

原 著

# Listen To Their Silent Cry: The Devastated Lives of Japanese Nuclear Power Plant Workers Employed by Subcontractors or Labour-brokering Companies

末端原発労働者の労働・生活実態について  
— 下請け事業主や派遣元事業主に雇われて  
原子力発電所で働く労働者の就労・被曝実態 —

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## Summary:

Nuclear power plant (NPP) workers and their families, especially those in the coastal area of Fukui Prefecture, have been deprived of the basic condition of survival and reproduction for many generations. It is no exaggeration to say that they have been paid for their exposure to radiation, not for their working hours. In Japan, national regulations stipulate that workers exposure to radiation should not exceed certain levels. The limit of exposure is 100mSv in five years and 50mSv per year. However, the limit is not applied to female workers expecting children, despite the fact the working environment is extremely dangerous. In some NPPs, the legal limit permits workers to work only for short periods. While NPPs utilize freely local workers abundantly according to employers' needs, those people who earn a meagre income have been discarded mercilessly. <sup>i)</sup>

The majority of the NPP work force consists of temporary workers who are multiply exploited in complicated labour relations. The atomic-industry complex is a multiple-exploitation system in which the liability of employers is shifted onto workers themselves. The exploitation system runs not only vertically, but also horizontally: piping work is done by 'small companies,' each consisting of only a few day-workers; primary subcontractors consolidate those small companies to commission construction jobs to them. Many of the workers employed by these small companies have not received a Notice of Employment Conditions. There are also many cases where employers who do substantially the same work as hired workers have no contracts.

All employers are legally and ethically obliged to secure a safe working environment for their employees. Working conditions for frontline workers in the industry have not improved in the past thirty years. <sup>ii)</sup> In the case of accidents, these workers are not always compensated appropriately. Multiple contracting systems and unstable employment with ambiguous labour contracts enable electric power companies and prime contractors to avoid liability for labour-related accidents.

Key words : nuclear power plants, NPP workers, worker dispatching,  
radiation-exposed workers, work-life issues

## Introduction

This paper summarises the results of surveys I conducted from July 1986 through September 1987 on local workers (and their families) who worked in NPPs located in the Wakasa Bay area of Fukui Prefecture. The paper includes the results of my ongoing inquiry into the working conditions of NPP workers and local residents in the same area which began on January 2012. Map 1 shows distribution of many NPPs in Japan. Wakasa Bay is crowded with NPPs

(Tsuruga, Fugen, Monjyu, Mihama, Ohi, Takahama).

Most NPP workers in Japan hesitate to speak out about their working conditions. Restraints put upon them by electric power companies and their contractors prevent the workers from talking about their jobs even with their families. It is presumed that employers fear disclosure of grave problems such as recruitment methods, working environment, NPP inspection results, accidents and their handling, and workers' illnesses and disabilities. If workers speak out without restraint, the structural vulnerabilities of NPPs could be exposed, as well as information about workers who have been illegally employed and several cases of illness and death possibly caused by radiation exposure. Although the Fukushima nuclear disaster exposed long-term problems surrounding NPPs, the harsh employment and working conditions of NPP workers <sup>iii)</sup> and their serious health problems remain largely hidden from the public. <sup>iv)</sup>

Because they want to maintain a continuous flow of contracts with the NPP industry, subcontractors never speak out. NPP workers, who hardly have enough employment opportunities in their community, collectively remain silent because they need jobs to feed their families, who are also employed in the industry. Persons involved in catering industries that service NPP workers are also gagged. No gag order would prevail if legal and dignified employment and working conditions were arranged for safe and sound labour and if fair industrial relationships were established.

Workers have to receive the education for

working safely, before working in a NPP. Those who take charge of education have ordered orally to tell nobody what workers saw in the work place or was heard. (The interview by Takaki on July 21, 2013)

The Interviewed people 1, 2, 3, 5, 6, 7, 8, and 10 required of me so that what it spoke about might be told to nobody.

From January 2012 through October 2013, at least ten interviews were conducted with NPP workers (including retired persons), their family members, and NPP subcontractors. Among these, three people were interviewed a second time. Many NPP workers live in the Wakasa Bay area, but it was very difficult to hear from some of them because they feared participating in the survey. For example, on 5 May 2012, an interviewee told me, 'Everybody around here fears NPPs even if they don't openly admit it, but publicly they say they hope to restart NPPs that were shut down in the wake of the Fukushima disaster.' <sup>v)</sup>

## 1. Location of NPPs in Japan and the lack of local employment opportunities

On 27 May 1964, the Japanese Atomic Energy Commission proposed guidelines recommending that NPPs be built in non-residential areas. In fact, unlike the capital city of Fukui Prefecture and its neighbourhood, no large factory or housing estate for workers has been constructed in the Wakasa Bay area. The area is not far from major cities including Kyoto, but improvement of the traffic situation was there was delayed, and neighbouring mountains are overrun with electric power cables and pylons that lead to metropolitan districts. <sup>vi)</sup>

As a result of political manoeuvring, the population density of the area has remained low. The government has not given enough aid to farming, and stable employment has been limited. Young people who want jobs have no choice but to become civil servants (including teachers and health care workers), bank clerks, *Nōkyō-syokuin* (employees of agricultural cooperatives), or employees of electric power companies (and their prime contractors). A few have been lucky enough to obtain such jobs, but

most have not.

## 2. Work-life issues of NPP workers in the Wakasa Bay Area in the 1980s

### 1) ultiple exploitation system of workers

In the 1980s when my previous survey was conducted, ‘multiple-exploitation system’ of workers was prevalent. (See Chart 2 and Table 1) At the time, subcontracts, its subcontracts, and its subcontracts (～tier- six) existed in participation of two or more principal contractor companies. Frontline subcontractors usually had no offices (or only makeshift ones).

Although many subcontract business proprietors were carrying out exploitation from workers, they themselves were doing contamination labor. Needless to say, the scale of their exploitation might have been much smaller than the electric power firm and their direct agents.

