

case study



Japanese Red Cross Society disaster response and the Fukushima Daiichi nuclear power plant accident

The Earthquake

11 March 2011 – 14:46 (2:46 pm)



Magnitude: 9.0

The Tsunami



Peak Height: 40.5 m



Distance the Tsunami travelled inland: 9.6 km



Time until the Tsunami hit Land: 8 mins (minimum)



Number of people evacuated after Early warning: only 42%

Damage caused by the earthquake and the tsunami



People died: 19,418



People missing: 2,592



Building destroyed (full or partly): 1,144,495



People injured: 6,220

Source: Fire and Disaster Management Agency, as of 1 March 2016.
<http://www.fdma.go.jp/bn/hiqaihou/pdf/iishin/153.pdf>

The nuclear accident



Explosions between 12–15 March 2011
4 nuclear reactors damaged



Restricted area/evacuation zone: 20–55 km



Number of people evacuated: 154,000

This case study gives an overview of the Japanese Red Cross Society (JRCS) initial emergency response to the Great East Japan Earthquake and Tsunami (GEJET) which happened on the 11 March 2011. The time-frame covered is approximately 3 weeks during the time of launch of the response and first phase of the relief period. It also looks at the challenges the Emergency response teams faced after the cascading disaster which triggered the accident at the Fukushima – Daiichi nuclear power plant. Further on it describes the different steps undertaken to address the specific challenge of a nuclear accident and operating in an environment potentially contaminated with radiation. The case study concludes with results obtained from the experiences and the lessons learned by JRCS for the International Federation of Red Cross and Red Crescent Societies (IFRC) and its member National Societies.



Timeline of Disaster and Nuclear Accident and response by Japanese government

11/3/2011 14:46

On 11 March, 2011 at 14:46 a huge earthquake, M9.0 hit Eastern Japan.

11/3/2011 14:49

Tsunami Warning (Major Tsunami) was issued along the East coast

11/3/2011 15:37

The Fukushima Daiichi Nuclear Power Plant (NPP) has a complete blackout due to damaged power lines and equipment destroyed by tsunami.

11/3/2011 21:23

National Government issued an evacuation order for an area of 3 km and sheltering order for 3-10 km radius around Fukushima Daiichi NPP.

12/3/2011 15:36

The Reactor No.1 at the Fukushima Daiichi NPP caused a hydrogen Explosion.

12/3/2011 17:39

Japanese Authorities gave "Evacuation order" to residents within 10 km from Fukushima Daiichi NPP (32.426 persons)

12/3/2011 18:25

"Evacuation order" extended to 20 km radius from Fukushima Daiichi NPP.



Response by Japanese Red Cross Society and RC Movement

11/3/2011 14:50

Disaster Response HQ at the JRCS Fukushima Chapter was set-up.

11/3/2011

15:00 JRCS initiated Nationwide Disaster Relief System. JRCS response teams began to prepare deployment.

IFRC regional office alerted and first information posted on IFRC Disaster Management Information System (DMIS)

15:30 JRCS set up National Disaster Response HQ.

16:00 JRCS requested to IFRC for support to International media relations.

16:30 JRCS DMAT¹ response launched.

17:00 2nd information update on DMIS. No international support requested! IFRC publishes 1st Information bulletin for RC network

11/3/2011 23:59

A total of 55 Red Cross relief teams from all over Japan were deployed to each affected area.

12/3/2011 04:00

DMIS update: No international support required but JRCS will accept donations through National Societies.



12/3/2011 22:45


Inquiries from relief teams started coming in due to "Fear from Radiation".

