

Survey of the workers at the Fukushima nuclear power plant

- After the accident, many of the TEPCO workers did not evacuate, but they stayed on-site in order to help with the accident response. Most of the subcontracted workers evacuated at 16:00 on March 11. There were problems with the communication of information to the subcontracted workers. On March 11, the subcontracted workers who did remain at the plant did not receive an explanation about the dangerous state of the reactors.
- Efforts to monitor the radiation exposure of those workers who fought to contain the accident at the plant were limited by the emergency conditions and the limited availability of measuring devices on-site. There were no reports on the cumulative radiation dose of individual workers, and no efforts were made to manage internal radiation. Many workers have expressed anxiety and frustration regarding the lack of worker radiation dose checks. This needs to be improved.
- Most of the workers who remained after the earthquake to deal with the accident were registered radiation workers.
- Some workers had to share one dosimeter with several others because the devices were limited. Very few were without a dosimeter at all.
- A system for managing dosimeters was unavailable. Because of this, about 30 percent of the workers were not told of their cumulative dosage, which is a problem.
- No significant difference in the response between TEPCO employees and its subcontracted workers over how measures against radiation were managed has been observed.
- Most of the workers who dealt with the accident were not told in advance that they would have to do so if one broke out. Some had to work without consent. There were problems with how employees were briefed on preparations against a nuclear disaster.
- Approximately 80 percent of the workers received an explanation about the radiation dosage in their operation areas, or were made aware of the radiation dosage of the site through dosage maps prior to working. Approximately 20 percent of the workers stated that they received no explanation about the radiation dosage in their operation area. Although it is necessary to have workers on-site to deal with the crisis, an explanation of the radiation levels and the risk should always be given.

(*) Note: As we could not conduct the survey on the employees of companies that did not wish to cooperate with our survey, this sample does not accurately represent all the workers and is to a certain degree incomplete. Additionally, this Commission asked TEPCO subcontractors for the current addresses of the employees who worked at the Fukushima Daiichi Nuclear Power Plant on March 11, 2011, but some of them provided the addresses of employees who started working at the plant after March 11, 2011. These workers are included in the 5,500 targeted respondents. For this reason, it cannot be said that the samples taken through this survey give an accurate statistical analysis of the workers at Fukushima Daiichi on March 11, 2011. Therefore, please note that the responses may not be statistically reliable except for those from the employees of TEPCO, which provided the contact information of almost all its employees.

