

Rates of dengue increased 30 fold between 1960 and 2010. This increase is believed to be due to a combination of urbanization, population growth, increased international travel and global warming. The World Health Organization counts dengue as one of the 17 neglected tropical diseases. The rate can be decreased

by the inhibition of viral RNA-dependent RNA-polymerase. It is possible to develop entry inhibitors which stop the virus entering cells, or inhibitors of the 5'-capping process, which is required for viral replication.

**Jharna Bhattacharyya\***

---

## Tomography for the Reactors in Japan

**Anil Kumar Ghosh**

The reactor accident of Fukushima Daiichi completes four years on the 11<sup>th</sup> March 2015. The improvements in the reactor compound are tiresome so to say Japan deals with the challenge technologically.

The operation at the damaged nuclear powerplant of Fukushima Daiichi will continue till the middle of this century. The cost estimate lies near about 75 milliard Euro. None can definitely say whether time and money would suffice. The factory association Tepco adheres to part by part success. Till the end of the last year, minimally all 1533 fuel elements from the storage bowl of Block 4 have been successfully salvaged.

This is the beginning, Principal challenge remains whether to get information at all as to how it appears in the cores of the reactors of the blocks 1 to 3. Because it is not possibly to make the robot pictures out of the inner parts as available in other building areas. Electronics refuse partly for the reason of high radiation intensity, the invasive techniques salvage the risk of further liberation of radioactivity.

In the project "Benchmark study of the Accident at the Fukushima Daiichi NPS" the worldwide famous technical organizations, in which the Association for Reactor Safety in Cologne (GRS) have been taken into account as to what must have occurred in the cores of reactors. The onsets of this model are different, they do not always come to the same result but so to say they are consistent. In all the three blocks it has come to high core damage and the damage of the reactor pressure vessel.

How big are the destructions, how much hydrogen is generated along with the models are not in agreement, how the GRS writes in their monthly beginning up-to-date report on Fukushima. In blocks 1 & 3 the nuclear fuel rods presumably molten through the damage of the reactor pressure vessel, the molten mass is placed in the concrete safety container. The experts want to feed the simulations with new available information in future in order to get always an exact picture out of the core of the reactor. A project of Tepco also serves together with the Los Alamos National Laboratory of USA. A detector for myonentomography should help in order to exactly localize the quantity of core burning rods.

The technique makes contact with homonymous elementary particulate which are omnipresent as the component of the cosmic high radiation. With the going through of material myons are scattered, the heavier the atomic nucleus the stronger is the scattering. To that two detectors are brought at the outer wall of the reactor building. These are, however also in the areas which are charged with high radiation. The solution for that must now be developed.

For 2016/2017 Tepco has planned the investigations under the reactor pressure vessels of Block 2. The blocks 1 to 3, the Block No. 2 is damaged the least as per model calculation. Here, Tepco certainly wants invasive trial to inspect the regulating rods below the reactor pressure vessel with the help of a robot and camera.

### **The consequences of reactor accident in Fukushima Daiichi**

- Side by side with the clearing of debris at the power plant compound the consequences of Tsunami and reactor accident till today load the population in the region.
- About 150000 people were evacuated out of the region surrounding Fukushima. The number of those who still live as nuclear refugee is about 125000. The big portion of that lives today in more than 70000 containers.
- On the radiation exposure there are several studies. The WHO in 2012 came to conclusion that the effective doses lie in between 10 mSv to 50 mSv. Investigations of the Fukushima Medical University in December 2014 on 296253 children and youths gave as a result 109 suspected cases of thyroid gland cancer of which 82 were confirmed.

### **The management in Japan wants to shutdown finally the first nuclear power plant**

Two Japanese Electricity suppliers want shortly to begin the shut down of three nuclear reactors. The decision for the withdrawal of the power plants out of the network is based on the consideration of superannuation and high costs for maintenance. It deals with the first shut down since the catastrophe all the reactors had been withdrawn from the network; their re-commissioning is bound with comprehensive safety catalogue.

The decision comes to a point of time, as because the

government in Tokyo formulates a new energy plan. This should be placed at the end of this spring or in early summer 2015. Although Japan wants to hold on the atomic energy. It is expected that in future more than half of the total 48 nuclear power works of the country should be placed out of working condition. Already in the beginning of April 2015 is earmarked for the proclamation.

Kansai Electric Power Co. now announced, to shut-down the reactor Blocks 1 and 2 in nuclear powerworks Mihama during which Atomic Power Co announced the closing of the block in Tsuruga. According to both the suppliers it will be very costly to bring the reactors in the newest stage in view of their explicit tightened up safety requirements for the nuclear powerworks. All the three power plants are older than 40 years and have been rendered inefficient.

The Japanese view the shutdown of reactors as high technical challenge, before all the leakage of radioactive materials which will cost many milliard dollars as per the declaration of energy expert. First in the past weeks the government in Tokyo has changed the regulations by means of which the energy generators can transfer on the users of energy a part of their cost for shutdown. With that Tokyo wants to bring the shutdown process in course.

**Anil Kumar Ghosh**  
*Indian Science Cruiser*

Source: i) VDI Nachrichte 20 Marz 2015, Nr. 12, Seite 10  
ii) VDI Nachrichte 27 Marz 2015, Nr. 13/14, Seite 13

---