Mr R., an NPP worker in his fifties who was employed by a third-level subcontractor, told me: ‘Until 1981, my employer gave me a sheet of paper with the amount of my wage written on it, but since 1982 a the word *jirei* (letter of appointment) was added. There were subcontracted NPP workers who

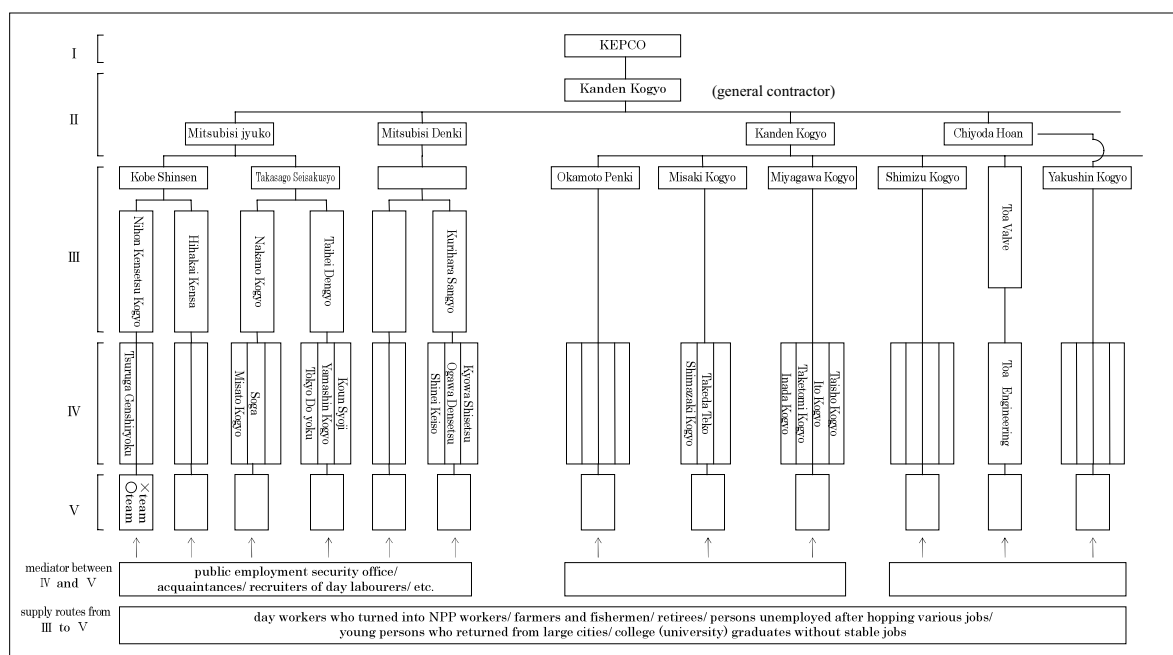
ranked lower than me who earned a better wage than I did, but they were exposed to higher levels of radiation. And they had no “*kenkōhoken*” .’

As shown in Chart 2, most irregular workers were excluded from public health insurance, although all employers are legally required to contribute to the system. Mr R. said he was lucky to be enrolled.

Japanese public health insurance has two main pillars: ‘*kenkōhoken*’ and ‘*kokumin-kenkōhoken (kokuho)*.’ The former is for employees of private enterprises, the latter for those who are ineligible for employment-based programs. In 1984, enrolees in ‘*kenkōhoken*’ had to pay 10 % of their medical bills by themselves (30 % in April, 2003 and afterwards); enrolees in ‘*kokuho*’ had to bear 30%. In the same year, the nominal wage in Japan was 300,000 yen.

### Wage schedule of NPP workers (1980–1984)

	May 1980 (20 days)	June 1982 (21 days)	November 1984
Basic wage:	100,000 yen	11,300 yen	157,500 yen
Overtime allowance:	7,820 yen	3,316 yen	1,970 yen
Holiday allowance:	6,250 yen (per day)	13,250 yen (two days)	0 yen
Total:	114,070 yen	127,866 yen	159,470 yen
Net income:	100,000 yen	110,000 yen	140,000 yen



- ※ 1) Roman numerals show each subcontractor's status in the system.  
 2) Names of working teams are usually derived from subcontractors' surname.  
 3) In subcontractors IV and V workers assignments frequently changes. Some subcontractors engage in only regular check-ups.  
 4) It is impossible to schematise as a whole the subcontracting system, which changes gradually, but chart 3 is useful to recognize subcontractors' status.  
 5) Most of low-ranking administrative staff of the Kanden Kogyo's coordinating section was said to have any links to the KEPCO.

Source: Takaki Kazumi, "Actual Condition of Day workers in NPPs—Tentative Study to Comprehend Workers Exposed Low-level Radiation on a Daily Basis,"  
 "Ritsumei Hyouron Issue 85 (1987, P.35)

Chart 2 NPP subcontracting system in the Wakasa Bay Area in early 1980s

Table 1 List of the survey's subjects(in order of belonging stratum)

\*All subjects are divided into four 'strata' according to their status in the multilayered subcontract system.

\*Each number in parentheses in the 'family' column indicates the number of household members; the letter that precedes the number indicates the type of family arrangement: a) three generation, b) arrangement unclear, c) a fatherless family, and d) childless couple.