Summary of the methodology of the workers survey

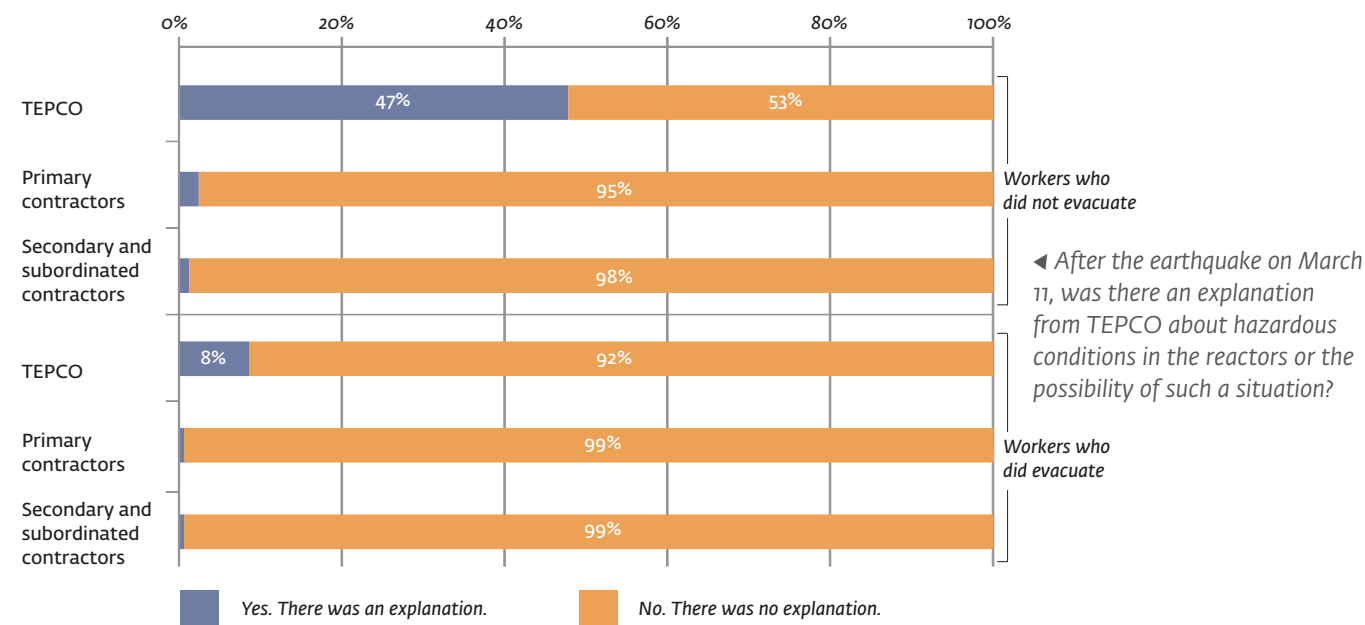
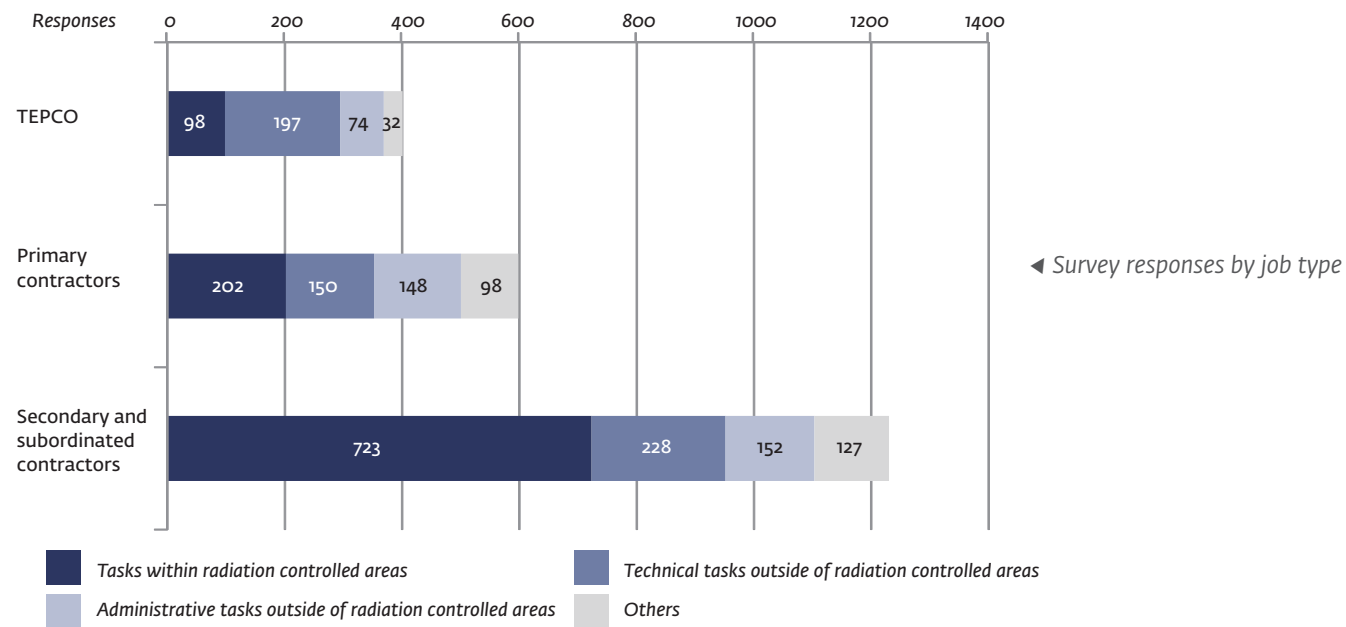
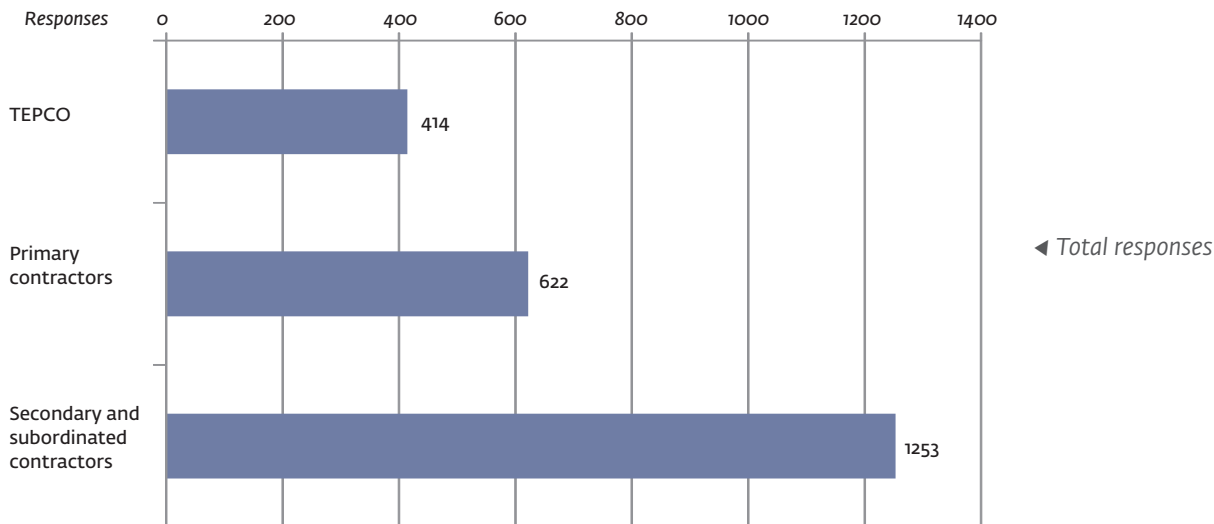
- This survey was conducted on the workers who were at Fukushima Daiichi Nuclear Power Plant on March 11, 2011.
- *Objective:* To understand the reality of the communication of information, evacuations, and health monitoring that went on inside the nuclear power plant.
- *Method:* Postal survey.
- *Duration:* April 27 to May 18, 2012
- *Targeted respondents:* Approximately 5,500 workers who were at Fukushima Daiichi Nuclear Power Plant on March 11, 2011, and are/were employees of TEPCO or subcontracted companies (*) which agreed to cooperate with our survey.
- *Total respondents:* 2,415 (Approximately 44% of the targeted respondents.)
- Of the 2,415 respondents, 1,060 respondents (44%) wrote in the free space for comments. Furthermore, 41 respondents wrote on the front and back of the survey sheet or provided further comments on envelopes and separate papers. We sensed their strong will to be heard.

