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DIRECTORATE OF INTELLIGENCE

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MEMORANDUM FOR: See Distribution

FROM: [redacted] Chief 25X1
International Security Issues Division
Office of Global Issues

SUBJECT: Iran's Nuclear Ambitions: Persistence Despite Manpower Problems [redacted] 25X1

1. The attached memorandum points up Iran's determination to breathe new life into its ambitious nuclear development program, even in the face of major constraints. Looming large among the constraints is a shortage of workers and a serious lack of fully qualified specialists, across the board. The steps Iran is taking to alleviate the manpower situation, along with other moves, show Iran's determination and, we believe, indicate its intention to position itself for faster nuclear progress, once it is free of the constraints of war with Iraq. [redacted] 25X1

2. Comments and questions are welcome and may be addressed to [redacted] Chief, Nuclear Proliferation Branch, International Security Issues Division, Office of Global Issues [redacted] 25X1 25X1 25X1

[redacted] 25X1

[redacted]

Attachment:
Iran's Nuclear Ambitions:
Persistence Despite Manpower Problems [redacted] 25X1
GI M 86-20230 October 1986

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SUBJECT: Iran's Nuclear Ambitions: Persistence Despite Manpower Problems [redacted] 25X1

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DIRECTORATE OF INTELLIGENCE

October 1986

Iran's Nuclear Ambitions: Persistence Despite Manpower Problems [redacted] 25X1

Summary

Iran is intensifying efforts to reinvigorate its stalled nuclear energy program, despite major impediments. Tehran faces major difficulties in acquiring badly needed foreign technology, apportioning scarce financial resources, and managing significant personnel deficiencies. In the manpower area, in particular, they are pursuing efforts aimed at gradually improving indigenous expertise and increasing the number of capable nuclear workers. In our view, Tehran has few illusions that its efforts will yield significant returns in the short run. But we believe the efforts demonstrate the seriousness of Tehran's commitment to its ambitious nuclear goals and that they may position Iran to make faster nuclear progress once the financial and other constraints of the war with Iraq have begun to recede. [redacted] 25X1

This memorandum was prepared by [redacted] Nuclear Proliferation Branch, Office of Global Issues. Information available as of 1 October 1986 was used in its preparation. Comments may be directed to [redacted] Chief, International Security Issues Division [redacted] 25X1 25X1 25X1

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Iran's Nuclear Ambitions: Persistence Despite Manpower Problems

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Iran is trying hard to advance its ambitious nuclear energy development goals. In the past year the Iranians have pushed plans to complete their first power reactor, gain the ability to produce fuel, and work toward indigenous construction of a research reactor. The Iranians, however, are constrained by resource limitations imposed by the war with Iraq and difficulty in acquiring needed foreign technology. Quality and quantity of manpower is also a major constraint, but one which is more tractable for the Iranians, who are making a concerted effort to upgrade their capabilities in this area.

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Impact of Manpower Problems

A severe shortage of qualified personnel across the professional spectrum--particularly applied scientists, managers and technicians--has become a major worry for Iran's nuclear decisionmakers. The existing nuclear establishment lacks sufficient personnel to staff Tehran's ambitious development program, and the quality of many employees is low.

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the lack of skilled manpower, by itself, is serious enough to hamper Iran's nuclear development in the short term, even if the other major obstacles should be overcome.

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Progress on several major nuclear projects is stalled, and in our judgment, the manpower problem has played an important role in this situation. Iran's indigenous effort to develop a natural uranium-fueled subcritical assembly is bogged down, still unfinished eighteen months after its scheduled completion date. Tehran may be obliged to bring in an outside expert to head its reactor design effort, which includes the development of the subcritical assembly and a zero-power reactor planned as a follow-on project.

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Moreover, existing AEOI personnel clearly do not have the expertise to oversee final development or run the country's first nuclear power plant, located at Bushehr. The original contractor, Kraftwerk Union (KWU) of West Germany, had completed approximately 85 percent of power reactor Unit I and 55 percent of Reactor II by the late 1970s. However, little progress has been made on the project since 1979, when KWU suspended work due

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to the revolutionary government's failure to make contracted payments. AEOI's numerous requests during the last two years for training and assistance from abroad attest to the incountry lack of the nuclear and non-nuclear engineering and quality assurance expertise required to develop and run Bushehr. AEOI engineers completed an additional ten percent of the work on Reactor I sometime after 1979, but lacked the technological capability to finish the final five percent. in a subsequent assessment KWU stated that the added work Iran had accomplished was of such poor quality that it would have to be redone. even if a new agreement were reached with KWU and needed equipment were quickly delivered, manpower problems would delay by five years finishing construction and bringing the Bushehr facility on-line.

Nuclear officials have been forced to scramble for ways to stretch the personnel that are available.

Origins of the Manpower Deficiencies

The severe manpower deficiencies stem from longstanding problems. Foremost, in our view, was the departure from the AEOI of nearly 6000 experienced personnel (at least two-thirds of whom were scientists and technicians) after the fall of the Shah, according to US Embassy Although the organization has built up again in the intervening years, its staff now numbers only about 2,000, Furthermore, the capability of many now in the program is open to question, in our view. most of the nuclear staff assigned since the revolution were hired more for ideological than technical suitability, nuclear engineers had left that organization in recent years and that more than 85 percent of the nuclear specialists trained in the West since the Shah's fall had not returned to Iran, Finally, Iran has never had a training and education infrastructure sufficient to graduate anywhere near the professional cadre its nuclear ambitions would require. The

upheaval that saw so many of the country's intelligentsia leave the country or lose their positions has further degraded Iran's training capacity.

