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NEW APPROACHES TO NON-PROLIFERATION: THE CASE OF LIBYA

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1. INTRODUCTION

a. Generally, when an indisputable example of the destabilizing effect of nuclear proliferation in the Third World is needed, mention is made of Libya.

The possibility that Tripoli could come into possession of atomic weapons, be they Libyan-built, or purchased from third countries, at the moment represents the classic "worst" hypothesis, not only on account of the radicalism and unpredictability of Libyan foreign policy and the strong ideological content and revolutionary aims, in terms of pan-Arabism, of Colonel Qaddafi's Third International Theory, but also because of the country's geographic position.

Tripoli's possession of nuclear capability would have direct repercussions well outside the limited confines of the Maghreb, on the entire Mediterranean area and all of northern and central Africa. This would be true even if after Qaddafi, a more moderate, less internationally adventurous leader were to succeed him. Furthermore, a series of factors tends to broaden these repercussions to involve relations between the United States and the Soviet Union (and as a consequence, the two European miitary alliances). The Mediterranean is an area of particular strategic importance to the two super-powers. It constitutes a significant part of the southern NATO front. Libya's geographic position gives it the possibility to control and interdict naval lines of communication in the sea's central basin. Libya has a military arsenal which is much greater than required by its defense needs including weapons systems which can carry and launch nuclear devices. Tripoli has set up close political and military ties with the Soviet Union and depends on Moscow for logistic support for the majority of its weapons. Thus, it seems evident that Libya's passage from a potentially nuclear country to a real nuclear power would represent a case of proliferation with overwhelming political and military effects.

Libya is also particularly emblematic because of the gap between the country's inclination to proliferate and its actual ability to do so. In Libya's case, this gap is so large that it brings the country's intentions and its times and prospects of proliferation into a whole different perspective and leads to a re-evaluation of the country's classification as "proliferant".

In the past, Libya has had a very strong propensity toward proliferation, expressed both in explicit statements(1) and through specific political and diplomatic action. In recent years, there has been some change in Colonel Qaddafi's position and Libya's policy with regard

to nuclear arms,(2) but it's not clear in what way and to what extent this has affected or modified that propensity.

b. A picture, albeit fragmentary and incomplete, can be painted of this policy. Available information is scarse, scrappy and sometimes doubtful.(3)

From 1969 until today, Libya has made numerous and diverse efforts to obtain a nuclear capability. These have not been without their contradictions and have, all tolled, not been very fruitful.

The first country to which Qaddafi turned immediately after the coup which brought him to power was Egypt. President Nasser had tried to build the "bomb" during the '60s, but in vain. Even if it had wanted to, Egypt was in no position to help Libya.

While Egypt couldn't, China didn't want to. On his visit to Peking to sound out the Chinese' attitude towards selling a nuclear device, the Libyan premier, Jalloud, found himself up against a polite but firm "no" from Chou En-lai. China was willing to give Libya qualified assistance, but no more. Its atomic weapons were not for sale.

In 1974, Libya signed a cooperation agreement with Argentina for development of nuclear energy for peaceful purposes. Buenos Aires agreed to supply equipment and experts for geological prospecting for radioactive materials. Libyan chemists were to be trained in Argentina in uraniumm extraction and purification techniques.

During the visit of French Prime Minister Jacques Chirac to Tripoli in March of 1975, within the framework of a broader accord on cooperation, Paris agreed to build a 600 MW pressurized-water nuclear reactor.(4) This agreement was later suspended and finally cancelled.

In July 1978, Libya entered into an accord with India for cooperation in the field of peaceful use of nuclear energy whereby, in exchange for considerable oil supplies,(5) Libyan students and scientists would be trained at Indian research and study centers in the management of nuclear plants.

But August of the following year witnessed a drastic deterioration in Indo-Libyan relations. India refused to comply with Libya's claims that the cooperation agreement included supply of technological know-how and assistance in the development of a nuclear capability. For leverage, Libya suspended its supply of oil, but to no avail. Since then, all forms of collaboration seem to have ceased.

In 1978, the first widespread news appeared of intensification of Libyan financial support of Pakistan's nuclear program which was supposed to have been started up at the time of Prime Minister Ali Bhutto with funding from

Qaddafi. According to many observers,(6) Libya agreed to give 1500 million dollars to development of an Islamic nuclear bomb and to supply Pakistan with uranium in exchange for enriched uranium and nuclear technological know-how.

As far as the uranium goes, at the annual meeting of the IAEA which took place in New Delhi in 1979, the representative of Niger announced that his country had sold 300 tons of "yellow cake", a mineral with 70% uranium content to Libya. It is presumed (but the news was not definitely confirmed) that at least a part of this ore was meant for the Pakistani nuclear program.(7)

In 1980, Libya tried international recruitment. An advertisement appeared in a specialized American magazine "Spectrum", offering twenty-five positions at the Al Fatah University in Tripoli on exceptional economic terms for electronics and computer experts and specialists in the management and running of nuclear plants.(8)

In January 1981, Qaddafi created the Secretariat for Atomic Energy for peaceful purposes, presumably to take over and extend the functions of the Atomic Energy Commission established in 1973.(9)

Besides France, Libya turned to other European countries - West Germany, Finland, Sweden and Belgium - for help and assistance in the nuclear field. But apart from training of technicians and specialists, all negotiations stayed at a preliminary level, without any agreements of a technical nature reached.(10)

c. In Western Europe, Belgium is the country with the longest technical cooperation with Libya in the nuclear field. This cooperation, which goes back to the early 1970s, was expanded in 1981 and 1982.

Under a consulting contract with the Libyan Atomic Energy Commission two Belgian firms, Belgatom and Belgonucléaire, provided technical assistance regarding the Tajoura nuclear research center, expertise for the pending Soviet power reactors project, and feasibility studies concerning the development of Libyan uranium deposits.(11) For example, under the tutelage of Belgonucléaire, Libya has requested modifications to the Soviet 440 MW reactors to make them more compatible with Western safety standards and the high siesmic risks on Libya's northern coast.(12).

On May 17, 1984, an umbrella agreement for nuclear cooperation was initialed in Brussels during a visit by a Libyan delegation to Belgium.

The agreement was supposed to facilitate the establishment of more detailed cooperation accords, including possibile collaboration in the construction of the power plant and the desalination unit based on Soviet

nuclear reactors (with the Belgonucléaire playing an architectural-engineering role), and the eventual building of a facility in Libya to convert U3O8 to UF4 (uranium tetrafluoride).(13)

However, partly due to strong European and American pressure, and notwithstanding a Libyan threat to seek nuclear expertise elsewhere, as of December 1984 the Belgian cabinet had not yet approved the nuclear cooperation agreement with Libya.(14)

d. The most fruitful collaboration has been achieved with the Soviet Union, which seems to be the only country willing to help Libya with its nuclear development program and give it reactors.

Information in the sector of Soviet-Libyan relations is also scarse and sometimes conflicting and the picture it offers is, therefore, uncertain and incomplete, in particular, concerning future prospects.

Libya has a nuclear research center at Tajoura, near Tripoli, equipped with a small, 10 MW enriched uranium reactor supplied by the Soviets following agreements concluded in May 1975 during Kosygin's visit to Tripoli and the visit to Moscow from May 26 to 30 of Omar Abdullah Meheishi, Minister of Scientific Research and Planning.(15)

According to numerous sources,(16) this reactor should have come into operation in 1981, but in October of 1982, Radio Moscow stated in a broadcast that it was still in the final stages of construction. (17)

It could be hypothesized that the reactor which was declared in operation in 1981 was the 2 MW reactor referred to in agreements (18) and that the work being completed in autumn of 1982 regarded increasing the output from 2 to 10 MW. Equally, if not more valid, is the hypothesis that statements concerning the operating conditions of the reactor in 1981 were overly optimistic and that, in reality, it only came into operation after the end of 1982. Another explanation could be that Radio Moscow was referring to completion of the entire research center and not just the reactor.

It is more likely that the reactor went critical in 1983.(19) In fact, only in September 1984 was it possible to acquire detailed information on the Tajoura center when it was opened to host an international seminar on "The use of research reactors in fundamental and applied science".

The center, which covers an estimated 700 square meters, is composed of seven main departments: reactor, radiochemistry, physics, plasma physics, radiation protection, computer center, activation analysis, and operation and maintenance.

The reactor building houses two Soviet-designed enriched uranium reactors: a 10 megawatt swimming pool research reactor, and a zero-power critical facility described as a one-on-one mockup of the reseach reactor.