Distribution of respondent sample according to location

- Most respondents were working in radiation controlled areas on March 11.

Communication of information to the workers during the accident

- Approximately 40 percent of TEPCO workers received a warning that the reactors were or could be in a dangerous state. On the other hand, hardly any workers from the subcontracted companies said that they received such a warning.



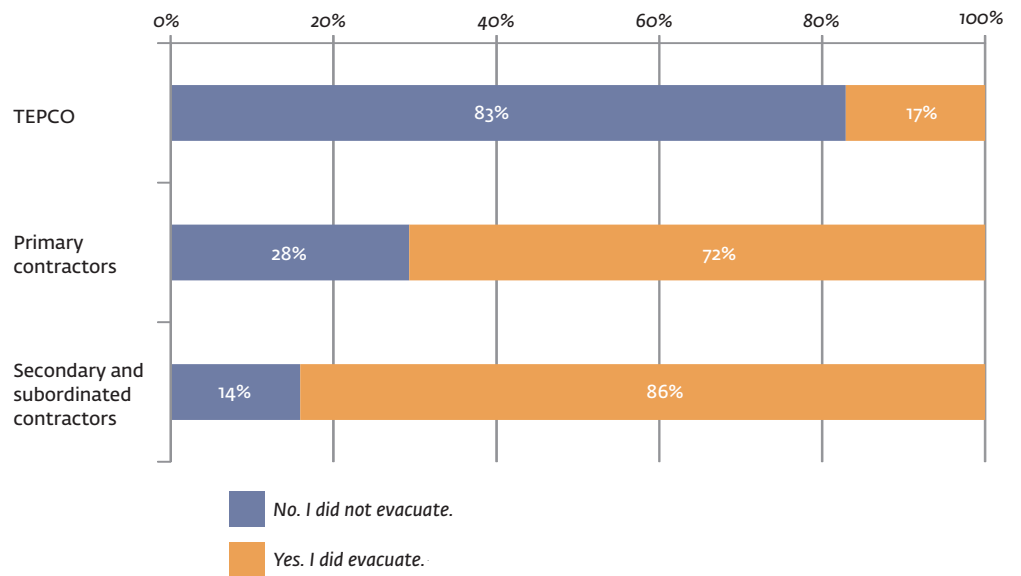
State of evacuation after the earthquake

- Over 80 percent of TEPCO workers did not evacuate after the earthquake and stayed on-site. Many of the subtracted workers evacuated from the plant facility at least temporarily.
- Almost all of the workers who evacuated on March 11 did so at around 16:00.
- Over half of the subcontracted workers who evacuated answered that they did not receive orders to evacuate. (This includes workers who answered that they went home because they received orders related to the earthquake, not because of the accident at the power plant.)
- Approximately 30 percent of primary subcontracted workers and 15 percent of the subordinated subcontracted workers remained on-site to deal with the accident.