Attacking the Manpower Problem

Iran is moving in three specific areas to deal with the manpower problem. Though our information is incomplete, it is clear that efforts are being made on various fronts and have been underway for some time.

Recruiting Former Nuclear Officials

Tehran appears to be recruiting Iranians now living abroad who had worked in the Shah's nuclear program. According to the US Embassy in Ankara the AEOI has begun seeking out non AEOI-affiliated Iranian scientists working and studying abroad. Presumably, the AEOI is also tapping specialists who had worked in the nuclear energy program before the revolution but had remained in Iran. We do not have information on numbers and kinds of specialists sought nor on the response to date.

Upgrading Indigenous Training

The Iranians are also seeking to improve indigenous nuclear training capabilities. Late last year, for example, press reporting from Tehran indicated the establishment of a doctoral program in nuclear science and technology at Amir Kabir Technical University. The program's purpose, ultimately, is to staff AEOI's research and administrative departments. According to further press reporting, some 100 students applied for the program. We also believe Iran is working to upgrade research and training efforts at other institutions.

The new educational initiatives are highly modest efforts when compared with Iran's ambitious goals, and even these efforts face major impediments. The weakness of Iran's educational infrastructure means that such specialized, advanced programs will have relatively few qualified students upon which to draw. Moreover, the lack of qualified specialists to run the nuclear establishment implies, in our view, a similar lack of qualified instructors to teach in the nuclear fields. Most importantly, Iran suffers from a dearth of facilities and equipment by which students can acquire research and operational experience. For example, to the best of our knowledge there is no research reactor or simulator at Amir Kabir Technical University from which practical nuclear physics and engineering knowledge can be acquired. Researchers and technicians at the Tehran Nuclear

Research Center, Iran's largest nuclear training facility, complain about how infrequently they can utilize their research reactor given the need to preserve scarce fuel, according to the US Embassy in Doha. These specialists claim that, given the constraints they face, their level of experimentation does not even match that of undergraduate work at a US university. Finally, although in 1978 the AEOI contracted for a training simulator for the planned control room at Bushehr, to the best of our knowledge it still remains in the FRG awaiting an export license that the West German government has not granted despite repeated demands from Iran. 25X1

Looking Abroad for Training

Iran is also seeking training assistance from other countries to upgrade its pool of nuclear personnel. Throughout the last two and one-half years, Iran has approached official nuclear organizations or private firms 25X1
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with inquiries or requests concerning 25X1
training for its nuclear personnel, 25X1
Primarily, the AEOI has sought mechanical, civil, 25X1
electrical, and nuclear engineering skills and quality assurance techniques, although there have been some inquiries concerning generic fuel cycle training. The assistance requested includes both instruction within Iran by foreign specialists as well as training abroad for AEOI personnel. 25X1

To date, the response to Iran's inquiries has been mixed. Although few of the known requests have been refused outright, little country-to-country training has actually occurred. Iran does get some help from the International Atomic Energy Agency (IAEA) of which it is a member. Of the few confirmed, non-IAEA activities, West German entities have been predominantly involved, no doubt due to 25X1
associations arising from KWU's original Bushehr contracts. 25X1
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Looking Ahead

We believe the Iranians will continue their efforts to accelerate their nuclear energy program. The fact that they are now moving on several fronts, despite the serious constraints posed by the war with Iraq, demonstrates the depth of their commitment. We also believe they have few illusions about making short-term, dramatic gains. Rather, we judge they are seeking to position themselves for faster progress in years to come.

On the manpower front, in particular, we believe efforts set in motion will continue, especially since this is the one constraint Tehran can most readily address. We doubt, however, that these initiatives will improve the situation more than marginally in the next year or two. The lack of facilities, equipment and faculty for nuclear studies suggests little growth in the short term for indigenous training programs. Furthermore, we judge that although there may be increases in foreign training assistance, particularly from Argentina, such help is unlikely to solve the problem, at least in the short term. Moreover, Western supplier restrictions on sales to countries such as Iran, even though eroding somewhat, still have an inhibiting effect on some countries in a position to help the Tehran government. Additionally, in our estimation it is highly unlikely that large numbers of scientists who worked in the Shah's nuclear program would return to the AEOI, given their treatment at the time of the purges, the war with Iraq, and the unsettled political situation in Iran.

Iran will also continue aggressively to seek technological assistance abroad.

Tehran recently concluded three agreements with Argentina for nuclear engineering consulting services and fuel for the Tehran research reactor. Additionally, China and Iran are discussing cooperation in areas including medical research, isotope separation, and unspecified technology transfer and training.

When and if these and other agreements for cooperation materialize, we judge that Iran will seek to exploit them in ways that improve not only its technological status but its manpower situation as well. To the extent that such assistance means the involvement of foreign personnel, it would provide mechanisms for eventually easing Iran's manpower problems. Over time, advice and consulting by foreign experts would provide, in effect, "hands on" training experiences for AEOI personnel. Direct substitution of foreign skilled personnel to perform specific functions is also a possibility, and one that we judge Iran will continue to pursue.

As Iran persists in manpower-related efforts, it may make some limited, short-term headway in training more staff and upgrading existing expertise. Such marginal gains, along with any progress Tehran may make in the acquisition of foreign technical assistance, would place Iran in a better position to make faster nuclear progress overall, once the war with Iraq ends and it can devote greater resources to the program. 25X1

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