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# 2nd Asian Workshop on the Ethical Dimensions of the System of Radiological Protection

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Summary Report (finalized on 20 July 2015)

JUNE 2-3, 2015  
FUKUSHIMA MEDICAL UNIVERSITY  
Fukushima City, Japan

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## Executive Summary

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The 2<sup>nd</sup> Asian Workshop on the Ethical Dimensions of the System of Radiological Protection was held on June 2-3, 2015 at Fukushima Medical University, Fukushima City, Japan. This workshop was the 7<sup>th</sup> in a series of similar workshops conducted in collaboration with various professionals to fully examine, discuss, and debate the ethical basis of the current system of radiological protection. **The goal of this particular workshop was to inform Task Group 94 on the important ethical issues associated with post-accident situations.** There were numerous practicing professionals in attendance, and there was a very strong sense of practicality and emphasis on application in the various discussions and debates.

This report is an effort to **summarize** the workshop presentations and discussions while **reflecting the various perspectives** of those in attendance; the views expressed herein are those of individual participants and not the ICRP. Final decisions concerning the upcoming ICRP publication continue to reside with Task Group 94.

The workshop opened with a welcome from the Vice President of Fukushima Medical University, Hitoshi Ohto, and a summary presentation by Chieko Kurihara on the progress of Task Group 94 thus far. Nine presentations followed, given by individuals with varying professions, perspectives, and experiences, with brief discussions after to establish primary talking points for the breakout groups. These initial talking points were:

1. Definition and interpretation of the term “prudence”
  - a. The relationship of prudence to precaution
  - b. The relationship of prudence to the linear no-threshold (LNT) model for radiation dose and associated risk
  - c. The interrelationship between prudence, uncertainty, and tolerability
2. Roles and responsibilities in post-accident situations
  - a. Radiological protection criteria
  - b. Experts, authorities, and health care professionals
    - i. Respect of individual choices and fair support of affected people
    - ii. Stakeholder engagement and empowerment
3. Ethical theories and procedural ethics
4. Harmony versus flexibility and the system of radiological protection

Participants split into four groups to discuss the above topics, along with any other areas of interest that arose in the discourse. The groups re-integrated in the afternoon on the second day to review conclusions and to finalize recommendations and advice for Task Group 94. The primary focus of the synthesis portion was given to:

1. A fairly extensive discussion of **prudence**, concluding that additional clarity should be incorporated into ICRP recommendations.
2. **Overall well-being**, with a general consensus that ICRP should go beyond the classical health effects to a more global consideration of well-being.
3. Human **dignity** and early, fair, and transparent **stakeholder involvement**. Individual desires for moving forward with their lives should be respected, rather than forcing or imposing a new way.

## Presentation Summaries

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Ten presentations were given to spur discussion in the group sessions. Presenters were from a variety of backgrounds and experiences. The following provides a list of these presentations along with a brief summary of the major points and/or conclusions.

1. *State of current reflections of ICRP Task Group 94 on the ethics of radiological protection.* Chieko KURIHARA (NIRS, Chiba, Japan)

This presentation discussed the accomplishments of Task Group 94 and the previous workshops thus far, including a basic discussion of western and eastern ethical theories, the system of radiological protection, and the core values associated with this system.

Moving forward, there is the need for **further evaluation of core values against applications** and concrete examples, especially considering the lives of people living in post-accident areas.

2. *A line dividing people's life.* Ryoko ANDO (Ethos in Fukushima, Japan)

This presentation discussed various boundaries (e.g. reference levels) as well as criteria and impacts of such on individuals' lives. Specifically, three lines demarcating people's lives after the disaster were discussed in terms of **geographical distance** (exclusion zone), **decontamination requirement** (air dose rate) and **food contamination limit**.

As each "line" is drawn, it can **significantly impact every person's life**. Boundaries have the power to shape or tear apart someone's life or the fabric of community. Authorities believe that it is their responsibility to draw such "lines," although they do not often consider the full extent of the social impact and the effect on individual lives. With inadequate explanation, altered "lines" can also lead to misconceptions and mistrust of standards or authorities.

A concluding point was that we should consider these lines proactively, prior to an accident: what is a line which is "appropriate" and "necessary" for society? How can a line be drawn such that it will minimize people's pain?