The computer center is based on a Siemens 7748 host computer with a one-million byte main memory.

The metallurgical laboratory has a Soviet 50 to 100 kilovolt electron microscope and an American instrument (Instron) for measuring material stress.

The activation analysis department utilizes two separate neutron generators.

The solid state department houses various kind of experimental equipment, such as a Soviet neutron diffractometer and a Polish crystal analyzer.

The plasma physics installation utilizes Soviet equipment - the small TM4-A Tokamak and a pulse generator - supported by a Swiss/German/American computer-control system.(20)

The views about future programs are erratic.

According to R.B.St.John,(21) in 1978 the Soviet Union agreed to construct a 300 MW nuclear power plant and in 1981, Moscow and Tripoli discussed enlarging the Libyan nuclear program to construction of two 440 MW reactors on the coast of the Gulf of Sirte for production of electricity plus a desalination unit capable of treating 80.000 cubic meters of water per day.

Other sources say that the agreement, reached after over a year of negotiations and reciprocal visits of Soviet and Libyan nuclear experts to Tripoli and Moscow, concerned only one 440 MW reactor and was signed during Col. Qaddafi's first visit to the Soviet capital in December 1976. (22)

According to the Washington Post, (23) Libya had been discussing supply of a 440 MW reactor with the Soviet Union since the end of 1977. On the other hand, news appeared in February 1982, (24) that the Soviet Atomenergoexport was about to go ahead with construction of the Sirte plant and that, after long delay, the plans were to be approved by the Libyan Nuclear Energy Secretariat within the first half of 1982.

In the meantime, the state-owned Finnish industry Imatran-Voima backed out of its part in participation with the Soviets, that is, construction of the core-cooling system.(25)

With regard to the number and the size of the reactors, no further mention is made of the 300 MW power plant and in the latest Soviet-Libyan nuclear cooperation agreement signed by Qaddafi in May 1981, the possibility of building not one, but two 440 MW reactors was rererred to as being "at the study stage". (26)

In accordance to another source, as late as March 1983, Tripoli and Moscow were still negotiating the specifics of the nuclear deal.(27)

Finally, a survey carried out by Ann Knight in March 1984 on the energy situation in Libya and on the state of progress of the 1980-85 five-year plan in the sector, indicates that the plan for a 440 MW reactor, on which construction was to begin in 1982, has not yet got off the ground.(28)

e. Another interesting point with regard to Libya's nuclear capability refers to the number and quality of Libyan nuclear scientists and specialists.

Libya had to resort to foreign countries for the education of its students and the specialization of its experts.

Information concerning the number of students and kinds of courses frequented is very scarse.

In 1980, 25 students attended courses in nuclear technology at the National Center of Technical Research in Finland. In 1981, 200 to 300 students were enrolled in physics and nuclear engineering in the United States. As many again attended European universities.(29)
Today, following an American State Department decision of Mrach 11, 1983, Libyan citizens and citizens of Third World countries with close ties to Libya are no longer allowed to enroll in courses having to do with nuclear energy in the United States.

But then again, as has already been mentioned, professional training assistance in the nuclear field has been provided Libya by Argentina, India and, of course, the Soviet Union.

In Cooley's opinion, at least two scientists would be able to construct a nuclear device: Dr. Fathi Nooh, a physicist who received his education at the University of Berkeley in California, and Dr. Fathi Shingi, who studied in Great Britain and India. (30)

The present number of Libyan scientists and technicians may , on the one hand, exceed the country's requirements, given the existence of only one nuclear plant, but, on the other, they do not seem capable of managing an ambitious nuclear program aimed either at the production of energy for civilian use or the creation of nuclear weapons. Therefore, even if Libya were to have the necessary nuclear infrastructures, without considerable and all-important technical and managerial support from other countries, Libya's possession of a military nuclear capability seems plausible only in the long-term.

f. Another factor playing a role with regard to nuclear capability concerns possession and availability of uranium.

There is no definite information on the presence of uranium deposits in Libya. In 1977, the Libyan Atomic Energy Establishment declared that the chances of finding uranium were "excellent", indicating the basins of the Murzuk and the Kufra as probable deposit zones. In a table on uranium resources in the world compiled in Dec.1977 by the OECD Nuclear Energy Agency and the IAEA, Libya was not listed.(31) Up to now, no deposits have been found.(32)

However, in 1973, Libya annexed a wide strip of land (approx. 10,000 sq.km) of the northern part of Chad (the Aozou strip) which it believes to be rich in uranium.(33)

Libya's "interest" in Niger - in 1974, its presumed contribution to the fall of President Hamani Diori; in 1976, its attempt to annex a part of Niger's territory - is no doubt related to the uranium issue. That "interest" can effectively be used by Tripoli to exert pressure in the purchase of uranium. In fact, judging by the quantities of uranium imported from 1978 to 1981 (the latest available data), (34) it would seem that this lever has worked well.

So, at the moment Libya does not seem to be encountering too much difficulty in finding a supply of the mineral. It may be assumed that, apart from the quantity possibly supplied to Pakistan, the rest of the uranium imported is being stockpiled for future use.

g. The points mentioned up to now highlight the dichotomy referred to at the beginning, that is, the gap between propensity toward proliferation and actual capacity to proliferate.

If, accepting Stephen M.Meyer's formulation,(35) latent nuclear capability can be defined as the country's possession of the resources and the scientific, technical, industrial and economic means needed to produce a nuclear weapon within a six to eight year period, then it must be admitted that Libya does not possess that capability and will not have it in the next ten to fifteen years. For Libya, nuclear proliferation is a long-term prospect.

Nevertheless, considering the country's inclination toward nuclear arms - at least in a perspective not taking into account only Qaddafi's most recent declarations, but the whole course of his international policy and incentives deriving from it - that does not mean striking Libya off the "problem country list".

Thus, propensity is an important element even given a long time lag until expected acquisition.

In Libya's case, it seems opportune to find out whether this inclination stems exclusively from the policy or personality of Colonel Qaddafi, or whether there are

domestic or international motivations behind it which could guide Libyan nuclear policy during the post-Qaddafi period.

2. NUCLEAR DECISION-MAKING

a. Analysis of the centers of power, social groups, professional classes and lobbies in favour of acquisition of a nuclear capacity and of the interests behind their political action on an international and national scale is particularly difficult in Libya.

Colonel Qaddafi has brought about so radical a change in the society, that although the country can be defined as having an autocratic regime many of the typical elements of such a regime are not present.

On the other hand, the Libyan regime is only fifteen years old and the profound innovations introduced by Qaddafi have not yet had a chance to take root and consolidate themselves.

At the moment, the country is still going through a stage of transition, adjustment, experimentation and, in many respects, opposition and denial.

In order to try to understand the growth trend and determine and grasp the internal mechanisms which favour Libya's nuclear inclination today, and those which might favour it in the near future, it is necessary to briefly go over Libya's history under Qaddafi.(36)

b. Captain, later Colonel Muammar al Qaddafi emerges as a pre-eminent figure and charismatic leader of the small group of officers of the Revolutionary Command Council (RCC) which, after the coup in 1969, takes command of Libya. In Dec. 1969, the Declaration of the Constitution designates the RCC as the supreme executive and legislative authority of Libya. Qaddafi is its chairman.

Following the Egyptian model, in 1971, the Arab Socialist Union (ASU) is formed. Its representative bodies are to constitute a direct link between the population and the RCC, on which they depend for their operation and their existence. In fact, ASU resolutions must be approved by RCC executive decrees in order to become effective. The RCC can also annul any ASU decision and dissolve any of its organs.

On April 15, 1973, in his famous speech at Zouara, Qaddafi announces the beginning of a "cultural revolution" to destroy all ideologies imported from the West and the East and the creation of bodies - People's Committees - to implement it. The People's Committees are empowered with supervision and control, participation and intervention (up to firing of officials or managers considered to be professionally inadequate or politically lukewarm) in

management of public offices, banks, businesses, farms, universities, radio and television stations and press agencies.(37)

Nevertheless, the real reins of power continue to be firmly in the hands of the RCC and, on closer analysis, of Qaddafi.

The vague demarcation line between the responsibilites of the ASU (an organization aimed at mobilizing the masses) and the People's Committees (the main administrative instrument of the revolution) leads to a lack of cooperation and conflicts between the two systems.

