

Nuclear Workers and the Hermeneutics of Low-Doses

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❁ Main interviews with:

- ❁ Japanese nuclear plant workers before and after 3.11 (2002/2-9 Fukushima Daini, Shimane, Hamaoka)
- ❁ Iwaki 2011/6-7; 2012/1, 6; 2013/7; 2014/7)
- ❁ Japanese and foreign epidemiologists after 3.11 (Tokyo, Paris, Barcelona 2011, 2012)

❁ Main oral presentations of this paper:

- ❁ World Congress of Science Studies ("4S"), Copenhagen 2012.10
- ❁ UC Berkeley 2013.5
- ❁ ISA World Congress of Sociology Yokohama July 2014

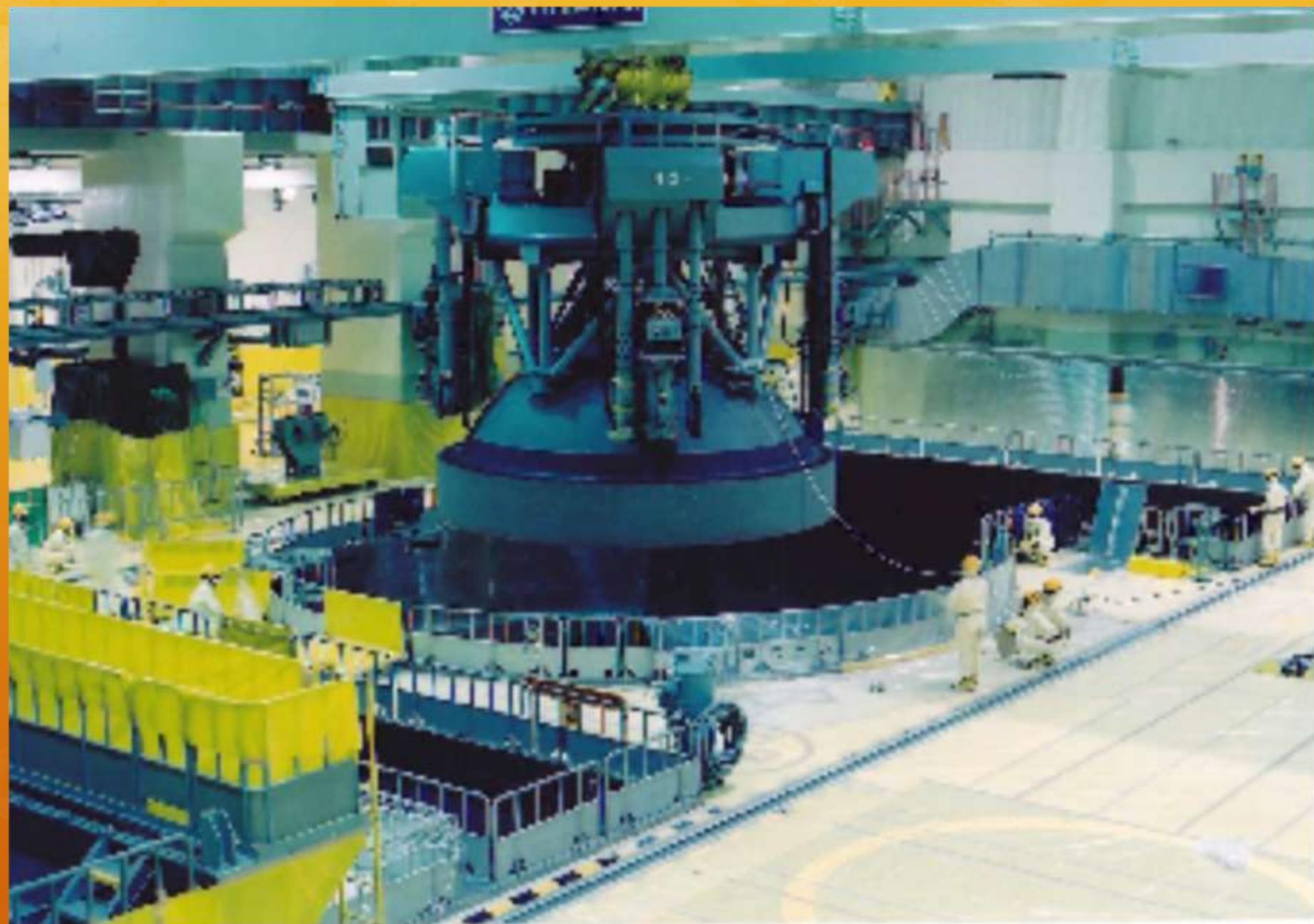
❁ Publications of this paper:

- ❁ *The Journal of Ohara Institute for Social Research*, 2013.8 (658), pp.14-30. (In Japanese)
- ❁ Book chapter in Chinese (in 《公民能不能？能源科技、政策公民能不能？能源科技、政策與民主》，國立交通大學出版社)

Outline

- ❁ **1) Introduction: The chronic dimension of a nuclear disaster**
- ❁ **2) The nuclear governance and its critique**
- ❁ **3) The hermeneutics of low-doses**
- ❁ **Conclusion: At what step is the critique?**

I. Introduction:
**The chronic dimension
of a nuclear disaster**







原子炉
給水ポンプ

2014.02





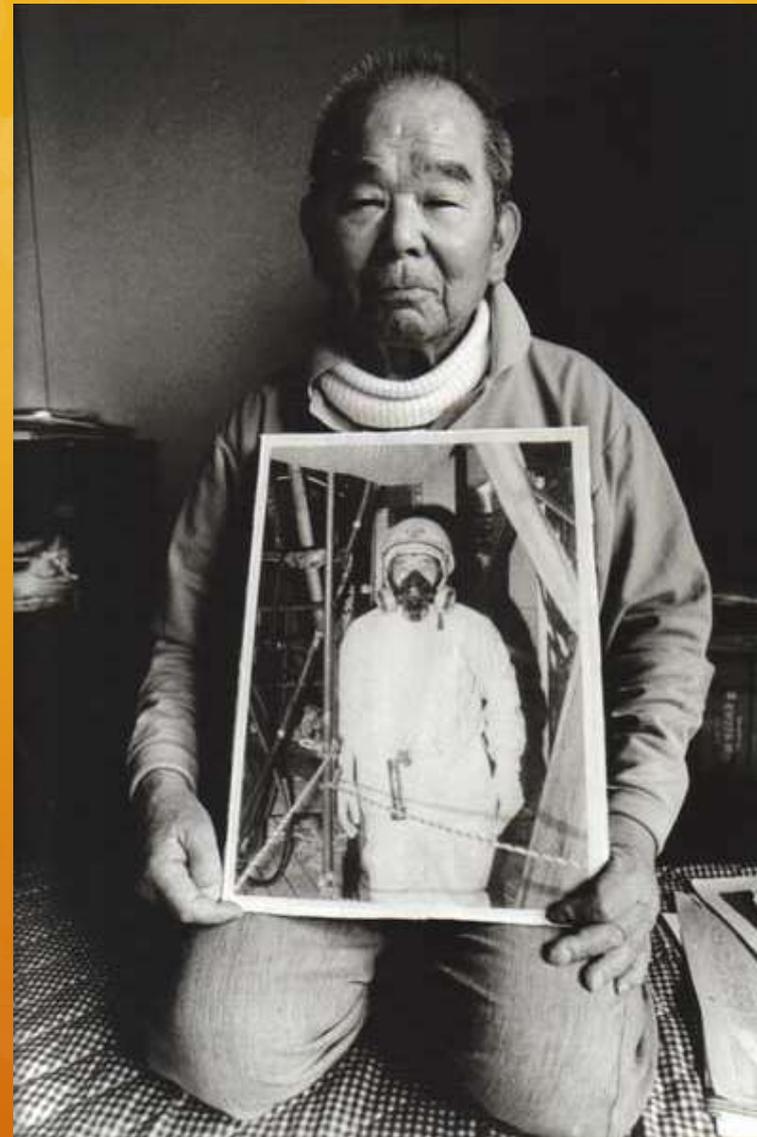


Before 311, workers compelled to falsify their own records (Tomioka, Fukushima Prefecture, 7.2002)