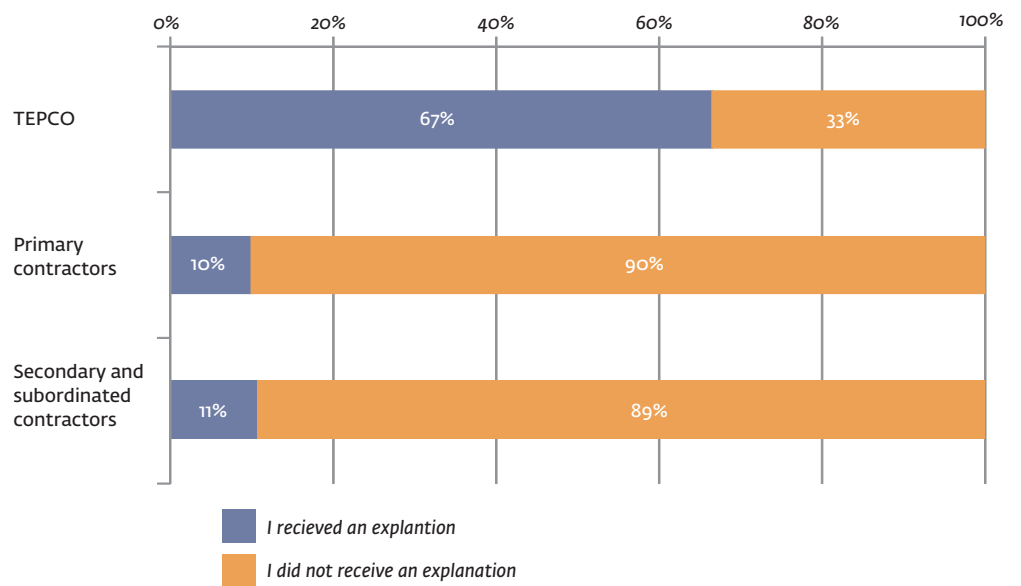
Workers involved in containing the accident

- Almost all of the workers who were involved in containing the accident were

On March 11, 2011, did you evacuate from within the the Fukushima Daiichi site (including temporary evacuation)? ▶



Before the accident, were you given an explanation of the possible response tasks you might be assigned to in the event of an accident? ▶

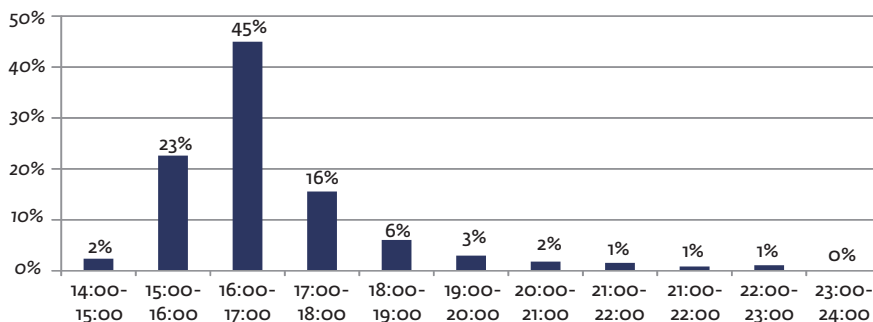
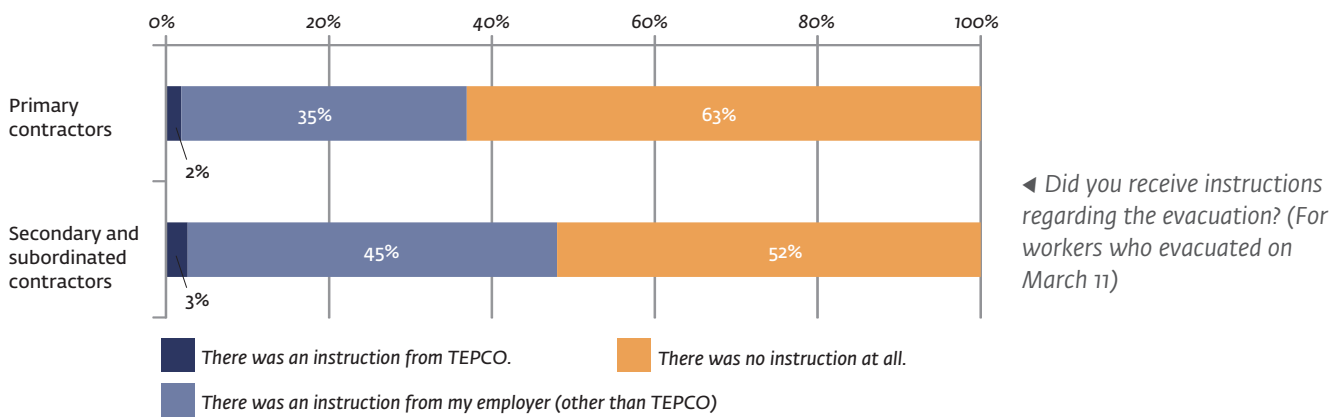


registered radiation workers.

- Only around 10 percent of the subcontracted workers who were involved in dealing with the accident received an explanation in advance about the possibility of the plant having a nuclear accident.
- Approximately 30 percent of TEPCO workers and 40 percent of subcontracted workers had not agreed to deal with such an accident.