Finally, despite the RCC's attempts to control their activity, the "guardian of the revolution" role carried out by the People's Committees, entailing the dismissal or transfer of thousands of officials, has a profound effect on the operation of the administrative structures and industrial productivity.

Fear of the formation of a new bureaucratic class and anarchist elements emerging from the People's Committees leads to a new election in 1974 and reaffirmation by the RCC of the ASU's authority over the committees.(38) This superiority is formalized in 1975. In April, Qaddafi announces a reorganization of the ASU, with a sharper division of responsibility, at least theoretically, between ASU People's Congresses and People's Committees. The committees are responsible for local administration; ASU congresses are responsible for political matters and for discussion of foreign and domestic policy lines presented to them by the executive. Given the superiority of politics over administration, the ASU also has the task of supervising and guiding the People's Committees.

In November of the same year, the General People's Congress (GPC) is established, composed of 618 members and comprising members of the RCC, leaders of the People's Congresses and the People's Committees and representatives of trade unions and professional organizations.

On March 2, 1977, a new tranformation of the Libyan state structure takes place. The Declaration of the Establishment of the People's Authority is adopted. The country's name is changed to Socialist People's Libyan Arab Jamahiriya (state of the masses). The RCC is abolished and its functions are taken over by the General People's Congress. A General People's Committee is set up whose members are called secretaries and which carries out the same function as the previous Council of Ministers. The General Secretariat of the GPC, of which Qaddafi is secretary general, includes the four remaining members of the old RCC. Thus, at least theoretically, the GPC becomes the ultimate legislative and executive body in Libya and the vertex of the system of direct people's authority created by Qaddafi.

But despite the wide popular participation in the GPC, even after 1977, power is wielded by the General People's Committee and, more precisely, by Qaddafi who, besides being secretary general of the GPC, is also Chief of Staff of the Armed Forces.

In answer to the persisting inefficiencies of the governmental and administrative systems at a subnational level, Revolutionary Committees are formed between the end of 1977 and 1978. As in the past, solution of the problem is seen mainly in terms of superimposing a new organ on those already existing. In fact, the function of the Revolutionary Committees seems to be that of guiding the leaders of the People's Congresses and People's Committees and of encouraging the masses to exercise their authority rather than just delegate it to representatives of those organizations. This involves the possiblity of friction and conflict between the Revolutionary Committees and the People's Congresses and Committees.

c. The impression one gets going back over Qaddafi's attempts to apply to Libya the ideas contained in his "Green Book", is that of a very divided society, only superficially moved by a desire to carry on the revolution; partially disappointed in its expectations of progress and well-being, especially after the economic difficulties of recent years; highly critical and frustrated in a few sectors - business, crafts, small farming and small industry - because of the radical nationalization and socialization measures which deprived them of their incomes; to a large degree still dependent on foreign manpower, even for jobs which do not call for any specialization (39); agitated by Islamic unity factions opposing the regime; behind in its industrialization plans and with difficult prospects as far as agriculture is concerned in the '90s.(40)

During the '70s, Qaddafi's policy seemed aimed at preventing the emergence of any one group, be it social, political or economic, which could take the power from the masses. Even trade unions were regarded as a threat, being both power groups and worker representatives.

On the other hand, the concentration of real power in the secretariat of the GPC - and within it, in Qaddafi's hands - does not allow for effective political dialectics, even if it should be emphasized that Qaddafi's decisions have not always found full approval or support on the part of popular government structures.

d. Up until now, no parallel or collateral powers (industrial, economic or socio-political) seem to have developed able to influence the political decisions of the

heads of the GPC or capable of having an effect on Libya's nuclear inclination.

Popular bodies (the People's Committees and Congresses and the Revolutionary Committees) do not have the political depth nor sensitivity to promote a nuclear decision. Logically, their range of action is substantially restricted to administrative matters and national, if not local, political questions. Then again, they do not seem to possess the required technical competence to be able to stimulate the GPC on this matter. On the one hand, if an interest in industrial development exists, it would presumably be directed towards labour-intensive sectors rather than the capital-intensive nuclear sector. Furthermore, the military nuclear question is of such national and international importance that neither the lowest nor the highest popular structures can discuss it without the leave of the highest levels of the regime.

Therefore, because of their disjointedness and their lack of the necessary political capability and experience, it is difficult to imagine that the popular bodies can become poles of attraction (as are Western political parties) and play a role in any nuclear decision.

They can, however, be opportunely manipulated (in particular, the Revolutionary Committees because of their structure) and become vehicles with which to indoctrinate public opinion, isolate any opposition, prepare the ground for decisions and once the decisions are taken, provide the resounding acceptance and unanimous approval useful on an international level.

e. The possibility that pressure be exerted by an industrial lobby is just as slight. The only industry in Libya which has reached a certain maturity and size is the oil industry. But it is quite unlikely that the oil industry's specific interests would include development of a rival nuclear industry.

A nuclear industry, which would bait decision-makers with a nuclear program for military purposes in order to receive more funding, does not yet exist in Libya and, thus, is not able to make its weight felt, either directly or indirectly.

It's difficult to say whether there are enough scientists, physicists, engineers and nuclear technicians and whether they are sufficiently organized or have adequate political ties and connections to form a lobby. And it is equally difficult to determine whether the Gar Younis Univeristy in Bengasi and the Al Fatah University in Tripoli, which could be interested in the scientific and technical fall-out of a nuclear program, have the instruments to effectively stimulate the Atomic Energy Secretariat.

Another problem is evaluating the role played by the Secretariat for Atomic Energy from its establishment in January 1981 till today. One positive sign of continuity is the fact that the Secretary, Abdul Magid el-Mabruk el-Gaud (considered by some observers to be close to Qaddafi), has kept his position despite two General People's Committee shuffles on March 3, 1982 and Feb.18, 1984. Then again, the slowness with which the Libyan nuclear program is progressing - no one knows whether due to political and economic factors or whether due to government inefficiencies - does not give the impression that the Secretariat is particularly dynamic. Even more so, if it's true that in the case of the 440 MW reactor, delay is not due to Soviet delivery, but rather to the Libyan go-ahead. (41)

Finally, there do not seem to be any particular ties between the Secretariat or the Tajoura research center and the armed forces, in general, or any one service in particular.

f. The institution-armed forces relationship leads to the question of to what degree the latter can, in Libya, be considered capable of influencing nuclear decision-making.(42)

The military were the ones who made the coup in 1969. Not only members of the Free Officers Movement, but also other Army units joined and supported their action. The Revolutionary Command Council which governed the Libyan Arab Republic in the first years of its existence was composed of twelve men from the military.

But the military, among them, some members of the RCC, have also been the promoters of many of the attempts to replace Qaddafi and overthrow the regime.

Qaddafi dedicated enormous financial resources to the expansion and modernization of the armed forces. Defense budgets jumped from 203 million dollars in 1975 to 709 million dollars in 1982. In the early '80s, the budget percentage of military spending was between 20 and 21%. (43)

The armed forces increased from 32,000 men in 1975 to 73,000 in 1983.(44)

Today, the quantity and quality of Libya's armaments far exceed its defense requirements and the capacity of its armed forces to use and manage them on a technical and logistical level. The weapons (many of them technologically very sophisticated, such as T-72 tanks, or Mig-23, Mig-25 and Mirage F-1 aircraft) are not all Soviet-built, even if Moscow still is Tripoli's main supplier. Libya has diversified its imports, purchasing arms from France, Italy, Turkey, Yugoslavia, Spain and Brazil.

Foreign military personnel present in Libya as instructors or advisors includes Soviets (approximately 1800), East Germans, Italians for basic flight training of Libyan pilots and technical assistance, Pakistanis, North Koreans and Palestinians.

On the whole, the Libyan armed forces give the impression of having considerable potential in terms of equipment and means, but little capability from a technical-logistical and operational point of view. The relative success of military operations in Chad does not seem to have completely erased the reputation for unreadiness Libyan forces earned during the brief conflict with Egypt in 1977 and the debacle of its armed intervention in Uganda in support of President Idi Amin in 1979.

The manpower available seems to be sufficient for the armed forces.(45) The main problem is the level of culture and technical education needed to operate and manage modern and highly technological weapons systems.

