Lecture 1
“Scientific Analysis of Radiation Contamination at the Area around the Fukushima-Daiichi Nuclear Power Station”
Prof. Satoru Tanaka and Prof. Shinichiro Kado

1. How can we improve the transmission of information?
2. How can we accelerate decontamination outside of the reactors site and people’s returning home?

Lecture 2
“Physics of Fukushima Damaged Reactors and its Preliminary Lessons”
Prof. Naoyuki Takaki

1. How serious is the consequences of Fukushima accident? Investigate from various views such as number of death, risk on health for current and future generation, fears and inconvenience imposed to public, impact on economy etc. Is it unacceptable on balance with benefit (energy) derived from it?
2. If our society allows to continuous use of nuclear, what attributes should be prepared to a nuclear system in the new era? Give a concrete image/concept of the new nuclear system (reactor plant and its fuel cycle).
Lecture 3
“Radiation Effect after Fukushima-1 Nuclear Power Plant Accident”
Prof. Toshiso Kosako

1. How do we think about the emergency workers dose limit? (Japanese regulation: 100 mSv, changed to 250 mSv in this period) What happened to the remediators working conditions in the usual radiation works after dose limit over works of emergency task?

2. How do you think about the evacuation for general public under a nuclear emergency situation? (Japanese regulation: 10 km as a typical evacuation zone) What kind arrangement is possible after using SPEEDI code results? The arranged area should be circle or fun-shape?

3. What is a reason of the main application of iodine pill to children? (Japanese regulation: about 40 mg for children)

4. What kind of arrangement is effective for making surface contamination maps? Use only radiation monitoring?

5. How do you think about the radiation level for school playground? What is your idea for a dose rate guideline?

6. Is it possible to remove all area in Fukushima prefecture by contaminated soil slicing of 5 cm for the decontamination of radionuclide?

7. What kind of way exists for the control of food after the accident? Please explain your idea.
Lecture 4
“Impact of Fukushima for Reactor Design Practice”
Prof. Per F. Peterson

1. Discuss “backfitting” policy (10CFR50.109 in the U.S.) which establishes the types of changes that a national regulatory authority can require to existing nuclear facilities. Consider analogies to policies for when existing buildings must be upgraded to meet new building code requirements, and requirements for when automobiles and consumer products must be recalled for repair or replacement. Discuss the societal tradeoffs in requiring backfitting (balance of the cost of backfitting against the benefit of improved safety). Discuss how backfitting policy might affect decisions to introduce improvements in new reactor designs.

2. Considering the vertical axis of the Farmers chart for the frequency of internal initiating events, discuss the commercial risks associated with introducing different fuels and materials in new reactor designs, and how such risks can be reduced.

Lesson 5
“Ethics, Risk and Safety Culture: Reflections on Fukushima and Beyond”
Prof. William E. Kastenberg

1. Are risk analysis methodologies robust enough to assess and manage the risk of core-melt accidents, such as at Fukushima, i.e. could the accident have been predicted or mitigated?

2. Was emergency planning and emergency response adequate enough to protect public health and safety both before and after the Fukushima accident?

3. Was there an adequate “safety culture” in place prior to and following the accident?

4. What would it take to improve the quality of risk analysis and emergency planning so that the loss of public confidence could have been avoided?
Lecture 6
“Regulatory “Failure” of Nuclear Safety and Institutional Design Issues for the Future”
Prof. Hideaki Shiroyama
1. Who and what mechanism should play roles for searching and integrating diverse knowledge that is necessary for managing complex system?
2. What is the way for strengthening regulatory capacity? Or how to keep civilian nuclear regulatory power without military use (which provide fund and personnel)? Or is it possible to restructure voluntary safety capability?
3. Is it possible and effective to organize and implement nuclear safety research separated from nuclear research and development in general?

Lesson 7
Prof. Miwao Matsumoto
1. How was the mutual relationship between success and failure in the little known but serious accident happened during wartime mobilization?
2. How do you think is the mutual relationship between success and failure in the Fukushima accident?
3. What is the similarity between the accident during wartime mobilisation and the Fukushima accident in terms of the mutual relationship between success and failure in the science-technology-society interface?
4. What is the difference between the accident during wartime mobilisation and the Fukushima accident in terms of the mutual relationship between success and failure in the science-technology-society interface?
5. How do you think is it possible to detect the cause of structural failure in advance and incorporate structural remedies, if there are, in your design practice?
Lecture 8 “Three Mile Island and Fukushima: Some Reflections on the History of Nuclear Power”
Dr. J. Samuel Walker

1. What are the most important lessons of Three Mile Island?
2. To what extent would a good understanding of the lessons of Three Mile Island have been helpful in the response to Fukushima? Would they have been useful in reacting promptly and as effectively as possible to the technical failures caused by the earthquake and tsunami? Would they have been helpful in responding to media questions and public fears about the effects, real and potential, of the accident?
3. Is it ever appropriate to intentionally provide information to the public about a nuclear accident that is incomplete, overly optimistic, or misleading? If so, under what conditions?
4. How do authorities deal with the problem of providing accurate and up-to-date information when their own knowledge of the situation after a nuclear plant accident is fragmentary?
5. Are the benefits of nuclear power worth the risks?
Lesson 9
“Engineers in Organization, in Industry and in Society: Ethical Considerations”
Prof. Jun Fudano

1. Compare and contrast the Code of Ethics of the American Nuclear Society\(^1\) and its counterpart in Japan, namely, the Code of Ethics of the Atomic Energy Society of Japan.\(^2\) Also make a list of values, in order of priority, which are stipulated in each code.

2. Which ethical principles have been violated in the case of the Fukushima Nuclear Accident?

3. Reflecting on the Fukushima Accident and referring to the above codes and any appropriate ones, write your own code of ethics. (Cite all codes you used.)

4. Explain, to laypeople, why engineers, especially, nuclear engineers, have special responsibility.

Lesson 10
“Long-term energy and environmental strategy”
Prof. Yasumasa Fujii

1. When should we use Uranium resource in the long-term perspective of human civilization?

2. To what extent can we depend on intermittent renewable energy?

\(^1\) [http://www.new.ans.org/about/coe/](http://www.new.ans.org/about/coe/)

\(^2\) [http://www.aesj-ethics.org/02_/02_03_](http://www.aesj-ethics.org/02_/02_03_/)