Family	Educational Background	Housing	Belonging Stratum	Retired, Active, Deceased	Health status	Health insurance	Age	Income(¥/yr)	Job description	Living conditions and other information
Unmarried/ single	Senior high school graduate	Company dormitory	I	Active	Good	Social insurance	25	120,000 (monthly) overtime allowance 50,000-80,000	Maintenance of facilities (such as replacement of valves and repairing of humidification system)	Complained that food and his car cost much / Third son of a farmer
b(3)	Senior high school graduate	Own house	I	Active	Good	Social insurance	32	300,000(monthly) (After-tax income 200,000)	NPP operator (three shift)	Farmer/Father had once been a regular employee of " 1 "
a(3)	Senior high school graduate	Own house	I	Retired	Good	Social insurance	34	250,000 (monthly)(includes allowance)	Isolation control	Complained of high resident's tax
Unmarried single	Senior high school graduate	Company dormitory	I	Deceased	Artusate leukemia	Social insurance	22	monthly income	NPP operator (three shift)	Third son of a farmer, Father worked as both farmer and day worker
c(3)	Junior high school graduate	Own house	IV→II	Deceased	Malignant sarcoma	Social insurance	38	-	Dismantlement, cleaning and assembly of machinery	Farmer and self-employed
b(4)	University graduate	Own house	II	Active	Good	Social insurance	29	100,000 (monthly) (After-tax income)	Radiation control	Eldest son became an employee of " III "
a(5)	University graduate	Own house	II	Active	Good	Social insurance	29	112,000 (monthly) (Basic Salary)	Measurement of exposure dose of workers	Changed jobs twice
b(4)	Senior high school graduate	Own house	II	Active	Not good	Social insurance	38	5,000,000 (a year)	Safety management(Measurement of air pollution	Changed job once
a(5)	Youth school graduate	Own house	III	Retired	Not good	Social insurance	69	1971 2,500 (a day) 1981 5,500 (a day)	Maintenance and examination of measurement instruments	Complained that food costs much
Couple and his mother	Higher elementary school graduate	Own house	III	Retired	Not good	Social insurance	61	1980 5,300 (a day) 1981 6,100 (a day) 1980 5,300 (a day)	Decontamination	Changed job once
-	-	Own house	III	Deceased	Stomach cancer	National insurance	-	-	Cleaning of water pipes	Housing loan and fee for day care were expensive
a(4)	-	Own house	III	Deceased	Accident	Social insurance	-	-	Removal of humidity	He is doing employment labor and self-employment (agriculture). He said that it was a loan of farm machines that presses a household economy.
Living alone	Higher elementary school graduate	Rented house	III	Deceased	subarachnoid hemorrhage	Social insurance	62	1985 230,000 (monthly) (daily wage paid monthly)	Haulage and assortment of clothing and sheets	Wife had side jobs at home
b(3)	Vocational school graduate	Own house	III	Active	Good	Social insurance	31	160,000(monthly)(before taxes)	Primary laundry	Farmer
b(3)	Dropped out of high school course	Own house	III	Active	Good	National insurance	40	2,500 (hourly wage)	Instrumentation (repairing and replacing motor)	Changed jobs twice
b(5)	Junior high school graduate	Own house	IV	Active	Good	National insurance	35	300,000(monthly) (daily wage paid monthly)	Examination of motors for pressure temperature and vibration	Terms of NPP's were better than those of other workplaces
a(4) (Practically) b	Junior high school graduate	Own house	IV	Active	Good	Social insurance	49	11,000 (a day)	Repairing of valves, examining weld joints	Does part-time and irregular jobs, also worked as a tutor. He is part-time job and the private teacher is also doing
a(3)	National school	Own house	IV	Active	Good	National insurance	58	8,000 (a day)	Repairing pumps, welding pipes	Housing loan and fee for day care were expensive
a(7)	Senior high school graduate	Own house	IV	Active	Good	National insurance	32	Own 230,000 (monthly) Wife 150,000 (monthly)	Crane operator, welder	Complained that food costs much
d	-	-	IV	Active	Good	National insurance	40	-	He is working as a day laborer from the time of the construction work of NPPs to the present.	Changed jobs 5 times
d	Senior high school graduate	Rented house	IV	Active	Good	National insurance	45	10,000 (a day)	Examination and maintenance of steam generators, examination of boilers and heat exchangers	Complained that food costs much
b	Junior high school graduate	Own house	IV	Active	Not good	National insurance	20	-	Decontamination	Changed jobs twice
d	Junior high school graduate	Rented house	IV	Retired	Good	National insurance	61	8,000 (a day)	Cleaning of tanks, decontamination	Had chronic disease / Father was also ill
d	Junior high school graduate	Own house	IV	Retired	Good	National insurance	45	daily wage	Plumbing	Couple living on unemployment pay
b(4)	Fishery school	Own house	IV	Retired	Not good	National insurance	57	daily wage	Safety management	He could not but change many work places until he came to have worked for the subcontracting company of NPP
a(7)	Senior high school graduate	Own house	IV	Retired	Good	National insurance	39	1970 2,400 (a day)	Maintenance and examination of measurement instruments	Wife is working in a bar. Self-employment
b(3)	Dropped out of senior high school	Rented house	IV	Retired	Good	National insurance	53	300,000 (monthly) (daily wage paid monthly)	Primary laundry	Changed jobs 4 times
a	Junior high school graduate	Own house	IV	Retired	Good	National insurance	36	1987 6,000(a day)	Primary laundry	Farmer/Currently has a steady job
a(5)	Higher elementary school graduate	Own house	IV	Deceased	Digestive cancer	National insurance	70	1981 6,000(a day)	Primary laundry, decontamination	Changed jobs 6 times/ Eldest son died of illness, and second son lived in a facility for disabled children
a(3)	Higher elementary school graduate	Own house	IV	Deceased	Renal disease, Anemia	National insurance	47	daily wage	Assembly of scaffolding, decontamination	He could not but change many work places until he came to have worked for the subcontracting company of NPP
c(2)	Junior high school graduate	Own house	IV	Deceased	Liver cancer	National insurance	50	1983 300,000 yen monthly pass to wife (Was a master)	Assembly of scaffolding, decontamination	Underwent surgery for cancer soon after being fired because of old age
c(2)	Higher elementary school graduate	Own house	IV	Deceased	Stomach cancer	Social insurance	56	1983 8,500(a day) (daily wage paid monthly)	Clothes arrangement shipping	Farmer/Used to do seasonal works
d(4)	Senior high school graduate	Own house	I→IV	Retired	Good	National insurance	34	300,000 (monthly) (includes allowance)	NPP operator (three shifts)	Changed job once
a(8)	Elementary school graduate	Own house	V→IV	Active	Hypertension	Social insurance	59	200,000 (monthly) (after-tax income)	Decontamination, repairing of machinery parts, processing of pipes	Small self-employment (farmer)
Unmarried/ single	Senior high school graduate	Rented house	IV	Active	Good	National insurance	38	400,000 (monthly) (daily wage paid monthly)	Decoration and repairing of walls	Changed job once
b(4)	Dropped out of senior high school	Rented house	IV	Active	Good	Social insurance	32	300,000 (monthly)	Steeplejack	He is living without thinking not much seriously, but caring own health.

