Lessons Learned from the Fukushima NPS Accidents

ICONE 19 at University of Osaka

October 25, 2011

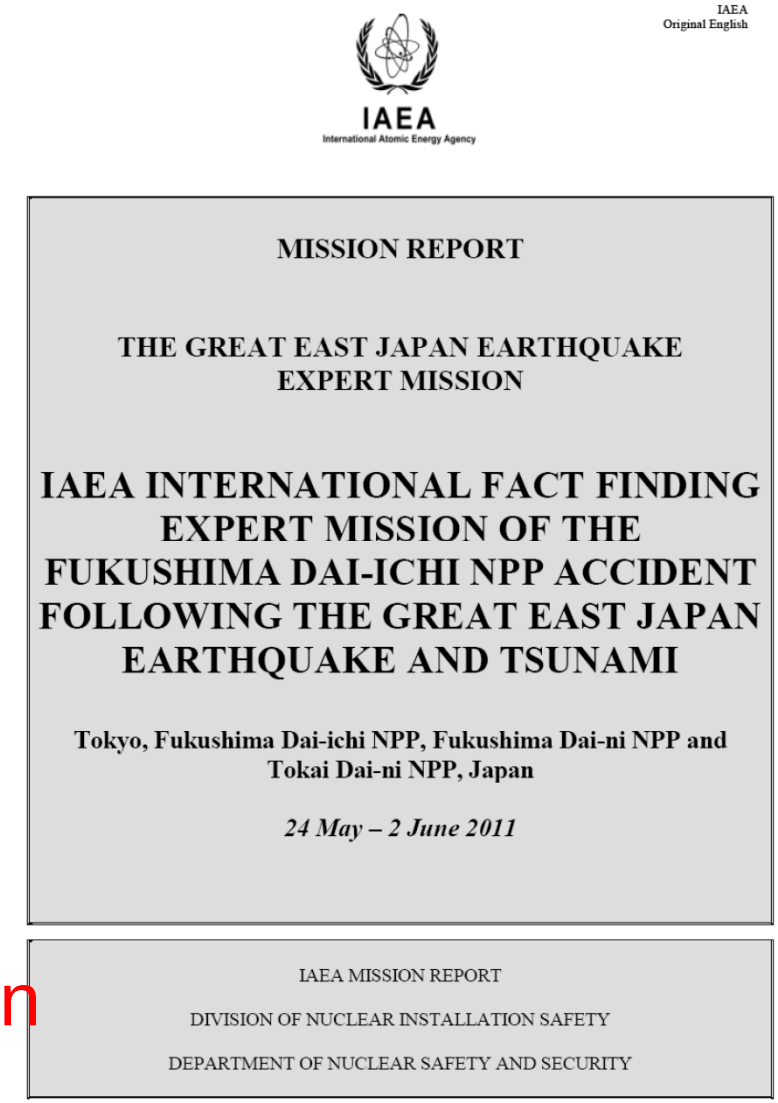
IAEA,OECD/NEA ISOE Committee 7th Chairman

JNES

Wataru MIZUMACHI

IAEA Expert Group conclusion on Fukushima

- This June, IAEA expert group visited Fukushima.
- This group is composed by 18 experts from 12 countries headed by Mr Weightman from HSE, UK.
- There is Jennifer Uhle from USNRC.
- They summarized 15 conclusion and 16 recommendation.



IAEA
Original English

IAEA
International Atomic Energy Agency

MISSION REPORT

THE GREAT EAST JAPAN EARTHQUAKE
EXPERT MISSION

IAEA INTERNATIONAL FACT FINDING
EXPERT MISSION OF THE
FUKUSHIMA DAI-ICHI NPP ACCIDENT
FOLLOWING THE GREAT EAST JAPAN
EARTHQUAKE AND TSUNAMI

Tokyo, Fukushima Dai-ichi NPP, Fukushima Dai-ni NPP and
Tokai Dai-ni NPP, Japan

24 May – 2 June 2011

IAEA MISSION REPORT

DIVISION OF NUCLEAR INSTALLATION SAFETY

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY

IAEA Expert Group conclusion on Fukushima

1. There is a need to consider the periodic alignment of national regulations in particular of the impact of external hazards.
   (every ten years)
   For Fukushima, the original design condition of the tsunami was 3.1m high and in 2002 they revised to 5.7m and ACRS member indicated there is the evidence of 15m tsunami at Jorgan Earthquake in 869.
   The actual tsunami was 14.5m this time .