3. *The relationship among stakeholders, experts, communicators, mediators, etc. in radiological protection: comparison with the existing public health service system in Japan.* Makoto MIYAZAKI (Fukushima Medical University, Japan)

This presentation discussed various experiences and lessons learned from the reality of Fukushima from a clinician's viewpoint.

"Measurement" has positive value for the individuals. Dose can be used to make daily decisions (e.g. eat, where to go, etc.), to make future decisions, and to grasp the overall situation.

Authorities have multiple roles and need to grasp the overall situation for better policy making and information sharing. **Easily accessible resources** (education as well as equipment) for principal communicators ("explainers") and for measurement should be provided. Careful evaluation should be tied to implementation of additional radiological protection measures.

Public health professionals should **collaborate** with principal communicators and authorities to **improve individual overall quality of life**.

Additional consideration and differentiation should be given to ALARA (as low as reasonably achievable) and ALAP (as low as possible). Specifically, more discussion is warranted for those

individual dose values that fall below the reference level (to be considered as a **space of freedom** for people to adjust their behavior according their level of concern and their desires).

4. *Ethical considerations on the empowerment of people affected by contamination after a nuclear accident.* François ROLLINGER (IRSN, France)

This presentation discussed the ethical dimensions of **empowerment of individuals** in post-accident management as well as the corresponding responsibilities of authorities and experts. Radiological protection and health issues are only one of the dimensions of the post-accident situation; the human dimension and ethical values are decisive. Experience has highlighted the importance of involving the population, with the support of authorities and experts, to ensure the **effectiveness and sustainability** of protection actions.

Individual choice should be respected and the system of radiological protection must allow for this. It is a moral duty for ICRP to highlight these choices with the resources of **science, experience**, and the **ethical principles**, which underline the system of radiological protection. It is the responsibility of authorities to implement reference levels to restrict inequity between individual exposures. It is the responsibility of authorities to implement conditions that allow **respect of individual choices and decisions** as well as **to ensure sufficiently fair support that will allow individuals the freedom of choice and informed decisions.**

A key challenge for radiological protection professionals is to prepare themselves to be at the service of inhabitants and their concerns, and to **support participative decision-making processes** in which radiological protection is only one aspect.

5. *Deontological approaches to the ethics of radiological protection during the post-nuclear accident phase.* Michio MIYASAKA (Niigata University, Japan)

This presentation discussed the various phases of an accident as well as Fukushima's position within this timeline. It also discussed ethical issues associated with existing recommendations for management of the current situation in Fukushima.

Although Fukushima has appeared to move past the emergency phase, the unsuccessful management of periodic and persistent releases of contaminated water demonstrate that a **strict delineation of accident phase may be artificial and not an accurate representation** of existing conditions.

ASN (the Nuclear Safety Authority of France) set a series of guiding principles, along with objectives and detailed recommendations for post-accident management, which anticipate the current situation of Fukushima. However, these guiding principles appear to emphasize utilitarian approaches. **Utilitarian approaches must be balanced with deontological principles**, e.g. fairness, through procedural justice (participation of stake-holders) and distributive justice (apportioning of cost and risk, distribution of benefit).

6. *An ethical dimension to sustainable restoration and long-term management of contaminated areas.* Deborah OUGHTON (Norwegian University of Life Science, Oslo, Norway)

This presentation discussed social and ethical challenges in remediation along with associated implications, based on earlier work conducted regarding Chernobyl.

The **issues associated with remediation evaluation are complex**, with frequent lack of agreement within society as well as a lack of established procedures and experience in incorporating these

complexities into decision-making. Remediation needs a **holistic multidisciplinary approach**, including consideration of social and ethical factors.

Management strategies can have benefits besides dose reduction (e.g. overall well-being). Public and stakeholder participation is essential in risk management, but the types of stakeholders and the processes will depend on the case in question. Ethical evaluation can aid in structuring decisions and making choices more transparent. There are tools (e.g. value and ethical matrices) that can assist with analysis.

7. *A role for medical professionals during a radiation disaster: effective risk communication.* Atsushi KUMAGAI (Fukushima Medical University, Japan)

This presentation discussed the purpose and strategies of risk communication. The purpose of risk communication is to **support the citizen's understanding of level of risk** as well as to support individual decisions; effective risk communication will **empower individuals to confidently make an informed decision**. The communication pattern as well as the risk will change depending on the accident phase; that is, prior to the accident, during the crisis, and after the crisis into long term recovery. Additionally, radiation should be put into **perspective of other risks** that pervade our life.

