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An international agency that monitors nuclear-power plants around the world faces crucial tests of its ability to spot any diversion of fuel for making atomic weapons. A change of policy in Washington may help the effort — or hurt it.

TRYING HARDER TO BLOCK THE BOMB

By Judith Miller

Valindaba, Angra, Osirak, Dimonah, Embalse, Kahuta, Tarapur ... the names are known to few, but they hold the potential for making the world more perilous for everyone. With a macabre poetry, nations have often turned to myth or the gods in choosing names and sites for their nuclear-energy facilities. Iraq's Osirak is derived from Osiris, god of the underworld in Egyptian mythology. Dimonah was a biblical town given unto to the tribe of the children of Judah. South Africa's choice was particularly evocative: Derived from the African language Sotho, Valindaba means the place where "we don't do much talking."

By contrast, there is little poetry at U.N. City, the antiseptic modern complex on the outskirts of Vienna that houses the International Atomic Energy Agency (I.A.E.A.) and several other United Nations bodies. The development's steel-gray towers and color-coded corridors are filled with engineers, scientists, lawyers and international civil servants who talk, in the mind-numbing parlance of arms control, of such things as "nuclear nonproliferation" and the "international safeguards regime."

In plain English, the I.A.E.A.'s mission is to promote the work of those places named for myths and gods and to monitor the sites at the same time, so that the agency can assure the world that some 840 nuclear facilities ostensibly dedicated to the production of nuclear power and research are not being used to make atomic weapons.



In many respects, the agency can claim a laudable record. After the dawn of the atomic age over Hiroshima in 1945, there were dire predictions that the world would soon be populated with dozens of nuclear-weapons states. But the nuclear club has remained fairly exclusive, boasting only five members: the United States, the Soviet Union, Britain, France and China. Eight years have passed since Prime Minister Indira Gandhi received the message "The Buddha is smiling," which told her of the success of India's nuclear test; yet India has held back from producing nuclear weapons.

Now, however, nuclear-policy analysts are warning with renewed fervor that the world is on the verge of a dangerous increase in the number of nuclear-weapons states. Soon, they say, several less-

developed nations — even some headed by irresponsible and irrational leaders — will possess the instruments of Armageddon. At the same time, the United States and the Soviet Union are intensifying their nuclear-weapons programs, and the Reagan Administration has adopted a new nuclear-export policy that, in the view of many critics, reduces safeguards against the diversion of nuclear fuel for military purposes. The response has been a rise of antinuclear movements in Western Europe and the United States demanding not only a freeze and reduction in weaponry but an end to the spread of atomic power.

These developments have focused attention on the International Atomic Energy Agency. As the agency prepares to celebrate its 25th anniversary at a general conference starting on Sept. 20, doubts about its ability to carry out its mandate are mounting. Within the past year, two former I.A.E.A. inspectors have charged that the agency is incapable of quickly catching a country that is secretly using its nuclear facilities to make bombs. Last November, the United States Nuclear Regulatory Commission informed Congress that the agency's safeguards system was inadequate for some

kinds of facilities. Senator Alan Cranston, minority whip, charges that the United States and other governments have been covering up the agency's failings so that they can pursue their nuclear commerce. Representative Edward J. Markey, Democrat of Massachusetts, says, "The I.A.E.A. has become little more than an international nuclear boosters club."

At U.N. City — or the Vienna International Center, as it is officially called — Hans Blix, the I.A.E.A.'s new director general, contests the justice of these accusations. "Our role is not understood by many in your country," said Mr. Blix, who is a Swede, in a recent interview. "We are not international nuclear policemen. We can't roam about searching for clandestine facilities, sniffing out hidden plutonium and uranium."

In their rounds of the world's nuclear-power plants, the agency's inspectors, recruited from many of its 111 member countries, may inspect seals on sensitive material that can potentially be used in weapons. They look at millions of slides from cameras monitoring huge indoor cooling ponds, where spent, or used, nuclear fuel is stored. They pore over records of fuel inventories to insure that all the material that went into the reactor came out and was accounted for. Yet, in the light of all the complexities, the inspectors' role is very circumscribed, and they may visit only those facilities that are designated by the government involved.

"I'll tell you what we are," Mr. Blix said. "We are somewhat like an airport security system. Of course there are deficiencies in the X-ray system that inspects your luggage. Sure, the system could use more security guards. But why concentrate on this when there are passengers on your plane who refuse to submit any luggage at all to inspection? Or why not worry about the passenger who says, 'I'll submit this bag but not these other three'?"