Compensation as occupational hazards: 5 mSv as standard but a few cases only

	Workers	Diseases	Labor Bureau (Prefecture)	Application addressed on	Decision of the Labor Bureau	Accumulated dose (mSv)
1	<i>Iwasa Kazuyuki</i>	<i>Radiation dermatitis</i>	<i>Tsuruga (Fukui)</i>	<i>1975 (19 March)</i>	<i>Reject (9 Oct. 1975)</i>	?
2	<i>A</i>	<i>Malignant lymphoma leukemia</i>	<i>Matsue (Shimane)</i>	<i>1982 (31 May)</i>	<i>Reject</i>	?
3	<i>M. K. *</i>	<i>Chronic myeloid leukemia</i>	<i>Tomioka (Fukushima)</i>	<i>1988 (2 Sept.)</i>	<i>Certified (24 Dec. 1991)</i>	40
4	<i>B</i>	<i>Acute myeloid leukemia</i>	<i>Kôbe (Hyôgo)</i>	<i>1992 (1 Dec.)</i>	<i>Reject (27 July 1994)</i>	?
5	<i>C</i>	<i>Acute myeloid leukemia</i>	<i>Kôbe (Hyôgo)</i>	<i>1992 (14 Dec.)</i>	<i>Certified (27 July 1994)</i>	?
6	<i>Shimahashi Nobuyuki</i>	<i>Chronic myeloid leukemia</i>	<i>Iwata (Shizuoka)</i>	<i>1993 (6 May)</i>	<i>Certified (27 July 1994)</i>	50,63
7	<i>N. M. *</i>	<i>Aplasic anemia</i>	<i>Tomioka (Fukushima)</i>	<i>1996 (16 Aug.)</i>	<i>Reject (14 Aug 1997)</i>	?
8	<i>I. I. *</i>	<i>Chronic myeloid leukemia</i>	<i>Tomioka (Fukushima)</i>	<i>1997 (16 May)</i>	<i>Reject (30 Sept. 1998)</i>	2,26
9	<i>D</i>	<i>Acute lymphoblastic leukemia</i>	<i>Tomioka (Fukushima)</i>	<i>1998 (22 Dec.)</i>	<i>Reject (30 July)</i>	?
10, 11, 12	<i>Accident de Tokkaimura</i>	<i>Acute Radiation Syndrome</i>	<i>Mito (Ibaragi)</i>	<i>1999 (20 Oct.)</i>	<i>Certified (26 Oct.)</i>	3 000; 10 000; 17 000
13	<i>H. S. *</i>	<i>Acute leukemia monocytic</i>	<i>Tomioka (Fukushima)</i>	<i>1999 (20 Dec.)</i>	<i>Certified (24 Oct. 2000)</i>	74,94
14	<i>Odawara Tsurubiko</i>	<i>Lung Cancer</i>	<i>Kamedo (Tokyo)</i>	<i>2000 (Jan.)</i>	<i>Reject (12 March 2003)</i>	?
15-19	<i>Accident of Mihama (5 contract workers)</i>	<i>Acute Radiation Syndromes</i>		<i>2004 (Dec.)</i>	<i>All 5 certified (Jan. 2005)</i>	?
20	<i>Nagao Mitsuaki</i>	<i>Multiple myeloma</i>	<i>Tomioka (Fukushima)</i>	<i>2003 (14 Jan.)</i>	<i>Certified (13 Jan. 2004)</i>	70
21	<i>Yukina Tadashi</i>	<i>Malignant lymphoma</i>	<i>Yodogawa (Osaka)</i>	<i>2005 (28 Oct.)</i>	<i>Certified (27 Oct. 2008) after a reject in Sept. 2006 and a new application in Oct. 2006</i>	100
22	<i>E</i>	<i>Acute lymphoblastic leukemia</i>	<i>Tomioka (Fukushima)</i>	<i>2006 (15 Fev.)</i>	<i>?</i>	?
23	<i>Umeda Ryûsuke</i>	<i>Myocardial infarction</i>	<i>Matsue (Shimane)</i>	<i>2008 (9 Aug.)</i>	<i>Reject (14 Sept. 2010)</i>	8,6
24	<i>F</i>	<i>Malignant lymphoma</i>	<i>Tsuruga (Fukui)</i>	<i>2009 (21 March)</i>	<i>Reject?</i>	