Health care professionals are in a good position to communicate with individuals about radiation anxieties. However, many of these professionals adopt a "not my field" attitude regarding radiation. There is a need to raise **ownership of professionals** to the task at hand; professionals in different fields need to work together to provide the support people need. Being an expert during a crisis is much more than delivering information and providing an attentive, sympathetic ear.

Different personal opinions held by individuals on a tolerable or acceptable level of risk should be **respected and supported**, which will incorporate not only science and medicine but humanities and liberal arts as well.

8. *Implementing ethics in radiological protection decision making: application to post-accident situations.* Nicole MARTINEZ (Clemson University, USA)

This presentation discussed an approach to engaging practicing radiation protection professionals in the ethical aspects of decision-making, which ties in with the existing system of radiation protection.

Ethical decision making in radiation protection, particularly in post-accident situations, requires **prudent balancing of many factors** as well as active inclusion of stakeholders.

Including discussion of **both ethical theory and a framework for applying the theory** may make ethics more accessible to those working in the field, hopefully making them more apt to apply ethical principles in decisions and practice.

9. *Radiation Protection in a Post-Fukushima World.* Kathleen ARAUJO (Stony Brook University, USA)

This presentation discussed historical developments in radiological protection with an emphasis on post-Fukushima activities the United States. It highlighted parallel "rethinking" that has occurred in the international nuclear energy playing field tied to technological scoping, value choices, and preparedness. **Concepts and questions were then raised for reconsideration** with respect to knowledge sourcing and legitimation, value choices, and risk scoping in radiological protection.

The general focus of the questions included trade-offs in: decision-making priorities, determining net positive benefits, quantification and measurement, harmonization of standards, and science/knowledge.

The primary conclusion was that in an age of competing values, accelerating and multiplying information flows, and varying ideas on governance and accountability, there is the need for those regulating and working with radiation protection to maintain **respectful deference for the scientific and societal tensions** that exist with flexibility vs. precision, harmonization vs. local nuance, and variations in social contracts.

10. *Some ethical reflections on risk assessment in post-nuclear accident situations.* Gaston MESKENS (SCK-CEN, Belgium)

This presentation discussed the ethical aspects of **risk governance** in post-accident situations.

The assessment of what is an acceptable collective risk is not a matter of science, it is a matter of **justice**. Fair risk governance involves societal trust in the method of knowledge generation and decision making. Trust in the method of risk governance implies a **joint ethical commitment** through inclusive democratic deliberation, trans-disciplinarity and inclusion in research, and plurality and critical thinking in education.

Radiological risk assessment remains complicated by knowledge-related uncertainty and value pluralism. Enabling 'the right to be responsible' of the affected people in post-accident situations in making sense of protection, restoration and compensation is a principle of justice.

**Inclusive post-accident policies** need to take into account that there was no intellectual solidarity with the introduction of nuclear power in the first place, and that the possibility of a future-oriented fair method for energy governance in the aftermath of the Fukushima accident is not considered by the Japanese authorities. However, it is not too late to involve the general public and those affected by the Fukushima accident in deliberation on a possible restart of nuclear energy production.

## Breakout Group Discussions

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The goal of the discussion groups is to inform Task Group 94 on the important ethical issues in post-accident situations. The discussion groups covered topics as time allowed, initially choosing from the below topics or adding alternate topics as they arise.

Basic topics for (potential) discussion resulting from the above presentations were:

1. Prudence/precaution, LNT, uncertainty, tolerability
2. The role of radiological protection criteria in post-accident situations
3. The role of experts and authorities in post-accident situations
4. Respect of individual choices and fair support of affected people
5. Ethical theories and procedural ethics
6. Stakeholder engagement and empowerment
7. The role of health care professionals
8. Harmony versus flexibility

### Group 1

Group 1 initially focused on the first discussion topic above, that is, prudence, the linear no-threshold (LNT) model, and risk tolerability. Subsequent discussions focused on stakeholder involvement in the decision making process.

## 1. Risk acceptability

For some of the people in post-accident areas of Japan, the level of acceptable risk seems to be zero risk. For example, providing a comparison between two risks considered unacceptable will be meaningless. **Precise information on actual radiation dose and (absolute) risk is needed.**

Local knowledge and personal experience are important in the process of both understanding and recovery. It is necessary for local citizens to know their own radiation dose (measurement) and to weigh the dose significance for themselves. Finally, **each individual determines her or his personal risk acceptability.**

## 2. Prudence

The **difference in perception of the meaning of prudence** between Western and Japanese people<sup>1</sup> was discussed in great detail, although the group was divided on the need for lengthy attention to etymologies.

