

世界原子力発電所の運轉実績

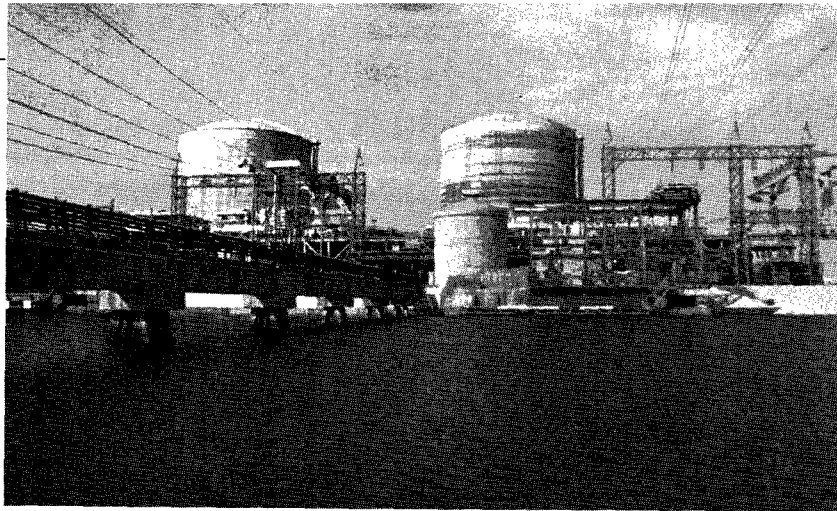
— 1987年 4月1일부터 1988년 3月31일까지 —

〈表1〉年間('87. 4. 1~'88. 3. 31) 및 累計 負荷率

		Annual figures (for 12-months to end March 88)					Cumulative (lifetime) figures to end March 88							Annual figures (for 12-months to end March 88)					Cumulative (lifetime) figures to end March 88											
Reactor name	Country	Rank	Load factor, %	Rank	Load factor, %	MWh generated	MWe gross	Type	First power	Reactor name	Country	Rank	Load factor, %	Rank	Load factor, %	MWh generated	MWe gross	Type	First power	Reactor name	Country	Rank	Load factor, %	Rank	Load factor, %	MWh generated	MWe gross	Type	First power	
Genkai 2	J	1	99.8	17	83.3	31978043	559	P	06/84	Doel 4	B	85	79.5	38	79.6	22178354	1059	P	04/76											
Pickering 7	C	2	97.7	11	90.3	14095867	540	H	11/86	Zion 1	US	86	79.5	214	56.9	79437706	1089	P	08/85											
Bruce 5	C	3	95.3	13	84.9	25038799	890	H	06/86	Krsko	JU	87	79.5	138	66.3	25053177	664	P	10/83											
St Lucie 1	US	4	93.9	111	68.7	61787265	872	P	05/82	Fugen	J	88	79.4	204	56.3	8363873	165	H	04/84											
Three Mile Is1	US	5	93.0	295	34.1	39256179	871	P	07/85	Bruce 5	C	89	79.3	11	85.1	17159900	915	H	12/87											
Lovisa 2	SF	6	92.7	12	85.1	25715232	465	P	11/83	Cofrentes	E	90	78.9	88	71.8	21467892	975	B	10/85											
Hunterston A1	GB	7	92.4	23	82.1	29378623	169	M	02/77	Shimane	J	91	78.6	96	71.0	40774891	460	B	01/82											
Lovisa 1	SF	8	92.3	34	80.1	36463569	465	P	02/84	Hamaoka 2	J	92	78.5	101	69.9	51066627	800	B	05/70											
TVO 2	SF	9	92.3	48	73.2	33891118	735	P	02/84	Vermont Yankee	US	98	78.4	114	68.5	51005827	545	B	09/80											
Paks 2	HU	10	92.3	8	86.6	11964908	440	P	09/71	Forsmark 2	S	94	78.2	84	72.5	44013266	1008	B	01/67											
San Onofre 3	US	11	92.2	212	57.6	27333529	1181	P	09/84	Forsmark 3	S	95	78.1	63	75.0	22326661	1101	B	03/83											
TVO 1	SF	12	91.6	31	80.3	47475429	735	P	09/80	Surry 1	US	96	77.9	230	54.4	64049603	858	P	08/74											
Pl Lepreau	C	13	91.3	4	87.9	29113728	680	H	09/84	Forsmark 1	S	97	77.7	59	75.7	49616264	1006	B	06/77											
Izarr 1	D	14	90.9	146	65.7	53981110	390	P	12/84	Vermont Yankee	US	98	77.6	116	68.5	51005827	545	B	09/75											
Pickering 8	C	15	90.8	3	88.2	9155940	540	H	01/85	Pickering 3	C	99	77.5	47	77.5	58575900	542	H	05/80											
Ikats 2	J	16	90.6	30	80.5	26642385	566	P	08/86	Takahama 1	J	100	77.3	238	53.3	54412152	826	P	03/60											
Pickering 6	C	17	89.0	33	80.2	16765174	540	H	11/80	Fukushima II 4	J	101	77.2	136	66.6	8284370	1100	B	12/78											
Embalse	A	18	89.0	164	62.8	17351295	549	H	05/86	Tsuruga 2	J	102	77.2	210	57.9	11003333	1160	P	05/79											
Barseback 2	S	19	88.6	42	78.2	45592608	600	B	03/81	Tsuruga 1	J	104	76.5	168	62.5	35908024	357	B	12/81											
Bruce 3	C	20	88.4	7	86.8	64552914	904	H	12/78	Tricastin 3	F	105	76.4	57	75.8	45570969	957	P	02/81											
Paks 3	HU	21	88.4	16	84.2	5138973	440	P	09/72	Neckar	D	106	76.3	67	74.5	66068960	855	P	06/81											
Fukushima I 6	J	22	88.4	107	69.3	59604270	1100	B	05/82	Takahama 4	J	107	76.3	53	77.0	19788665	870	P	10/79											