13/3/2011

IFRC Head of East Asia region and IFRC Communication delegate deployed to Tokyo

13/3/2011 17:45

"The Meeting on Relief Activities in Radiation Environment" was held with relief teams deploying in Fukushima Prefecture. As a result, non-Fukushima chapters' relief teams were to withdraw or move to other affected areas for activities.

| Timeline of Disaster and Nuclear Accident and response by Japanese government | Response by Japanese Red Cross Society and RC Movement |
|--|---|
| <p>14/3/2011 11:01 Fukushima Daiichi NPP Reactor No.3 caused a hydrogen explosion.</p> | <p>14–19/3/2011 IFRC and NS expert assessment team deployed JRCS Medical response teams support affected population keeping strict outside of a 30 km Zone from Fukushima-Daiichi NPP.</p> |
| <p>15/3/2011 06:00 Fukushima Daiichi NPP Reactor No.4 caused an explosion.</p> |  |
| <p>15/3/2011 11:30 Body contamination Screening system at 3 major evacuation centers established.</p> | <p>16/3/2011 International Committee of the Red Cross (ICRC) CBRN team deployed to Tokyo</p> |
| <p>16/3/2011 (approx.) Evacuation of 20 km zone around Fukushima Daiichi NPP completed.</p> | |
| <p>17/3/2011 09:48 Water bombing to Fukushima Daiichi NPP Reactor No.3 begun by Helicopters.</p> | <p>19/3/2011 09:00 JRCS HQ in Tokyo decided about the area of relief teams' responses and informed the chapters in the region (block) 1².</p> |

What is a Nuclear emergency?

An emergency is a non-routine situation or event that necessitates prompt action, primarily to mitigate a hazard or adverse consequences for human health and safety, quality of life, property or the environment. This includes radiation and conventional emergencies such as fires, release of hazardous chemicals, storms or earthquakes. It includes situations for which prompt action is warranted to mitigate the effects of a perceived hazard.

A Nuclear or radiological emergency is defined as there is, or is perceived to be, a hazard due to:

- The energy resulting from a nuclear chain reaction or from the decay of the products of a chain reaction; or
- Radiation exposure

Nuclear Power Plant Accident (definition)

Impact:

The threat of or release of radioactive contamination extending beyond the facility to a limited or wide geographic area as driven by prevailing weather systems. The overall impact varies given the perceived threat and scope of the event, ranging from temporary and precautionary safety guidance for adjacent areas to protective actions of severely contaminated zones. Local or regional commerce and agriculture may be impacted on either short term or protracted basis. Residential and government initiated precautionary and protective evacuations may ensue. Early detection, effective response procedures and prompt action within the area of impact dramatically reduce the consequences.

- DMAT = Disaster Medical Assistance Team, consisting of physicians, nurses, paramedics and pharmacists.
- Region (Block) 1 includes the chapters of Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata and Fukushima.

Response & Recovery Actions:

Public safety information and protective action guides are issued by responsible civil authorities. As deemed appropriate by the nature and scope of the event, decontamination processes may be initiated by government along with the issuance of potassium iodine as a prophylactic measure. Decontamination efforts of varying scope and duration may be required for affected areas. If so, temporary housing is arranged for the dislocated population which will vary in number and duration. Compensation processes may be initiated to address property loss and the disruption of affected income and economic activity. An array

of medical, psychological and public information services are engaged to address public concern and anxiety as to radiation risks and public health implications.

Challenges encountered

Right after the earthquake and tsunami occurred, the JRCS relief teams initiated relief activities at several places in affected areas including the coastal cities such as Minamisoma in Fukushima Prefecture. Later during the response operation, the Nuclear Power Plant Accident occurred, and JRCS relief teams had to decide

Steps undertaken to overcome the challenges**19/03/2011 09:00**

CBRN expert team from ICRC deployed to Japan meet with JRCS HQ. JRCS received advice on the operation under nuclear disaster environment.

- (1) The upper limit of cumulative radiation exposure should be 1 mSv per dispatch based on ICRP recommendation.
- (2) Each relief team member shall carry a personal dosimeter during the relief activities.
- (3) In order to shorten the exposure time, relief team members shall evacuate to a safe area and rest at night.
- (4) Assure a system that radiation experts can always give advice to the Relief teams.
- (5) Record the time and place of the activities, and the radiation exposure levels of each relief team member. JRCS referred to above advice and performed the relief activities in Fukushima. ICRC provided 80 units of personal dosimeters to JRCS.

