Wooing Mexico to nuclear power

Atoms for Peace and U.S. manufacturers sold the Mexican government on an ambitious nuclear power program in the late 1960s. The program has dwindled to one embattled reactor, 13 years overdue and 5,400 percent over projected cost.

by Octavio Miramontes

In the face of mounting criticism, Mexican government officials continue to prepare for startup of Mexico’s first nuclear power plant at Laguna Verde in Veracruz, on the Gulf of Mexico coast. Many critics, grouped around the Coordinadora Nacional Contra Laguna Verde (CONClAVE)—a national coalition of several antinuclear and environmental groups, housekeepers, farmers, and intellectuals—point out that the plant’s construction is shoddy, the design faulty, and its performance poor. They also question the need for a nuclear power plant in a country so rich in non-nuclear resources. In response, the government has mounted expensive publicity campaigns that have failed to persuade a skeptical public of either Laguna Verde’s benefits or safety: “The French love life too” says one of the many publicity slogans used to give the idea that nuclear energy is free of dangers.

If Mexico’s Laguna Verde nuclear power plant does go on line this year, it will be 13 years overdue. In the meantime, the cost of the plant, a 654-megawatt General Electric Mark II boiling-water reactor, has mushroomed from $128 million to $3.5 billion—a cost overrun of 2,600 percent. Since this figure fails to account for the costs of imported fuel, maintenance, eventual decommissioning and dismantling, and disposal of radioactive wastes, some critics estimate that the true costs of Laguna Verde will be closer to $7 billion—a 5,400 percent overrun.1 In fact, Laguna Verde will be the most expensive commercial source of electrical energy in the country.

In the aftermath of the accident at Chernobyl, nuclear reactor safety issues have been in the forefront of the nuclear debate, and the Mexican public views safety at Laguna Verde as very important. Many academics, politicians, and intellectuals have criticized the plant, citing many safety flaws. Critics include past presidential candidates from the political opposition, past top government energy officials such as Jacinto Viqueira and Jorge Young, and prominent scientists. Several major demonstrations in Mexico City and in the state of Veracruz suggest that a sizable portion of the general public rejects the project.

But Mexican nuclear power officials do not seem to care. Statements like “the nuclear power industry is at present as healthy as any other,” or “accidents could not happen here” are the usual responses. Plant officials Juan Eibenschutz, Rafael Fernandez de la Garza, and Ramon Cosio respond that the plant has been constructed following international norms and quality standards, and they argue that critics are misinformed. These officials have invited international visitors to the plant, but they have been very careful to invite only those who promote nuclear energy, such as International Atomic Energy Agency officials Noramyl Bin Muslim and Morris Rossen, who dutifully noted that “Laguna Verde guarantees the maximum safety.”

But Laguna Verde’s design flaws were first identified in U.S. Atomic Energy Commission (AEC) memoranda written between 1971 and 1972, and released in 1978 by the Union of Concerned Scientists and in the Reed Report—a General Electric internal safety assessment study made in 1975 but secret until 1987.2 And the flaws of the boiling-water reactor may have been compounded during construction, when the steel reactor vessel was dropped from a crane and fell to the ground. During operating tests, sea water accidentally entered the reactor containment building, and this may have led to corrosion.3

Mexico’s safety agency, the Comisión Nacional de Seguridad Nuclear y Salvaguardas (CNSNS), is required by law to watch over safety and, as an independent agency, grant an operating license to the Comisión Federal de Electricidad (CFE), the state-owned utility for power production which runs the project. Although the operating license has been granted, there are no documents showing that CNSNS conducted any safety assessment. In fact CNSNS plays the same ambiguous role as the old U.S. AEC because it is managed by the same ministry that owns the CFE. Thus it promotes nuclear energy while supposedly overseeing safety.

CNSNS has been criticized for negligence in the past due to its poor management of radiation accidents. In 1984 in Ciudad Juarez, a frontier city, the worst radiation accident in North America occurred when cobalt 60 pellets from a cancer therapy machine were inadvertently smelted in an iron foundry. Some of the metal pieces produced at the foundry were exported to the United States, where the radioactivity was first detected. In the meantime, several houses were built with radioactive iron rods, and their occupants received unknown levels of radiation. CNSNS did not release a study of this accident or make public any plan to institute preventive measures. U.S. officials expressed concern about CNSNS handling of the accident.4

Current safety precautions are no more encouraging. Since “the reactors were bought in the United States, the regulatory guidelines to be used in the Laguna Verde plant have
been taken from the U.S. Nuclear Regulatory Commission, according to the 1978 annual report of the Instituto de Investigaciones Electricas, the state-owned electrical research center that works in close cooperation with the CFE. But NRC guidelines have been adopted wholesale, and are not compatible with local conditions. This is particularly evident in emergency planning: population, roads, emergency facilities, and topography are very different in Mexico from conditions in the United States. No effort has been made to develop emergency plans or regulations appropriate to local realities. The current emergency evacuation plan is merely a combination of nuclear power boosterism and badly translated, out-of-date U.S. NRC documents.