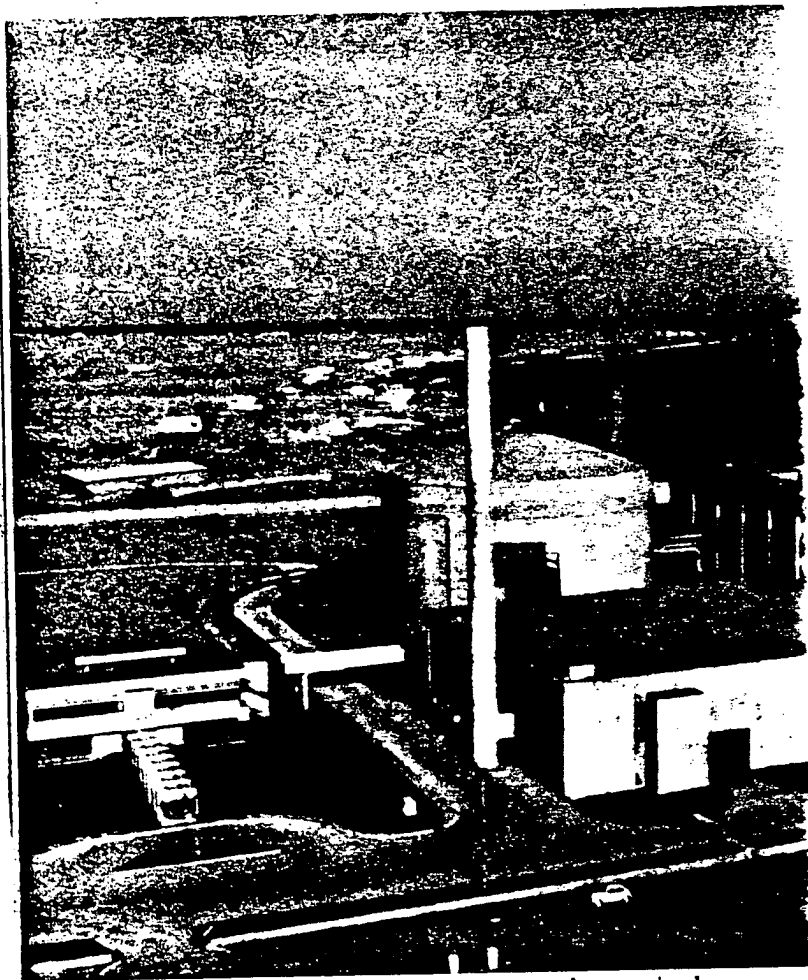
His analogy goes to the nub of one of the clearest challenges to the agency's effectiveness — the Pakistani nuclear reactor near Karachi.

For months, I.A.E.A. inspectors had been reporting disturbing incidents at the Canadian-supplied nuclear facility. Cameras monitoring the cooling pond began failing at an astonishingly high rate; their pictures showed a blur. The Pakistanis' odd explanation was that a tarpaulin had been placed over

the pond while the pond was being painted. Monitors installed near the reactor's exits were registering the passage of radioactive substances. Inspectors, according to intelligence reports, found a large, unexplained hole in a wall.

Matters came to a head a year ago. "It looked like a diversion," recounted a Congressional expert. "It smelled like a diversion. But, as usual, there was no actual proof that a diversion had occurred."

Pakistan had been a problem all along. It had declined to sign the Nuclear Nonproliferation Treaty of 1968, under which nations without nuclear weapons agreed to forswear their development. So only some of its facilities were open to inspection — only those where safeguards had been made a condition of a foreign sale. Pakistan's former President, Zulfikar Ali Bhutto, had vowed that his country would "eat grass," if necessary, to match the detonation of India's so-called "peaceful nuclear explosive" in 1974. In addition, Pakistan had established a worldwide network of purchasing agents, including phony companies and spies, to obtain components for a uranium-enrichment plant, which can be used to fabricate fuel for weapons.