On the other hand, since the beginning of the '70s, Qaddafi declared that the armed forces were to be transformed into a people's army by means of general military training.(46)

In the framework of the revolutionary program for total mobilization, in February, 1983, the eighth session of the GPC adopted a series of resolutions which were to implement the plan to substitute regular forces with a national guard formed by all citizens. Among the most significant were the requirement for all teachers under thirty years of age to attend military schools for a certain period of time; introduction of military sciences in the normal curriculum of schools and universities and introduction of the draft for all Libyans under retirement age.(47)

At the end of April of the same year, Qaddafi announced the partial liquidation of the regular army. This declaration was preceded by one from the Libyan press agency stating that thousands of men from the regular armed forces were to be demobilized as a first step toward final abolition of the services themselves.(48)

- If Qaddafi's plan to create a people's army finds definitive approval and is actually implemented, then the role of the services within Libyan society will increase, at least in terms of diffusion and pervasion, but will presumably decrease in terms of ability to exert pressure and political influence and thus actually affect the process of nuclear decision-making.

- Although he stepped down from all public positions on Sept.1,1978 (49) including that of general secretary of the

GPC, Qaddafi has maintained the supreme command of the armed forces. Two other officers from the former RCC are now at the head of the armed forces. If the purges, the arrests and the forced resignations have not completely destroyed the ranks of the revolutionary movement of 1969, and if the new officers have managed to create ties of close collaboration and trust with the surviving figures of the old guard, then it should not be difficult to have the armed forces' requirements and demands, including those of a nuclear weapon, reach the country's decision-making center. While on the one hand facilitating direct contacts between the military leadership and Qaddafi, on the other hand, lack of a Ministry of Defense eliminates the intermediate level at which the differing views of the three services can be modified and integrated, finding compromise solutions satisfactory for all.

Recent attacks in the press at the armed forces, and in particular, at the officer class (50), with accusations of corruption, nepotism and anti-revolutionary activity could be a sign of a lack of credibility and therefore, influence. But it could also, much more simply, be a means by which Qaddafi is trying to impose his much disputed project of a people's army and widen his consensus while warning opposition within the armed forces that any attempt at a counter-revolution could find itself without the necessary popular support.

- If one considers the efforts and resources dedicated by Qaddafi to modernization of the armed forces and if one assumes that the diversification of arms suppliers is not the result of a decision by Qaddafi imposed on the military, but rather a consequence of the acceptance of requests moved by the less pro-Soviet wing of the armed forces, then it is reasonable to suppose that the military has a certain influence on decison-making centers and that it makes use of it. An alternative hypothesis would mean that the armed forces' demands are granted only when they fall in with Qaddafi's security and defense policy. In this case, a lack of influence demonstrated in the choice of conventional weapons would be repeated with regard to the nuclear question.

The most probable hypothesis is that the armed forces have in the past and still do make their voice heard in military matters. However, since the nuclear question can not be simply classified as technical, the military would have less say than on conventional defense matters.

In other words, Qaddafi would always reserve the right to the final decision and could enforce it, even if the armed forces were against it.

In conclusion, it does not look as though there are forces or people in Libya able to have an effect on the nuclear decision-making process. Despite the lack of certain information, the process is quite well defined. The structure of the Libyan Jamahiriya points to Qaddafi as the last, if not only, actual decision and policy-making center.(51)

3. INCENTIVES AND DISINCENTIVES TO NUCLEAR PROLIFERATION

a. The most important incentives for development of a military nuclear capability are linked to security and the strong attraction of the status of being a nuclear power.

Each country considers its independence, its sovereignty and its territorial integrity as its prime values. Choices made in defense of those values can easily be rationalized and consensus for them obtained.

The more a country perceives a threat against its security, the more likely it is to equip itself with those political instruments (interregional alliances, international ties, friendship and collaboration agreements with powers willing to offer security guarantees) and those military instruments (efficient and modernly equipped armed forces) considered necessary to counter it.

Naturally, the "threat" can be manipulated so as to make it seem more menacing or closer to home than it really is.

In Libya's case, apart from foreign policy objectives pursued by Qaddafi, the security factor, of itself, does not appear sufficiently credible as an incentive to nuclear proliferation.

Of the countries bordering on Libya, only Egypt poses a possible threat. Egypt's military strength is, in fact, superior to that of Libya. It's enough to think of the difference in population between the two countries (Egypt has 46 million people and Libya just over three million) in terms of mobilization possibilities; of the difference in size of their armed forces (447,000 men in Egypt, 73,000 in Libya); and, at the present, Egypt's superiority in ground, air and naval units, in the number, and often the quality, of its means, and finally, in the better training and greater war experience of the Egyptian armed forces, which have been involved in four Mideast conflicts, with respect to Libyan forces which are completely unprepared for war operations (in this sense, Chad was altogether different, half-way between a police operation and an anti-guerrilla operation). The brief conflict in 1977 clearly displayed Libya's vulnerability and difficulty in adequately defending itself against a real attack from the east.

The present contrast between the two countries springs from Qaddafi's violently anti-Egyptian attitude within the Arab world and his policy of destabilization by supporting terrorism and anti-government groups in Middle-East and North-Africa countries. By signing the peace treaty with Israel, Egypt, for Tripoli, has become a traitor of the Arab cause and, therefore, a potential enemy.

Qaddafi's attitude represents an obstacle to Cairo's regional policy, but not to the extent that it justifies military intervention, except in the form of pre-emptive or retaliatory strikes to stem or punish the Libyan subversive threat in the region.

Exclusive possession of nuclear arms could, from Qaddafi's point of view, be the only way to dissuade Cairo, as well as to balance Libya's military inferiority. And the deterrent effect of nuclear weapons could be viewed by Tripoli as the only safe umbrella under which to continue pursuing its foreign policy.

The most evident symbol of Western imperialism, an ally of Israel and a friend of Egypt, the promoter of a solution to the Middle East question based on respect of the right to exist of the State of Israel, present in the Mediterranean with a fleet often used as an instrument with which to challenge Libya's self-declared sovereignty over the Gulf of Sirte and declaredly in favour of the fall of the Qaddafi regime is the United States. At an international level perhaps, it represents the most troubling term of Libya's security equation. The aerial clash of August 19, 1981, when two F-14 "Tomcat" fighter planes of the Sixth Fleet on maneuvre in the central Mediterranean shot down two Libyan Su-22 "Fitter" aircraft shows that Washington is ready and willing to cross the threshold of military confrontation when necessary to defend its rights to operate in international waters and airspace.

The American presence in the Mediterranean region is perceived as a direct, imminent and pervasive threat, not only because of its military weight, but also because the United States is considered capable of influencing or even determining Egypt's behaviour and willing to provide military assistance to Cairo in case of a conflict with Libya.

The cruise missiles installed at Comiso in Sicily within the framework of NATO's nuclear modernization program are not perceived by Tripoli in an East-West perspective as a balance to Soviet Intermediate Range Nuclear Forces, but as weapons to be used in a North-South context and therefore, basically, as American weapons aimed at Libya.

There is no doubt that nuclear weapons in Qaddafi's hands would set drastic limits to American military options. Qaddafi could refuse to accept the logical rules of deterrence and not be dissuaded by America's overwhelming nuclear supremacy. He could decide to play his nuclear card in any case, without calculating risks and without worrying about the consequences. His unpredictability and his Messianic spirit could drive him to act in a totally irrational way, putting the United States up against very difficult decisions in consideration, also, of the repercussions such decisions would inevitably have on relations with the Soviet Union and the entire Arab world.

In this case, the deterrent power of the weaker with respect to the stronger would not depend so much on the degree of destruction that Libya could inflict (on the ships of the Sixth Fleet), but its irrational and explicit willingness to use force, of whatever kind (52) and the conditioning that that kind of willingness would impose on the United States' freedom of action.

But can the American threat really be considered a plausible security reason justifying a nuclear military capability?

Nuclear weapons are effective against naval formations and therefore, apart from the political implications, possession would be an important means of dissuasion towards the American fleet in the Mediterranean. But conventional weapons systems - medium-range Tu-22 Blinder bombers armed with air-to-surface missiles, Foxtrot class submarines, third and fourth generation Soviet- and French-built fighter and fighter-bomber aircraft, frigates, corvettes and fast attack craft armed with anti-ship missiles - that Libya has today constitute a formidable military instrument "theoretically" capable of inflicting heavy losses during any Libyan-American aerial-naval conflict in the Mediterranean or a possible landing attempt. In theory, due to the questionable combat readiness of Libyan armed forces.

Nuclear weapons could be seen by Libya as a way to make up for deficiencies in the preparation of the armed forces and to build up the low credibility of the military instrument in the face of both the American and the Egyptian threat, which surely seems to be the greater, in terms of capability for invasion and conquest.