Farley 1	US	23	88.3	135	66.8	33891118	735	P	08/84	Tokai 2	J	108	76.4	110	68.7	66827290	1100	B	09/80											
Waterford 3	US	24	88.1	147	65.6	20444210	1153	P	03/72	Asco 2	E	109	76.0	109	69.1	14088432	930	P	10/85											
Mihama 3	J	25	88.1	119	68.3	59791055	825	P	03/83	Doel 2	B	110	76.0	60	75.6	64256760	413	P	08/78											
Barseback 1	S	26	87.9	79	73.1	49799884	616	B	05/74	Hunterston A2	GB	111	75.9	14	84.9	29848462	169	M	07/76											
Tihange 2	D	27	87.8	55	78.9	34874674	941	P	10/73	Brookford	D	112	75.8	43	78.0	13968152	1225	P	10/70											
Gronhede	D	28	87.7	47	85.7	36764219	1368	P	09/88	Meitohk	US	113	75.7	163	66.8	58319147	580	B	08/80											
Muehleberg	CH	29	87.4	24	82.0	39053577	336	B	07/78	McGuire 2	US	114	75.7	169	62.5	33007866	1395	P	05/80											
Tihange 3	B	30	87.1	15	84.8	22076960	1048	P	06/81	Bradwell	GB	115	75.4	172	62.1	4830020	174	MX2	10/86											
Bruce 3	C	31	86.8	2	89.0	14127900	890	H	04/78	Fessenheim 2	F	116	75.3	97	70.6	60420819	930	P	10/72											
Surry 2	US	32	86.8	213	57.1	65352474	856	P	02/79	Paluel 2	F	117	75.3	185	60.7	25599850	1345	P	09/79											
Gravelines A	D	33	86.8	11	83.0	59929458	1300	P	02/83	Gravelines C6	F	118	75.2	83	72.5	16223193	957	B	08/80											
Kewaunee	US	34	86.8	56	76.5	51360271	856	P	03/77	Kuosheng 2	TW	119	75.1	130	66.9	33734432	985	B	06/76											
Tihange 1	B	35	86.7	66	74.6	78722490	920	P	03/83	Brunsbüttel	D	120	74.9	255	51.5	42773322	806	P	07/78											
Hunterston B2	GB	36	86.2	244	52.6	33688130	660	A	04/82	Borssele	NL	121	74.6	44	77.9	48443620	481	P	07/77											
Gosgen	CH	37	86.2	32	80.2	62505541	970	P	02/77	Kori 3	SK	122	74.5	129	67.7	17635148	950	P	01/89											
Hinkley Pt A	GB	38	86.0	82	62.7	81805280	280	MX2	07/83	Fukushima II 2	J	123	74.4	123	74.4	34652960	950	B	11/80											
Phillipsburg 1	D	39	85.7	181	61.0	42926600	900	B	05/72	Ringhals 3	S	124	74.4	237	63.0	34925866	980	P	09/74											
Paluel 3	F	40	85.6	90	71.6	21121036	1345	P	09/74	Calvert Cliffs 1	US	125	74.4	113	68.6	7297876	918	P	01/80											
Takahama 3	J	41	85.6	46	77.7	23232861	870	P	05/81	Fitzpatrick	US	126	74.3	195	58.7	58998260	851	B	02/84											
Doel 3	B	42	85.4	29	81.3	40178020	613	P	02/77	Tricastin	F	127	74.3	99	70.2	46809787	977	P	05/84											
Phillipsburg 2	D	43	85.4	5	87.8	33729703	1349	P	01/85	Ford Calhoun 1	US	128	74.1	162	63.4	41897870	915	B	09/85											
Leistadt	CH	44	84.5	54	77.0	27161774	1045	B	05/73	Farley 2	US	129	74.0	41	78.5	41120368	852	P	05/84											
Oconee 3	US	45	84.1	152	64.7	71314768	826	P	09/83	Yankee Rowe	US	130	74.0	100	70.1	31143830	185	P	11/82											
Osakosharn 1	US	46	84.1	145	65.7	45304629	960	B	03/84	Cathlamet 1	F	131	73.9	115	68.5	11039730	1330	P	11/85											
Prairie Is 2	US	47	84.1	40	78.5	5148390	561	P	12/72	Doel 3	B	132	73.8	22	82.6	38529492	936	P	06/86											
Wurgassen	D	48	84.0	270	48.2	48423722	672	B	12/85	Hatch 1	US	133	73.6	217	66.5	54192901	818	B	11/71											
Stade 1	D	49	83.7	21	82.6	719160322	670	P	01/84	Onagawa 1																				