22/03/2011 09:00

JRCS Fukushima Chapter relief teams and Blood Centre staff received Basic awareness trainings on Radiation from the JRCS Hiroshima Atomic-Bomb Hospital and Dr. Tomonaga, President of the JRCS Nagasaki Atomic-Bomb Hospital.

Further on these lectures were given to all relief team members.

22/03/2011 11:00

JRCS HQ defined the code of conduct for relief teams as follows:

- (1) If at all possible, a radiological technologist would accompany the relief team.
- (2) The experts from JRCS Hiroshima and Nagasaki Atomic-Bomb Hospitals are to be stationed at Fukushima to establish a system to provide information and advice on safety measures for medical relief activities.
- (3) Protective equipment and materials (dosimeters, protective suits, medical supplies) are to be stocked at Fukushima Chapter, Azuma Gymnasium and Kawahigashi Gymnasium.

MARCH 2011

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whether to continue the relief activities in the area under evacuation order or to withdraw in order to ensure the JRCS staff own safety. Unfortunately, a code of conduct for the JRCS relief teams to perform relief activities under conditions of radiological contamination did not exist. In addition, protective equipment and tools to operate in an environment with radiation were not prepared.

Therefore, the JRCS Fukushima Chapter, as the Local Disaster Response Headquarters, had no choice but to give up the dispatch of external relief teams until the JRCS National Headquarters decided on a

response plan for the nuclear disaster on 15 March. However even after this decision, JRCS continued the relief activities in Fukushima under the nuclear disaster condition by trial and error.

Description of RC response activities

The range of response activities of a Red Cross National Society is manifold. JRCS performed emergency relief activities which ranged from Risk assessment to restoring family links. In the sector of Health support due to its wide network



25/03/2011 13:00

An initial 10 personal dosimeters were dispatched to JRCS Fukushima Chapter and operational guidance was given.

29/03/2011 16:00

A Radiation Adviser Team has been dispatched to support the Emergency relief teams in Fukushima to provide guidance on radiation protection.



of JRCS Hospitals and medical centres activities focussed on general medical treatments of disaster affected population through medical doctors and nurses and Emergency Medical response teams in the field (approx. 500 teams). Various teams provided First aid, vaccinations and Psycho social support also at evacuation centres.

As part of the national response to the Earthquake and Tsunami, JRCS performed its mandated role as auxiliary to the government during disasters, which is:

- providing medical relief and psychosocial support;
- distributing relief supplies;
- ongoing provision of full blood services; and
- the collection of voluntary donations.

The area of Livelihood support saw the immediate distribution of relief mate-

rials. The items consisted of blankets, sleeping sets and Emergency Family kits. In addition, JRCS provided to the affected population clean water and food. A Relief fund supported the people in need with a cash contribution channeled through the authorities in the affected prefectures. JRCS played a central role in the Coordination of the disaster response with authorities and RC Movement but also in the Risk communication and Beneficiary engagement. Although JRCS in response to the nuclear accident assisted in the evacuation of affected population and the support in the evacuation centres, the relief activities focussed strictly on the safe zone outside of contaminated and restricted areas.

Success/results obtained

In overcoming the challenges faced during providing humanitarian assistance following the Nuclear accident at the Fukushima-Daiichi NPP, JRCS and IFRC achieved the following:

- National Manual for Disaster Response during a Nuclear emergency developed
- Nuclear Emergency Guidelines for Preparedness, Response and Recovery developed in Japan (JRCS) and globally (IFRC)
- Basic Training Session for Response to Nuclear Disasters developed and conducted by each Region/Block in Japan
- Establishment of the Red Cross Nuclear Disaster Resource Centre in Tokyo/Japan
- Gathering, compiling and sharing information about nuclear emergencies through a digital archive/knowledge base
- Radiation emergency medical care advisors in Japan assigned and trained
- Establishment and regular meetings and exchange of the IFRC Reference group on Nuclear/CBRN emergencies.