Finally, acquisition of nuclear capacity would allow Libya to slacken its ties with the Soviet Union should it so desire, without too serious repercussions from a security point of view with respect to the United States.

In part to counter-balance the American threat and partially to compensate for its international isolation, Tripoli has, in recent years, strengthened ties with the Soviet Union.

But relations between Libya and the Soviet Union - which, for Qaddafi, is an atheist, ideologically removed and basically imperialist country (53) - appear to be instrumental in the context of the fundamental objectives of Qaddafi's foreign policy.

In case of a future Soviet-Libyan rift, from a security point of view, acquisitions of a nuclear capability could represent the means with which to deal with the loss of ties with the only nation able to offer protection, be it implicit or explicit.

However, Libya's nuclear inclination must be seen more in the framework of foreign policy incentives, than as a projection of security requirements to strengthen the defensive apparatus already set up with conventional weapons. In this field, there seems to be a logical motivation for acquisition of a nuclear capability.

b. From a security point of view, Libyan disincentives for military nuclear proliferation can be traced back almost wholly to two elements which are closely related: on the one hand, recognition of the fact that any attempt at proliferation could not be kept secret for too long and that any action of the kind would force countries concerned to take preventive action to avoid it; on the other hand, the knowledge of not having an adequate defense capacity with respect to this increased vulnerability.

Regionally, Israel (but it could be not the only country) would certainly consider Libya's acquisition of a nuclear capability, either through development of a program for that purpose, or diversification of a program for production of nuclear energy for civilian use, as a deadly threat to its security and therefore, an event to avoid at all costs.

With its aerial bombing of the Iraqi reactor in Osirak, Israel has already demonstrated not only its political will to block Arab nuclear aspirations (be they real or suspected) but also its technical capacity to organize and successfully carry out complex military operations to implement it.

It is difficult to imagine that Tel Aviv would not react to a nuclear development program in Libya which, if only hypothetically, could mean the first step towards the atomic bomb.

Preventive action could be carried out (with or without the tacit support of Egypt and with or without the tacit approval and support of the United States) using, once again, the Air Force or special forces units backed by the Navy.

Another disincentivating element could well be the cost-effectiveness ratio (in economic and military, not political terms) of atomic weaponry as compared to a further build-up of conventional weapons.

The efficacy of this disincentive depends on a number of factors:

- if Libyan leadership feels that the quantitative and qualititative level of its current conventional arsenal is sufficient for the military policy it wants to pursue with respect to a nuclear weapon which has an enormous political weight, but limited military usefulness;
- the cost, which would cut into the defense budget in proportion to the kind of program: civilian with military fall-out or specifically military;
- the effect that possible inter-force rivalries can have on pushing Libya towards conventional weapons or emphasizing the need for nuclear arms for national defense;
- what resources Libya will actually be able to allocate to military programs in the next years, given insecurity about future demand for oil.

Even though defense spending does not seem to have been affected by the economic crisis up to now, Qaddafi could be forced to reduce his military ambitions to calm the growing discontent in the country. In that case, a choice between conventional and nuclear weapons would be imperative, with more weight given to purely military requirements, especially with the dizzying cost increases of sophisticated modern conventional weapons systems.(54)

c. As has been mentioned previously, rather than mere security requirements, in terms of national defense, the real motives behind Libya's inclination toward a nuclear capability seem to lie in Qaddafi's foreign policy objectives.

Since 1969, Libya's foreign policy has moved along three main lines: pan-Arabism, that is, the establishment of Arab unity; anti-imperialism in the broadest sense of the word, even though essentially directed against the United States; national security and interests which together with the two preceding components tend to take on transnational characteristics with expansionist projections.

This is a multidirectional policy which extends well beyond the regional confines of the Maghreb to the Middle East, the Persian Gulf, the Horn of Africa, central Africa

and, more recently, the Comoro Islands, the islands of Dominica and Saint Lucia and the Mauritius Islands.(55)

Interest in a specific area springs from the varying combinations of these three decisive factors, developed not only horizontally, that is, in geographic terms, but also vertically, that is, in historical-temporal terms.

Up to the end of the Yom Kippur war, pan-Arabism, with a strong anti-Israeli accent, seems to be the determining factor in Libyan foreign policy. One has only to think of Libya's vain attempts at union with other Arab countries and its insistence on placing destruction of the State of Israel as a prerequisite and, at the same time, aim of Arab unity.

After 1973, while other Arab countries show their desire to gradually lay the foundation for a negotiated solution to the Middle East question, in which Israel's existence and the rights of the Palestinian population are guaranteed - a solution in which the United States plays an all-important role

- Libya puts more emphasis on the anti-imperialist (and therefore anti-American) leaning of its Islamic revolutionary policy, accentuating its transnational components and thus its expansionist characteristics and maintaining its bitter anti-Israeli colouring. At the same time, agreement with Soviet policy becomes more evident and political ties between Tripoli and Moscow are strengthened.

Libya's foreign policy appears hallmarked by ostentation and a desire to be in the limelight as well as by the two words:unpreparedness and impatience. Improvisation has the upper hand over preparation and attempts to have its own way prevail internationally over flexibility and willingness to compromise.

- Dedication to Arab unity remains a constant of Qaddafi policy. Changes in direction are often determined by contingent considerations and temporary detours due to setbacks or disappointments. Arab unity is fundamental and is expressed towards the more moderate or conservative Arab countries in the form of support to opposition forces with obvious destabilizing effects in the region.

- Libyan foreign policy feels the pressure of the two superpowers and is conditioned by it. Its ties with the Soviet Union still appear to be instrumental and have not reached the point of dependence.

- Qaddafi's ideology can only be used in part as a key to understanding of Libyan foreign policy. Rather than an expression of a consistent and coherent plan, it often

seems the result of a series of reactions, aimed at exploiting favourable situations and occupying political gaps left by others.

In this context, more than one motivation for nuclear proliferation can be found.

- A nuclear capacity would allow Qaddafi to give his plan for Arab unity a strong political colouring, presenting Libya's new status as a binding element. This even in the present Qaddafi's perspective of unity no longer seen as the fusion of Arab nations, but, through reconsideration of pan-Arabism, as common objectives and coordination of policies needed to achieve them.

- The anti-Israeli and anti-imperialist components of Libyan foreign policy would gain credibility.

- Nuclear status would allow Qaddafi to be less conditioned and constrained by external threats.

- A nuclear capacity could be used as an instrument of political pressure not only on those countries, such as Tunisia, which already feel the effects of Libya's conventional military superiority, but also on other countries with respect to which Libya is militarily inferior.

- Finally, a nuclear capacity would allow Qaddafi to play a more decisive role in defending and protecting the revolutionary cause. Military intervention of the type which took place in Uganda in 1979, with the addition of a couple of sub-kiloton atomic bombs on Libya's part, is a scenario which might whet the Libyan leader's Messianic spirit and ambitions of power.

d. There are also a number of disincentives in the field of foreign relations.

- Given Libya's geostrategic importance and the general trends of Qaddafi's policy, an attempt at nuclear proliferation would provoke concern in a number of countries both inside and outside the Mediterranean area. Some of these might decide, explicitly or implicitly to coordinate their policies (diplomatic, economic and commercial) to impede Libyan plans and, basically, further isolate the Qaddafi regime. They could, for example, embargo the purchase of Libyan oil, causing a drastic drop in oil returns and a difficult economic situation for the country. But they could also decide to support Libyan

dissidents or, more generally, to facilitate a changing of the guard, from the inside, or at least, exert enough economic and political pressure on Gheddafi to have him give up his nuclear military plans.

- The tendency toward military nuclear proliferation would probably also undermine Libya's recent attempts to realize its dream of pan-Arabism.

Arab countries have never accepted Libya's ambition to exercise a kind of political and, above all, ideological supremacy within the context of its projects for union.

Qaddafi could become convinced of the uselessnes and even of the harmful effects of a nuclear capability with regard to the creation of a united Arab nation and could decide that the political advantages gained from nuclear status which can be made to bear on relations with Arab and African states, would not be compensated by the disadvantages in terms of the suspicion and hostility of those same countries resulting in a greater isolation of Libya.

- Furthermore, Qaddafi could come to believe that the aims of his pan-Arabic, anti-imperialist and revolutionary policy can be better pursued by giving up the idea of a military nuclear capability and continuing the use of traditional methods such as subversion, destabilization, support of international terrorism, economic aid and military training to external and internal opposition of conservative Arab and African nations.