Management of radiation

- As there was a lack of dosimeters due to the tsunami, TEPCO let multiple workers in areas with low radiation levels share dosimeters immediately after the accident. As a result, the percentage of workers who did not have any dosimeters was kept to 5 percent. No significant difference in the distribution of dosimeters among TEPCO workers and subcontracted workers was observed.



- TEPCO manually tracked the workers' radiation dosage because the system of measuring and managing cumulative radiation became unavailable. However, around 30 percent of the workers said that they were never told of their cumulative radiation dosage. There is no major discrepancy between the TEPCO workers and subcontracted workers over the level of information given on dose exposure.
- As the accident evolved, radiation levels heightened outside the anti-earthquake building, even outside of the radiation controlled area. In response to this, TEPCO explained to workers engaged in tasks outside the anti-earthquake building about the radiation dose at the work sites and about the increased possibility of irradiation. While about 40 percent of the workers responded that they were briefed each time, 20 percent said that they were never given such information. No significant difference among TEPCO employees and subcontracted workers was observed regarding how and to what extent workers were informed of the exposure risks during their operations.
- Management of worker radiation exposure was conducted to the extent possible given the limitations and limited availability of the devices on-site. However, many workers stated that cumulative and internal radiation management and testing was insufficient.

Comment by a TEPCO employee

"There was no explanation at all about how dangerous it was until the early morning of March 15. I understand that it was a difficult situation and there was limited time to give explanations, but at least we wanted to be informed."

"We were supposed to manage our cumulative radiation exposure level on our own, perhaps because the database became unavailable due to the earthquake. But we didn't even have pen or paper. We had no way to accurately keep track."

"My cumulative radiation exposure level reached around 0.08 millisieverts as of the end of March, so I asked for a whole body counter check. The company refused, saying that I was not eligible for the test unless I reached 0.1 millisieverts. I was working in the main anti-earthquake building for two weeks from March 11, and I spent at least five to six hours a day there. I'm sure that I was internally exposed. In mid-May, I went through the WBC (white blood cell) check, but the results showed that I was less exposed than people who spent fewer hours in that building than I did."

Comment by a TEPCO employee

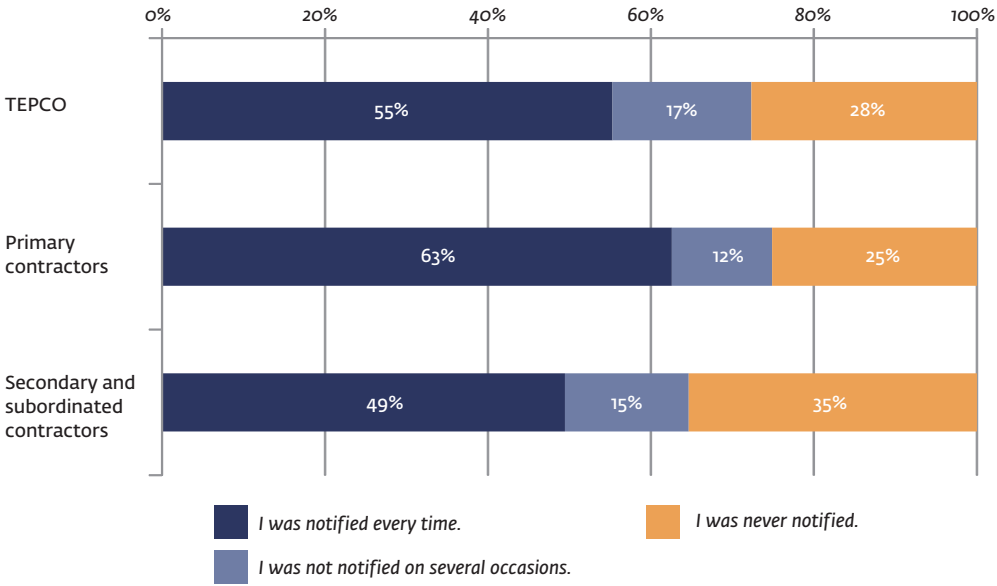
"I strongly call for a thorough follow-up, especially with the younger generation of workers, who are probably feeling abandoned. Some have been temporarily relieved of their jobs due to receiving their legal annual limit of radiation exposure. TEPCO executives are saying that this accident is not another Chernobyl, despite its scale, but I see no difference in terms of the suffering of the residents, especially the loss of their homelands. I don't want the executives to be so dismissive of this accident."