Lessons learned/ recommendations for sister National Societies

- Prepare for specialized Guidelines and contingency plans in each country/region
- Be aware of potential cross-border effects
- Establish a relief system based on the

“We established a first aid centre at the evacuation centre in Soma. Soon after that we had to close it down because of the Fukushima Daiichi Nuclear Power Plant accident, and then moved to Kawamata. After the relief activities at the evacuation centre in Kawamata, we moved to Nihonmatsu in the afternoon on March 13th to receive the body contamination screenings. Before the accident, I had a sense of security that such a severe accident as radioactive substances being spread around would never happen. However, “3.11” changed my mind completely. Radioactive substances had been widely spread in Fukushima that forced many evacuees unable to return to their lands, houses or homes they had lived for a long time. I received a big shock from the disaster, but more than that I felt how powerful the “bond” [“kizuna” in Japanese] between people was, and what wonderful human beings we were!”

*Masayuki Kanno
Administrator, Relief Team 1
Medical Social Operation Department*



guidelines

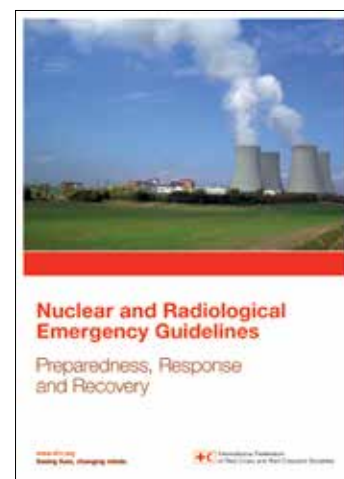
- Specialized training for RC staff and volunteers
- Prepare for relevant equipment on stock (personal dosimeter, protective suits)
- Create a resource network of experts
- Prepare the relevant rules on radiation protection to achieve the duty of care for RC staff and volunteers
- Assure Psychosocial care for staff and volunteers and affected population
- Focus not only emergency response, but create mid and long term strategies and programmes to support the victims. Take into consideration the prolonged effects of radiation on the health of people because of the unique characteristic of a nuclear accident and as well the impact on the social structure and the livelihood due to the effects on the environment.

Further information

More information about the Red Cross response to the Fukushima – Daiichi Nuclear accident can be found at:

- Red Cross Nuclear Disaster Resource Centre (JRCS) – [Digital Archive](#)
- The IAEA comprehensive Fukushima – Daiichi Accident report – [Technical volume 3 Emergency preparedness and response](#)
- The Great East Japan Earthquake and Tsunami – [JRCS Complete Report Document](#)
- The [IFRC Nuclear and Radiological Emergency guidelines – Preparedness, Response, Recovery](#)

Disaster Response Mapping. Source: NDRC JRCS.



Review on the activities of the JRCS Fukushima Hospital and the lessons for our future activities

by Yoichi Watanabe, Deputy Director General, JRCS Fukushima Hospital

- 1) It is important to quickly and accurately grasp the number of inpatients and empty beds, and the status of damages to the staff and the facility.
- 2) The annual training for disaster medical response was useful and our entire staff had a clear understanding of what to do.
- 3) Need to upgrade the emergency back-up power generator to support X-ray instruments and elevators during a power failure period.
- 4) Food for the inpatients and the staff are essential and therefore having an in-house kitchen staff and a kitchen facility is desirable.
- 5) Since both the satellite phones and the Red Cross Radio Communication System were not functioning, a reliable communication method in a disaster situation needs to be reconsidered.
- 6) Per ordered from the JRCS Fukushima Chapter, we withdrew from Hamadori. All the relief teams from other prefectures had gone home, and no replacements were coming. The possibility of the evacuees being exposed to radiation to the point that decontamination was necessary was small. Therefore, the activities could have been continued with necessary preparation such as the protective suits and dosimeters.
- 7) There were issues on the responses to the radiation exposure. By all means, securing the staff's safety is most important.
- 8) The medical institutions having nuclear power plants in their residing prefecture, and the JRCS National Headquarters need to hold workshops on radiation exposure and the training for radiation emergency medical care, so that we can prepare and properly perform the medical activities in these kind of emergencies.



Dr. Watanabe receives screening to examine physical decontamination after relief activities in Minami Soma.



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