“Nuclear Engineering International誌는 8월號에 施設容量이 150MWe(Gross) 以上인 原子爐를 대상으로 '87년 4월 1일부터 '88년 3월 31일까지 1년간 및 계 통병입 이후의 누계 負荷率을 집계, 발표하였다.”

Reactor name	Country	Annual figures (for 12-months to end March 88)			Cumulative (lifetime) figures to end March 88			Type	First power	Reactor name	Country	Annual figures (for 12-months to end March 88)			Cumulative (lifetime) figures to end March 88			Type	First power
		Rank	Load factor, %	MWh generated	Rank	Load factor, %	MWe gross					Rank	Load factor, %	MWh generated	Rank	Load factor, %	MWh generated		
Mihama 2	J	170	65.9	200	58.6	41078542	500	P	04/77	Salem 1	US	255	52.1	256	51.3	59615260	1170	P	12/76
Crus 1	US	171	66.9	177	61.3	24754078	921	P	04/75	Crus 3	F	256	51.7	126	67.7	21011748	921	P	05/76
Bibis 1	D	172	66.8	124	67.9	97429777	1204	P	08/62	Bugey 1	F	257	51.6	202	58.3	45795040	960	M	04/76
Arkansas 1	US	173	66.5	216	56.7	61383884	903	P	08/63	Gravelines B3	F	258	50.8	114	68.6	42190303	957	P	12/80
Oskarshamn 3	S	174	66.4	86	72.2	21501948	1101	P	03/71	Crystal River 3	US	259	50.7	249	52.3	45876293	890	P	01/73
Limerick 1	US	175	66.2	225	55.4	16617107	1140	B	04/65	St Laurent 1	F	260	50.6	250	51.8	43340874	500	M	03/84
Hope Creek	US	176	66.0	143	65.8	12376675	1170	B	06/75	Sizewell A	GB	261	49.5	205	58.1	73077930	326	MX2	05/74
Oyster Creek	US	177	66.0	248	52.3	5610425	680	B	10/83	La Salle 1	US	262	49.4	208	38.3	21047972	1122	B	09/84
Blayais 1	F	178	65.8	108	69.2	39437702	951	P	06/77	Taikanama 2	J	263	49.4	190	60.0	56628679	826	P	03/84
Salem 2	US	179	65.7	273	48.0	34693990	1170	P	05/83	Mulheim Karlich	D	264	49.1	297	30.7	7227257	1308	P	03/71
Ozcinne 2	US	180	65.7	173	62.0	12130145	926	P	12/78	Wylfa	GB	265	47.4	264	49.4	96056820	655	MX2	05/86
Catawba 1	US	181	65.0	224	55.6	1908742	1205	P	01/79	Turkey Pt 4	US	266	46.8	188	60.0	56794288	728	P	06/76
Garona	E	182	64.4	163	62.9	43319900	960	B	03/75	Uentrop (THTR 300)	D	267	46.5	296	32.6	2089371	308	T	11/76
Yongkwang 2	SK	183	64.2	156	62.2	7784294	496	P	11/80	Clinton	US	268	45.4	277	45.4	3683156	985	B	04/71
Hatch 2	US	184	64.1	227	54.8	37523381	820	B	10/72	Mulheim Karlich	D	269	44.1	297	30.7	7227257	1308	P	03/71
Duquoin	US	185	63.8	154	64.5	16447100	1164	P	10/84	Trojan	US	270	44.2	253	61.8	65223246	1178	P	12/71