Comment by a TEPCO employee

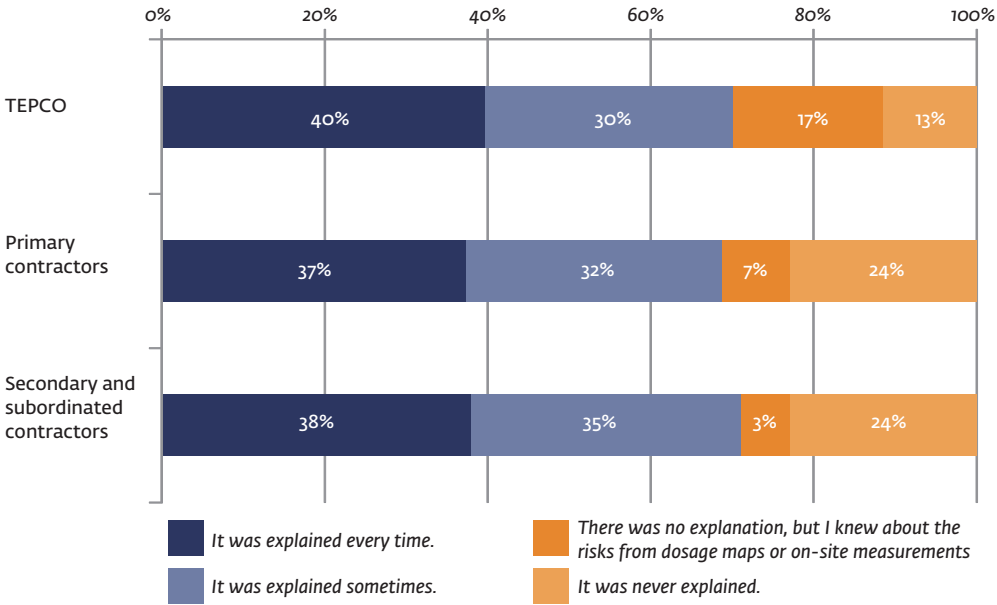
"Workers in the main anti-earthquake building were laboring under conditions where they couldn't trust anyone but themselves, and they were the only ones responsible for their own safety. Don't all of these problems stem from a fundamental lack of preparedness for disaster? I don't want to hear that this event occurred because it was 'unanticipated.' The government and the power company are accountable for the pre-existing problems that led to the disaster. Isn't it also NAIIC's responsibility to reveal these problems and report them?"

Comment by a subcontractor employee

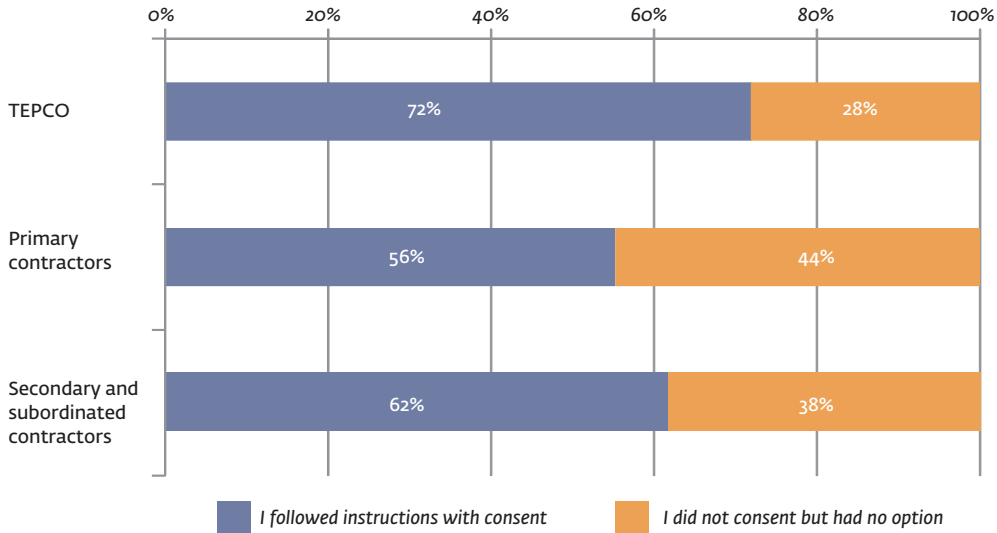
"No information whatsoever about the station blackout was delivered to the end-workers like us. I had to learn about the emergency evacuation orders for residents within 20km of the plant from TV. Though I was a subcontracted worker, I had to work on a 24 hour shift based on my existing contract. My employer knew there were several employees like me staying in the main anti-earthquake building. However, the company's managing director, deputy managing director and radiation protection supervisor all evacuated with their families. I finally managed to call our Tokyo head office on March 14, but they were not aware that there were still employees working in the main anti-earthquake building. I asked to evacuate, but they declined my request. I hardly ate or slept and I



◀ Between the time of the accident and the end of March, did your employer notify you about your cumulative radiation exposure level every time you worked?



◀ Between the time of the accident and the end of March, did anyone explain about radiation levels or the possibility of exposure to radiation every time you worked outside of the main anti-earthquake building?



