The earthquake in Niigata that occurred on 16 July 2007, which was named the ‘2007 Chuetsu Offshore Earthquake’, caused great damage to people’s lives and property. If you look back, over the past twenty years we have had twenty examples of big earthquakes that caused great devastation inside Japan. The damage (50,000 people dead and injured, 250,000 wrecked houses) of the earthquake in January 1995, known as the ‘Great Hanshin Earthquake’, sounded a warning which told us just how frightening it is when an earthquake happens directly above its epicentre in a big city. Among these natural disasters, the one I am particularly interested in caused damage to the Kashiwazaki nuclear power plant during the Niigata earthquake of 2007. The reason for this is that I used to be involved in the safety of a nuclear power plant, working as a design engineer for the nuclear reactor and responsible for the safety of the power plant.

Although I have never been in charge of any Kashiwazaki power plant work or earthquake-proof designing by myself, through the process of filling in the application form for safety inspection, I have had some experience with these kinds of technical situations. This is why I think that the safest buildings in Japan today are nuclear power plants.

Most places in Japan, whether on land or sea, are near active seismic centres. Also, the record shows that we have had more than 130 earthquakes which have caused great damage in the past 100 years. This is why we have been careful to avoid active faults, which is where an earthquake originates, when we select a site for a power plant. Next, the foundation of the reactor is built by digging into the bedrock below the ground and using reinforced concrete. With
Nuclear Power Plant in Earthquake Country

Earthquake-proof construction designed to meet the most stringent safety standards as our top priority, we keep planning and analysing the architecture and the machinery. Moreover, we ensure our calculations are correct by mock-up-testing using large machines that simulate earthquakes. However, the earthquake in Kashiwazaki of 6.8 magnitude emerged from a fault which we hadn’t noticed when we chose the site for the nuclear power plant compound. It was, in fact, a bigger quake than the limit approved by the safety inspectors for earthquake-proof construction.

Nevertheless, at the Kashiwazaki plant, all seven nuclear reactors were successfully shut down. Also, the radioactive leakage was negligible directly after the earthquake and there was almost no negative impact on the environment outside the plant. There are three rules a specialist must follow in an emergency: ‘To stop the nuclear reactor’, ‘To cool off the reactor’, and ‘To trap the radioactive waste’, and all were successfully handled at that time. In reality, the damage to human life happened not in the nuclear plant but outside where fires started in the built-up areas.

Even so, this earthquake created a painful problem for people who were involved in nuclear power plants.

As regards nuclear administration, there is certainly a question of how to make use of this experience to improve the earthquake-proof, safety inspection of the nuclear power plant guidelines. Last year, in September, new inspection guidelines for earthquake-proof construction were put in place. When assessing faults, the old guidelines said that we had to reconstruct an image of how the fault appeared 5,000 to 10,000 years ago. In the new guidelines, however, we are supposed to go back 120–130,000 years. The reaction to an earthquake taking place directly above the epicentre has also changed. Under the old guidelines, it states: ‘Hypocentre magnitude 6.5’. In the new guidelines it states: ‘Hypocentre magnitude 6.5–7.2’. The power companies have to reinforce and remodel the plants that are below the standards according to the changed guidelines, but it is problematic because the guidelines that are essential are constantly changing.

Now I will tell you my personal story. The house I am living in today is thirty years old and made of wood. Several years ago, I went