

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

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A Nuclear Plant for Santa Cruz

The April 9, 1970, Pacific Gas & Electric Company announcement that they planned to build a large nuclear power plant on the coastal terrace just north of Davenport set off a community debate that went on for several years.

On the one hand were those who believed that the creation of new jobs and increased tax base would be a boon for Santa Cruz, whose economy was still based in large part on summer tourism. On the other side was an embryonic environmental community concerned about the potential environmental impacts and safety of a nuclear plant. At that time there were only a handful of nuclear plants across the country.

PG&E in their advertisements at the time stated rather emphatically that nuclear power plants were efficient, economical, safe and clean. They were being perceived by some as the wave of the future, like all electric homes.

A local group soon formed with the acronym of CEDAR, the Committee to Examine the Dangers of Atomic Reactors. This citizen's group, as well as the first Environmental Studies class on the UCSC campus, the Environmental Workshop, both began to look carefully at these four claims.

The class produced a booklet, *Santa Cruz and the Environment*, which took a lot of local heat for publicizing the environmental issues affecting Santa Cruz at that time, including the proposed nuclear plant. This was a striking contrast to the many environmental groups today that are actively engaged locally in every environmental issue that arises, large or small.

Investigating the advertised efficient, economical, safe and clean nature of nuclear plants revealed that none of these claims were really true.

Although nuclear power represents a highly concentrated source of energy, it doesn't achieve the high temperatures of burning oil or coal, so the steam produced doesn't have the necessary temperatures and pressures for efficient conversion of

heat to electricity. As a result, a nuclear plant operates at a lower overall efficiency and requires considerably more cooling water than a fossil-fuel plant of the same capacity.

A closer look also revealed that nuclear plants were far more expensive to build than conventional plants. Much of the cost of the early plants was covered by subsidies, including about one-third of the construction costs coming from the Atomic Energy Commission, which had the conflicting roles at that time of both promoting the use of nuclear energy but also regulating it. The federal government was also subsidizing the insurance, the fuel, as well as the removal and storage of radioactive waste.

Safety is a much more serious issue with a nuclear plant than a fossil fuel plant, simply because the accidental release of radiation can be carried over large distances by wind and water, stays around for a long time, and can produce both immediate and long-term impacts. While there had been a number of accidents in test and experimental reactors at that time, there had been relatively few commercial plants in operation such that their overall safety record was good.

The partial meltdown of the Three-Mile Island plant in Pennsylvania in 1979, followed by the Chernobyl disaster in the former Soviet Union in 1986 with the release of radiation that spread over much of western Russia and Europe, and then the Fukushima Daiichi disaster in 2011, all contributed to a much greater public concern for the safety of nuclear plants. Ultimately nuclear plants all depend upon error free construction and operation, and unfortunately humans are not quite perfect.

While nuclear plants don't produce the visible emissions of fossil fuel plants, they do produce radioactive wastes. Of greatest continuing concern has been the spent fuel, high-level radioactive waste that must be isolated from humans and the biological environment for thousands of years, which is still being stored in huge tanks in the states of Washington, Idaho and South Carolina. No permanent solution has yet been agreed upon such that California banned any new nuclear plants decades ago until this waste storage/disposal problem had been resolved.

Ten nuclear power plants were proposed over the years along the California's coastline; only four were ever built; three of those have now been closed.