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Japan's nuclear crisis is expected to boost demand for nuclear specialists globally.

NUCLEAR ENERGY

Defying disaster

The worst nuclear disaster since Chernobyl is unlikely to slow job growth in the industry.

BY QUIRIN SCHIERMEIER

The catastrophe at Japan's Fukushima Daiichi nuclear power plant is likely to have long-term ramifications for the nuclear industry. It is not, however, expected to shrink the number of jobs in the field. In fact, in some niches, such as safety and quality control, the number may even rise.

Despite the crisis, many countries still consider nuclear power an important part of their energy future. Nuclear specialists are therefore likely to remain in high demand. "The tragic events in Japan made everyone take pause, but they will not stop the recent nuclear renaissance," says Elizabeth McAndrews-Benavides, programme manager for workforce development at the Nuclear Energy Institute in Washington DC.

In response to the events in Japan, governments in the United States, Asia and the European Union have ordered additional safety checks that could lead to modifications in plant design and operation. These changes are likely to increase, not decrease, the demand for nuclear professionals, says McAndrews-Benavides. Moreover, says Weston Stacey, a nuclear engineer at the Georgia Institute of Technology in Atlanta, the industry will soon have to replace the thousands of engineers and technicians who are nearing retirement (see *Nature* **459,** 124–125; 2009). In the United States alone, some 38% of the nation's nuclear workforce will be eligible for retirement by 2015, he says.

Many US universities already offer undergraduate to doctoral programmes in nuclear engineering that provide students with solid knowledge and skills in reactor physics, engineering and materials science. Heavily recruited by local utilities and national labs, graduates of these programmes have a promising future, says Stacey.

In Japan, where funding for (and training in) nuclear engineering is detached from normal university funding, scientists expect that collaboration between university researchers and industry specialists will expand in response to the country's triple disaster of earthquake, tsunami and near nuclear meltdown. "This tragedy must make us rethink how we deal with, and respond to, nuclear risks, says Shoji Nagamiya, director of the Japan Proton Accelerator Research Complex (J-PARC). In addition to reactor design and safety, Nagamiya predicts that scientists will be needed to work on health issues such as the effects of nuclear radiation on foods, animals and humans. In some countries, the most challenging obstacle will be to get science students enthusiastic about nuclear energy and technology. In Germany, where the public is notoriously hostile towards nuclear energy, the government ordered that the seven oldest plants be switched off temporarily, and put a three-month moratorium on the previously planned extension of its 17 nuclear reactors.

But even though it is phasing out nuclear energy, Germany must train experts who can cogently and clearly present data on technical nuclear issues to regulators to help them incorporate the information into policy, says Joachim Knebel, chief science officer at the Karlsruhe Institute of Technology in Germany, who has helped set up six working groups to assess the accidents at the Fukushima plant and outline future research needs. "Well-trained nuclear engineers and safety experts will always find jobs, whether in this country or abroad," he says.

The Organisation for Economic Co-operation and Development (OECD) estimates that the 14% of electricity currently produced by nuclear means worldwide will rise by 10–20% by 2050. Sixty-five nuclear plants are currently under construction, 27 in China alone. The United States is building one new reactor, and up to eight are scheduled to go online by 2020. Whether safety reviews ordered in response to the Fukushima events will slow the growth of the global nuclear fleet is not yet clear.

The briskly rising global demand for energy will require all available technologies, including nuclear, says Thierry Dujardin, deputy director for science and development at the Nuclear Energy Agency in Paris. "So whatever nuclear policies some countries may opt for," he says, "the world will need a qualified nuclear workforce for decades to come." ■

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