Note: As to deceased subjects, the number in ( ) in the family column indicates the number of bereaved family members.

Source: Takaki Kazumi, Meiro wo katacu (The environment and labor actual conditions inside NPPs which NPP day employees told); Wage & Social Security NO.993, Rodo Junposha, 1998.

## 2) Daily jobs of NPP workers

Inside an NPP, water contaminated with radioactive substances always leaks, and the air is not safe to breath. Protective gear cannot completely prevent external exposure, and protective masks are not sufficient to guard workers from internal exposure.

The work NPP workers perform includes: scrubbing contaminated floors or pipes; setting up shields to lessen exposure for valve repair men; checking and repairing cracks or holes in pipes or tanks; welding; transporting tools, machinery, radioactive substances, and nuclear wastes; laying and removing sheets for lorries when they come in and out of facilities; washing contaminated protective

gear and masks; removing filter elements (from radioactive waste evaporator) to clear large trash; using grinders to scrap rust or peat moss off tanks inside buildings; inspecting gauges in contaminated areas (which may entail climbing high places with a lifeline tied around the waist); and preventing the erosion of nuclear piles by infusing chemicals. Most of these 'dirty' jobs were done by irregular workers, who were exploited by several employers and had no other means of making a living. A handful of subcontracted regular employees also perform these jobs. In a sense, it could be said that executives of NPP-related businesses earned their fortune at the expense of these frontline workers. However, according to information provided by interviewees

1, 3, 4, and 5, it could not be said that the lowest subcontractors were in equal partnership with prime contractors, including electric power companies.

### 3) People who lost their jobs or died due to disease

A great number of NPP workers who had been chronically exposed to radiation suffered from cancer or heart disease, and many of them died.<sup>vii)</sup> Some of the victims' families, such as their widows and children, applied for public assistance. (See Table 2 for a trade union's list of deceased workers.)

Table 2 List of deceased NPP workers living in the Wakasa Bay Area

Compiled by Takaki based on document provided by Unyu Ippan A local branch of the Transport General Workers' Union (Unyu Ippan Kansai Namakon-shibu Genpatsu-bunkai)

※Roman numerals show roughly subcontractors' (employers') status									
□	Year of death	Age at death	Subcontractor's status	Period of work engagement	Contents of work	Cause of death etc.	N.B.		
01	1982	69	IV	—	'71~'81	digestive cancer	Lost weight 5 kg each month but continued working		
02	1985	62	III	—	'75~'85	subarachnoid haemorrhage	Collapsed on the way to work		
03	1984	68	—	—	—	lung cancer	Son succeeded to his house		
04	1974	64	II	1.20rem	'70~'74	cleaning/odd jobs	angina pectoris		
05	1975	63	III	—	—	cleaning of Second-level odd jobs	myocardial infarction		
06	1975	65	III	4.05rem	'71~'75	cleaning/checkpoint keeper at restricted area	lung cancer		
07	1976	62	III	2.47rem	'74~'76	cleaning/odd jobs	cerebral haemorrhage		
08	1986	61	III	—	—	driver etc.	rectal cancer		
09	1982	70	—	—	—	cardiac failure	Father was small business owner		
10	1977	58	III	—	—	—	Had been on dialysis every week		
11	1982	56	—	—	—	—	died of illness		
12	1982	56	—	—	—	—	lung cancer		
13	1983	55	III	—	—	—	stomach cancer		
14	1972	52	II	0.15rem	'71~'72	cleaning/odd jobs	stroke		
15	1983	49	IV	—	'62~'83	liver cancer	Complained of languidness. Died ten days after seeing a doctor		
16	1975	49	III	—	—	accidental death in a NPP	Chain for compensation for workman's accidents was rejected		
17	1986	49	IV	—	—	decontamination/odd jobs	suicide		
18	1982	45	—	—	—	accidental death	Thought of NPP labour as a social issue.		
19	1978	44	III	—	'70~'71	kidney disease	After his death his wife and children engaged in NPP related works		
20	1980	40s	III	—	—	decontamination	Amassed expensive medical bill. Received public health care assistance when provider of the family could not work		
21	1980	40s	III	—	—	stomach cancer	Lost two/three kg each day but continued to work		
22	1984	38	III	—	—	off-the-job accidental death	Chain for compensation for workman's accidents was rejected		
23	1975	38	III	3.68rem	'72~'75	malignant myoma	After his death his wife and children engaged in NPP related work		
24	1982	20s	—	—	—	myocardial infarction	Wife also engaged in NPP related work		
25	1983	26	IV	—	—	myocardial infarction	Comes from other regions		
26	1977	26	II	4.82rem	'73~'77	machinery maintenance	cardiac failure		
27	1985	—	—	—	—	cirrhosis of the liver	Parents were small business owners		
28	1983	22	I	—	'80~'83	NPP operator	No abnormality was found in health check sponsored by his company every three month		
29	1975	—	III	—	'73~'75	decontamination	Exposed to excessive radiation several times		
30	—	—	III	—	—	checkpoint assistant	leukemia		

Source: Takaki Kazumi, Current Analysis of Work and Life Issues of Day Workers—Based on Research on NPP Day Workers in Wakasa Area, *Nihon Fukushi Daigaku Kenkyu-Kyo* (Nihon Fukushi University Bulletin) Issue 79, 1989: 104-105.