◀ Did you give your consent to be assigned to response tasks in the event of an accident?

was reaching my mental and physical limits. I later told a general manager of TEPCO that I wanted to pull out, but it was very hard to get his consent. We found that the company car we were planning to use had been taken by TEPCO employees, but a colleague gave us a ride. I repeatedly requested a whole body check from my employer in late March and April, but my request was always denied. I was assigned to work at Daiichi at the end of April, which I refused to do because of health concerns. As a result I was later subjected to power harassment from my employer and I became mentally unbalanced. Because of this, I had to leave the company in June, which they termed a 'resignation for personal reasons.'

Comment by a primary contractor employee

"For workers, there were almost no evacuation instructions. There has to be a clearly understood protocol for communicating information. Measures taken in response to the accident were uncoordinated and poor overall. This is also true from the perspective of the residents. Evacuation procedures and destinations were vague and still remain so. All these issues must be clarified. Only then can the recommissioning of the Oi nuclear power plant be discussed. There are workers who go back to their homes at night and try to lead daily lives after being exposed to radiation. This is inconceivable."

Comment by a primary contractor employee

"I was working at Fukushima Daiichi on March 11. When the earthquake happened I tried to go outside, but it took two hours to leave the premises of the plant because there were so many people. The first waves of the tsunami arrived while I was leaving, yet there were no announcements about tsunami. Thinking about it now gives me a chill in my spine."

Comment by a primary contractor employee

"The radiation level in the main anti-earthquake building was so high that under normal circumstances it would have been locked down to prevent entry. I had no choice but to try to estimate my radiation exposure level in my head. The main anti-earthquake building was clearly contaminated and there was a rise in the concentration of dust and iodine. Water was scarce, and I could not wash my hands to eat emergency food. I was clearly exposed to radiation internally. Water and electricity were urgently needed, however there was no supply of either from outside. The plant was completely isolated and I thought I had been abandoned."

Comment by a primary contractor employee

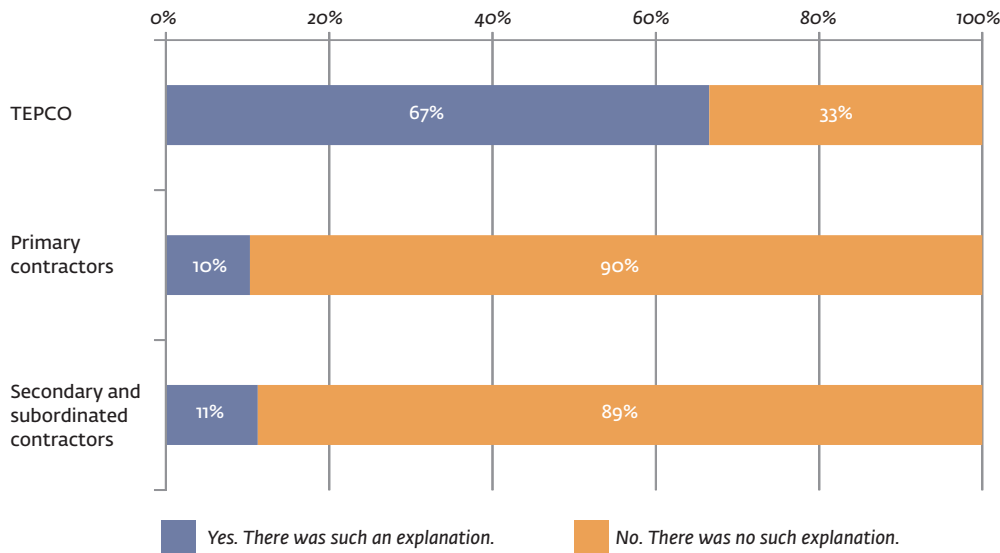
"Because workers were desperately needed, I didn't have time to confirm the well-being of my family, which bothered me so much that I could not concentrate on my duty. Responding to the accident was the priority, yet there was no way for the workers to track their exposure. I felt endangered. There were not enough dosimeters, so workers had to share them. Workers in charge of unnecessary tasks evacuated, but we did not. I feared for my life. The main anti-earthquake building survived the earthquake, but it did not protect against radiation. Hotspots in the building were marked with tape. Because the focus was on the accident response meeting between TEPCO headquarters and the plant, information was not transmitted to the surrounding area at all, though there was a radiation dispersion forecast from TEPCO's internal system based on wind direction. Workers who were engaged in accident response at that time deserve to be assigned to another location!"