Suspicious events at Pakistan's nuclear reactor have raised

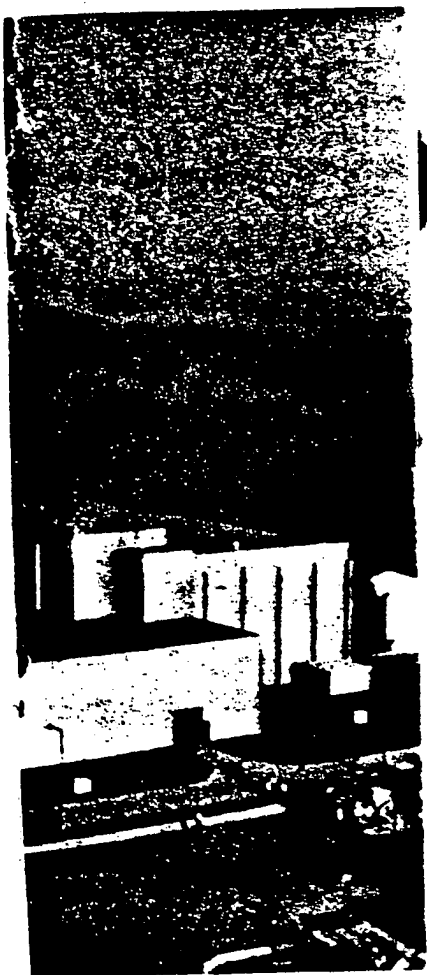
Now came these "anomalies" and "irregularities," as the agency preferred to call them, at Pakistan's deuterium uranium reactor. In this type of facility, which the United States does not sell, fuel rods are loaded into the reactor and extracted from it without any shutdown of the plant and mostly without the presence of inspectors. Since the fuel for the Pakistani reactor is produced domestically, the agency had no right to oversee production and count the number of rods made. Theoretically, therefore, it was possible for the Pakistanis to load and extract more fuel rods than the inspectors were aware of. And, theoretically, any rods that slipped by could be used to make bombs.

The I.A.E.A. had been monitoring the installation of the fuel rods, but as Pakistan's fuel-production capability increased, the inspectors felt they needed more cameras and other surveillance equipment. The agency asked Pakistan for permission to install more monitors; the Pakistanis balked. This dispute, combined with the suspicious activities reported by the agency's inspectors, led to a dramatic warning. In September 1981, Sigvard Ek-hund of Sweden, the agency's

director general at the time, informed his board that the agency could no longer provide assurances that Pakistan was not diverting nuclear fuel for military purposes.

His statement — the agency's first acknowledgment of this kind — shook the international safeguards system to its foundation. In the face of the uproar in various capitals, including Washington, Pakistan agreed to some of the I.A.E.A.'s requests. But, as Mr. Blix, the new director, emphasized in his best bureaucratic statement last February, "full implementation of safeguards is needed before requisite assurance of verification can be made by the agency." The deadlock continues to this day.

Moreover, disquieting reports have continued to reach Washington. Pakistan, according to American officials, has been trying to make secret purchases of highly sensitive diagnostic coaxial cable from European and American suppliers; the cable can be used to monitor underground tests. The Pakistanis, the same officials report, have dug a huge tunnel in the Baluchistan Mountains near the Afghan border, where such a test could be



CANADIAN GENERAL ELECTRIC

fears of secret fuel diversion.

conducted. And, these sources say, Pakistan recently approached the French and other suppliers for 13-inch metal globes for shaping uranium, instruments primarily used in nuclear explosions.

Despite these developments, the lesson as Mr. Blix sees it is that "the system works" — at least as far as his agency is concerned.

"We have rung the alarm," he said during the interview in his Vienna office. "That is the end of our role. The governments must now decide what to do about Pakistan. Safeguards, after all, are not an end in themselves."