- Lastly, disincentives on a security level, especially the fear of a preventive use of force which would be difficult to stand up to and repel and with unpredictable international consequences, could combine with those of an international nature to cancel the influence of any incentive, even if it could be rationalized in terms of national interest.

e. Domestic policy incentives refer to creation of a nuclear industry for civilian purposes rather than military nuclear proliferation.

- An interest in development of atomic energy could be justified by depletion, in the mid-term, of oil reserves and growing Libyan energy requirements needed to implement the country's industrialization plan.

Estimates of oil reserves differ, as do predictions of finding other fields in Libyan territory or in the waters of the Gulf of Sirte. (56)

At the end of 1978, reserves were estimated at 25 billion barrels of oil and 8,300 billion cubic meters of natural gas. Such reserves would be sufficient for another 33 years at the 1977 production level (99 million tons)(57) and approximately 60 years at 1982 production levels (55.4 million tons).

Apart from the possibility of finding other fields (58), the Libyan regime could also consider 60 years a brief period of time and the chances of hitting on new fields slim. Therefore, development of a nuclear industry could be considered the only possible alternative.

Actually, the enormous natural gas reserves could partially compensate the gradual depletion of oil sources and prospects of new discoveries could be better than thought today.

- Another incentive to becoming nuclear could come from the prospect of using facilities for desalination. They could be justified if Libya implements a tourism campaign and the construction of infrastructures all along the coast making use of the 440 MW reactors which the Soviet Union is to provide Tripoli with in the near future, even if the Libyan state does not seem either interested in, nor suitable for increasing tourism. On the other hand, desalination could be logically justified in terms of agricoltural development.

- There are also the incentives deriving from the technological jump that Libya would make by developing a nuclear industry in terms of subsequent fall-out in other sectors of national industry.

- Finally, there are the incentives, which would also be derived from a non-military nuclear program, of legitimation of the regime as a promoter of the country's economic and social development and those provided by the prospect of the support of élite groups.

f. Among the élite groups, the military could, besides those reasons of security and international policy already analyzed, favour a nuclear capability for reasons of international prestige, a more important internal role, greater political influence and new career possibilities. Furthermore, this ground seems quite important in opposing Qaddafi's attempts to create a people's army on the basis of the evidence that a nuclear role can only be credibly and effectively managed by a regular armed force.

g. Disincentives on a national level refer to:

- The possibility of increased opposition to the regime on the part of those social groups that fear the international consequences of a military nuclear program and Libya's political and economic isolation with negative consequences on national life. These groups might be represented by those scientists and physicists who consider nuclear development possible only if Western support and cooperation is obtained - a very unlikely eventuality unless the Libyan regime dramatically changes its foreign policy. And by those in the military who fear that a Libyan military nuclear program would eventually jeopardize the acquisition of European high-technology conventional weapons systems, thus undermining the warfighting capabilities Libya needs most.

- The cost of a nuclear capability which, as already mentioned would deprive the military of the resources needed to continue buying and modernizing conventional weapons systems;

- The decision of weapons suppliers to stop providing weapons, cutting down the armed forces' possibilities of diversifying their supply source and dramatically affecting technical and logistic support of Western weapons systems, with a remarkable reduction in the efficiency of the services.

4. PERCEPTION OF THE PRESENT NON-PROLIFERATION REGIME

a. Tripoli has signed and ratified both the Partial Test Ban Treaty (PTBT) and the Nuclear Non-Proliferation Treaty (NPT). The date of the ratification of the latter (May 26, 1975) seems to confirm the hypothesis that this took place at the insistence of the Soviet Union, which set it as a condition for supply of the 10 MW reactor.

Furthermore, Libya is a member of the International Atomic Energy Agency (IAEA) - its representatives have been on the Board of Governors of the organization - with which it reached an agreement in 1980 on application of the safeguards provided for by the NPT on all its nuclear activity.(59)

It is believed that the Soviets have substantial control over the activities carried out at the nuclear research center in Tajoura and that in any case, safety measures satisfy IAEA standards. The Soviet presence in Tajoura, estimated at between 100 and 150, is reportedly vary pervasive. According to a 1984 report, the Soviets appear to have withheld some basic information about the equipment. For example, they did not provide manuals for

the software connected with the Soviet-supplied computer network, nor did the Libyans receive the gamma catalogues that are usual in nuclear research programs.(60)

It is assumed that even if the Soviet Union should supply the 440 MW reactors, it will continue with its traditional policy of control, aimed at preventing the facility from being used for purposes other than civilian. It is, therefore, reasonable to suppose that Moscow is perfectly aware of the profoundly destabilizing effect Libya's acquisition of a military nuclear capability would have.

Synthetic analysis of the declarations of Libyan representatives to the IAEA's General Conferences make it possible to evaluate Tripoli's attitude toward the NPT and nuclear technology.

- Libya feels that a nuclear program is indispensible to meet the country's future energy needs.

- The Libyan nuclear program is intended exclusively for peaceful purposes.

- Libya has fulfilled its commitments in signing the NPT and has reached an agreement concerning application of safeguards. This demonstrates Libya's willingness to set up a development program aimed exclusively at "peaceful application of nuclear energy".

- Libya feels that the gap in nuclear technology between the developed and the developing countries is growing. Tripoli feels that it is both necessary and urgent that developed countries increase their financial and technical assistance, in particular, in connection to the "fuel cycle and processing".

- Libya needs uranium for its nuclear program and has thus intensified prospecting operations within its territory. As initial results seem reassuring, prospecting will be intensified.

- Libya intends to develop "laboratory techniques for uranium processing as a first stage in the establishment of the nuclear fuel cycle".

- Libya accuses Israel and South Africa of having nuclear programs for military ends and asks "the Agency to inquire into those activities and to stop all assistance to Israel in order to preserve the credibility of NPT".

Logically, the declarations (61) emphasize the pacific aims of the Libyan nuclear program. But it is difficult to

establish to what extent they are expressions of a sincere political commitment or only token tributes to international public opinion and the IAEA, from which it wishes to continue receiving assistance.

The main justification for the program is the need for alternative energy sources and the possible benefits of application of nuclear know-how in the fields of agriculture and medecine.

The IAEA's main role is seen as one of technical and promotional assistance.

The non-proliferation regime is considered substantially discriminatory and the IAEA "unduly responsive to the major powers".

For his part, Qaddafi has never directly responded to accusations of pursuing military nuclear objectives and of financing construction of an "Islamic bomb". As already stated, in his declarations in recent years, he has always given assurances of the pacific aims of Libyan nuclear policy.

5. CONCLUSIONS

a. There has been a change of tone in the Libyan declarations concerning Tripoli's nuclear aspirations. Even Qaddafi's statements in recent interviews (most notably the one published in "Time" magazine in 1981) have given the impressions that Libya's "nuclear propensity" has somewhat subsided.

It is difficult, however, to determine whether it is the first sign of a revision which will extend to Tripoli's foreign policy. In actual fact, nothing in the basic ideology of that policy seems to have changed. Libya's overall international activity still appears to be marked by the same mixture of radical and extremist positions and outward projections characterized by interference in the internal affairs of other countries.

The incentives to nuclear proliferation - the objective of a huge united Arab nation, for which an atomic weapon could be the political bond; nuclear capability seen as a counterbalance to Israel's presumed nuclear power and as a deterrent to the imperialist threat posed by the United States and its allies; a nuclear capability to build up credibility and feasability of Libya's guiding role in the region and the Islamic world - seem concretely capable of having an influence inasmuch as they are in keeping with the fundamental lines of the Libyan leader's strategic and political thought.

It is presumable, therefore, that a military nuclear propensity is still present in Qaddafi's nuclear policy. This factor should not be underestimated in judging the

development and the progress of the Libyan nuclear program. Because of the particularly explosive effects on an international level of Tripoli's implicit or explicit acquisition of atomic weapons, this factor puts Libya into the "problem country" category, despite its present scarse nuclear capability.

b. At the moment, Libya has only one 10 MW reactor for research and a zero power critical facility provided by the Soviet Union. It has been reported by Libyan sources that the fuel is 80% U-235 enriched and that there are 2.3 Kg. of fuel in each core. But the uranium figure is disputed and considered by some experts as inferior to the real one. Others speculate that the Libyans do not know exactly what is in the fuel wich is provided on a turnkey basis by the Soviet Atomenergoexport.(62) Tripoli does not have the industrial capacity to produce its own nuclear materials or equipment. Programs based on the two Soviet 440 MW reactors still appear uncertain and far-off. Moreover, the country does not have enough qualified scientists, engineers and technicians to produce nuclear materials and to construct and manage nuclear plants.

