

Table 1. Safety Problems in Japanese Boiling Water Reactors

Unit	Type	Cap.	Order	Com. Op.	Constr.	Operator	Problems [Nb of cracks detected]	Discovered	Inspect	Repair	Source
Fukushima I-1	BWR	460	1966	03/1971	GE	Tepco	Primary loop recirculation system pipe cracks	> 1992	Hitachi	2000	(2,8,11)
							Core shroud cracks	1993	GEII	08.1999	(3,5,6,12)
							Steam dryer cracks [6]	1989	n.c.	1991	(12)
Fukushima I-2	BWR	784	1967	07/1974	GE-Toshiba	Tepco	Primary loop recirculation system pipe cracks	> 1992	Toshiba	1995-2000	(2,9)
							Core shroud cracks	1994	GEII	1998	(6,12)
Fukushima I-3	BWR	784	1970	03/1976	Toshiba	Tepco	Primary loop recirculation system pipe cracks	> 1992	Toshiba	1995-2000	(2,9)
							Core shroud cracks	1994	GEII	1997	(12)
Fukushima I-4	BWR	784	1971	10/1978	Hitachi	Tepco	Core shroud cracks [3]	1993	GEII	no	(1,12)
							Primary loop recirculation system pipe cracks	> 1992	Hitachi	1995-2000	(2,9)
Fukushima I-5	BWR	784	1971	04/1978	Toshiba	Tepco	Primary loop recirculation system pipe cracks	> 1992	Toshiba	1995-2000	(2,9)
							Core shroud cracks	1994	GEII	1999	(12)
Fukushima I-6	BWR	1,100	1971	10/1979	GE-Toshiba	Tepco	Jet pump instrumentation piping cracks	Late 1980s	GEII	no	(1)
Fukushima II-1	BWR	1,100	1972	04/1982	Toshiba	Tepco					
Fukushima II-2	BWR	1,100	1975	02/1984	Hitachi	Tepco	Core shroud cracks [23]	1994	GEII	no	(1,12)
							Jet-pump mounting gaps and/or wear	n.c.	GEII	no	(1)
Fukushima II-3	BWR	1,100	1977	06/1985	Toshiba	Tepco	Core shroud cracks [> 6]	1997	GEII	07.2001	(1,4,12)
							Jet-pump mounting gaps and/or wear	n.c.	GEII	no	(1)
							Primary loop recirculation system pipe cracks	> 1992	Toshiba	no	(2,9)
Fukushima II-4	BWR	1,100	1978	08/1987	Hitachi	Tepco	Core shroud cracks [2]	1995	GEII	no	(1,12)
							Jet-pump mounting gaps and/or wear	n.c.	GEII	no	(1)
Hamaoka 1	BWR	540	1970	03/1976	Toshiba	Chubu	Primary loop recirculation system pipe cracks [1]	> 1995	Chubu	no	(9,11,12)
Hamaoka 2	BWR	840	1972	11/1978	GE-Toshiba	Chubu					
Hamaoka 3	BWR	1,100	1978	08/1987	Toshiba	Chubu	Primary loop recirculation system pipe cracks [8]	> 1995	Chubu	Partial (5/8)	(7,9,10,11)
Hamaoka 4	BWR	1,137	1986	09/1993	Toshiba	Chubu	Core shroud crack [67]	09.2002	Chubu	n.c.	(11,12)
							Primary loop recirculation system pipe cracks	07.2002	Chubu	n.c.	(10)

Kashiwazaki-1	BWR	1,100	1975	09/1985	Toshiba	Tepco	Core shroud cracks [2]	1994	GEII	no	(1,12)
							Primary loop recirculation system pipe cracks	> 1992	Toshiba	no	(2,9)
Kashiwazaki-2	BWR	1,100	1981	09/1990	Toshiba	Tepco	Primary loop recirculation system pipe cracks	> 1992	Toshiba	no	(2,9)
							Jet-pump mounting gaps and/or wear	n.c.	GEII	no	
Kashiwazaki-3	BWR	1,100	1985	08/1993	Toshiba	Tepco					
Kashiwazaki-4	BWR	1,100	1985	08/1994	Hitachi	Tepco					
Kashiwazaki-5	BWR	1,100	1981	04/1990	Hitachi	Tepco	Jet-pump mounting gaps and/or wear	n.c.	GEII	no	
Kashiwazaki-6	ABWR	1,356	1987	11/1996	Toshiba-Hitachi-GE	Tepco					
Kashiwazaki-7	ABWR	1,356	1987	07/1997	Toshiba-Hitachi-GE	Tepco					
Onagawa-1	BWR	524	1971	06/1984	Toshiba	Tohoku	Primary loop recirculation system pipe cracks [4]	1998	n.c.	n.c.	(8,9,11)
							Core shroud cracks [73]	09.2002	n.c.	n.c.	(12)
Onagawa-2	BWR	825	1987	07/1995	Toshiba	Tohoku					
Shika-1 (Noto)	BWR	540	1986	07/1993	Hitachi	Hokuriku					
Shimane-1	BWR	460	1969	03/1974	Hitachi	Chugoku	Core shroud cracks	1994	GEII	2000	(13)
Shimane-2	BWR	820	1981	02/1989	Hitachi	Chugoku					
Tokai-2	BWR	1,100	1971	11/1978	GE-Hitachi	Japco					
Tsugura-1	BWR	357	1965	03/1970	GE	Japco	Core shroud cracks	1994	n.c.	1999-2001	(12)