Expert analyses of the emergency plan have pointed out its inadequacies and the impossibility of evacuation, contending that radiological protection of the public has been ignored. Critics argue that there are inadequate medical facilities, roads, communications, and economic resources to handle a major radioactive release.

Less than two months after the plant was loaded for pre-operational testing in October 1988, two accidents occurred, producing ruptured pipes. Had the plant been on line, the accidents would have been severe. In one case, plant officials and local authorities tried to hide the accident, claiming that military, police, and medical personnel were mobilized as part of a safety exercise. Eventually the authorities were forced to admit the accident, and a commission of the Mexican House of Representatives investigating the incidents recommended that a number of officials be dismissed for having deliberately misled its investigators and the public. The accused officials include J. Eibenschutz, deputy director of the CFE; Rafael Fernandez de la Garza, director of the plant; and Miguel Medina, director of the CNSNS. No decision has been made on this recommendation.

As a country with proven and potential oil reserves currently estimated at about two trillion barrels, Mexico is among the most oil-rich countries in the world, and a leading oil exporter. Mexico also has significant geothermal and hydrologic power potential, particularly in view of domestic engineering experience in these fields. In contrast, Mexico lacks the technology to exploit its uranium deposits.

Encouraged by the U.S. Atoms for Peace program, in the late 1960s many countries designed ambitious programs for nuclear power plants, and Mexico was no exception. The Mexican government sent a number of scientists and technicians for foreign training in nuclear energy sciences and
engineering, and these people are today the nuclear promoters in charge of key energy projects. At that time Mexico planned to build at least 20 nuclear plants by the end of the century, which would produce a total of 21,000 megawatts, estimated to represent 16.6 percent of total electricity production in Mexico by the year 2000. For mainly economic reasons, only the Laguna Verde Unit 1 has been completed.

Many top government officials and scientists from the nuclear establishment, some of them at the National Council for Science and Technology, the Physics Institute of the National University, and the National Institute for Nuclear Research claim that Laguna Verde is essential because it signals an era of progress and modernity. They argue that it will save hydrocarbons, and add to engineering experience and technical knowledge. But subjecting these claims to closer scrutiny is revealing. Nearly all of the nuclear technology has been imported. In turn, Mexico gets hard currency from oil exports. This means that Mexico must sell hydrocarbons to pay for the nuclear power plant. It has been estimated that Mexico will have to export about 345 million barrels of oil to cover the cost of the plant, but the plant will save only about 240 million barrels. In an effort to save hydrocarbons, Mexico will lose 105 million barrels of oil and gain hundreds of tons of radioactive wastes.

The effort to save hydrocarbons would be more effective if a way could be devised to use the millions of cubic feet of natural gas that Mexico has been burning in the atmosphere each year—about 100 million in 1986. In fact, critics of Laguna Verde claim that the plant could be converted to a gas electric plant using the gas that otherwise is lost. Laguna Verde is near the southern oil-rich regions and a partially used gas duct passes in front of the plant site.

Nor has Mexico gained any significant engineering experience or technological knowledge from the plant. The reactor was bought from General Electric, and the turbogenerator from Mitsubishi. The construction work was initially conducted by Burns and Roe, a U.S.-based firm. Their contract was retired following an assessment made by Bechtel, another U.S. firm, recommending that the contract be given to Ebacso Services Inc., a New York-based firm. Imported construction of the Laguna Verde project means that the effective transfer of technology or basic engineering experience is negligible. The operation could best be described as a turnkey project. And, since Mexico lacks the ability to process and enrich nuclear fuels, they must be purchased in the international market. For Mexico, nuclear technology is thus a turn backward from self-sufficiency toward energy dependency and vulnerability.

The Mexican Government has been an important promoter of nuclear disarmament and was a leader in establishing the 1967 Treaty of Tlatelolco which bans the production and stockpiling of materials that could be used for nuclear weaponry, making Latin America a nuclear-weapons-free zone. Mexico has also promoted and endorsed international initiatives related to the environment. But like other power reactors, Laguna Verde will produce plutonium along with other radioactive wastes. At first, the wastes will be stockpiled in the reactor’s pools. Mexican law forbids military uses of nuclear materials, and the government has given international guarantees, through the International Atomic Energy Agency, that nuclear energy will never be used for these purposes. But the government has not yet announced long-range plans for disposing of the plant’s wastes. Mexico’s prestige as a leader in disarmament and environmental affairs could be diminished, as Greenpeace International Chairman David MacTaggard and Austrian Green party Chairwoman Freda Meissner pointed out in letters to President de la Madrid.

If Mexico goes nuclear, it will be a doubtful triumph for the country but it will make a rare success for the U.S. nuclear industry, which has been unable to sell, without subsequent cancellation, any nuclear power plant in its own market since 1973. As the world heads away from nuclear energy, seeking clean and safe energy technologies, both economic and safety issues are systematically ignored in the Mexican nuclear program.

7. Gabriel Quadri, “Energía y Desarrollo.”