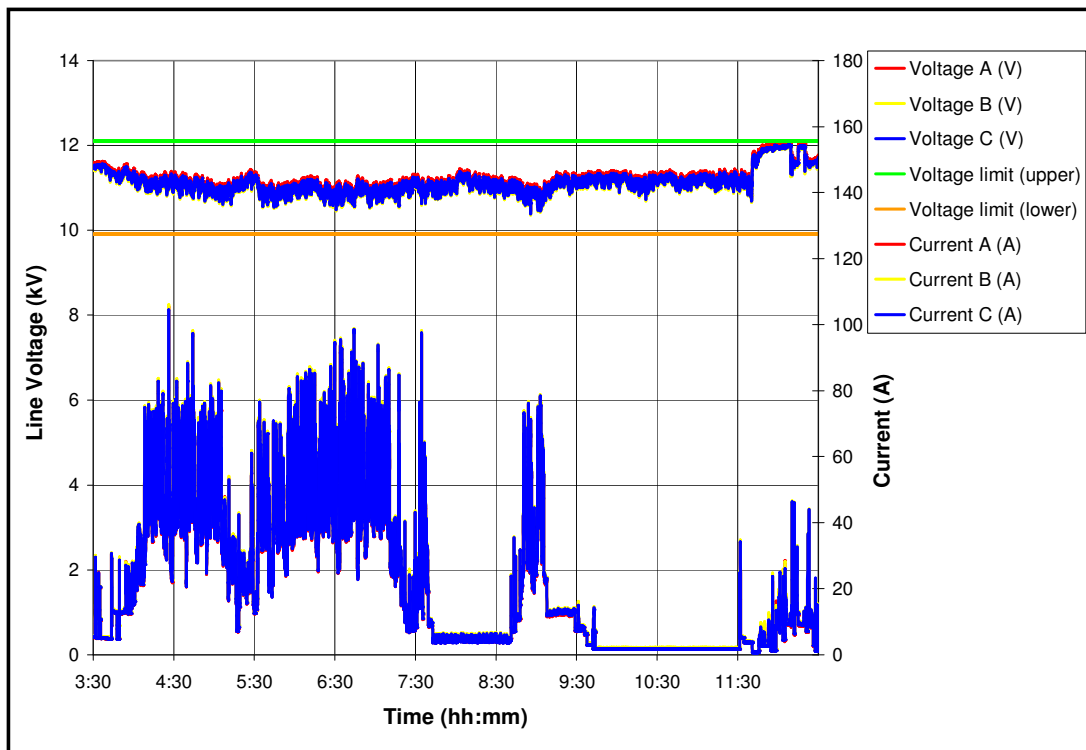


Figure B.1-12: Load current and voltage for a MSU – 25 May 2005.

B.2 HISTOGRAM

The next section focuses on the frequency with which a MSU consumed a certain load current. The graphs show the number of times a certain current has been consumed. The tables give data about the tonnes produced during the shift and the percentage time of the shift that power were consumed. The time that the supply cable has been over loaded or loaded within capacity is given as a percentage of the actual producing time. The morning shifts and afternoon shifts are separated as well as the measurements made at the different sections.

B.2.1 SECTION 21

B.2.1.1 Morning shifts

Table B-6: Data for the total consumption of a MSU in section 21.