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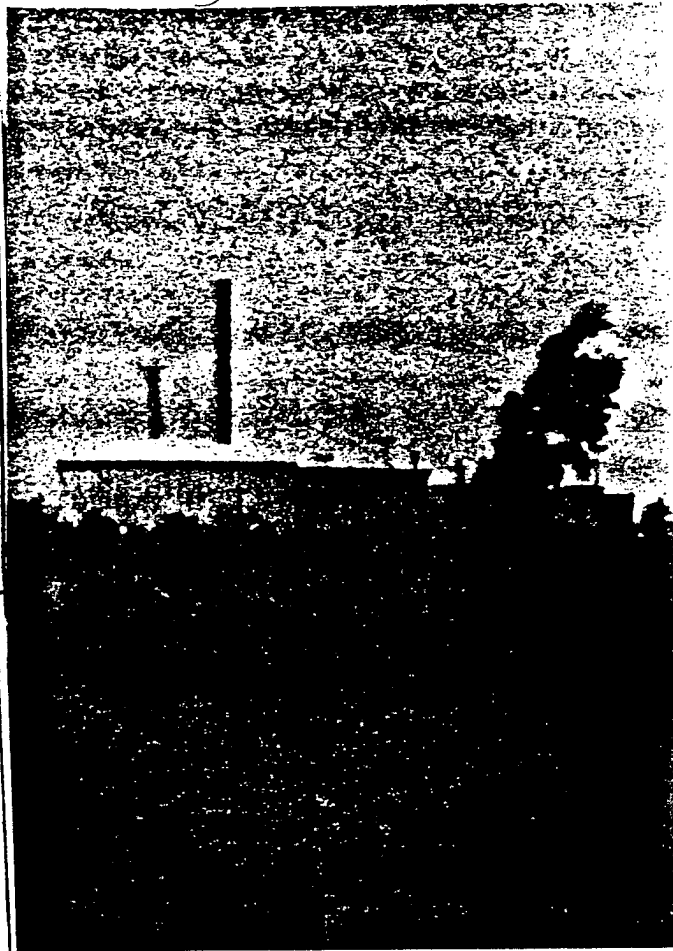
If the I.A.E.A.'s safeguards are alarm bells whose usefulness depends on how the member governments respond to the warning, then the agency's effectiveness depends first and foremost on the United States, the leading exporter of nuclear technology. Consequently, the most significant factor in the whole situation may be the change of policy instituted by President Reagan.

Every nuclear reactor is a potential bomb factory. Highly enriched uranium, which is burned in reactors to produce power, can also be

used directly in weapons. Uranium rods that are "cooked" in a reactor to produce power also produce plutonium, another weapons substance. If a country wants to make plutonium bombs, it separates the plutonium from the spent, or used, fuel rods through what is known as reprocessing.

What arms-control experts fear most in the whole process is the development of trade in plutonium. Such commerce, they say, would immeasurably complicate efforts to curb the spread of atomic weapons, while substantially increasing the threat of nuclear terrorism. Man-made and highly toxic, plutonium is an extremely dangerous bomb-making material. Only 10 to 20 pounds are required to make an atomic device. A far smaller amount placed in a building's ventilation system could kill hundreds of people, some experts say, by poisoning the air.

Presidents Ford and Carter sought to raise international consciousness about sensitive nuclear exports — equipment that is very difficult, if not impossible, to safeguard. Mr. Carter in particular tried to persuade European suppliers not to export enrichment plants or reprocessing facili-



Iraq's nuclear plant before its destruction in an Israeli air raid.

ties — or breeder reactors, a type of facility that produces more plutonium than it consumes. Mr. Carter banned commercial reprocessing and breeders in the United States. He also vowed to deny nuclear fuel and technology to any nation that did not submit to international controls.

Toward the end of his Administration, however, Mr. Carter began backing away from his strategy. Even though his message on the perils of proliferation was making an impact on the Europeans and the Japanese, the friction produced by their unwillingness to give up reprocessing was interfering with broader foreign-policy objectives, particularly after the Soviet invasion of Afghanistan. This exposed him to attacks on two fronts — by those who ridiculed his policy as overly ideological and by those who charged him with inconsistency.

President Reagan's policy differs from Mr. Carter's in tone and substance. Despite statements to the contrary, stopping the spread of nuclear weapons plays a less prominent role in the spectrum of foreign-policy objectives. Administration officials have adopted a security-oriented approach to the

problem: They argue that third-world nations can best be dissuaded from acquiring atomic weapons if their security concerns are allayed. This approach has resulted in greater emphasis on military aid and security arrangements and less emphasis on public efforts to tighten international nuclear controls. Mr. Reagan has canceled the ban on domestic breeder and reprocessing technology and has vowed to stimulate both efforts.

Reagan officials argue that it is best to recognize "reality." The Europeans and the Japanese, they say, have been adamant about reprocessing because they are determined to reduce their dependence on

imported oil and imported uranium, and to establish an independent nuclear-power capability. With that as a national goal, it is reasoned, these nations will eventually turn to plutonium no matter what Washington says or does. Thus, officials explain, the Reagan policy is aimed at limiting the use of plutonium to Japan and the Western European allies, which (with the exception of Britain and France) are not likely to build nuclear weapons.