There was also discussion of prudence as **“preventive principle” versus “precautionary principle”** with the meaning of prudence depending on the particular situation (e.g. deterministic versus stochastic effects).

An additional suggestion was that prudence could be related to **“Wa (和) ” (peaceful harmony)** which is an important word for Japanese. However, because “Wa” is associated with conflict avoidance, it may also suggest “peer pressure,” causing unspoken but significant stress within the population. This may be common especially in Fukushima, where customs and expectations are deeply rooted in the old feudal system.

## 3. LNT model

The LNT model is used in the current risk assessment framework, but includes many assumptions. Without being informed of these assumptions or the implications thereof, people may think using this model is harmful.

Saying “this is just an assumption”; “there is uncertainty”; “not statistically significant” without additional context can cause a misunderstanding. These statements could be interpreted as being synonymous with “there is no scientific evidence” which in turn could result in distrust. Therefore, radiological protection specialists should **discuss the existing scientific evidence** with citizens who want to discuss it.

However, decision-making is not only based on scientific evidence. All the other factors should be integrated into consideration.

## 4. Decision making process and stakeholder involvement

Emergency exposure situation

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<sup>1</sup> *Western participants generally understand prudence to mean “good judgment,” including elements of both wisdom and caution. One of the workshop participants said the original meaning is “the decision to choose one option among several number of alternatives.” Many of Japanese don’t know a specific meaning of the English word “prudence.” Those Japanese who are familiar with the word (primarily those in the radiological protection community) know the meaning of the word as “precaution.” (Shincho 慎重 in Japanese, Chinese, and Korean)*



**Multidisciplinary expertise** should be utilized in the process of decision making, and conflicts of interest should be disclosed. The Japanese authorities have not adopted such a process in emergencies because they did not want to cause panic, although it is not certain whether such process cause panic. On the other hand, insufficient information disclosure may also result in panic.

**Preparedness** before the accident is necessary, but too much rigidity in the development of regulations may result in a situation where they cannot respond to exceptional cases.

Existing exposure situation (multiplicity, diversity, compensation)

National and local government, scientists, counselors, pro- and anti-nuclear activists, nuclear industry representatives, citizens, and any other relevant or interested party should be involved in the post-accident policy decision-making process (e.g. returning to contaminated land; re-starting of nuclear power plants, etc).

In addition to diversity in expertise of the particular people involved, a “**cross-sectoral**” **approach** would be useful to avoid bureaucratic sectionalism at the top (evident in Japan) while engage input and cooperation from localities.

Compensation may cause a discrepancy among the people, according to how lines were drawn; for example, compensation is provided to the evacuees but not to the people staying in “middle risk” areas.

More support can be provided for the people who are returning, but this may result in the criticism that people are being forced to return to dangerous area. **Fairness of the compensation** policy-making process is important (procedural justice: fairness and equity is different matter).<sup>2</sup>

## Group 2

Group 2 primarily focused on the core value dignity, with overall themes of accountability, overall well-being, community, and decision-making, which included the subthemes paternalism versus autonomy, roles and responsibilities, and consultancy/stakeholder involvement. The discussions of group 2 consisted of both theory and concrete, practical examples.

### 1. Accountability

There is the ethical principle of reparation, that is, doing good for those that you have harmed (not necessarily monetary). Reparation could be discussed under the combined umbrella of justice and dignity. It would be difficult for ICRP to give examples, but could say that it is something to be considered.

A nuclear **compensation** law was first put in place at the 1999 JCO criticality accident in Tokai-mura. It was a long term compensation plan designed at the national level and was very complicated. Some people think that compensation is the most important thing so they develop a strategy based on getting compensation. Some people really want to return to their original life and don't really care about compensation though. Also, as has been seen in the past, compensation can become like a drug and has the potential to destroy a community.

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<sup>2</sup> As means of fair distribution of compensation, one group member advocated reducing the compensation so that it is equally distributed.