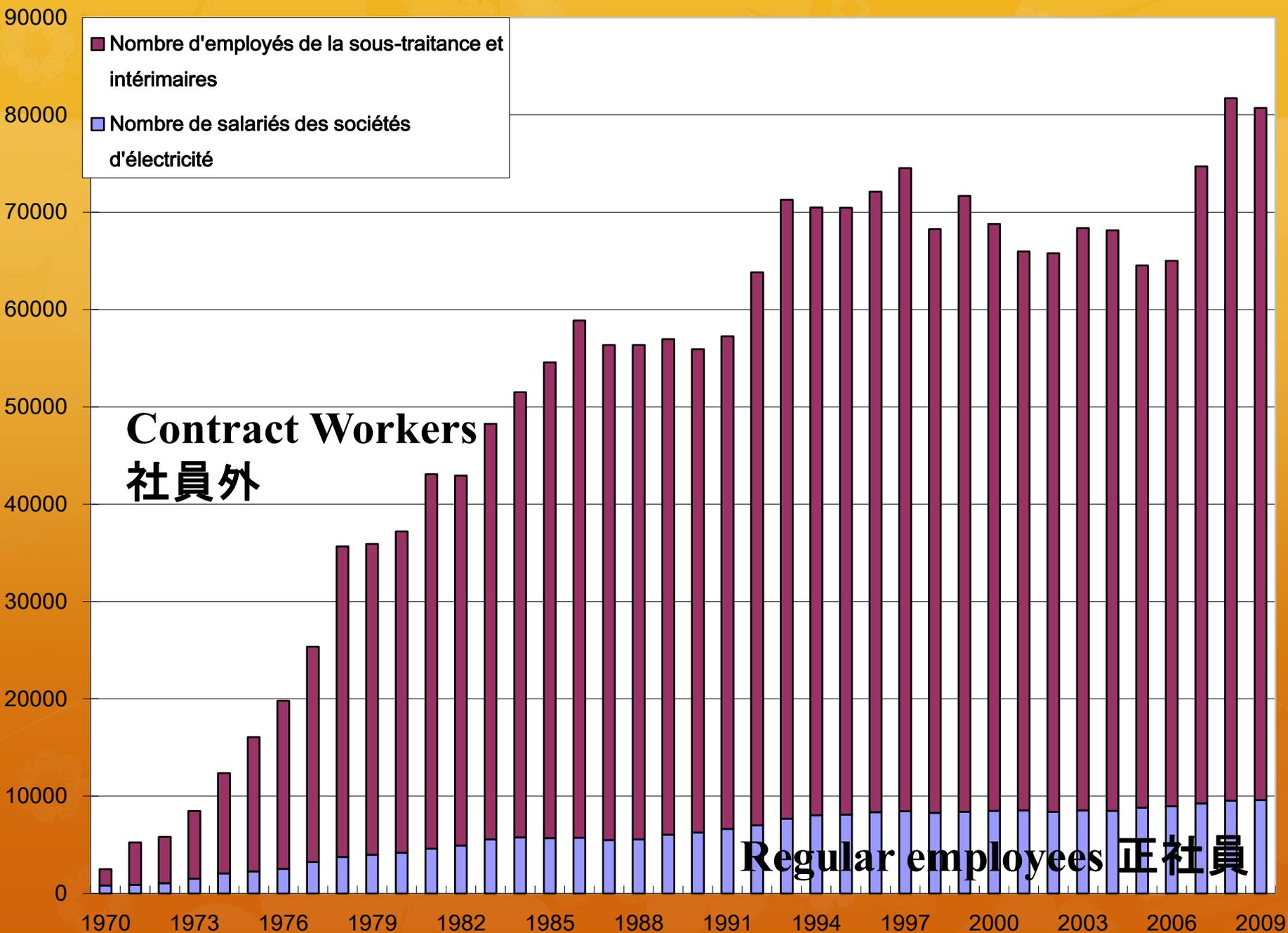
Shimabashi Nobuyuki (their son): 50 mSv



Nagao Mitsuaki: 70 mSv

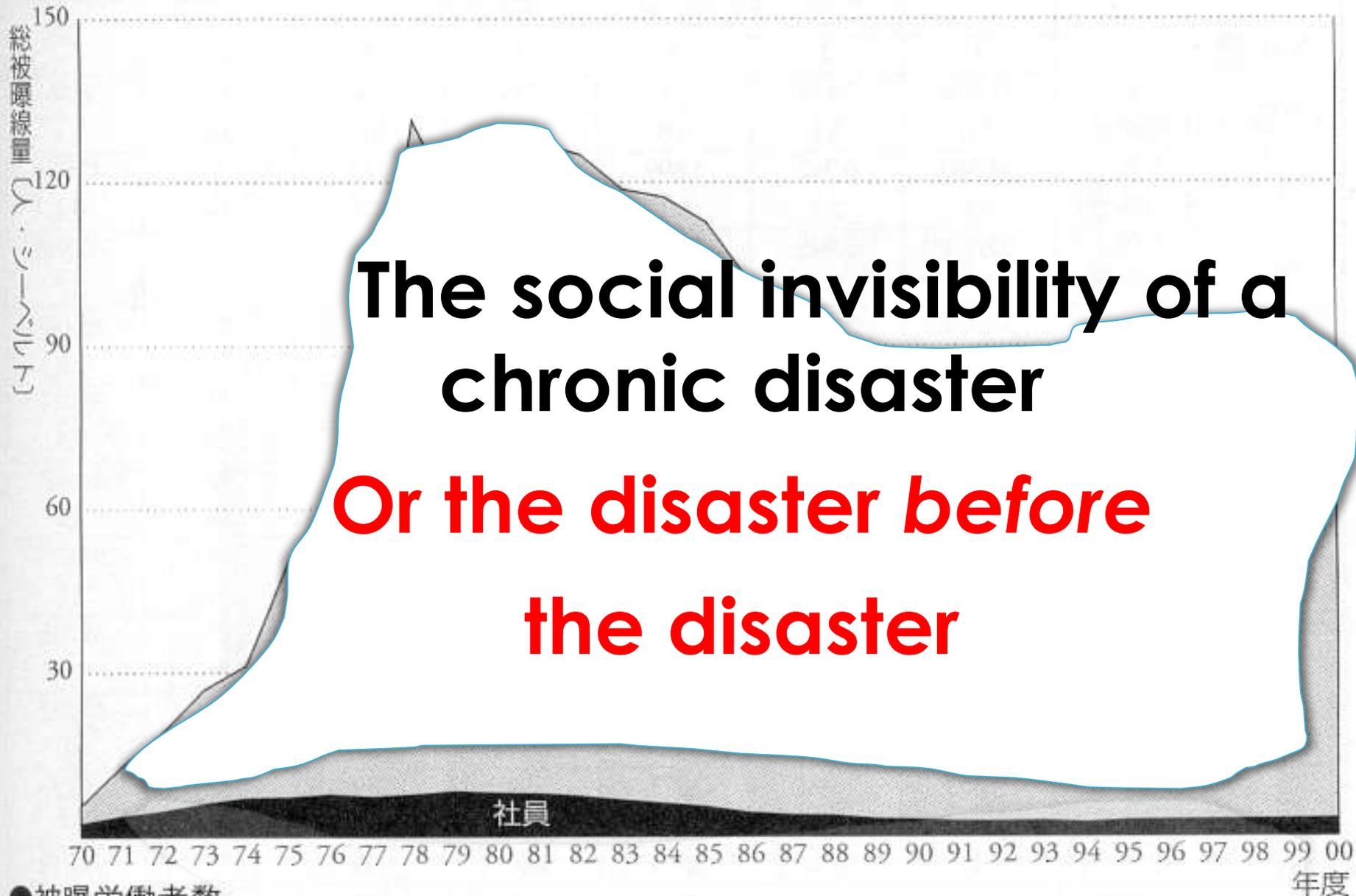


Kiyuna Tadashi (her husband): 100 mSv



商業用原発の被曝実績

● 総被曝線量



The social invisibility of a chronic disaster
Or the disaster *before* the disaster

● 被曝労働者数

80000