At the same time, they add, the Administration is committed to tight international controls on the sale of all sensitive technology to suspect countries, and they claim that private diplomatic efforts are succeeding in reducing this flow. Finally, they say, the Administration is seeking to re-establish the United States as a "reliable supplier" of nuclear fuel and nonsensitive technology in order to reduce the temptation for third-world countries to go their own way and develop facilities that are not under I.A.E.A. controls.

"There's not all that much difference between Carter's and Reagan's export policies in practice," asserted one long-time arms-control official. "The Reagan Administration is just more discriminating in its approach."

But critics, who include some moderate Democrats and Republicans in Congress, vehemently disagree. Senator Charles H. Percy, Republican of Illinois and chairman of the Foreign Relations Committee, and Democratic Senators Cranston of California, John H. Glenn of Ohio and Gary W. Hart of Colorado, have accused the Administration, in Mr. Glenn's words, of "turning the clock back to the days of laissez-faire nuclear commerce of the early 1970's."

They are particularly critical of the decision on reprocessing. This approach, they warn, will result in the spread of reprocessing facilities not only in Western Europe and Japan but eventually in less reliable countries. These facilities, they say, will generate thousands of pounds of plutonium — enough material for hundreds of bombs. This fuel, they caution, can be diverted and converted very quickly for use in atomic weapons. Moreover, they argue, the Administration will not be able to discriminate so neatly between reliable and unreliable nations.

The critics also assail recent Washington decisions they regard as capitulation to Japan's wish to use plutonium rather than uranium in its existing reactors and as encouragement to American companies to vie for reprocessing construction contracts. In the critics' view, the Administration has gone beyond acquiescing to "nuclear reality" and has been creating new realities with fateful implications for the world.

"Our Government has long acknowledged that the I.A.E.A. cannot adequately inspect reprocessing plants," said Paul Leventhal, president of the Nuclear Control Institute, a private watchdog group. "Yet the White House is promoting the very technology that the agency cannot safeguard. This is really the beginning of the end."

At the I.A.E.A. in Vienna, the reaction to the Reagan approach is mixed. Officials fear that if reprocessing

spreads widely, they will not be able to provide "timely warning" that a "significant amount" of plutonium — enough to build a bomb — is being diverted. "We are stretched to our limits already," said a senior agency official. "There is no way that we will be able to provide assurances that thousands of tons of plutonium are being devoted to peaceful purposes. And that seems to be where the world is heading."

On the other hand, the Reagan philosophy of seeking to allay the security fears that make countries hanker for nuclear weapons was strongly endorsed by Mr. Blix and other officials. "Security considerations are decisive," Mr. Blix said. "If a country feels secure, it is more likely to invite us in. Insecure countries are more likely to seek atomic bombs."

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From the vantage point of U.N. City, the tests of the Reagan Administration's approach are multiplying.

Not all of the I.A.E.A.'s member governments have signed the 1968 nonproliferation treaty. Under the Ford-Carter policy, Washington put pressure on the holdouts to sign; agency officials sense that under the Reagan



VICTOR LUBENCH

Atomic agency head Hans Blix: "The alarm bells are ringing."

Administration this pressure has let up. The nations that did not sign the treaty submit some but not all of their atomic facilities to inspection. Pakistan, India, Israel and South Africa were among the member nations that refused to sign, and all four have either developed or are close to developing a nuclear-weapons capability.

In its 1981 annual report, the agency admitted that it could no longer guarantee that two unnamed countries — known to be Pakistan and India — were not diverting nuclear fuel for use in a weapons program. Many intelligence analysts believe South Africa secretly assembled and tested an atomic device in September 1979. Israel is believed to have a number of unassembled, untested nuclear bombs — to be a screw-driver-turn away from full nuclear capability. "The alarm bells are ringing loud and clear with respect to these four," Mr. Blix declared.

There is growing anxiety, too, about nations suspected of engaging in what is known as "phantom proliferation" — pledging commitment to nonmilitary use of the atom but secretly putting together the pieces for a potential bomb. Libya, for example,

has ratified the nonproliferation treaty, and so far has purchased only one small, Soviet-supplied research reactor. Yet Western intelligence agencies report that the Libyan leader, Col. Muammar el-Qaddafi, has tried secretly to buy bomb components and fissionable material, from several countries, including China.