	17-May-05	18-May-05	19-May-05
Tonnes/CM/Shift	858	1320	1716

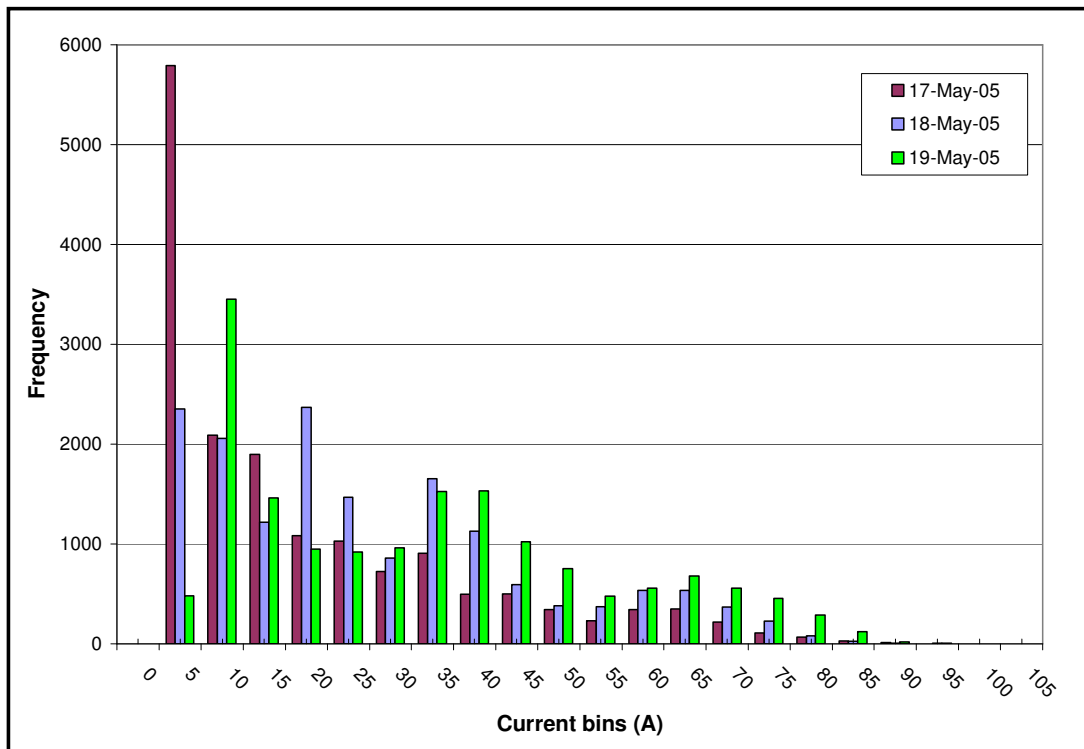


Figure B.2-1: Histogram for current consumed by a MSU.

B.2.1.2 Afternoon shifts

Table B-7: Data for the total consumption of a MSU in section 21.

	17-May-05	18-May-05	19-May-05
Tonnes/CM/Shift	2145	2112	2013

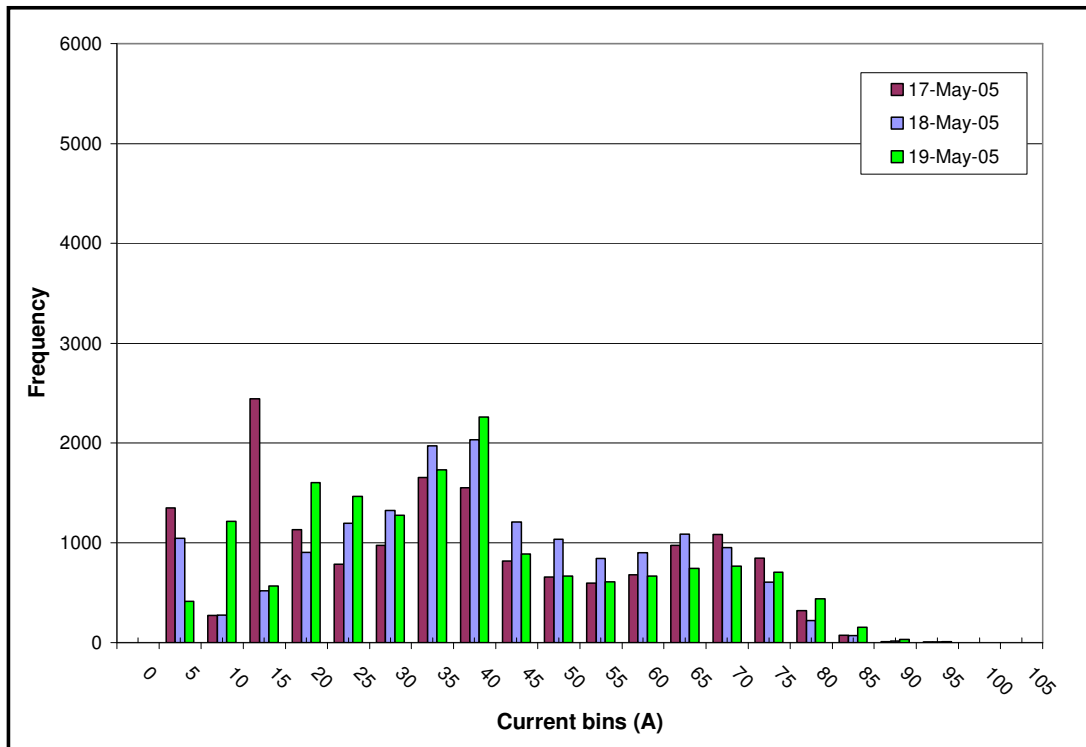


Figure B.2-2: Histogram for current consumed by a MSU.

B.2.2 SECTION 61

B.2.2.1 Morning shifts

Table B-8: Data for the total consumption of a MSU in section 61.