## 2. Decision making

In an accident situation, there will be a **series of decisions**, and this series will **evolve over time**. As the rules, processes, or protective measures change, there is the need to continue to respect ethical values while also being practicable. Initially, authorities have a duty to protect citizens in the acute phase of an accident (crisis management). Is paternalism justified here? This is a hard question to address as involvement of people is possible but has to be done in the preparedness phase. Engaging stakeholders proactively has historically proven to be a challenge as holding public interest is not often sustainable.

There should be a **decentralization of decision making with time**, that is, a transition to reduction of paternalism and promotion of autonomy. The share of the decision making should move closer and closer to community, with the government supporting people in their decisions and helping make those decisions possible.

Care should be taken when discussing “choice;” there are many conditions an individual will consider in making a decision, and although people have a choice, it is not always a “free” choice

## 3. Roles and responsibilities

The duties of authorities, experts, and citizens change over time as the share of the decision making moves closer to the local community in time. The ethical duty of beneficence (doing good) is consistent throughout the situation, although how it is implemented changes. Framing this process in terms of ethical obligations of different groups could be a very useful thing for ICRP to incorporate into the recommendations. The **“do your best” approach is optimization in a nutshell**, and should be a general approach, which concerns all interested parties.

The roles of authorities should be set in place such that dialogues are facilitated; **stakeholder analysis in the very beginning** is important. The national government has a duty to protect citizens in the acute phase of an accident, which can be seen as taking a utilitarian approach, but as the stages of the accident evolve individual circumstances need to be incorporated. That is, moral duty becomes more important. Generally, crisis management does not take into account individual dignity. It is more a collective calculation between positive and negative consequences.

Authorities should utilize a **consultancy system** following the acute stage of an accident. A liaison of governmental policy should interact with the people on an individual basis such that individuals can communicate their reality. Additionally, it is inevitable that care takers will get tired, so consultancy system really needs to be implemented; care for the care-takers becomes more and more important as the system can easily and quickly become overwhelmed. Eventually, the duty of the authority is to **support people in their decisions and help make those decisions possible**.

Experts should do their best to completely and honestly provide the knowledge and skills an individual needs or desires to feel empowered to make decisions. First duty of the radiation protection community is to **provide good science**. The expert community should be prepared to deal with radiation risk-related questions, with the obligation to not underplay the risk of radiation, but to put the risk into perspective. Counseling is similar to other issues and has to be personalized; something that doctors and nurses do every day. Many medical people adopt a “not my field” attitude regarding radiation and radiological protection. It is important to increase the ownership of both residents and (non-radiation) professionals to the task at hand. With that being said, these front line people should be equipped to do that with radiation issues, meaning radiation experts and medical/public health experts will need to **work together**.

The roles of both authorities and experts in the post-accident phase should be to **respect, support, and enable individual decisions**, although the specific implementations will be different.

Stakeholders and local communities also have responsibilities, primarily in the emergency preparedness stage. Incorporating stakeholders in the preparedness phase is very important so that during crisis management it will be possible to communicate with stakeholders. However, this is typically very difficult. One of the difficulties with various stakeholder involvement strategies is involving them for an extended amount of time because people lose interest. Stakeholders and local communities also have the responsibility to **engage proactively**.

#### 4. Overall well-being

Developing an appropriate radiological protection culture involves consideration of the **overall well-being** of people. It is important to put radiation in a broader perspective and consider a **balance** of the different elements at play in post-accident situations. Although it is non-trivial, there is the definite need to create some decision process which allows inclusion of the overall well-being of the population. Improving overall well-being continues to be important regardless of disaster status. Ideally, ICRP should acknowledge in the recommendation that there are other issues beyond the physical health concerns associated with radiation exposure, such as stress and anxiety.

**There is no single strategy that will be successful or applicable in all situations;** ICRP recommendations should provide a framework for what concerns or issues that people will be expected to confront.

An appropriately designed long-term medical surveillance may help alleviate concerns and work to promote overall health and well-being.

#### 5. Community

When we discuss the ethical values concerning dignity, we always imply individual. There is also the **dignity of the community**. The decision of relocating is clearly an individual decision, but linked to the community, which is changing post-accident. Due to the disturbance created by the accident, it is no longer possible to return to the same life or community.

The **Tonarigumi** system is very strong, sometimes stronger than the family tie, and should be utilized in preparing for recovery. How do you reach out to a community that has now spread out to see what they need?