Therefore, Libya is almost totally dependent on foreign countries for technical assistance, technological know-how, training and supply of materials and plants.

Without outside help, Libya could hardly manage a nuclear program for civilian use, let alone acquire the capacity for a nuclear weapon. Even with outside help, Libyan military nuclear power is a long-term prospect (more than 15 years). That period could be drastically reduced only if foreign assistance were totally focussed on acquisition of a military nuclear capability or if Tripoli were to obtain a nuclear device, nuclear explosive or nuclear weapon.

c. In the medium-term, nuclear energy does not seem to be urgently needed to fulfill electrical energy requirements, nor does it seem indispensible for the industrial development of the country. Even at very high annual production levels, oil reserves offer a vast time margin. Libya also has good possibilities of developing alternative sources.

On the other hand, justifying a nuclear program by the need for an alternative energy source with respect to oil which will, sooner or later, be depleted, is legitimate and hard to deny.

d. Like the whole decisional process and resulting foreign or domestic policy choices, nuclear decision-making within the small group of former RCC members which today

form the general secretariat of the GPC, is dominated by Qaddafi.

The profound transformation of the political and administrative structure and of management of power at a subnational level cannot disguise the reality of the concentration of power in the hands of one or only a few men.

Libyan society does not yet seem capable of creating groups or forces capable of influencing the leaders' political and economic choices, much less with regard to the trends and developments of the country's nuclear policy.

The armed forces seem to be the only ones capable of exerting pressure or acting as a brake. Nevertheless, besides security incentives and disincentives, and interest in or indifference to an atomic weapon, Libyan armed forces are not always in absolute accord with the leader of the revolution. Involved in almost all the coup attempts from 1969 till today, accused of corruption, nepotism and anti-revolutionary practices, often placed under the control of the Revolutionary Committees, the military do not seem to have Qaddafi's complete trust, and therefore, do not seem capable of influencing his decisions, especially if he were to come to the conclusion, right or wrong, that accepting their proposals could either directly or indirectly lead to an increase in their power and influence. Qaddafi could consider nuclear capacity too important a gift for armed forces which are not totally trustworthy or, even worse, are planning his overthrow.(63)

e. A change of regime could change Libya's nuclear propensity in the sense that it could reduce the importance of security and foreign policy incentives. Nevertheless, even a less radical, more predictable and internationally more moderate regime would not cancel the nuclear program undertaken. It might take another look at the main trends and modify the implementation schedule, it might more readily accept conditions posed by possible supplier countries and reconfirm commitments regarding safeguards taken on with the IAEA. But it is difficult to imagine that, whatever the regime, Libya would or could give up nuclear energy.

f. Libya has ratified the NPT and has accepted to place its nuclear activity under the IAEA's control.

In any case, as long as the Soviet Union is the only country supporting Libya's nuclear program, it is logical to suppose that no secret detours will be made toward a military nuclear capability.

The situation could, however, change as the consequence of two hypothetical events.

The first is that having acquired an adequate level of technological know-how and sufficient infrastructures, Libya decides to rid itself of Soviet control and to continue development of a military nuclear capability on its own, making use of the loopholes offered by present regulations for passing IAEA checks.

The second is that other countries decide to provide assistance to Libya in the future without getting assurances concerning rigid fullscope safeguards. In the first as well as the second hypothesis, it would be possible for Libya to bypass IAEA controls or decide to pull out of NPT.

g. What attitude should European countries have toward Libya? What political stance should they adopt given Libya's strong nuclear propensity in the past and its apparently weaker and different inclination today; given its scarse technical capacity which makes nuclear power a long-term prospect in any case, despite Libyan aspirations; and given Tripoli's legitimate desire to implement a nuclear program for peaceful purposes?

The European countries' options basically boil down to two.

1) Adoption of a rigid position of isolation of Libya with regard to anything nuclear (direct assistance, supply of materials and equipment, training of scientists and technicians) and possible adoption of preventive measures inside and outside the context of the NPT in the event of well-founded indications and sure evidence of a process of acquisition of a military nuclear capability.

But that would mean leaving the role of the main supporter of Libya's nuclear program to the Soviet Union. In this way, Moscow's relations with Tripoli would become exclusive with respect to Western countries, making them difficult to break. As a matter of fact, no exclusive relations exist even in the field of arms sales.

Then again, if Soviet assistance were integrated or even substituted by a country now a part of or about to become a part of the new group of suppliers, especially if there were ideological or religious affinities, those controls and safeguards which today make Libyan proliferation very unlikely would be eliminated.

2) Adoption of a more flexible policy taking into account European interest in Libya - that which is already occurring in a great many European countries (Italy,

Belgium, France, Spain, Western Germany, Turkey) in the field of military assistance and arms sales.
This means working out a policy of cautious and moderate open-mindedness, conditioned in its practical implementation by concrete proof of a real change in propensity toward proliferation and a more moderate and less aggressive international stance.

This kind of policy could be used to pressure Qaddafi into reconsidering the destabilizating aspects of his foreign policy; could serve as an instrument with which to weaken relations between Tripoli and Moscow by making the most of the appeal of advanced Western technology and organization; could prevent formation of alternative ties with Islamic new supplier countries, perhaps more willing to satisfy Libyan requests, even if potentially proliferant; could direct development of Libyan nuclear policy toward equipment and plants which are less easily turned into means of proliferation; could lead to forms of cooperation protected by fullscope safeguards.

Cautious and gradual European cooperation should concentrate more on supply and assistance in nuclear power plant management than on providing nuclear technological know-how, always excluding, however, plants and large-scale research reactors able to produce weapons-grade plutonium.

It should also provide for effective political and economic sanctions in case of proliferation attempts.

Finally, the European countries should apply discrete pressure on Argentina and Pakistan to induce them to be very cautious and adopt particular restraint in their nuclear cooperation with Libya.

h. Of Western countries, for reasons including historical links, geographic position, close commercial ties, and the number of people working in Libya, Italy seems suitable to become, on the one hand, the focal point in working out (with Belgium and France) and coordinating European policy towards Tripoli also in the nuclear sector (perhaps within the framework of the European Community), and on the other hand, the privileged channel of communication through which to keep up contacts, sound out intentions and answer any Libyan requests.

i. The second option seems better than the first and more suited to long-term European interests. The time, however, is not yet right for its implementation.

Libya has not yet given sufficiently clear proof of its desire to change its international stance and the fundamental lines of its foreign policy.(64)

Furthermore, one must be certain that Libya's new position, which the results of talks in Tripoli (July

30-31,1984) between Italian Foreign Minister Giulio Andreotti and Libyan leader Qaddafi tend to support, are not an instrumental choice aimed at coming out of isolation. Thus, new, lasting elements in Qaddafi's foreign policy must be awaited and consolidated. Elements which would unequivocally indicate that Libya has abandoned its subversive foreign goals and its support to international terrorism.

Therefore, although it is politically right for European countries to take on a flexible attitude toward Libya, albeit uncompromising with regard to the destabilizing effects of its international actions, such flexibility should not yet include prospects of cooperation in the field of nuclear energy.

FOOTNOTES

(1) At the beginning of the '70s, Qaddafi supported and agreed with the political line of Muhammad Hassanein Heikal, editor of the influential Egyptian daily "Al Ahram", according to which Arab nations should build up an independent nuclear capability, not only for anti-Israeli reasons, but also to be able to play a different and more decisive role internationally. In fact, in the Libyan leader's revolutionary and Messianic philosophy, the "bomb" fits in perfectly as an element of pan-Arabic cohesion. In an interview with a Sudanese newspaper in 1975, Qaddafi announced that Libya was soon to become a nuclear power. In another interview printed by the "Washington Post" on Nov.17, 1975, he confirmed his statement. Still in the same year, in an interview with the French "Le Pointe", he stated that the era of nuclear monopoly was drawing to a close and that soon all countries would be able to become nuclear. In 1978, during a conference in Tripoli, Ahmed el-Shahati, head of the Foreign Liaison Office of the People's Congress stated unequivocally that Libya was seeking nuclear weapons. Jeremy Stone, director of the Federation of American Scientists, who participated in the conference later reported: "That evening I dined privately with Shahati and his group of Western trained people-to-people entrepreneurs. I opened the discussion by saying that our scientists were often quite tolerant of anti-American statements and widely varying politics. But we did draw the line at the use of science for killing innocent people. Were they going to persist in supporting terrorists, and were they seeking an atomic bomb ? They were. Shahati made no bones about it, saying thay would seek all weapons with which to defend themselves. To be sure I understood, I asked again were they seeking to maintain the right to get a bomb or actually trying to get the bomb itself ? It was the latter". See Federation of American Scientists, Public Interest Report, December 1978, p. 1. In 1979, top Libyan officials confirmed that their country would soon become a nuclear power.