Davis Besse 1	US	186	63.7	289	38.2	34254222	960	P	06/78	Koeberg 2	SA	271	43.8	239	53.3	12415503	965	P	07/83
Callaway 1	US	187	63.6	81	72.8	28063500	1192	P	10/67	Magnum 2	IN	272	43.7	196	59.4	49799576	964	P	05/81
St Laurent B2	F	188	63.4	223	54.5	31232097	957	P	06/73	Palo Verde 1	US	273	43.7	281	42.8	2276946	1235	H	08/81
Dungeness A	GB	189	63.0	125	57.7	64331460	286	MX2	12/70	Heysham A2	GB	274	43.1	282	42.0	13946380	1336	P	06/72
Fliamansville 2	F	190	62.8	203	58.3	11696360	1344	P	07/75	Pickering 1	C	276	41.8	174	61.8	49011176	542	H	04/76
Crus 2	F	191	62.7	153	64.5	18734302	940	P	09/73	Berkeley	GB	277	41.1	157	64.2	46000240	190	MX2	10/87
Arnold	US	192	62.7	241	53.2	36437440	565	B	06/86	Downeay	GB	278	39.4	304	20.0	4910410	270	F	02/84
Gundremmingen C	D	193	62.5	64	74.8	29268910	1308	B	11/72	St Alban 1	F	279	38.8	251	51.8	15839772	1348	P	08/64
Brunswick 1	US	194	62.4	267	48.8	42045287	849	B	09/71	Hinkley Pt B1	GB	280	36.3	236	53.7	35475470	660	A	11/75
Tarapur 2	IN	195	62.4	252	51.7	17779047	210	B	08/75	Koeberg 1	SA	281	36.0	296	39.3	15753880	965	P	04/85
Maanshan 1	TW	196	62.2	77.8	45.1	14745012	951	P	05/78	North Anna 1	US	282	34.2	186	60.2	50019633	947	P	04/85
Bugey 5	F	197	62.0	102	69.8	50730686	957	P	08/69	Hartlepool 2	GB	283	33.5	303	23.9	4738260	660	A	11/73
St Alban 2	F	198	62.0	247	52.4	10808550	1348	P	07/82	Atucha	A	284	30.3	118	68.4	30502565	367	H	06/76
Gravelines B2	F	199	61.9	125	67.7	43625860	957	P	08/67	Heysham A1	GB	285	27.3	300	24.7	6771440	860	A	07/84
Brunswick 2	US	200	61.7	280	44.0	42564257	849	B	04/72	Tarapur 1	IN	287	24.6	275	47.4	16581920	210	B	04/71
Rapp 2	IN	201	61.7	258	50.7	7243392	220	H	11/73	Perry 1	US	288	24.3	301	24.3	4227456	1252	B	09/82
Fukushima 1 I	J	202	61.7	268	48.5	33410042	460	B	03/72	Fort St Vrain	US	289	23.6	309	15.0	5101796	342	T	12/77
San Onofre 2	US	203	61.5	243	53.1	30686627	1181	P	09/86	Rapp 1	IN	290	19.4	302	14.3	6729624	220	H	12/74
Crus 4	F	204	61.5	127	61.6	19098079	921	B	02/74	Chiron 3	F	291	19.1	299	10.0	28496739	500	M	08/81
Tricastin 4	F	205	61.5	106	69.4	39771165	957	P	06/66	Angra 1	BR	292	17.8	306	18.9	6428829	657	P	04/78
San Onofre 1	US	206	61.5	228	54.6	44396028	456	P	12/85	Turkey Pt 3	GB	293	9.8	193	59.8	58194508	728	P	11/80
Bugey 3	F	207	61.4	155	64.5	52212435	964	P	09/82	Chooz	US	294	6.5	307	17.8	2320206	660	A	04/85
