

THE CERN LARGE HADRON COLLIDER: ACCELERATOR AND EXPERIMENTS

LHC Machine

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ABSTRACT: The Large Hadron Collider (LHC) at CERN near Geneva is the world's newest and most powerful tool for Particle Physics research. It is designed to collide proton beams with a centre-of-mass energy of 14 TeV and an unprecedented luminosity of $10^{34} \text{ cm}^{-2}\text{s}^{-1}$. It can also collide heavy (Pb) ions with an energy of 2.8 TeV per nucleon and a peak luminosity of $10^{27} \text{ cm}^{-2}\text{s}^{-1}$. In this paper, the machine design is described.

KEYWORDS: Acceleration cavities and magnets superconducting; Beam-line instrumentation; Hardware and accelerator control systems; Instrumentation for particle accelerators and storage rings — high energy.

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Contents

1	Introduction	1
2	Main machine layout and performance	3
2.1	Performance goals	3
2.2	Performance limitations	4
2.2.1	Beam-beam limit	4
2.2.2	Mechanical aperture	4
2.2.3	Maximum dipole field and magnet quench limits	5
2.2.4	Energy stored in the circulating beams and in the magnetic fields	5
2.2.5	Heat load	5
2.2.6	Field quality and dynamic aperture	5
2.2.7	Collective beam instabilities	6
2.2.8	Luminosity lifetime	6
2.2.9	Average turnaround time	7
2.2.10	Integrated luminosity	7
2.3	Lattice layout	7
2.4	Corrector circuits	11
2.4.1	Arc orbit corrector magnets MCB	11
2.4.2	Chromaticity or lattice sextupoles, MS	11
2.4.3	Lattice skew sextupoles, MSS	11
2.4.4	Tune-shift or tuning quadrupoles, MQT	11
2.4.5	Arc skew quadrupole corrector magnets, MQS	12
2.4.6	Landau damping or lattice octupoles, MO	12
2.4.7	Spool-piece corrector magnets	12
2.5	High luminosity insertions (IR1 and IR5)	12
2.6	Medium luminosity insertion in IR2	13
2.7	Beam cleaning insertions in IR3 and IR7	15
2.8	RF insertion in IR4	16
2.9	Beam abort insertion in IR6	16
2.10	Medium luminosity insertion in IR8	16
3	Magnets	19
3.1	Overview	19
3.2	Superconducting cable	19
3.3	Main dipole cold mass	22
3.4	Dipole cryostat	27
3.5	Short straight sections of the arcs	27
3.6	Orbit and multipole correctors in the arcs	29
3.7	Insertion magnets	30
3.8	Dispersion suppressors	31

3.9	Matching section quadrupoles	32
3.10	Matching section separation dipoles	35
3.11	Low-beta triplets	40
3.12	Compensator dipoles in ALICE and LHCb experiments	44
4	The RF systems and beam feedback	46
4.1	Introduction	46
4.2	Main 400 MHz RF Accelerating System (ACS)	48
4.3	Staged 200 MHz Capture System (ACN)	51
4.4	Transverse damping and feedback system (ADT)	52
4.5	Low-level RF	53
5	Vacuum system	55
5.1	Overview	55
5.2	Beam vacuum requirements	55
5.3	Beam vacuum in the arcs and dispersion suppressors	56
5.3.1	Beam screen (figure 5.1)	57
5.3.2	Cold interconnects (figures 5.2 and 5.3)	57
5.3.3	Beam position monitor bodies and supports (figure 5.4)	59
5.4	Beam vacuum in the insertions	59
5.4.1	Beam screen	59
5.4.2	Cold interconnections and Cold-Warm Transitions	60
5.4.3	Room temperature beam vacuum in the field free regions	61
5.4.4	Beam vacuum in room temperature magnets	61
5.4.5	Bake-out and NEG activation	61
5.5	Insulation vacuum	62
5.6	Vacuum controls	63
6	Powering and protection	64
6.1	Overview	64
6.2	Powering circuits	64
6.3	Powering equipment	69
6.3.1	Current leads	69
6.3.2	Electrical feedboxes	69
6.3.3	Superconducting links	70
6.3.4	Bus-bar systems	71
6.3.5	Normal conducting cables	71
6.4	Protection equipment	71
6.4.1	Quench heater power supplies	72
6.4.2	Energy extraction systems	72
6.4.3	13 kA circuits	73
6.4.4	600 A extraction equipment	75
6.4.5	Cold diodes	75