### 4) Exposure dose of regular and irregular workers

Electric power companies in Japan report every year to the Nuclear Regulation Authority on NPP workers' radiation exposure. These reports show a difference of exposure doses between regular and irregular workers. On 26 July 2012, the online version of *Asahi Shimbun* reported that the 'average exposure dose of irregular workers, including people employed by subcontractors, is four-times as much

as regular workers directly employed by electric power companies.' The article went on to report, 'Almost 90 percent of NPP workers are employed by subcontractors. Why is their exposure dose so high? It is because they are not properly educated on safety measures. Furthermore, they tended to be allocated more dangerous duties. It is a reflection of improper labour practice.' (See Charts 3-1 and 3-2.)

Even in the 1980s, there was a case of a regular worker who had allegedly died of radiation exposure. The man, who died of leukemia, had told his family, 'It is risky to work as a subcontractor's employee. They are exposed to too much radiation. It is only relatively safe if one works directly under prime contractors.'<sup>viii)</sup>

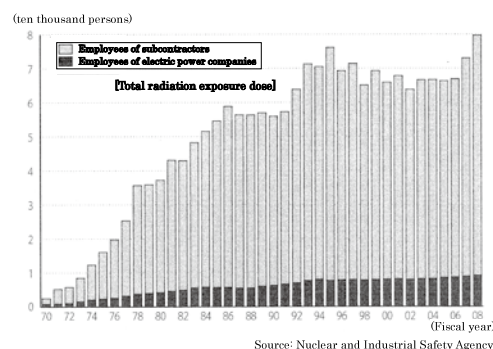


Chart 3-1 The number of workers exposed to radiation and total dose of exposure: as to employees of electric power of electric power and subcontractors

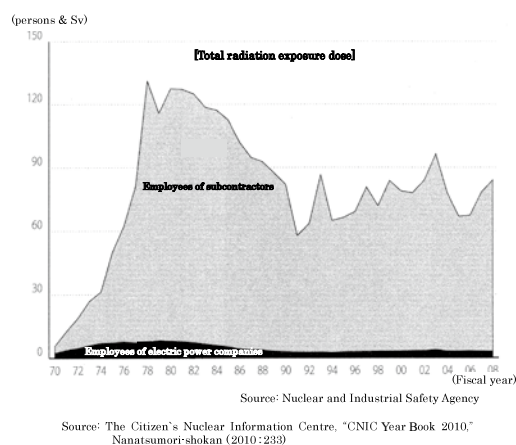


Chart 3-2 Total radiation exposure dose of NPP workers

### 3. Employment and working conditions of NPP workers after the Fukushima nuclear disaster

#### 1) NPP Subcontracting system of the Tokyo Electric Power Company (TEPCO)

Chart 4 shows the current NPP subcontracting system. It was produced by Watanabe Hiroyuki based on the result of hearings conducted after the Fukushima nuclear disaster in 2011. The system has not changed much since the 1980s.

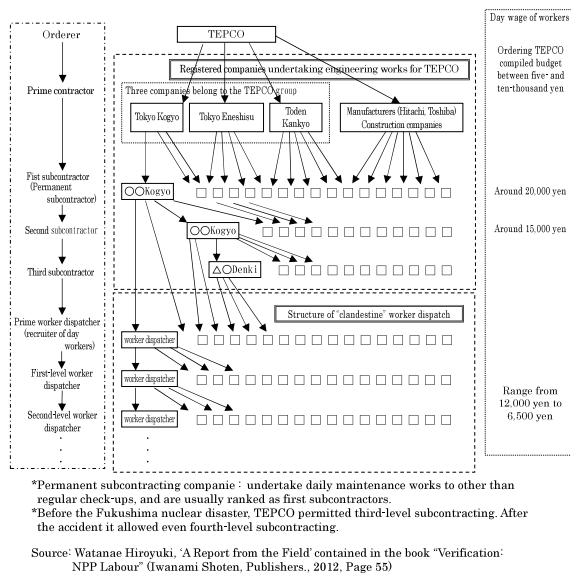


Chart 4 Subcontracting system for regular NPP check-ups and others

Nowadays, the main workforce of NPPs consists of atypical workers called '*haken-rōdōsha*,' or dispatched workers. There are two types of dispatch agencies ('*haken-gaisya*') for '*haken-rōdōsha*': one employs workers permanently and dispatches them according to demand from other employers; the other employs workers temporarily and makes a contract of employment with the workers only when demand from other employers arise. While the latter is required to obtain legal permission from the authority concerned, the former can operate only if they register with the authority.

Even legal '*haken-gaisha*' are sometimes punished for illegal activities. On 26 April 2013, the Nagasaki Labour Bureau (Ministry of Health, Labour and Welfare) issued an improvement order to three companies that had illegally dispatched a total of 510 workers to TEPCO's Fukushima Daiichi

Nuclear Power Station (FDNPS) to contain the accident. One of the reprimanded companies was Yamato Engineering Service (YES). According to an official document, from 1 July through 9 August 2011 two other companies, Sowa Kogyo and Agress, dispatched 510 workers to YES. It is alleged that of the 510 workers, 341 were employed by YES and 169 were dispatched by another '*haken-gaisha*' to YES. The dispatched workers were engaged in pipe work at the FDNPS. In Japan, the two-fold dispatch of workers by multiple employers is illegal. Article 44 of the Employment Security Act states that it is forbidden for a person to 'have workers supplied by a person who carries out a labour supply business under his/her own directions or orders.' In addition, Article 4 of the Worker Dispatching Act prohibits labour supply companies from the construction industry.

#### 2) Results of TEPCO's 'employment questionnaire'

From 20th September to 18th October 2012, TEPCO collected employment questionnaires from 3,186 people who belonged to 27 TEPCO subcontractors (76.1% of which were frontline workers; 22.6%, administrators) and who were working at the FDNPS. The response rate for the questionnaire was 80.2%.