Bruc 4	C	208	61.3	20	82.9	56396798	904	H	12/81	Creyss Mailville	F	296	5.2	310	8.4	2035904	1242	F	01/85
Senou 1	US	209	61.2	132	66.9	15118325	1009	P	02/74	Dungeness B1	GB	297	2.6	305	9.7	5879490	660	A	04/86
Genkai 1	J	210	60.7	98	70.3	44210030	559	P	06/86	Browns Ferry 3	US	298	0	284	41.6	46372380	1098	B	09/84
Susquehanna 1	US	211	60.7	267	58.1	31796117	1152	B	11/65	Hartlepool 1	GB	299	0	308	15.9	4309660	660	A	08/66
Hunterdon B1	GB	212	60.7	242	53.1	37459750	660	A	02/83	Pilgrim	US	300	0	274	48.0	46002598	691	B	06/83
Fliamansville 1	F	213	60.7	215	56.8	15815102	1344	P	12/73	Sequoyah 2	US	301	0	291	37.9	24878774	1183	P	12/86
Wolf Creek	US	214	60.0	131	66.9	19805007	1192	P	06/73	Tinno	I	302	0	279	44.8	25027520	270	P	10/73
Beaver Valley 1	US	215	59.8	276	47.4	44413079	897	P	05/85	Rancho Seco	US	303	0	290	37.9	43376230	967	P	10/84
Maanshan 2	TW	216	59.8	234	54.0	14223372	951	P	02/74	North Anna 2	US	304	0	285	40.4	52835648	1098	B	09/75
Calvert Cliffs 2	US	217	59.8	76	73.8	66782663	911	P	12/74	Sequoyah 1	US	305	0	293	37.0	28809940	1183	P	10/83
River Bend	US	218	59.3	253	51.6	10454398	919	B	12/68	Peach Bottom 3	US	306	0	246	52.4	71567432	1152	B	09/82
Cook 2	US	219	59.2	180	61.0	61432270	1133	P	03/74	Pickering 2	C	307	0	194	59.7	48803376	542	H	10/86
Dampierre 4	F	220	59.0	104	69.5	38858753	957	P	08/70	Peach Bottom 2	US	308	0	251	50.1	71485908	1152	B	02/83
Ringhals 2	S	221	58.8	219	56.3	58030314	860	P	08/87	Carso	I	309	0	292	37.3	29027339	894	B	05/76
Indian Pt 3	US	222	58.8	266	48.8	51669940	1013	P	05/80	Browns Ferry 1	US	310	0	283	41.7	58245307	1098	B	10/86
Shearon Harris	US	223	58.7	199	58.7	5166722	960	P	01/74										
Quad Cities 1	US	224	58.5	160	63.7	73682756	838	B	04/85										
Hinkley Pt B2	GB	225	58.4	257	51.3	36100950	660	A	02/85										
Oldbury	GB	226	58.4	218	56.4	62301960	313	MX2	03/78										
Blayais 2	F	227	58.3	91	71.6	34322727	951	P	07/78										
Chiron B1	F	228	58.1	140	65.2	28458883	919	P	12/67										
Nine Mile Pt 1	US	229	58.1	197	59.4	62473070	640	B	06/81										
Maine Yankee	US	230	57.9	128	67.0	78658420	864	P	10/72										
Byron 2	US	231	57.8	231	54.1	6489984	1175	P	02/87										
Dampierre 1	US	232	57.7	158	64.0	43432953	957	P	03/77										
Robinson 2	US	233	57.5	189	60.0	68298340													



