



**THIRD WORLD SYMPOSIUM
ON SUSTAINABILITY
SCIENCE AND RESEARCH**

Sustainability Futures: Challenges
and Opportunities Towards a More
Sustainable World

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Sustainable Nuclear Energy: Chernobyl and Fukushima Experiences

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OBJECTIVES OF THE PAPER

35 years after Chernobyl disaster and 10 years after Fukushima disaster put a next questions:

1. What are the consequences of these disaster?
2. How to overcome them?
3. What is a future of nuclear energy?

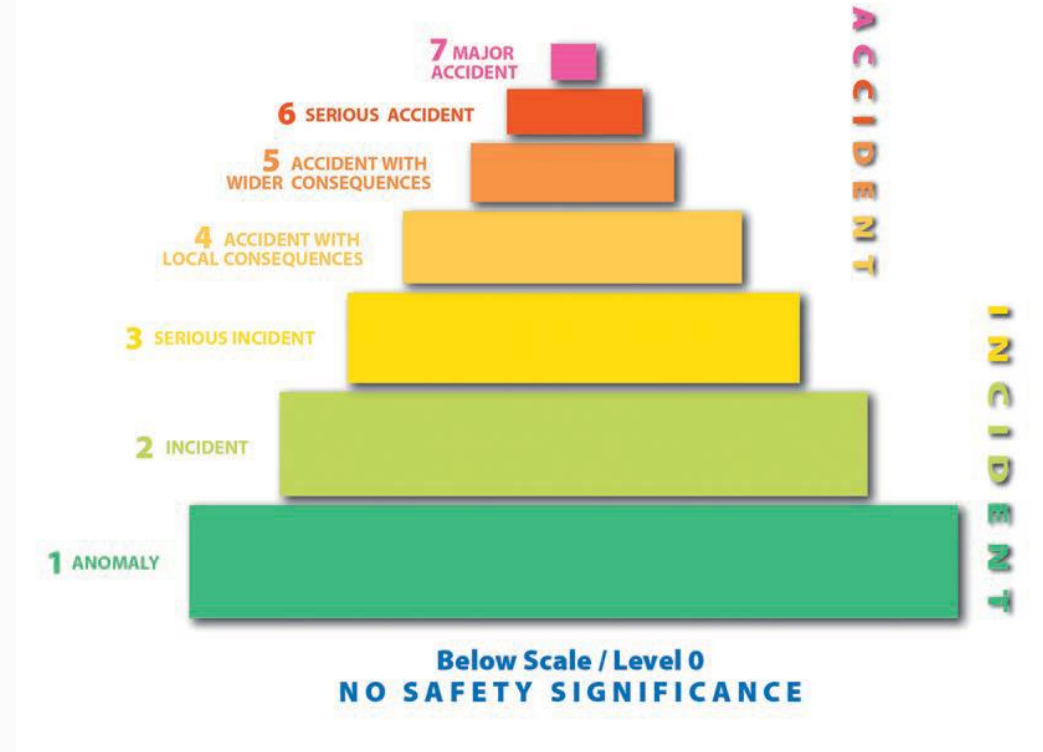
OBJECTIVES OF THE PAPER

Two largest man-made disasters at nuclear power plants in Chernobyl (Ukraine) and Fukushima (Japan) entailed the need to eliminate their consequences for many years.

This led to a decrease in sustainability in regions, including neighboring states: the evacuation of settlements, long-term treatment of people, the need for employment and the provision of benefits for the victims.

Governments of affected nations (Ukraine, Belarus, Russia, Japan and others) are constantly updating their long-term action plans to overcome the consequences of the largest nuclear catastrophes in the history of mankind.

