

Remembering Three Mile Island

There were no fatalities, but the accident at the nuclear power plant on Three Mile Island, in Pennsylvania, lingered in people's minds and had a long-term impact on the development of nuclear energy in America.

| by Yves de Saint Jacob

Bertrand Barré, a French engineer famous for popularising science and an adviser to the chairman of the Areva group, recalls the most serious nuclear accident in America:

'It is 4 o'clock in the morning on March 28 1979 when small operating failures occur at the Three Mile Island nuclear power plant, on an island in the middle of the Susquehanna River. The plant is situated 15 km from Harrisburg, a town of 60,000 inhabitants in the centre of an urban area with a population of 500,000.

The nuclear plant is comprised of two pressurised water reactor units generating 800 and 900 MWe. The so-called TMI1 unit, still in operation in 2009, was started up in 1974, while TMI2 was started up at the end of 1978.

On this particular night, TMI1 has been shut down for recharging and TMI2 is running at 97% of full power. The small failures reported lead to a shutdown of the pumps which feed water to the steam generators. This breakdown by itself is in no way disastrous and the safety procedures are activated. However, misled by ambiguous information from the control instruments, the TMI2 operators wrongly interpret what is happening: while the reactor is losing its water they, on the other hand, believe that the security

systems are injecting too much water and cut them off.

It is only 3 hours and 20 minutes after the accident commenced when the operator recommences the injection of water,



allowing the core to cool again to some extent. However, the damage is already done.

The internal damage was considerable: one-third of the fuel had melted, and another third had been damaged. More than 2,000 m³ of radioactive water spilled into the vault through a breach. However, the melted core remained inside the reactor vessel and the containment shell, which is the third barrier between the radioactivity and the environment, did its job: all the radioactivity remained contained inside the reactor building.

Nonetheless, the Three Mile Island accident terrified America. For a whole week there was debate about whether a partial or total evacuation of the region's inhabitants should take place. More than 200,000 people fled the region. Yet this accident produced no victims (although the panic caused some fifty local women to abort) and the only release of radioactivity into the environment consisted of a mere emission of inert gases with no biological activity.

It should be said that the confusing explanations given by the nuclear safety authority – the Nuclear Regulatory Commission – did nothing to reassure the public, and that the plant's management were subjected to pressure from journalists which they were not prepared for and which was unlike anything previously experienced in this industry.

All the reactors in the world benefited from the lessons learned from the TMI2 accident. It has been estimated that the application of these lessons has reduced the risk of core meltdown in Western second-generation reactors to a tenth of what it was before. Another lesson learned is that it is not enough to control such an accident "technologically" – it is also necessary to control the communication to the press and the outside world.' ■