What about people outside the directly affected area? Although their situation is out of the scope of the radiological protection system, due consideration should be given to the creation of **solidarity with fair participation** of different categories of people, as well as having a process that incorporates neighbors.

There is a variety of thinking in the population, which depends on the interest or value of the group or person. Social consideration into tolerability/acceptability, which is **informed by science**, and there will inevitably be a disparity between individuals in a community.

A good example of **active community involvement** is seen in the litate village newsletter. litate village is now publishing local newsletters to communicate the situation in various communities. It is a practical tool for facilitating the decision making process involving local stakeholders and local government. They have a meeting together involving community residents, government officials, and radiation specialists, and graphic artists to put together and publish the newsletter.

## Group 3

Group 3 focused on the role of experts and authorities in post-accident situations, respect of individual choices and fair support of affected people, and stakeholder engagement and empowerment.

### 1. Well-being

Protection strategies and criteria should be developed through **participative processes** with focus on the **well-being** of affected people. The “new normal” life should be pursued through consideration of individual desires.

### 2. Achieve common understanding

A goal of post-accident radiological protection should be to help affected people **understand their circumstances**, including (1) radiological aspects of what we know and what we don't know about risks, (2) radiological characterization of affected areas and (3) personal dose information. Radiological protection experts should address questions from affected people.

### 3. Respect and support decisions

Each person's decision must be **respected**. **Balanced (fair) support** should be developed and managed for all decisions by affected people, even those affected in different ways. For example, it is ethically important that the decisions to stay or to go should be accompanied by appropriate support, which could include such things as information, cleanup, protection support, compensation, housing, psychological support, etc.

### 4. Trust

**Effective communication** is a skill that can be developed. However, communication can also be used as a propaganda tool. For this reason (among others), information should come from a trusted source; in general, the medical community is well trusted, but it is difficult to add radiological protection aspects to the medical-school syllabus.<sup>3</sup> Enormous resources are needed for listening to and providing information to affected people. Various professions need **to work together** to build both knowledge and trust; long-term commitment is needed to ensure continuation of public trust.

## Group 4

Group 4 focused primarily on the importance of human dignity and respect through discussions concerning: (1) the roles and responsibilities of experts and authorities in various stages of a nuclear accident, (2) the role of criteria in post-accident situations, (3) respect for individual decisions, and (4) fair support of affected persons.

### 1. Role of experts and authorities

During the emergency phase, experts and authorities have to **communicate** about the situation even in the absence of precise/accurate information or in the presence of conflicting information.

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<sup>3</sup> Note that on 4 September 2014, the Science Council of Japan proposed that all Japanese medical schools offer lectures on radiation health risks for medical students. The Council of Deans of all Japanese medical schools accepted the proposal, so it may be that in the near future, lectures about radiation health effects will be delivered to all medical students (and associated health care students) in Japan.

The moral obligation of experts during the emergency phase is to gather and compile data as soon as possible in order to characterize the situation. Additionally, any information provided must be in a form that is **meaningful and accessible** to all people. Arrangements must allow for two-way communications as soon as possible.

In the recovery phase, experts and authorities inevitably collect or have access to information related to the radiological situation and/or the health status of the communities for whom they work. Sharing this information with people is a way to make them aware of their personal situation and to encourage them to take action, if necessary.

Not sharing this information: (1) is a lack of respect, a manifestation of contempt, or even an offense vis-à-vis the persons concerned, and (2) goes against the right-to-know principle that is now part of modern democracies (Cf. The Aarhus Convention<sup>4</sup>).

In the recovery phase, experts and authorities must inform the public in a manner that is meaningful. A **bottom-up system** for transferring information should be implemented to ensure that policy is based on information **reflecting the reality of the local situation**.<sup>5</sup>

## 2. Role of criteria in post-accident situations

In the emergency phase, radiological protection (avoiding/reducing exposure) is the priority. In the recovery phase, the priority is the rehabilitation of living conditions. Individual doses should be the driver for the management of the radiological protection dimension of the recovery phase. Radiological protection professionals and health care professionals should be (1) readily accessible to individuals, and (2) flexible in addressing individual needs. That is, professionals should be at the service of inhabitants in **collaboratively working to improve living conditions and well-being**.