APPROACH USED



Chernobyl and Fukushima disasters refer to 7th level of this scale

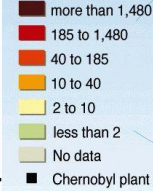
KEY RESULTS

Differences between disasters;

1. Chernobyl is man-made disaster and Fukushima is nature-made disaster.
2. Chernobyl NPS was disposed on continent and Fukushima was disposed by the ocean.
3. Population density:
 - a) Chernobyl – 62 people/sq.km;
 - b) Fukushima – 370 people/sq.km
4. Evacuation of people:
 - a) Chernobyl – 50 thousand people
 - b) Fukushima – 80 thousand people
5. Damage:
 - a) Chernobyl – \$ 200 billion
 - b) Fukushima - \$ 189 billion
6. Radiation channels:
 - a) Chernobyl – atmosphere, soil
 - b) Fukushima – atmosphere, soil, ocean

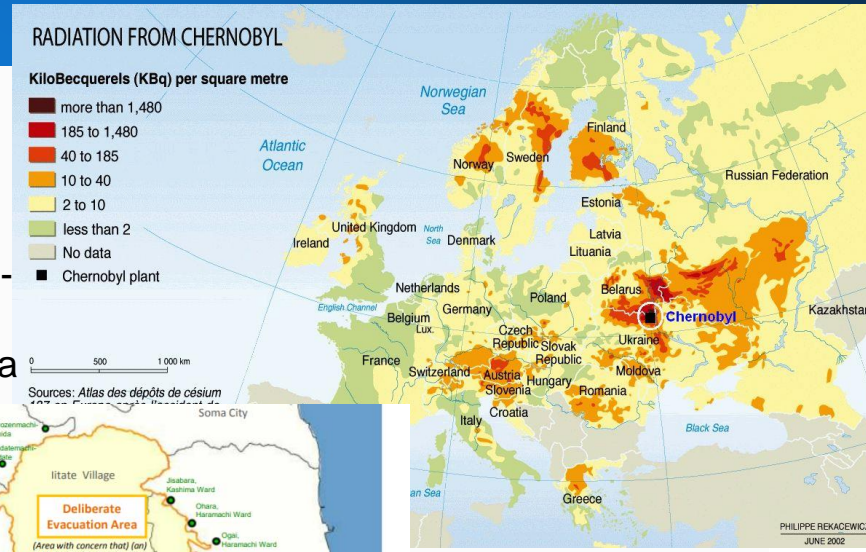
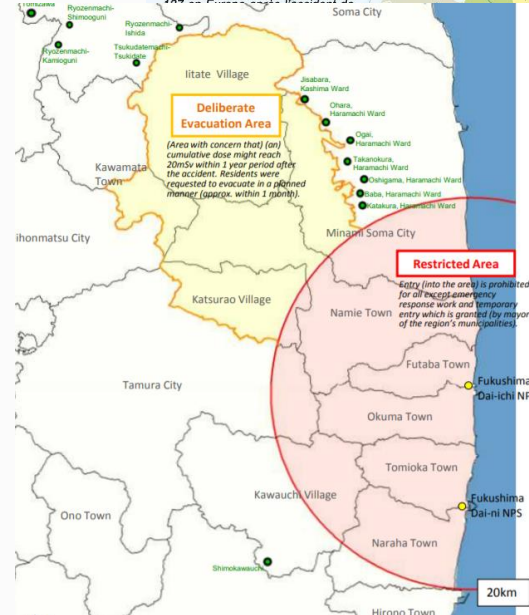
RADIATION FROM CHERNOBYL

KiloBecquerels (KBq) per square metre



0 500 1 000 km

Sources: Atlas des dépôts de césium



DISCUSSIONS

1. Removal from service of NPP with RBMK reactors (by 2034)
2. Experience of Chernobyl was very valuable and was considered in Fukushima
3. NPP become safer, technologies are more dependable than before
4. Renewable energy sources are currently not applicable in all areas
5. Fusion energy is expected to be more prevalent in the near future



MAIN CONCLUSIONS

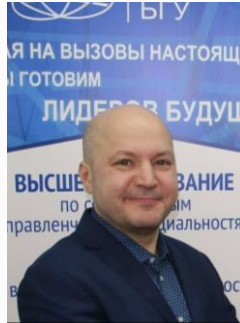
Chernobyl and Fukushima disasters are the largest nuclear accidents.

According to a report by the International Atomic Energy Agency (IAEA), as of 2021, there were 443 operating nuclear power, 51 power units are under construction, 192 power units are closed.

Currently, new countries are choosing nuclear energy to meet their future energy needs. Nuclear new build will offer opportunities for host country supply chain businesses to participate in the construction of the reactors.

To meet the growing demand for reliable, affordable and clean electricity, we will need all low-carbon energy sources to work together.

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