Post 3.11 Nuclear Work

Or the disaster after the disaster



2) The nuclear governance and its critique

Nuclear governance

And its critique

✿ International organizations:
IAEA, UNSCEAR, ICRP, WANO,
WHO...

✿ Electricity suppliers: TEPCO...

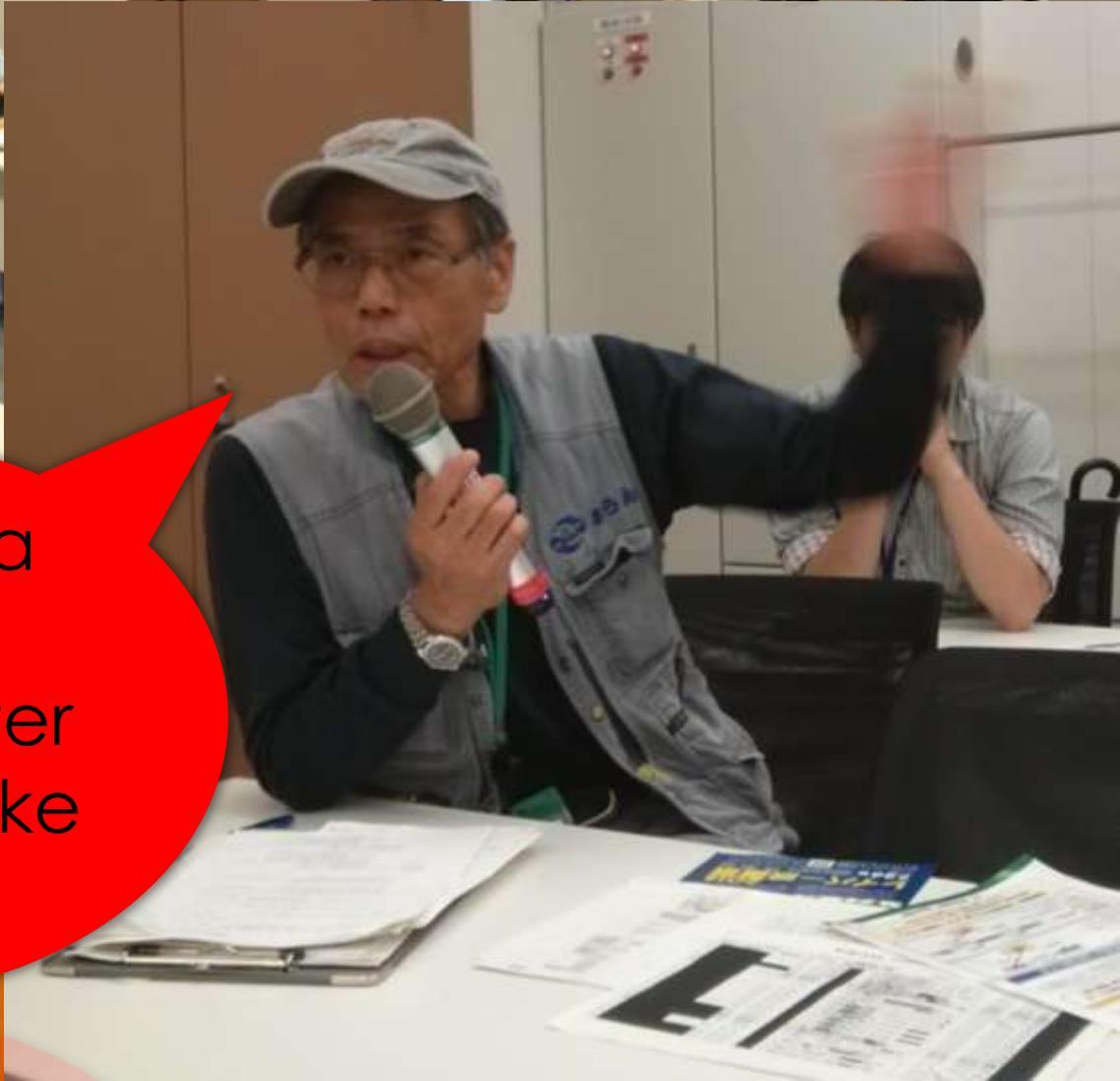
✿ Nation states bodies:

- ✿ Nuclear Regulation Authority 原子力規制委員会
- ✿ Ministry of Health and Labor 厚労省
- ✿ Ministry of Environment 環境省
- ✿ Ministry of Economy 経済産業省,
- ✿ Ministry of Education and Science 文科省
- ✿ Ministry of Reconstruction 復興省
- ✿ 放射線影響協会

✿ Citizens and Labor NGOs

- ✿ Pre 3.11: CNIC 原子力情報室, JOSHRC 労働安全センター
- ✿ Post 3.11: Hibaku netto 被ばく労働考えるネットワーク (山野、釜ヶ崎等よせばの労働活動家) Hibaku hantai campaign ヒバク反対キャンペーン (広島出身等の学者等) 福島原発事故緊急会議等

✿ But no big union (e.g. Rengo)



Bla bla bla
bullshit!
You'd better
go to F1 take
a look!



よりかなり差がある可能性がある。これらの要因及び他の不確実性のため、事故の非常に早い時期の職業被ばくを完全に明らかにするためには、更なる調査が必要である。」

国連科学委員会の報告書では、国連科学委員会として更なる調査が必要としており、当社に対して再調査を要求しているものではありません。

なお、国連科学委員会の報告書にて「更なる調査が必要」とされている点について、政府に確認をしたところ、現時点で国連科学委員会から特段の追加情報の提供等の要望は受けていないとのことでした。

4. いわゆる「古田調書」について

① 政府事故調査・検証委員会のヒアリング結果（いわゆる「古田調書」）について、当社は所持しておりません。

② ヒアリングメモの取り扱いについては国が管理しているものと認識しており、当社が

③ 当
あわ
して
故
明す
報保
行っ



On radiation protection, activists contest

- ❁ No health follow-ups to workers exposed to a cumulative dose below 50 mSv for external radiation exposure (only those above this dose will receive a one-year cancer test)
- ❁ No records for internal radiation below 2 mSv
- ❁ So far no systematic dosimetry nor health follow-ups for the people employed in the decontamination work on the hot spots of Fukushima prefecture.

- ❁ Activists claim that workers should be given the right of an access to the epidemiological survey planned by Tepco and the MHLW on a cohort of 20,000 workers
- ❁ Epistemic constraints / epistemic injustice
- ❁ Accumulating wrong data aggravates the structural disaster on the long haul (Matsumoto Miwao, *Structural disaster* 2012)

3) The Hermeneutics of Low-Doses

長崎大学
午後6時すぎ

長崎大学大学院
医歯薬学総合研究院
山下 俊一 教授

“放射性。ヨウ素とセシウム
何が違う？健康への影響は？”



Below 100
mSv,
no worry!

Damned fool!



「100ミリシーベルトは大丈夫、
毎時10マイクロシーベルト以下なら外で遊んでも
大丈夫」などと発言した。



ICRP, AIEA,
WHO,
UNSCEAR,
WANO...

Vs. Independent WHO, CRIIRAD, CSRP...





日本ほど豊かな国が



日本記者クラブ
Japan National Press Club

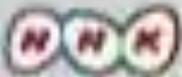




7 原発対応の参与辞任へ



東京大学大学院
小佐古 敏 荘 教



20 mSv a year:
That's like in
nuclear plants
or uranium
mines!