To the question: 'Is the company that supervises you the same one that pays your wage?' 47.9% of respondents answered, 'No' and 2.1% answered, 'I do not know.' Not surprisingly, to the question: 'Is the company that employs you, a subcontractor of TEPCO?' all respondents answered, 'Yes' and 88.4% added, the company was 'a first/second/third/fourth-level subcontractor.' One respondent even wrote that 'I cannot speak out about illegal employment out of fear of losing my job.' (See TEPCO. '*Shuroujittai nikanssuru anketo*' *nikanssurukekka oyobi konngonotaisaku nituite* (The questionnaire result about the employment actual condition, and the proposal of the measure against future) .

3 December 2012, Web. 22 March 2013.

<[http://www.tepco.co.jp/nu/fukushima-np/roadmap/images/m121203\\_05-j.pdf](http://www.tepco.co.jp/nu/fukushima-np/roadmap/images/m121203_05-j.pdf)>.)

### 3) Tsuruga and Wakasa area people who told their experiences to the author

I conducted interviews with NPP workers (including retirees), their families, and NPP subcontractors from 22 January through 30 September 2012. Interviews were conducted with the following individuals:

Interview 1 (conducted 22 January 2012): Mr K. A. (60s), once employed by a direct subcontractor of KEPCO (Kansai Electric Power Co. Inc.), retired before he turned 60. Exposed to radiation on the job.

Interview 2 (conducted 20 July and 31 August 2012): Mr H. B. (50s), is now employed by a prime contractor. Exposed to radiation on the job.

Interview 3 (conducted 22 June and 28 September 2013): Mr H.C. (60s), an active NPP worker employed by third- or fourth-level subcontractor. Exposed to radiation.

Interview 4 (conducted 15 July and 11 August 2013): Mr S. D. (70s), a retired NPP worker employed by subcontractors. Exposed to radiation.

Interview 5 (conducted 21 July 2013): Mr H. E. (60s), an active manager of an NPP subcontractor company (third- or fourth-level subcontractor). Exposed to radiation.

Interview 6 (conducted 4 September 2013): Mr H. F. (60s), a retired regular employee of an affiliate company of an ordering company. Exposed to radiation.

Interviewee 7 (conducted 12 September 2013): A family member of Mr I.G. (age unknown). Mr I.G. was a manager of third-or fourth-level a NPP subcontract company. The interviewee assists with the business. Mr I.G. is currently receiving medical treatment for a disease presumably caused by radiation exposure.

Interview 8 (conducted 30 September 2013): Mr Y. H. (50s), a retired regular employee of a second-level subcontractor. Exposed to radiation.

Interview 9 (conducted 12 October 2013): A family member of Mr Y.I., who had been a prime contractor's employee. Mr Y.I. was exposed to radiation, and retired early after undergoing surgery for cancer. He died soon after getting a new job.

Interview 10 (conducted 19 October 2013): F.J. (50s), an employee of a first-level subcontractor. Exposed to radiation.

Interviewee No.3 (Mr H.C.) has been working at NPPs in the Wakasa Bay area since 1984. The following is an excerpt from his story.

My parents were blue-collar workers. After I graduated from junior high school, I got a job at a machinery maintenance company as a regular worker, but my wage was not enough. When I was 26 years old, I quit the company and got another job in a small factory doing mechanical maintenance. There were only manager and me, so it was a two-man company. The factory, which faced a main road, lost customers after a wider, new road was constructed. Ironically, it was exactly at this time that I married and my first child was born. I left the factory when I was 35 and got a new job from a second-level NPP contractor as a (third) contractor. It was not difficult for me to become accustomed to NPP work because I was a veteran mechanic.

One time, my wife and I lived in public housing. In my forties, I bought a house with a loan. I had to work hard to provide for my family. My wife quit her job after marriage. She has been doing piecework at home while taking care of us and raising our children.

I worked anywhere, regardless of the radiation level. I often did one hour overtime, sometimes working all night without sleep. Time spent with my family decreased or increased, depending on the job. The exposure dose limits were set by employers, and I usually did my job within the limits, but once I had to flee workplace because of excessive exposure.<sup>ix)</sup> Before working at NPPs, I really hesitated to do the work and I am scared to death when I think seriously about it. You cannot see radiation, so you

can ignore it. <sup>x)</sup>

I have a kind of stable position, so I hardly have any contact with other NPP workers who wander the country looking for work; we are strictly separated from each other. In the past, the 'sub-sub-subcontractor' boss collected workers, but nowadays, '*haken-gaisha*' do it. Worker dispatchers often send in people who have no experience at all.

When another company was busy, my employer ordered committing me in the another company. My employer does not change. And I supervise inexperienced workers recruited elsewhere in the company, though I am not officially a director. <sup>xi)</sup> Since the end of 2012 and early 2013, the central and local government directed employers to enrol their workers in social insurance, and I was directly employed by the company [with which Mr H.C. had contracted as an independent contractor]. In the past the company I contracted with did not enrol in social insurance, but it does now. While I was employed regularly, I joined social insurance with employer contribution. The situation has changed. Both the chain of command at the workplace and my own working style have not changed even though I have become a regular employee. The social insurance premium and income tax are deducted from my salary, so my take-home pay has decreased. In the company employing me, there are only four regular employees, including me, and no irregular workers. When the manager needs more workers, he asks *haken-gaisha* for them. *Haken-sha-in*, or dispatch workers, earn a mere 150, 000 yen a month; some lucky ones earn 200,000 yen. <sup>xii)</sup>

## Conclusion

What are frontline NPP workers doing, and what kind of situation are they in? Their employment conditions and working environment have not improved since the 1980s. NPP employers, electric power companies and their main subcontractor usually evade liability for labour accidents, such as radiation exposure, hiding behind the cover of the multiple subcontracting system and flexible employment. Furthermore, my study shows cases

where the working conditions of NPP workers are desperate and there is little hope that they can be improved solely through the collaboration and cooperation of frontline subcontractors. We must spell out how to organize the work system in cases where nuclear reactors are decommissioned. The paper makes the following observations:

1) The vast majority of maintenance and control of NPPs, transportation of nuclear fuel and waste disposal is done by temporary workers employed in multiple subcontracting system. The workers are collected in accordance with the demands of electric power companies and/or subsidiary companies of plant manufacturers (such as Mitsubishi and Hitachi), and are discarded anytime with no mercy. Not only workers but also terminal subcontractors are expendable.