Industry sources report that Colonel Qaddafi has bought more than 1,000 tons of uranium concentrate, or "yellow cake," from Niger, a material that can be converted into a substance suitable for weapons making. The Reagan Administration has quietly asked other nuclear suppliers not to cooperate with Libya. It has

pressed Belgium — with little success — not to proceed with plans to sell Libya a UF4 plant, which would enable Colonel Qaddafi to proceed with conversion of his massive yellow-cake stockpile.

Then there is the case of Argentina, one of the I.A.E.A. members that did not sign the 1968 nonproliferation

treaty. Argentina, whose nuclear program is in its 31st year, has been working openly to acquire the ability to produce on its own all it would need to build nuclear-power plants. When and if Argentina succeeds in completing its own independent nuclear-fuel cycle, it will be able to make nuclear fuel — and, theoretically, nuclear weapons — without violating any of the 11 safeguard agreements it has signed with five supplier countries under the auspices of the I.A.E.A.

Moreover, Rear Adm. Carlos Castro Madero, head of Argentina's Commission on Atomic Energy, has stated that Argentina might export plutonium soon to be produced in a reprocessing plant. "In addition to building a bomb themselves, the Argentines now seem intent on helping others do it," said an exasperated I.A.E.A. official. Whatever Argentina's determination to acquire nuclear-arms capability, it can only have been heightened by its defeat in the Falkland Islands war.

American and international experts list Iraq, Taiwan, South Korea and Brazil as other aspirants to nuclear-power status, though all four are I.A.E.A. members and all except Brazil signed the 1968 treaty. The Iraqi program became a major crisis for the I.A.E.A. when Israel carried out an air strike against the Iraqi nuclear reactor in June 1981, claiming it had detected advanced preparations for the manufacture of atomic weapons.

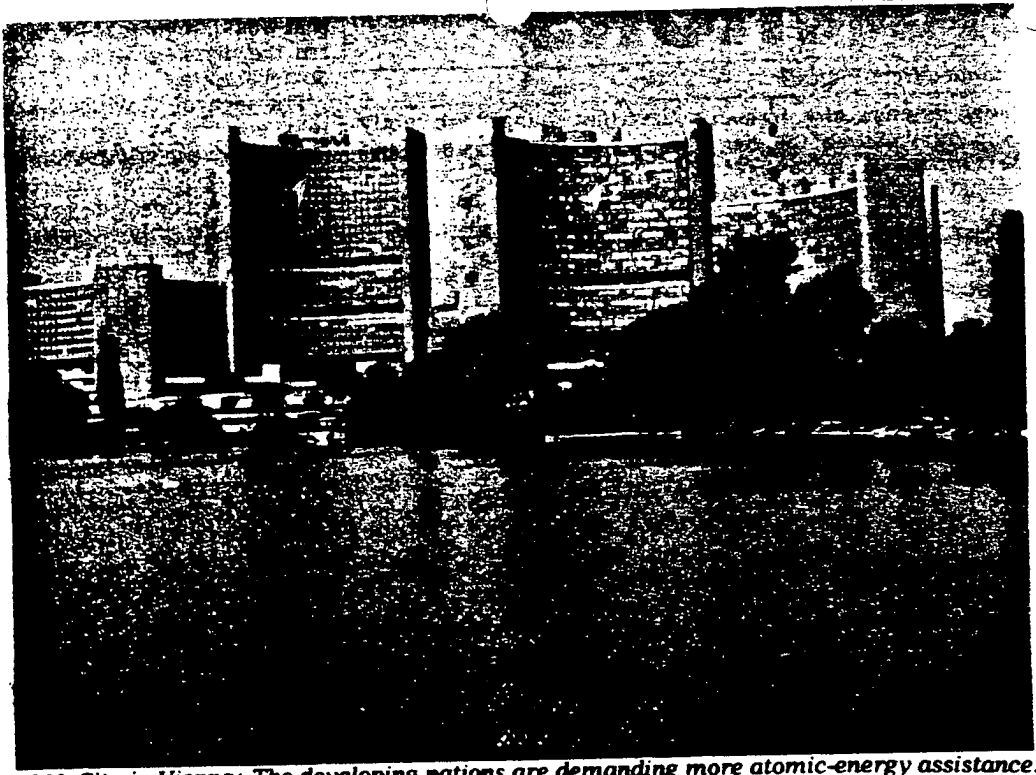
While admitting that there were suspicious aspects to the Iraqi program, the I.A.E.A. maintained that there was no evidence that Iraq was not living up to its pledge to use its French-supplied Osirak reactor near Baghdad only for peaceful purposes. Hence, the intense resentment aroused among I.A.E.A. officials by the Israeli action, a stunning demonstration of no confidence in the agency.