## 3. Respect of individual choices and fair support of affected people in the recovery phase

The system of radiological protection must be neutral with regard to the choices of individuals to stay, leave, return, or not return; **all choices should be respected**. It is the responsibility of authorities to ensure a **fair support** of all groups of affected people. Fairness in this respect refers to the fundamental values of equity and transparency. In term of fairness of this support, whether people have been ordered to evacuate or have voluntarily evacuated should be considered. Fairness is the possibility for those concerned to enter into a dialogue with the authorities. In order to assist evacuees decide whether to return, the best estimate of present and future exposures should be provided by authorities as well as explanations about the inconveniences and constraints imposed by the situation. Authorities should also ensure decent and sustainable living conditions.

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<sup>4</sup> *The Aarhus Convention is otherwise known as the (United Nations Economic Commission for Europe) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. Additional information, including the full text and ratifying states, can be found at: [https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVII-13&chapter=27&lang=en](https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-13&chapter=27&lang=en)*

<sup>5</sup> *Note that informing exposed individuals is one of the basic requisites of ICRP Recommendations, along with assessing exposures and stakeholder involvement.*

## Synthesis and Conclusions

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Discussion groups re-integrated to summarize findings (as above) and finalize various points for consideration. The following four points were considered in the concluding moments of the workshop to reflect combined working group discussions and additional nuances.

### 1. Discussion of precaution and prudence

- What is the best way to interpret “prudence”?
  - o In English: discretion, foresight, forethought, circumspection; refers to the exercise of good judgment, common sense, and even caution, especially in the conduct of practical matters especially in case of uncertainties.
  - o Considering prudence in terms of jurisprudence, which is a legal concept, just applying the law is not what should be done; *prudence* is included in order to make legal application positive to certain communities and institutions.
  - o It is extremely important to **differentiate precaution and prevention**, as well as the terms’ relationships to prudence. There is a significant difference between precaution and prevention; deterministic effects have a threshold (prevention is emphasized) whereas stochastic effects do not have a threshold (prudence is emphasized). For example, one would hold a child’s hand when crossing the street until you are sure they are fully aware of the hazard, etc. How prudence is managed is where the discussion of reasonableness, tolerableness, and ALARA arises.
- Ethics is a **legitimate** basis for prudence. Rational arguments in philosophy are legitimate, but can be a challenge if people do not recognize them as such. It is important to **formulate philosophical arguments in a clear way**; ethics and emotion naturally differ.
- Additional clarity could be useful in ICRP recommendations.

### 2. Overall health and well-being

- All groups emphasized the question of well-being, with a general consensus that **ICRP should go beyond the classical health effects to a more global consideration of well-being**. Although ICRP cannot discuss what prescriptively should be done regarding the support of affected persons, it might support the consideration of participatory processes which acknowledge and go beyond more than purely radiological aspects.
- Related to well-being is the concept of returning to a “new normal.” In some cases, this “new normal” may look significantly different than its pre-accident form. Some individuals may be happy with the new condition, but in many cases there may be a desire to return to a condition as close as possible to that prior to the accident. For example, an apartment may seem like a decent and sustainable housing arrangement; however, for an evacuee who originally lived on a large farm, living in an apartment has the potential to be a very difficult transition and may not, in fact, be acceptable. **Recovery should focus on what people would like in their new life** rather than (1) strictly focusing on what it was before or (2) mandating a new way without considering individual and community needs and desires.

### 3. Stakeholder involvement

- **Early and fair stakeholder involvement** is of the utmost importance.

- Examples exist of functional and successful frameworks that include concerned parties. These may be useful as a model to follow in incorporating stakeholders in decision-making, e.g. Airnet, founded by EC, which was a thematic project on air pollution and health.
- Public discussion of the issues—scientific and otherwise—is very important. On the science side, there is an enormous amount of discussion of the LNT model. A **public discussion** to address how prudent we should be in the existing uncertainty may be a more relevant and fruitful topic.
- It is important to consider individual desires for moving forward with their lives and **not to force or impose a new way**. Additionally, a key aspect in recovery is improvement of living conditions in the broad sense, which is a discussion that needs to happen at the individual and community level. For example, some communities may not agree with the decontamination policy, preferring that this funding be used to help support evacuees, e.g. finding employment, reuniting families, etc.
- The classical top-down approach with experts deciding what is good for the public is not effective if the goal is to re-establish living conditions. It is in this spirit that ICRP started the **Fukushima dialogues**. The dialogues are not formalized or part of a committee but they exist. Additionally, ICRP publications are open to the public for comment, before they are finalized.