List of earthquakes in Japan

From Wikipedia, the free encyclopedia

This is a **list of earthquakes in Japan** with a magnitude of 7.0 or above or which caused significant damage or casualties. As indicated below, magnitude is measured on the Richter magnitude scale (M_L) or the moment magnitude scale (M_w), or the surface wave magnitude scale (M_s) for very old earthquakes. The present list is not exhaustive and reliable and precise magnitude data is scarce for earthquakes that occurred prior to the development of modern measuring instruments.

This list is incomplete; you can help by expanding it (http://en.wikipedia.org/w/index.php?title=List_of_earthquakes_in_Japan&action=edit).

~BC 200 Year

Yayoi Earthquake

Date	Magnitude	Name of quake	Japanese name	Rōmaj
November 29, 684	8.0–8.4 (unknown scale)	Hakuko Nankai earthquake	白鳳南海地震	Hakuk Nankai
June 5, 745	7.9 M_s	occurred at Minoh		
July13, 869	8.3 M	869 Sanriku earthquake and tsunami	貞観三陸地震	Jōgan s jishin

56th Emperor Seiwa

Present Emperor is 125th.

All victims by the Tsunami have no responsibilities.

I have all responsibility because the god punished my activities as the emperor.

Do not take any tax from these areas attacked by the tsunami.

I will pray at Ise Temple and the officers should go there and help

all victims.

Clean up the mass of rubble.

858～876 as Emperor

Jorkan Earthquake and Tsunami attacked the same area in 869.

IAEA Expert Group conclusion on Fukushima

2. Strengthen the management in the case of the severe accident.

In Japan, there is the special training on the severe accident at the job site including the prime minister once a year.

But it is a kind of ceremony which means they do not believe the severe accident really happens.

The complicated structures and organizations can result in delay in urgent decision making.

IAEA Expert Group conclusion on Fukushima

3. 2007 IRRS (Integrated Regulatory Review Service) indicated the complicated regulatory organizations.
   There is no answer on this issue from Japanese Government .

IAEA-NSNI-IRRS-2007/01
20 December 2007
ORIGINAL: English

IAEA
International Atomic Energy Agency

INTEGRATED REGULATORY REVIEW SERVICE (IRRS)

TO

JAPAN

Tokyo, Japan

25 to 30 June 2007

DIVISION OF NUCLEAR INSTALLATION SAFETY
DEPARTMENT OF NUCLEAR SAFETY AND SECURITY

R1 **Recommendation:** The role of NISA as the regulatory body and that of NSC, especially in producing safety guides, should be clarified.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES
S1 **Suggestion:** NISA is effectively independent from ANRE, in correspondence with the GS-R-1. This situation could be reflected in the legislation more clearly in future.

Stress Test Report in Europe

- 14 countries within 27 EU countries are operating 148 Nuclear Power Plants.
- They submitted the interim reports on the stress test.
- Every NPSs have concluded as follows.
- It was not necessary to take immediate emergency measures.
- A complementary safety assessment of nuclear installations with respect to similar events should be considered within short term.
- Only Switzerland Muhleberg NPS made modification of the intake structure to restart the plant.
- Final conclusion will be determined mid 2012 in IAEA

NRC published Recommendations for Enhancing Reactor Safety in the 21st Century

- USNRC studied Fukushima accident and summarized 12 recommendations and added 2 more on October.
- It is not necessary to take immediate emergency measures, but they have to reconsider the defense in depth basic philosophy in the long term.

Japan should need the quick actions

- Fukushima made the terribly bad accident.
- Japanese NPSs should reflect these bad mistakes and make the necessary modifications as soon as possible to show the nuclear safety to the public .
- Japan should make the clear phylosophy on the severe accident and require its rule-making with the international harmonization.

Enhancing the system against SA

The most important ones on the nuclear safety are

Water , Electricity ,and Instrumentation

Short Term Modification

- Water supply system to the core without electricity.
- Gas Turbine Generator ,Electric Car and so on.
- Enhancing Instrumentation of water level, pressure, radiation level and so on.
- Training and Education.

Middle Term Modification

- PCV Vent System with Filter working at PCV design pressure by Safety Valve or Rupture Disk.


Thank you for your attention
For more information, please visit:
www.isoe-network.net
www.nea.fr