2) Inside the NPPs, a complicated chain of command exists: subcontracted regular employees, irregularly employed workers, or dispatched workers (who are employed for limited period of time) work there. It is quite doubtful that mechanism to maintain, control, and repair NPPs in systematic and consecutive ways is firmly established.

3) The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) appeals to other concerned officials or organisations in order to modernise and normalise for-profit entities engaged in the NPP business. The aims of the MLIT are to enrol all employees in social insurance and to guarantee paid vacation for all workers. As a recent trend, it is not unusual for independent subcontractors who have enough capability to become employees of upper-level subcontractors. In such cases, NPP workers who earn the status of employees often lose a certain degree of their income because social insurance premiums and taxes are deducted from their wages. On the other hand, subcontractors that directly employ several NPP workers tend to reduce the wages of regular workers or refrain from hiring irregular workers in order to ease the burden of social insurance premium on employers. Every time a shortage of workers occurs, the subcontractors



collect irregular workers from *haken-gaisha*.

4) Working hours are substantially long for both irregular workers employed by rank subcontractors and dispatched workers, regardless of the provisions of the Labour Standards Act. It usually takes a long time for these NPP workers to travel to the workplace from their home or lodgings. All the while, nominal working hours at NPPs are set according to radiation exposure dose, and it is not rare for worker exposure doses to exceed set limits in just a few minutes.<sup>xiii)</sup>

5) It is routine for NPP workers to lose their jobs because their labour contracts have been terminated: the reason for their termination is that their exposure dose exceeds a certain level set by the government.<sup>xiv)</sup> As stated in Note 1 of this paper, as a general rule (with some exceptions), it is the standard national practice to record workers' annual exposure dose from 1 April through 31 March of the following year.<sup>xv)</sup>

6) NPP workers have to remain in extremely hot and wet place, where pipes twist and turn like a labyrinth. Sometimes they have to move heavy loads by hand. They have to wear heavy and clumsy protective gear, including masks, gloves and helmets and even if they aren't exposed to radiation, these factors certainly take their toll on their mental and physical well-being. On the other hand, so-called light work in NPPs does not require heavy protective clothing, but people who do such work are vulnerable to radiation exposure.

My study is far from complete; nevertheless, it is my conviction that the industry should adopt several measures to improve the employment and working conditions of NPP workers. Such measures include: (a) elimination of the multiple system of labour exploitation; (b) elimination of '*gisō-ukeoi*' (work contract fraud); (c) prohibition of the use of dispatched workers in NPPs; (d) distribution of certificates testifying that the bearer has been exposed to radiation and guaranteeing certain health care benefits by the national government; (e) the legal exemption of dispatched workers from any

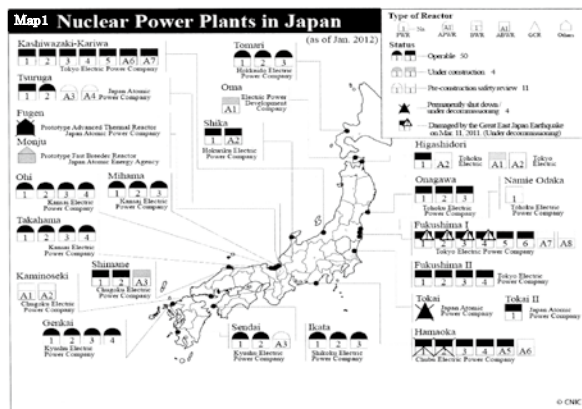
work that would involve exposure to radiation.<sup>xvi)</sup>; (f) creation by the government in collaboration with electric power companies, large plant maker and subcontractors of a substantial framework to secure employment of workers who have been exposed to radiation; (g) protection of law-abiding terminal subcontractors from the arbitrary actions of large-scale firms (including electric power companies); (h) facilitation of application for workers' accident compensation (WAC) by NPP workers for late radiation injury, and enlargement of the scope of WAC to include diseases related to radiation exposure; (i) enhancement of medical checkups for NPP workers and their families for which the government would be responsible; (j) permanent disclosure of information regarding subcontracting structure by electric power companies, plant makers and construction firms, and the creation of environment in and around NPPs so that workers can speak out [without fear of reprisal].

The sad reality is that it will take a large number of frontline workers, who cannot totally escape from radiation exposure, even if all NPP reactors are decommissioned.

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Source: Nuke info Tokyo ,No.146Jan/Feb 2012,Citizens' Nuclear Information Center)

## Notes

- i) Total annual exposure to radiation should fall within a certain legal limit from 1 April to 31 March of the following year. However, it is reset to 'zero' on next 1 April. This counting system permits 'low-level radiation exposure' that is hazardous to workers' health. In the case of normal work, the Ordinance on Prevention of Ionizing Radiation Hazards limits the exposure dose to 100 mSv in five-years or 50 mSv in one-year (Ordinance on Prevention of Ionizing Radiation Hazards Article 4) and in the case of emergency work to 100 mSv (Article 7). Article9 states : "The employer shall check the results of the measurement of the dose due to external exposure under the provisions of paragraph 1 of the preceding Article daily for those workers who are suspected to be exposed to radiation exceeding 1 mSv/day in terms of the 1 cm dose equivalent. The employer shall calculate and record the dose of radiation exposure for radiation workers listed in each of the following items without delay by using the methods designated by the Minister of Health, Labour and Welfare on the basis of the measurement and/or calculation results under the provisions of paragraphs 3 or 5 of the preceding Article, and keep such records for at least 30 years. This provision shall not apply in the event an employer turns over such records to an organization designated by the Minister of

Health, Labour and Welfare, after keeping them for a period of 5 years."

I think all workers should be notified in writing every day of their exposure levels as indicated by both alarm metres and glass dosimeters. The same procedure should be applied to workers whose daily exposure dose is assumed to be lower than 1 mSv.