〈表3〉 爐型別 容量

Reactor type	No. in operation, all types	No. with more than one year's operation at end March 1988, five main types
PWR	183(170096.5MWe)	173(158915.5MWe)
BWR	81(70573MWe)	80(69359MWe)
PHWR	26(15662.9MWe)	26(15662.9MWe)
Magnox	24(8065.4MWe)	24(8065.4MWe)
AGR	10(6600MWe)	10(6600MWe)
Misc	5(2412MWe)	
Totals	329(273409.8MWe)	313(258602.8MWe)

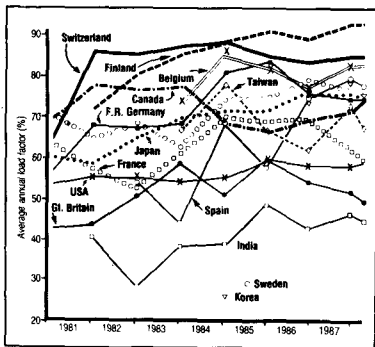
〈表4〉 國家別 負荷率

Country (No. reactors; total MWe gross)	Annual LF, %	Lifetime LF, %	Lifetime MWh generated
Finland (4; 2400)	92.2	80.7	148645348
Switzerland (5; 3079)	84.5	80.3	219576819
Belgium (7; 5729)	82.3	79.3	272180750
Spain (8; 5815)	77.7	67.5	232205799
Sweden (12; 10123)	76.5	67.9	509437626
Korea (7; 5815.7)	75.5	69.8	129503155
FR Germany (19; 19921)	75.3	68.8	912999144
Japan (36; 28046)	75.3	66.6	1311716704
Canada (18; 12894)	74.0	79.0	634261543
Taiwan (6; 5144)	67.4	62.4	180248709
France (49; 47360)	59.7	62.6	1570159572
USA (100; 93947.6)	59.6	57.0	4429282570
UK (29; 12179.4)	50.2	48.2	781634095
India (6; 1330)	44.5	44.2	55324934

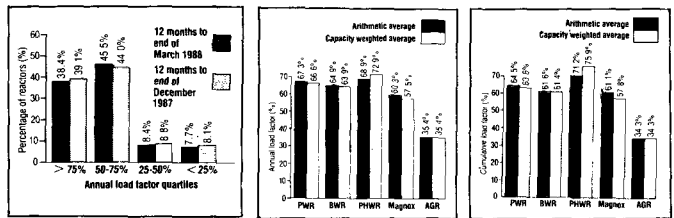
表1은 1988년 3월말 현재 1년이상 가동중인 유니트를 연간 부하율 순위에 따라 나열한 것이며, 누계 부하율은 상업운영개시 시점이 아닌 계통에 처음 병입한 시점 기준으로 기산한 것이다.

表2는 1988년 3월말 현재 운전기간이 12개월 미만의 신규 원자료를 나타낸 것으로서 헝가리의 4기의 Paks 유니트 이외의 나머지 Comecon 회원국의 유니트에 대해서는 자료부족으로 이 표에서는 제외되었다. 그림 1~5는 실적의推移를 나타낸 것이다.

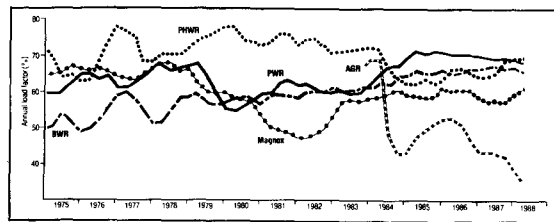
데이터베이스에는 현재 329기의 원자료가 수록돼 있으며, 총설계용량(Gross)은 273,409MWe이다. 爐型別 용량은 表3과 같으며, 1년 이상 가동된 용량 150MWe(Gross) 이상의 유니트를 4기 이상 보유하고 있는 국가간의 부하율을 비교하면 表4와 같다.



〈그림1〉 國家別 負荷率 추이



〈그림2〉 負荷率 에 따른 〈그림3〉 爐型別 年間 負荷率 占有比
 〈그림4〉 爐型別 累計 負荷率



〈그림5〉 爐型別 負荷率 推移