



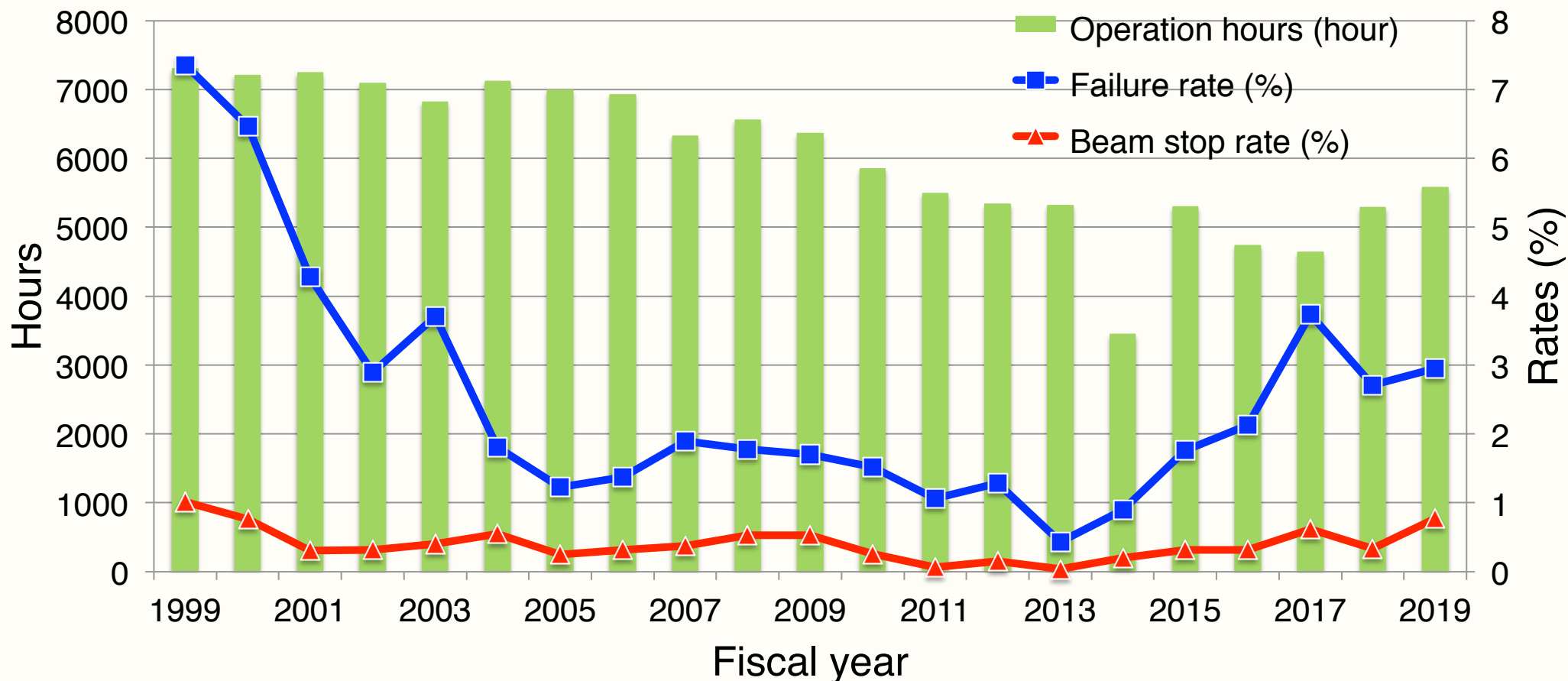
Injector Linac Failure Breakdown

Linac FY2019	RF	Magnet	Structure	Cooling Water	Vacuum	Control	Others	Utility	Earthquake Lightening	Total
Failure Time (Time)	40:56 25%	12:49 8%	0:57 1%	3:33 2%	1:25 1%	19:52 12%	75:50 46%	8:23 5%	0:32 0%	164:17 100%
Beam Stop (Time)	3:19 8%	4:23 10%	0:51 2%	1:26 3%	0:19 1%	3:54 9%	28:13 65%	0:47 2%	0:00 0%	43:12 100%
No. of Failures	618 33%	163 9%	63 3%	86 5%	277 15%	303 16%	312 17%	22 1%	24 1%	1868 100%
No. of Failures to stop beam	31 26%	13 11%	4 3%	6 5%	5 4%	21 17%	40 33%	1 1%	0 0%	121 100%

- ◆ "Others" are not yet categorized, and they include guns, event timing controls and items that span multiple categories
- ◆ "Failure" includes any failures that could be cured by redundancy, etc., and "Beam stop" means the failures that prevented beam injections

Operation Statistics History

Injector operation hours and failure rates



- ◆ "Failure rate" includes any failures that could be cured by redundancy, etc., and "Beam stop rate" means the failures that prevented beam injections
- ◆ The rate decrease in FY2018 indicate the end of construction, and the rate increase in FY2019 was caused by simultaneous top-up injections



More Statistics

	Scheduled hours	Time lost	No. of faults	Mean time btw failures (MTBF)	Mean time to recover (MTTR)
	(hour)	(hour)	(count)	(minute)	(minute)
FY1999	7,297	537	1,888	232	17
FY2000	7,203	466	2,401	180	12
FY2001	7,239	310	1,304	333	14
FY2002	7,086	205	1,424	299	9
FY2003	6,815	253	2,259	181	7
FY2004	7,117	129	2,323	184	3
FY2005	6,988	86	1,752	239	3
FY2006	6,927	95	1,665	250	3
FY2007	6,322	120	1,914	198	4
FY2008	6,556	117	1,536	256	5
FY2009	6,362	108	1,316	290	5
FY2010	5,847	89	1,027	342	5
FY2011	5,492	58	766	430	5
FY2012	5,331	69	859	372	5
FY2013	5,315	23	1,127	283	1
FY2014	3,448	31	1,243	166	1
FY2015	5,296	93	1,437	221	4
FY2016	4,733	101	1,986	143	3
FY2017	4,636	173	1,606	173	6
FY2018	5,284	143	2,283	139	4
FY2019	5,574	164	1,868	179	5

Injector Linac on May.7.2020.