Mr. Blix agrees with Israel's charge that the safeguards system contains an inherent weakness: It cannot detect a country's future intentions. Theoretically, Iraq could use the I.A.E.A. to acquire all the technology it needs for attaining an independent nuclear system, and then renounce membership in the agency. The nonproliferation treaty contains a clause that permits withdrawal on three months' notice.

"Yes, any nation could do this," Mr. Blix conceded. "But in the agency's 25 years, no nation has done so. We have found that nations honor their sworn commitments. Those that want to develop nuclear weapons refuse to sign the treaty."

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In one sense, the I.A.E.A.'s difficulties are rooted in its dual mandate — to promote the use of nuclear power and to monitor it. The agency grew out of President Eisenhower's 1953 "Atoms for Peace" speech at the



U.N. City in Vienna: The developing nations are demanding more atomic-energy assistance.

United Nations, in which the United States offered to share its atomic technology with any country that promised to use it for peaceful purposes. Established in 1957, the I.A.E.A. was enjoined "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world," optimism that seems naïve in retrospect. The program was enthusiastically supported by the American nuclear industry, which had long urged a shift in nuclear orientation from secrecy to salesmanship.

The industry lost little time in feeding the world's appetite for nuclear power. The allure of this new form of energy remains undiminished in the third world, whatever the second thoughts in some of the industrialized countries. Developing nations look to the I.A.E.A. for nuclear assistance. Particularly since 1977, the have-nots have complained that the agency has been spending too much of its budget on inspections and safeguards and not enough on technical aid.

Their demands for a policy reversal have been opposed by the United States and the Western European countries, which supply about half of the agency's \$86 million annual budget. The agency is becoming polarized between developing and developed nations; there are fears that the disagreement may jeopardize the I.A.E.A.'s future viability. "We're in danger," said one

official, "of getting a very bad case of United Nations disease."

The Group of 77, as the developing nations within the I.A.E.A. are known, has put forward proposals designed to increase its voting strength and political muscle. On third-world initiative, South Africa was expelled from the I.A.E.A. board of governors in 1977, though retaining membership in the agency. A move to expel Israel, in punishment for its raid on the Iraqi nuclear reactor, was narrowly averted at the last general conference. Another attempt will be made at the general conference next week. "If Israel goes, you can say goodbye to United States participation," said one American arms-control expert. "And that means you can say goodbye to the agency."

Another concern within the agency stems from the Reagan Administration's more confrontational attitude toward the Soviet Union. The Russians, who became I.A.E.A. enthusiasts after China detonated its nuclear device in 1964, have had a tough nuclear-exports policy. "This is one of the few places where the Soviet Union and the United States have worked together for many years in a quiet, orderly and quite effective way," said David Fischer, a former top agency official. He and others are concerned that this longstanding cooperation may fall victim to the new chill be-

tween Washington and Moscow.

Yet the most immediate worry remains the ambiguous status of Pakistan's nuclear program. The agency, like the United States Congress, has been relying on the Reagan Administration's assertion that while Pakistan may soon be able to detonate a nuclear device, it is not likely to do so, since that would jeopardize a \$3.2-billion, five-year American military-aid package and the sale of 40 F-16 fighter jets. American aid to Pakistan, terminated by Congress in 1979 because of concern about its nuclear ambitions, was restored last year, but Washington has warned that a nuclear detonation would jeopardize the new security relationship.

If the \$3.2 billion carrot does not dissuade Pakistan from crossing the nuclear threshold, a much more uncertain future awaits South-west Asia. What India would do if its bitter rival Pakistan exploded a nuclear device is an ominous question. Several American analysts have argued that neither India nor Israel is likely to stand by and permit Pakistan to develop a nuclear-weapons arsenal.

"If the I.A.E.A. fails and the Reagan Administration fails, a much less secure world is in store for all of us," warned a senior agency official. "A world of pre-emptive strikes and nuclear blackmail. It won't be a pretty world." ■