Prof. Toshisō Kosako, 29 April 2011

発電所名	区分	被曝線量分布[人]						総被曝線量 (人・Sv)	平均線量 (mSv)	最大線量 (mSv)
		5mSv以下	5mSv超 10mSv以下	10mSv超 15mSv以下	15mSv超 20mSv以下	20mSv超 25mSv以下	25mSv超			
東通	社員	250	0	0	0	0	0.04	0.2	1.3	
	下請け	1,786	2	1	0	0	0.42	0.2	10.3	
	合計	2,036	2	1	0	0	0.46	0.2	10.3	
福島第一	社員	1,070	36	2	0	0	0.85	0.8	12.9	
	下請け	8,269	671	220	35	0	14.00	1.5	18.0	
	合計	9,339	707	222	35	0	14.85	1.4	18.0	
福島第二	社員	699	0	0	0	0	0.19	0.3	3.6	
	下請け	6,418	144	13	0	0	3.67	0.6	13.1	
	合計	7,117	144	13	0	0	3.87	0.5	13.1	
柏崎刈羽	社員	1,168	1	0	0	0	0.28	0.2	5.0	
	下請け	9,188	163	50	16	0	5.43	0.6	18.2	
	合計	10,356	164	50	16	0	5.71	0.5	18.2	



発電所名	区分	被曝線量分布[人]						総被曝線量 (人・Sv)	平均線量 (mSv)	最大線量 (mSv)
		5mSv以下	5mSv超 10mSv以下	10mSv超 15mSv以下	15mSv超 20mSv以下	20mSv超 25mSv以下	25mSv超			
東通	社員	250	0	0	0	0	0	0.04	0.2	1.3
	下請け	1,786	2	1	0	0	0	0.42	0.2	10.3
	合計	2,036	2	1	0	0	0	0.46	0.2	10.3
福島第一	社員	1,070	36	2	0	0	0	0.85	0.8	12.9
	下請け	8,269	671	220	35	0	0	14.00	1.5	18.0
	合計	9,339	707	222	35	0	0	14.85	1.4	18.0

伊方	下請け	2,388	86	11	0	0	0	1.99	0.8	13.5
	合計	2,709	86	11	0	0	0	2.03	0.7	13.5
玄海	社員	535	1	0	0	0	0	0.10	0.2	5.6
	下請け	3,800	202	21	0	0	0	4.26	1.1	14.2
川内	合計	4,335	203	21	0	0	0	4.36	1.0	14.2
	社員	287	0	0	0	0	0	0.04	0.1	3.3
商業炉 合計	下請け	2,034	181	10	0	0	0	2.92	1.3	11.6
	合計	2,321	181	10	0	0	0	2.96	1.2	11.6
ふげん	社員	9,155	53	2	0	0	0	3.13	0.3	12.9
	下請け	69,532	3,417	1,072	258	0	0	78.95	1.1	19.5
もんじゅ	合計	78,687	3,470	1,074	258	0	0	82.08	1.0	19.5
	社員	108	0	0	0	0	0	0.02	0.1	1.7
もんじゅ	下請け	495	2	0	0	0	0	0.10	0.2	5.9
	合計	603	2	0	0	0	0	0.11	0.2	5.9
もんじゅ	社員	331	0	0	0	0	0	0.00	0.0	0.0
	下請け	1,081	0	0	0	0	0	0.00	0.0	0.0
総合計	合計	1,412	0	0	0	0	0	0.00	0.0	0.0
	社員	9,594	53	2	0	0	0	3.15	0.3	12.9
総合計	下請け	71,108	3,419	1,072	258	0	0	79.05	1.1	19.5
	合計	80,702	3,472	1,074	258	0	0	82.19	1.0	19.5

2003-2009: 21

2011.3.11 - 2012.7.21: 4 398



Koriyama Station, June 2012 $0,286 \mu\text{Sv/h} = 2,51 \text{ mSv/year}$



The Land of Hope by Sono Shion



Kosako regrets
his statement



No
regret!



scientific basis of radiation protection standards for environmental, occupational, and medical diagnostic exposures.

Design Multinational retrospective cohort study of cancer mortality.

Setting Cohorts of workers in the nuclear industry in 15 countries.

Participants 407 391 workers individually monitored for external radiation with a total follow-up of 5.2 million person years.

Main outcome measurements Estimates of excess relative risks per sievert (Sv) of radiation dose for mortality from cancers other than leukaemia and from leukaemia excluding chronic lymphocytic leukaemia, the main causes of death considered by radiation protection authorities.

Results The excess relative risk for cancers other than leukaemia was 0.97 per Sv, 95% confidence interval 0.14 to 1.97. Analyses of causes of death related or unrelated to smoking indicate that, although confounding by smoking may be present, it is unlikely to explain all of this increased risk. The excess relative risk for leukaemia excluding chronic lymphocytic leukaemia was 1.93 per Sv (<0 to 8.47). On the basis of these estimates, 1-2% of deaths from cancer among workers in this cohort may be attributable to radiation.