Comments by a primary contractor employee

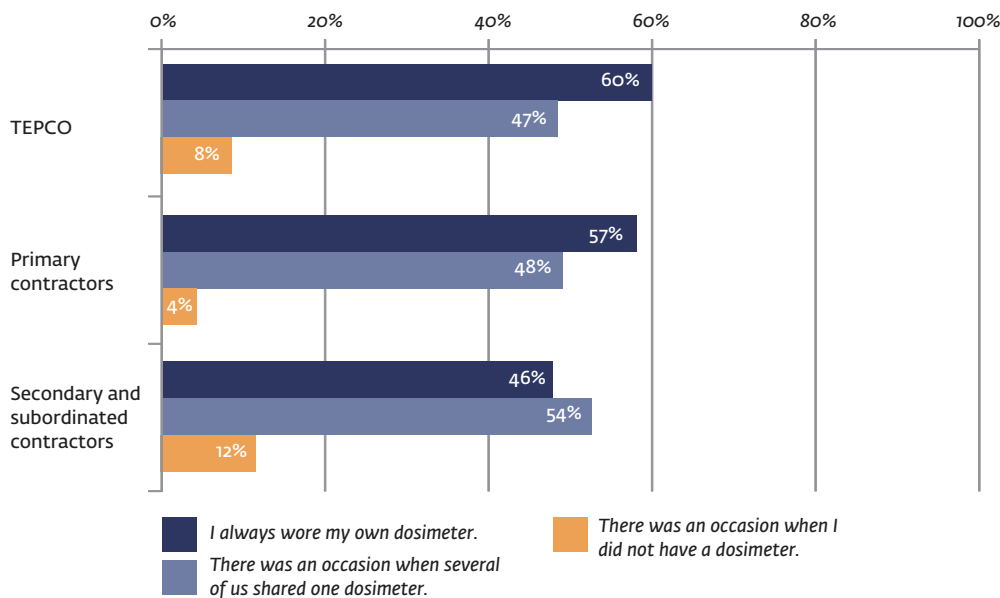
"The radiation dose management was sloppy right after the accident. Annual radiation dose management has been a vague issue for the past 15 years. The worker-to-worker deviation radiation exposure was large. I was over-exposed, about 0.15 milliSv/h external and 0.07 milliSv/h internal exposure, so now I can not work within the controlled area for the next five years."

Comments by a primary contractor employee

"After the accident, there were no whole body counter tests and it was deemed that there



◀ Prior to March 11, did you receive any notification that you may be tasked with responding to an accident?



◀ Between the time of the Unit 1 explosion on March 12 and the end of March, were you wearing a dosimeter when you worked outside the main anti-earthquake* building?

(*The only building designated for coordinating the response to an earthquake and from which all crisis responses were staged.)

was no radiation. (I wonder, could this be the result of orders from the electric companies and primary contractors?)”

“As there was no information disclosed during March 12-13, we did not know in what direction the radiation had dispersed when we evacuated.”

“If decontamination is not prioritized, we cannot return to our homes. I hope that the decontamination will be conducted by volunteers from TEPCO and 100 percent TEPCO-related companies (i.e. by people who do not work at nuclear power plants).”

Comments by a primary contractor employee

“I don’t think there was much attention paid to the workers who actually dealt with the accident. The first whole body counter was installed in Iwaki city, but only TEPCO employees were allowed to use it. Other workers had to go all the way to Kashiwazaki, and we almost never saw TEPCO people there. TEPCO left everything to the primary contractor. Before assigning blame, the operator should first focus on carrying out the initial response in the event of an accident.”

Comments by a primary subcontractor employee

“As a primary subcontracted worker, I had no choice but to be involved in the work after the accident, which involved extremely high radiation levels by normal standards.

I have been worried about my health since March 11. After the accident, I received some compensation for the emergency from my own company, but it was a very small amount. Can we even say that our work was for the country? If it was, we should receive more money. I have suffered from stomach cancer before and if I get it again because of working on this accident and die, it will be unforgivable.”

Comments by a primary subcontractor employee

I have worked in a subcontracted company for around four years—during which time I never once experienced evacuation training for a nuclear accident. TEPCO’s mindset was that “there is no possibility that an accident will occur,” and “we only need to do evacuation training for fires.” Because of such irresponsible thinking, I was fired, I have lost my income, and I have had to evacuate far away in order to raise my three children and protect their health. I want our time and livelihoods back.”

Comments by a primary subcontractor employee

“I demand to receive sufficient compensation and insurance as soon as possible. We cannot wait for another day to receive our compensation.”

“I think that this accident was going to happen eventually. TEPCO is expert at hiding information. Even now, TEPCO has not disclosed all of the information regarding water leakage etc.”

“The government and TEPCO should have referred to past accidents such as the one in Chernobyl when formulating their response to this accident. There have not been any apologies to the evacuees. How can this be acceptable?”

Comment by a subordinate contractor employee

“On the news it was reported that the plant workers who were dealing with the accident were prepared to die, but I was watching the news, thinking that there is no way we were ready to die. I did a whole body check for the first time at the end of April, and my radiation dosage was unbelievably high. My heart goes out to the people who are still working to deal with the accident. I hope that the people working at Fukushima Daiichi will take care of their health.”