	23-May-05	24-May-05	25-May-05
Tonnes/CM/Shift	1740	1450	2320

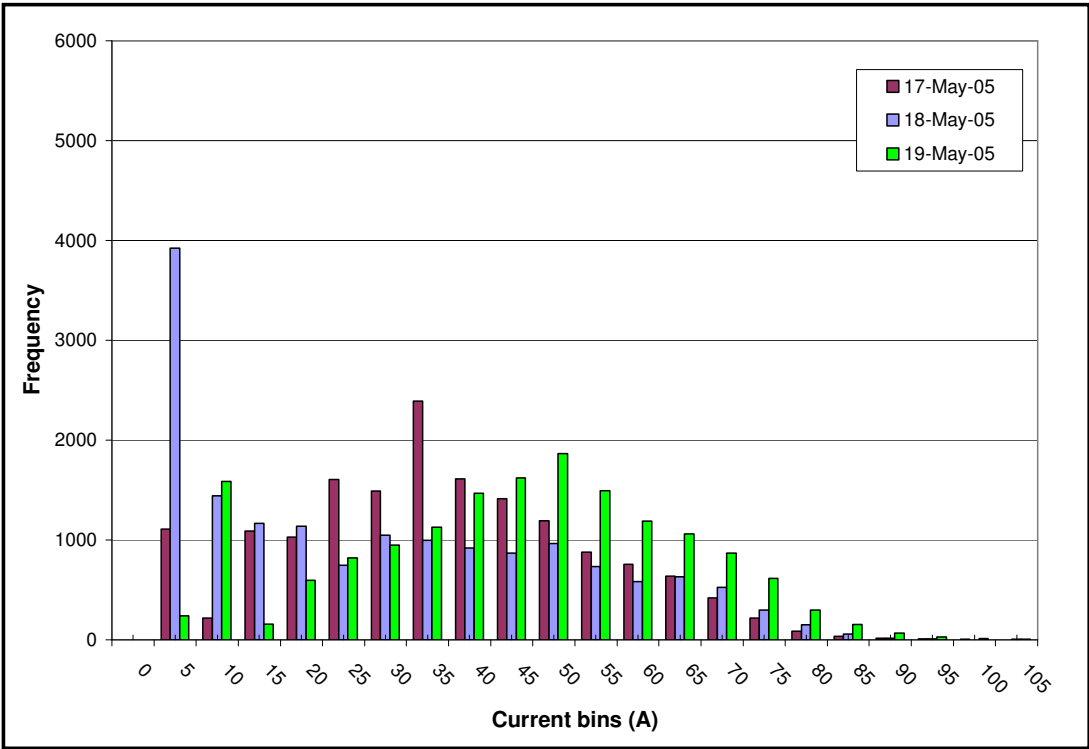


Figure B.2-3: Histogram for current consumed by a MSU.

B.2.2.2 Afternoon shifts

Table B-9: Data for the total consumption of a MSU in section 61.

	23-May-05	24-May-05	25-May-05
Tonnes/CM/Shift	2030	2320	1160

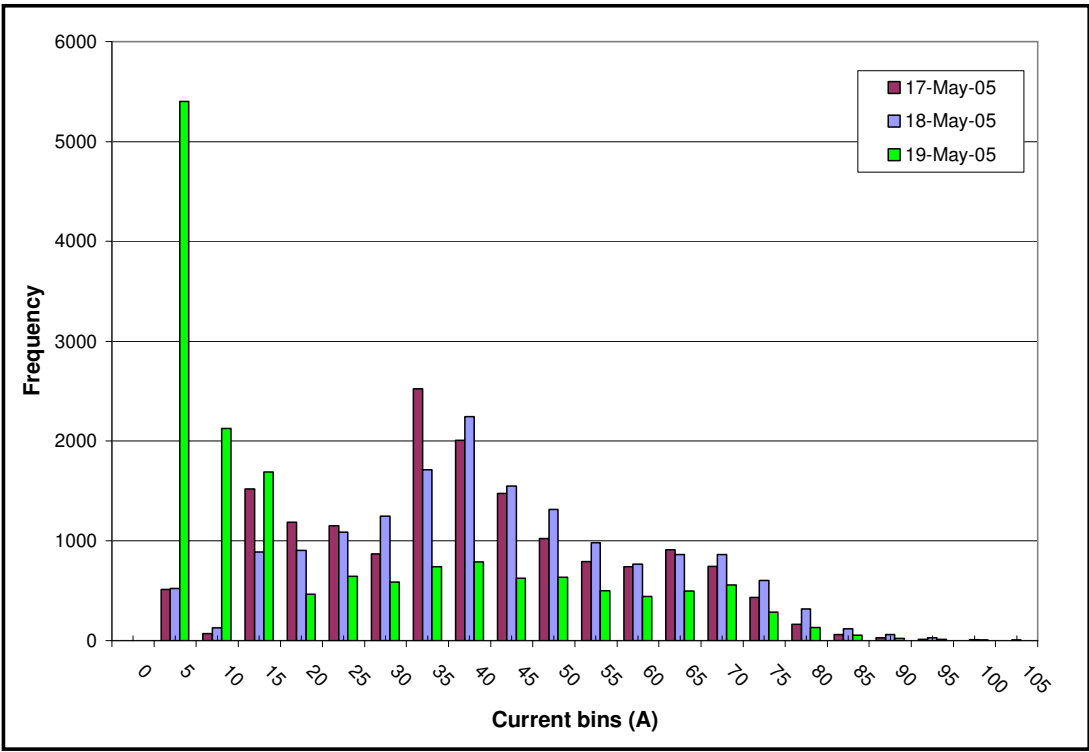


Figure B.2-4: Histogram for current consumed by a MSU.