## Final thoughts

To close the workshop, each participant briefly expressed their final thoughts regarding the most important aspects of the past two days. The general points included:

1. Most important aspects to consider in developing the future ICRP Publication on the ethics of radiological protection are:
  - Human **dignity**, to include public participation and respect/support of individuals and their choices. It is also important to keep in mind that ethics allows ICRP to broaden scope, but radiological protection professionals should not make decisions for society.
  - **Communication**, to include sharing and considering all opinions and experiences, a consultancy between authorities and individuals, open discussions between experts and the public as well as between experts themselves, and continual, on-going discussion and consideration of the issues. Additionally, professional communicators who speak in plain, accessible language for both science and ethics should be utilized.
  - Regardless of the specific process implemented, **fairness** should be ensured.
  - Authorities and professionals must accept **ownership** of the task at hand.
  - **Prudence** and precaution; the explanation of the terms should be clear and explicit with examples provided when possible.
  - **Holistic approach to well-being**; issues in a post-accident situation extend beyond radiation protection issues.
  - The primary goal and responsibility of radiological protection professionals should be to develop and provide **good science**. Communication within the radiological protection community is just as important as communication outside of the community; bitter differences between radiological protection professionals on the implications of scientific data can result in mistrust of the science overall.
  - **Balance of cross-cultural ethical theory and practicality**; practical ethics need to be incorporated.

## 2. General concluding remarks

- Ample time is needed to develop and implement a system, when many relevant issues need to be considered. It will be a challenge for ICRP to deal with all the interlinking aspects of post-accident situations, although they should not shy away from such a challenge.
- Care should be exercised in the application of the word “expert” or “specialist;” for example, very few people are actually experts in terms of post-accident situation management.
- Many participants expressed gratitude for the opportunity provided by this series of workshops.
- There is a strong educational aspect/opportunity associated with these workshops, which emphasizes the importance of **life-long learning** as well as the benefit gained through taking a multidisciplinary approach to problems.
- **It is important in moving forward to remember the many sacrifices, efforts, resilience, and courage of Fukushima people.**



## Appendix A: Attendee List

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Family name	Given name	Nationality	Group	Role
Ando	Ryoko	Japan	4	Presenter
Arai	Tazuko	Japan	4	Participant
Araujo	Kathleen	USA	1	Presenter
Asanuma-Brice	Cecile	France	3	Participant
Cantone	Marie-Claire	Italy	3	Group Rapporteur
Clement	Chris	Canada	2	Chair (Day 2)
Goto	Aya	Japan	2	Participant
Hamada	Nobuyuki	Canada	3	Participant
Homma	Toshimitsu	Japan	2	Participant
Ismail	Audrie	Canada	1	Participant
Iwata	Wataru	Japan	1	Participant
Kai	Michiaki	Japan	4	Group Chair
Komatsu	Mariko	Japan	3	Participant
Kumagai	Atsuchi	Japan	1	Presenter
Kurihara	Chieko	Japan	1	Presenter, Group Rapporteur
Lazo	Edward	France	3	Group Chair
Lecomte	Jean-François	France	1	Participant
Lochard	Jacques	France	4	Chair (Day 1)
Martinez	Nicole	USA	2	Presenter, Rapporteur
Matsui	Hideyuki	Japan	2	Participant
Meskens	Gaston	Belgium	4	Presenter, Group Rapporteur
Miyasaka	Michio	Japan	2	Presenter
Miyazaki	Makoto	Japan	4	Presenter
Mushakoji	Kinhide	Japan	1	Participant
Nakamura	Toshitaka	Japan	1	Participant
Nakamura	Takashi	Japan	4	Participant
Niwa	Ohtsura	Japan	2	Participant
Ochi	Sae	Japan	3	Participant
Oughton	Deborah	Norway	1	Presenter, Group Chair (Day 1)
Rollinger	François	France	3	Presenter
Sakata	Kiriko	Japan	4	Participant
Sakiyama	Hisako	Japan	2	Participant (Day 1)
Sasaki	Yasuhito	Japan	1	Group Chair (Day 2)
Schneider	Thierry	France	2	Group Chair
Skuterud	Lavrans	Norway	3	Participant
Sugimoto	Megumi	Japan	1	Participant
Takala	John	Canada	4	Participant
Tsuda	Toshihide	Japan	4	Participant
Yamaguchi	Fumie	Japan	2	Participant

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