Conclusions These estimates, from the largest study of nuclear workers ever conducted, are higher than, but statistically compatible with, the risk estimates used for current radiation protection standards. The results suggest that there is a small excess risk of cancer, even at the low doses and dose rates typically received by nuclear workers in this study.

Introduction

Ionising radiation is one of the most studied and ubiquitous carcinogens in our environment. The main basis for radiation protection recommendations is the study of survivors of the Japanese atomic bomb (A bomb), a population exposed primarily at high dose rates.¹⁻³ The primary public health concern, however, is the protection of people from relatively low dose, protracted or fractionated exposures such as those received

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workers in the nuclear industry. The precision of these estimates, however, are compatible with the reduction of risk at low current radiation levels.

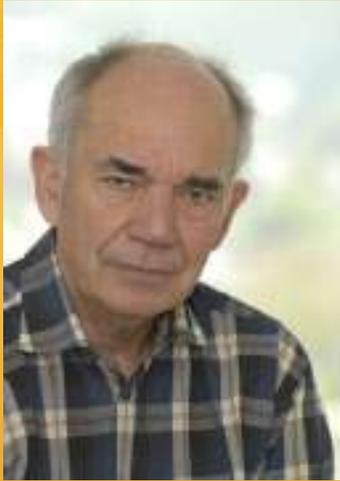
The 15 country study was carried out to further investigate the scientific basis of radiation protection standards for leukaemia, excluding chronic lymphocytic leukaemia, and compare them with estimates from the A bomb. We have used data from facilities engaged in production of nuclear weapons, enrichment of uranium, and production of radioisotopes. Uranium mining is not included.

Methods

This multinational retrospective cohort study protocol in 15 countries included 600 000 workers. Study cohorts or dosimetric records were available, from centralised databases, for inclusion based on eligibility criteria for inclusion: complete and non-selective for individual annual records; workers; and availability of policies and practices. We monitored for external radiation through the use of personal dosimeters. Specific methods are described.

Ascertainment of vital status

We established vital status through regional death registries. I



- ❁ KEITH BAVERSTOCK led the Radiation Protection Programme at the World Health Organisation's Regional Office for Europe from 1991 to 2003.
- ❁ In 2002 he transferred to the WHO's European Centre for Environment and Health located in Bonn where he was the Regional Advisor for Radiation and Public Health.
- ❁ From November 2003 to April 2005 he served on the UK Committee for Radioactive Waste Management. **His critical views** of the management and conduct of the Committee, particularly in its failure to make proper use of science and its lack of adherence to the Code of Conduct in Public Life, **resulted in his dismissal.**



津田敏秀教授



長瀧重信座長

Conclusion:

Where exactly is the critique?

At what step is it?

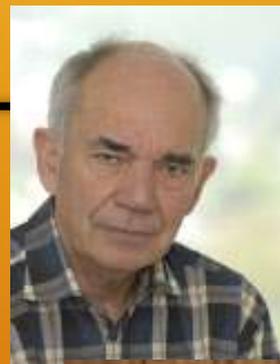
What are its effects?



Nuclear Governance



Nuclear Critique



2014年放射線疫学調査報告会

公益財団法人放射線影響協会

テーマ 放射線の健康影響について－細胞・動物実験・疫学研究を通して線量率効果をよむ

：

（公財）放射線影響協会は、低線量放射線の健康影響を調べるため、原子力発電施設等にお

ける放射線業務従事者を対象

の健康影響に関する様々な

放射線の影響は同じ被ばく

異なること、すなわち線量

率として報告会を開催いたし

高線量・高線量率放射線

率放射線がもっている健康

進められています。そこで、

る課題に関して何が解明されていて、何がわかっていないのか、研究はどこまで進んでいるの

か、など本報告会で理解を深めていきたいと思えます。

線量率に関わる知見についての俯瞰的な講演に続いて、講演者が実施してきた細胞や動物実

験または人を対象とした調査からの研究成績について講演頂くこととしています。

是非とも多数の方々のご出席をたまりたくご案内申し上げます。

開催日時：平成26年12月15日（月）13時15分～17時15分

（公財）がん研究振興財団 国際研究交流会館 国際会議場3階（[地図はここか](#)

参加を希望される方は、[お申込メールアドレス](mailto:houkokukai@rea.or.jp) 宛（houkokukai@rea.or.jp）に、メールの件名を「2014 報告会」と入力していただき、①氏名（ふりがな）、②所属、③連絡先（e-mailアドレス、電話番号、FAX番号等）を明記の上、メールをお送り下さい。また、メール等をお持ちでない方は、当協会の電話（03-5295-1494）または

**Thank you
for your attention**