Contents

1	Basic Pneumatics for Circuit Breakers		1
	1.1	What is pneumatics?	1
	1.2	Units of measurement	3
	1.3	Pascal's law	6
	1.4	Force multiplication	6
	1.5	Pressure intensification	7
	1.6	Pressure acting on different areas	9
	1.7	Gas laws	11
	1.8	Pneumatic symbols	13
	1.9	Safety with pneumatics	18
2	Components of Pneumatic Systems		19
	2.1	Elements of a pneumatic system	19
	2.2	General configuration of a pneumatic system	19
	2.3	Components of a pneumatic system	20
	2.4	Seals	29
3	Reyrolle 132 kV Circuit Breaker Type OS		31
	3.1	Introduction	31
	3.2	Maintenance of pneumatic operating system	35
4	Circuit Breaker 3AP1 DT		39
	4.1	Specifications of the breaker	40
	4.2	Construction of the breaker	41
	4.3	Spring drive mechanism of the circuit breaker	43
	4.4	Maintenance of a circuit breaker	50
	4.5	Inspection checks for the drive mechanism	53
5	Maintenance of Circuit Breaker Pneumatic Systems		55
	5.1	Safety	55
	5.2	Maintenance of breaker pneumatic operating mechanism	55
	5.3	Breaker pneumatic components and their maintenance issues	56
	5.4	Pneumatic system protection issues	58
	5.5	General maintenance tips for pneumatic systems	61
6	Compressors		63
	6.1	Air compressor	63
	6.2	Principle operation of a reciprocating compressor	64
	6.3	Tips for safe and efficient operation of air compressors	66

7	Breaker Pneumatic System Tips and Tricks		69
	7.1	Air quality	69
	7.2	Air leakage	70
	7.3	Mechanism	71
	7.4	Safety valve	73
	7.5	Pressure gauge	73
	7.6	Tools	73
	7.7	Lubrication	74
	7.8	Troubleshooting	74