

‘Everybody has an opinion on nuclear energy’: This scientist is determined to defuse nuclear myths

When Singaporean nuclear energy scientist Ian Ang recently visited his neighbourhood doctor for a check-up, he did not expect a debate over his area of research.

“Oh, I disagree with that,” the general practitioner blurted out upon learning that Ang was a researcher at the NUS Singapore Nuclear Research and Safety Institute (SNRSI).

Ang, 35, is not unfamiliar with the topic of nuclear energy triggering opposition. Instead of feeling disheartened, he saw the moment as another opportunity to debunk fears about nuclear energy. “I think it’s funny that nobody really has an opinion about a researcher, but everybody has an opinion if you are doing nuclear energy,” said the nuclear safety researcher.

Probing further, he learnt the doctor had formed his negative opinion of nuclear energy by “many people dying” due to the Chernobyl and Fukushima nuclear disasters.

In 1986, the world’s worst nuclear accident at the Soviet-built Chernobyl plant in Ukraine exposed millions to radiation and contaminated swathes of land.

Decades later, in 2011, a natural disaster triggered meltdowns at

Japan’s Fukushima Daiichi Nuclear Power Plant. While many had died from those disasters, the UN had concluded in 2020 that there were no radiation-related deaths directly attributable to the Fukushima incident.

Some 18,430 people died or went missing from the earthquake and tsunami in Fukushima, while more than 3,700 died from illness or suicide linked to the tragedy’s aftermath.

Turning to Chernobyl, Ang noted that while about 50 emergency responders died, less than 0.5% of some 6,000 cases of thyroid cancer linked to the accident resulted in death, according to a 2008 UN report. Most thyroid cancer cases can be cured with treatment.

“To me, (Chernobyl) was an issue caused by humans, not really the technology itself,” Ang said.

Research has shown that the explosion arose from design flaws and operator errors. The operators, for instance, were not informed that their actions could cause the reactor to enter an explosive condition.

Encountering public scepticism about nuclear energy had, in fact, cemented Ang’s decision to study the field more than a decade ago.

At the time, he was a physics

student at the National University of Singapore, looking to research anything physics-related, from atomic clocks to solar energy.

In 2014, he landed on nuclear energy for his final-year project after learning that the Singapore Government had set aside \$63 million for a nuclear safety research and education programme.

Convinced that nuclear energy has a strong safety record overall, produced low greenhouse gas emissions, and can help Singapore overcome its resource constraints, Ang then applied, successfully, to SNRSI for a scholarship to pursue a PhD in Physics.

As a doctoral student at the University of Bristol, a leading institution in nuclear research that sits near a nuclear facility, he helped conduct research proving that material from the Fukushima reactor core had escaped into the environment, and developed methods to quickly trace other materials from the reactors.

Since returning to Singapore, Ang has been spending his time digging deeper into nuclear safety.

He is studying the methods and modelling needed for an underground geological repository to store nuclear waste in Singapore, which includes looking into Fin-



Singaporean nuclear energy scientist Ian Ang said encountering public scepticism about nuclear energy had, in fact, cemented his decision to study the field more than a decade ago. ST PHOTO: NG SOR LUAN

land’s efforts to build the world’s first deep geological repository for spent nuclear fuel.

Addressing the misconception that Singapore lacks space for such facilities, he estimated that the world’s current volume of spent nuclear fuel since the 1950s is the equivalent of just 10 Olym-

pic-sized swimming pools.

In contrast, Singapore’s Jurong Rock Caverns has a capacity of 600 Olympic-sized pools. “We have the common argument that Singapore has no space, but one of the advantages of nuclear technologies is actually that the waste is very manageable,” he added.

While Singapore has made no commitment to nuclear energy, Ang is determined to continue hammering out the science needed to make the sector a reality here. He said: “It’s the only energy industry that cares about its entire lifespan and beyond.”

Ang Qing