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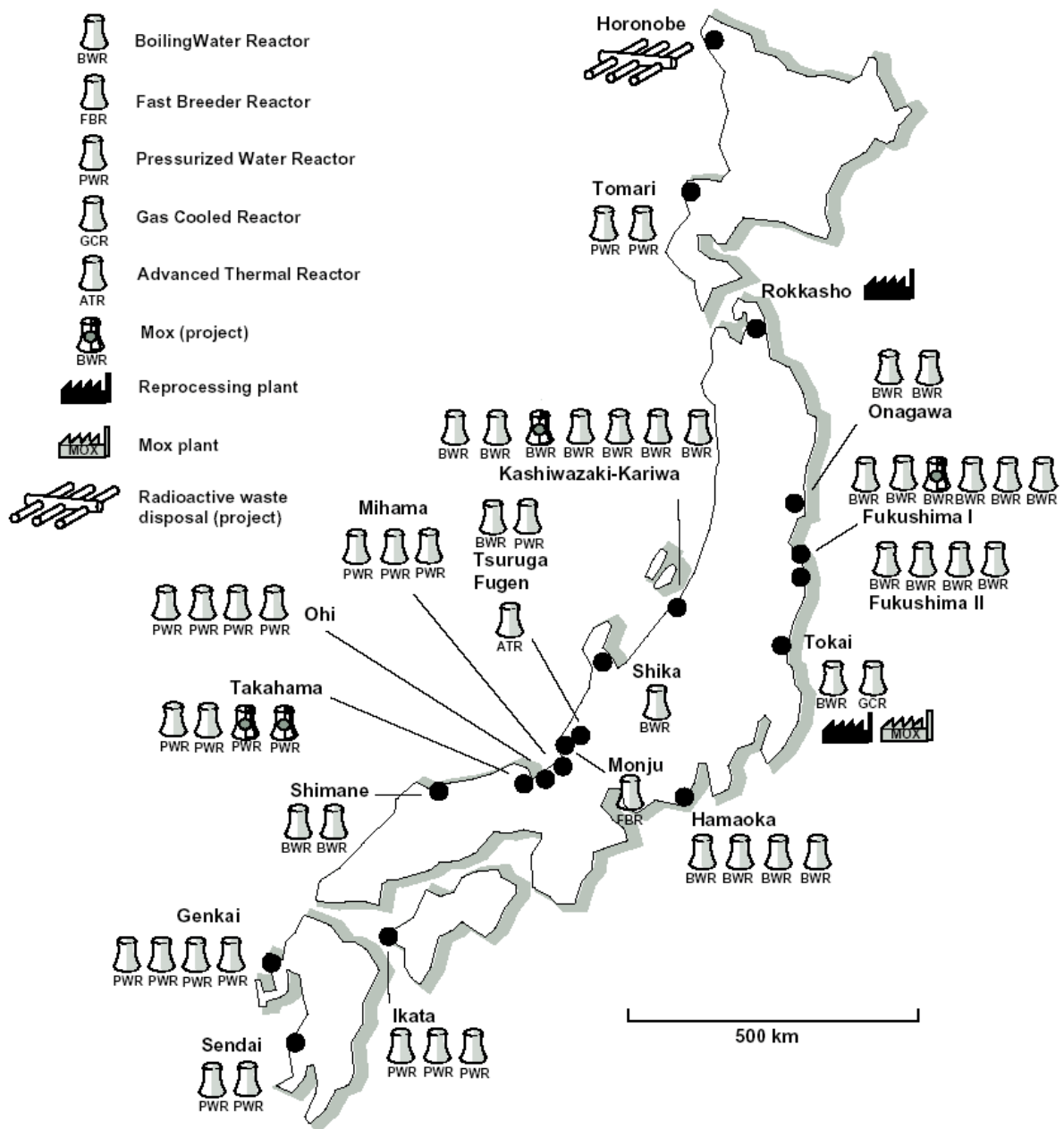
Note: Green Action, Kyoto, provided significant assistance for the establishment of this overview

Sources:

- (1) NISA Report, 29 August 2002.
- (2) Tepco Report, 17 September 2002.
- (3) Green Action, 12 September 2002.
- (4) Yomiuri Shimbun, 5 September 2002.
- (5) Yomiuri Shimbun, 13 September 2002.
- (6) Yomiuri Shimbun, 19 September 2002.
- (7) Chubu spokesman, 20 September 2002.
- (8) AFP, 20 September 2002.
- (9) Green Action, 20 September 2002.
- (10) Globeandmail.com, 20 September 2002.
- (11) Yomiuri Shimbun, 21 September 2002.
- (12) Personal communication, Green Action, 26 September 2002.
- (13) Green Action, 9 October 2002.

Fig. 1. Japan nuclear power plants

Plutonium in Japan



Source: *Plutonium Investigation*, n°2, January 1998