6.4.6	Controllers	76
6.4.7	Supervision of the Quench Protection System (QPS)	76
6.5	Operational aspects and reliability	76
6.5.1	Electrical quality assurance	76
6.5.2	Quench detectors	77
6.5.3	Quench Heater Power Supplies (DQHDS)	77
6.5.4	Energy extraction	78
7	Cryogenic system	80
7.1	Overview	80
7.2	General architecture	81
7.3	Temperature levels	83
7.4	Cooling scheme	84
7.4.1	Arc and dispersion suppressor cooling loops	84
7.4.2	Matching section cooling loops	86
7.4.3	Inner triplet cooling loops	86
7.5	Cryogenic distribution	86
7.6	Refrigeration plants	88
7.6.1	4.5 k refrigerators	88
7.6.2	1.8 k refrigerators	88
7.7	Cryogen storage and management	88
8	Beam instrumentation	90
8.1	Beam position measurement	90
8.2	Beam current transformers	92
8.3	Beam loss system	93
8.4	Transverse profile measurement	94
8.5	Longitudinal profile measurement	94
8.6	Luminosity monitors	95
8.7	Tune, chromaticity, and betatron coupling	96
8.7.1	General tune measurement system	96
8.7.2	AC dipole	96
8.7.3	High sensitivity tune measurement system	96
8.7.4	Chromaticity measurement	97
8.7.5	Betatron coupling measurement	97
8.8	Long-range beam-beam compensation	97
9	Control system	98
9.1	Introduction	98
9.2	Architecture	98
9.2.1	Overall architecture	98
9.2.2	Network	100
9.3	Equipment access	101

9.3.1	The VME and PC Front End Computers	101
9.3.2	The PLCs	102
9.3.3	The supported fieldbuses	102
9.3.4	The WorldFIP fieldbus	102
9.3.5	The Profibus fieldbus	103
9.4	Servers and operator consoles	103
9.5	Machine timing and UTC	103
9.5.1	Central beam and cycle management	103
9.5.2	Timing generation, transmission and reception	104
9.5.3	UTC for LHC time stamping	104
9.5.4	UTC generation, transmission and reception	105
9.5.5	NTP time protocol	105
9.6	Data management	105
9.6.1	Offline and online data repositories	106
9.6.2	Electrical circuits	107
9.6.3	Control system configuration	107
9.7	Communication and software frameworks	108
9.7.1	FEC software framework	108
9.7.2	Controls Middleware	108
9.7.3	Device access model	109
9.7.4	Messaging model	110
9.7.5	The J2EE framework for machine control	110
9.7.6	The UNICOS framework for industrial controls	111
9.7.7	The UNICOS object model	112
9.8	Control room software	113
9.8.1	Software for LHC beam operation	113
9.8.2	Software requirements	113
9.8.3	The software development process	114
9.8.4	Software for LHC Industrial Systems	115
9.9	Services for operations	115
9.9.1	Analogue signals transmission	115
9.9.2	Alarms	116
9.9.3	Logging	117
9.9.4	Post mortem	118
10	Beam dumping	120
10.1	System and main parameters	120
10.2	Reliability	122
10.2.1	MKD	122
10.2.2	MKB	123
10.2.3	MSD	123
10.2.4	Vacuum system and TDE	123
10.2.5	Post-mortem	123

10.2.6	Synchronisation	123
10.2.7	Energy tracking	123
10.2.8	Other protection	124
10.3	Main equipment subsystems	124
10.3.1	Fast-pulsed extraction magnets MKD	124
10.3.2	Generator	125
10.3.3	Fast-pulsed dilution magnets MKB	126
10.3.4	Extraction septum magnets MSD	127
10.3.5	Beam dump absorber block TDE	127
10.3.6	Activation	129
11	Beam injection	130
11.1	Overview	130
11.2	Injection septa	131
11.3	Injection kickers	132
11.4	Control system	136
11.5	Beam instrumentation	136
12	Injection chain	138
12.1	Introduction	138
12.2	LHC and SPS requirements	139
12.3	Scheme to produce the LHC proton beam in the PS complex	140
12.3.1	Space charge issues in PSB and PS	140
12.3.2	LHC bunch train generation in the PS	142
12.3.3	Initial debunching-rebunching scheme	142
12.3.4	Multiple splitting scheme	143
12.4	Overview of hardware changes	143
13	LHC as an ion collider	146
13.1	LHC parameters for lead ions	146
13.1.1	Nominal ion scheme	147
13.1.2	Early ion scheme	147
13.2	Orbits and optical configurations for heavy ions	148
13.3	Longitudinal dynamics	149
13.4	Effects of nuclear interactions on the LHC and its beams	149
13.5	Intra-beam scattering	150
13.6	Synchrotron radiation from lead ions	150
	LHC machine acronyms	153
	Bibliography	154