- ii) The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) sent a letter dated 26 March 2012 entitled "More Social Insurance Enrolment in the Construction Industry" to chief secretaries of ministries and agencies, heads of ordinance-designated cities, directing managers of public corporations, and main contractors (private entities). Since then, subcontractors have been trying to enrol their regular employees. In this process, irregular workers tend to be fired, and utilization of dispatch workers by subcontractors reappears when worker shortages sporadically occur. On 22 June 2013, an NPP worker told me that he had become a regular employee. He had worked as an individual contractor for a long time but to his dismay his income decreased as a result of the change in his status. The average monthly wage of regular workers who are employed by subcontractors and engaged in administration jobs at work sites is around 300,000 yen, but social insurance premiums (such as health care, pension and long-term medical care) and taxes (income tax and resident tax) are deducted from their wages.
- iii) According to information I obtained from interviews conducted on 21 July and 12 September 2013, some subcontractors took pains over the employment continuation of employees.
- iv) Support of workmen's accident application with NPPs contamination workers by Dr Murata Saburo and civic activists were is very important. See Ishimaru Koshiro et.al., *Fukushima NPP and Radiation Exposed Labour*, (Akashi-shoten, 2013).
- v) This man is a subcontractor whose work is not

related to NPPs but his father worked in NPPs.

- vi) While most of the land belongs to local communities or individual residents, pylons and power cables are property of electric power companies (EPCs). Lease contracts of the land are designed to permit EPCs to use their towers and cables for a long time.
- vii) A part of “oral history” of NPP workers in early 1980s written by this author is found in: Takaki Kazumi, “Research Note on NPP Day-Workers in Wakasa Area part 2,” *Nihon Fukushi Daigaku Daigakuin Kenkyu-ronshu* (Nihon Fukushi University Graduate School's magazine) Issue 3, 1988.
- viii) Radiation is a kind of “light” which can penetrate substances. Radioactivity has the capacity to produce radiation. Radiation exposure means that the human body is exposed to radiation. There are two types of radiation: electromagnetic radiation and corpuscular radiation. Radiation exposure may be divided into two categories: external exposure and internal exposure (Matsui Eisuke, *Mienai Kyōfu: Hōshasen Naibu Hibaku [Invisible Terror: Internal Exposure]*, Junpo-sha, 2011: 36-37). All forms of radiation (alpha, beta and gamma) affect the body. However, alpha and beta radiation disrupt molecules, so exposure to them is more dangerous than external exposure to gamma radiation. As long as radioactive small particles remain in bodies, internal exposure continues. (Yagasaki Katsuma, ‘Naibu Hibaku’ (Internal Radiation Exposure. In *Naibu Hibaku kara Inochi wo Mamoru (Protecting One's Life from Internal Exposure)*, Shimin to Kagaku no Naibu Hibaku Mondai Kenkyūkai (Association for Citizens and Scientists Concerned about Internal Radiation Exposures (ed.), Junpo-sha, 2012: 81-82)

According to Matsui, internal radiation exposure has been ignored because of the International Commission on Radiological Protection (ICRP), once the most respected institution in the field. Matsui points out that the ICRP had stated that the effects of radiation ‘should be

determined by exposed micro area,’ and it had adopted a standard “to estimate the average exposure dose to each organ,” but it ignored the significance of internal exposure. In case of internal exposure, intensified exposure at “micro area” matters. The ICRP's standard is mostly based on data which analysed the effects of acute external radiation exposure in Hiroshima and Nagasaki (Matsui, *Mienai Kyōfu*, 2011: 53). Established in 1951, the ICRP once consisted of not only a committee for external exposure but for internal exposure as well; however, the latter soon ceased to exist. Carl Sagan, who was elected the first president of the committee for internal exposure, later wrote his observations in his book *The Angry Genie*. He admitted that the ICRP could not escape from the reign of the nuclear industry and wrote that he could understand why the institute had lost its prestige.

- ix) According to interviewee 8 (Mr Y.H.), each worker has a film badge and a pocket dosimeter to measure the dose of radiation exposure, and equipment readings are compiled every month for each worker. It is not unusual that differences appear between the aggregated readings of the film badges and those of pocket meters. When such cases have occurred, Mr Y.H. said, only lower readings have been officially recorded.
- x) In 1980s several people told me the same thing. For example, another said, ‘If you could see radiation, nobody would work in NPPs.
- xi) Back in the 1980s, according to the interviewee 8 (Mr Y.H.), when a prime contractor lacked engineers, employees of its subcontractors were falsely hired as the contractor's employees or placed in other positions in different companies.
- xii) On 4 September 2013, an employer dispatching workers posted a job advertisement the Hello Work website of a public employment security office. The employer, based in Tsuruga, Fukui, wanted to hire workers for “security jobs in nuclear power plants” as terminable employees.

The ad said that the monthly wage of an experienced person would be between 160,000 and 180,000 yen.

- xiii) KEPCO restricted working-hour of each NPP worker in reactor buildings to ten hours a day. On 21 July 2013 an interviewee told me, “One would be exposed to radiation before reaching ‘hot’ points. If you are lucky, it takes five or six minutes to check switches to move nuclear fuel. For this procedure alone, an exposure dose of two or three mSv is unavoidable. Sometimes you have to check twice, so it takes twice as long, and the exposure dose would be four or six mSv.”
- xiv) Employers should not fire employees because they have reached the exposure dose limit. Employers have an obligation to retain NPP workers. This means that employers should secure other employment for the workers whose exposure exceeds the limit and should pay them a substantial wage. Needless to say, it is unrealistic to place all responsibilities as employers on the shoulders of subcontractors.
- xv) Exposure to radiation in the work place is sometimes fatal. It is hazardous to NPP workers’ health, can have serious consequences long after the workers retire, and might even cause genetic damage that will affect future generations.
- xvi) On 13 December 2013, the director of the Tsuruga Labour Standards Inspection Office told me that most regular inspections of NPPs were categorized as ‘construction work.’ Even under current regulations, dispatching workers to do construction work is forbidden. In my opinion, these regulations have been defined too narrowly.