(2) A change in emphasis and interest was first noticed in an interview in the "New York Times" on Dec.10,1979, in which Qaddafi stated,"We have signed all agreements on the non-proliferation of nuclear weapons. Our nuclear research is conditional on international conventions. But we are as serious as the rest of the world in our desire to reduce our dependence on oil and to find alternative sources of energy including atomic sources. We are victims of the story that we want to build an atom bomb. It is not true.

It is a reactionary charge that I am sorry to hear. It is against progress. As for Pakistan, they have a reason to build a bomb because India has one. If they can make it they will."
Furthermore, in an interview with "Time Magazine" in June, 1981, Qaddafi denied the idea of an "Islamic bomb" and declared himself to be against the construction and acqusition of atomic weapons. He stated: "I have nothing but scorn for the notion of an Islamic bomb. There is no such thing as an Islamic bomb or a Christian bomb. Any such weapon is a means of terrorizing humanity, and we are against the manifacture and acquisition of nuclear weapons. This is in line with our definition of, and opposition to, terrorism." See Time, June 8,1981, p.31.
Finally in February, 1982, Abdul Magid-el-Mabruk-el-Gaud, head of the Libyan Atomic Energy Secretariat, stated that his country's goal was to develop a nuclear program able to satisfy 20% of Libya's electrical energy requirements by 1995 and that, had that been Libya's intention, it would have been cheaper to opt for an exclusively military nuclear arms construction program.
See Claudia Wright, "Libya's nuclear program" The Middle East, No.88, Feb.1982, p.47.
Concerning Libya's presumed fall-off of interest, see Ronald Bruce St.John, "The Soviet penetration of Libya" The World Today, No.4,April 1982, p.135.

(3) I used various sources (Wright, Cooley, Jabber) and in particular, the article by Joseph V.R.Micallef, published in The Bulletin of Atomic Scientists, August-Septemeber 1981, p.14-15 and the fundamental work by Carol A.Eberhard and Warren H.Donnelly,"A brief analysis of the nuclear power interests of Cuba and Libya and their closeness to nuclear weapons" Congressional Research Service, December 30,1983.

(4) See Keesing's Contemporary Archives, May 28, 1976, p.27755.

(5) One million tons in 1979, 2.3 million tons in1980. See Financial Times, July 20, 1978.

(6) See C.Wright, op.cit., Micallef, op.cit., C.A.Eberhard and W.Donnelly, op.cit., as well as John K.Cooley, "The Libyan Menace" Foreign Policy, No.42, Spring 1981, p.87 and Thijs de la Court, Deborah Pick and Daniel Nordquist, "The Nuclear Fix", World Information Service on Energy, 1982, p.65.

(7) Christian Science Monitor, Dec.19, 1979.

(8) See Le Monde, July 25, 1980.

(9) See International Herald Tribune, Jan.21, 1981.

(10) According to unconfirmed and not very reliable information (an article published in "The Observer" of London in February 1980), the German Federal Republic supplied Libya with the materials necessary for uranium enrichment. In any case, Libyan technicians and scientists are trained in Germany. Finland agreed to construct the cooling system for the nuclear power plant that the Soviet Union was to supply to Libya, but this commitment was later annulled. Contacts with Sweden concerning assistance to Tripoli in development of a small nuclear research center were to lack a follow-up. See C.A.Eberhard and W.H.Donnelly, op.cit., p.CRS-23.

(11) See Leonard S. Spector, "Nuclear proliferation today", Vintage Books, New York, 1984, p. 157.

(12) See "Belgium and Libya will sign an agreement on nuclear cooperation", Nucleonics Week, May 24, 1984.

(13) Ibid. and L.S.Spector, op. cit. pp. 159-161, where the proliferation significance of the UF4 plant is analyzed.

(14) See Nucleonics Week, November 1, and December 6, 1984.

(15) See the Washington Post, June 3, 1975; Keesing's Contemporary Archives, Sept.1-7, 1975, p.27313; C.Wright, op.cit. and R.B.St.John, op.cit., p.135.

(16) See C.Wright, op. cit. J.K.Cooley, op. cit., and V.R.Micallef, op. cit.

(17) See Middle East Economic Digest, October 15, 1982, p.26.

(18) According to Libyan sources, the 1975 agreement included a "research center with a nuclear reactor with 2 MW power which can be increased to 10 MW". See Keesing's Contemporary Archives, Sept. 1-7, 1975, p.27313.

(19) See "Belgium and Libya will sign an agreement on nuclear cooperation", Nucleonics Week, May 24, 1984.

(20) For more details, see Ann MacLachlan, "Libyans are seeking broad international cooperation in nuclear area", Nucleonics Week, September 27, 1984.

(21) See R.B.St.John, op.cit.,p.135.

(22) See Arab Report and Record, Feb.1-14, Feb.15-29 and Dec.1-15, 1976. See also Il Resto del Carlino, Dec.7, 1976 and Il Fiorino, Dec.14, 1976.

(23) See The Washington Post, Dec.12, 1977.

(24) See Middle East Economic Digest, Feb.5, 1982,p.29.

(25) See Middle East Economic Digest, Oct.9,1981 and Feb.5, 1982,p.29.

(26) See T.de la Court, D.Pick and D.Nordquist, op.cit.,p.66.

(27) See "On-again off-again. Libyan nuclear plant surfaced once more", Nucleonics Week, March 31, 1983.

(28) See Ann Knight,"Libya tries to plug its energy gap", Middle East Economic Digest, March 23, 1984, p.28.

(29) See J.V.R.Micallef, op.cit., p.15 and J.K.Cooley, op.cit., p.87.

(30) See J.K.Cooley, op.cit., p.87.

(31) The table was printed in Steven J.Warnecke's "Uranium non-proliferation and energy security" The Atlantic Papers, No.37, Paris, 1979, p.55.

(32) See T.de la Court, D.Pick and D.Nordquist, op.cit., p.66 and Arab Report and Record, Nov.1-3, 1977.

(33) It seems that the only geological study done in the area resulting in the discovery of traces of uranium oxide, were carried out by the French Bureau de Recherche Général Mineraire in the years 1969 and 1970. See J.V.R.Micallef, op.cit., p.15.

(34) Data concerning uranium purchased from Niger is conflicting. T.de la Court, D.Pick and D.Nordquist, cit.,p.66 state 300 tons in 1979, 500 tons in 1980 and 1212 tons in 1981. C.A.Eberhard and W.H.Donnelly, cit., p.CRS-24, state 258 tons in 1978, 150 tons in 1979, 180 tons in 1980, 1212 tons in 1981.

(35) See Stephen M.Meyer, "A statistical risk model for forecasting nuclear proliferation" ACIS Working Paper, No.41, July 1983, p.3.

(36) As sources, I made particular use of the book edited by Harold D.Nelson, Libya a country study The American University, Washington, 1979, the Keesing's Contemporary Archives series and a series of articles by Paul Balta which appeared in Le Monde from Dec. 27 to 30,1980.

(37) See Keesing's Contemporary Archives, July 2-8, 1973, p.25967.
According to Libyan news reports, by the end of June, 1800 People's Committees had been established in all spheres of national life.

(38) Nevertheless, in 1976 an editorial in a Libyan newspaper complained that the work force was composed of thousands of directors and supervisors and most of them in the public sector. See H.D.Nelson,ed., op.cit., p.101.

(39) The number of foreign workers in Libya in 1981 was estimated to be 500,000, with a Libyan population of just over three million people. See Keesing's Contemporary Archives, Sept. 3, 1982, p.31681.

(40) See J.A.Allan, ed.Libya since Independence, Croom Helm, London, 1982, p.20 and 68-69.

(41) See Nucleonics Week, March 31, 1983, p.11.

(42) The matter becomes complex and difficult mainly because of lack of reliable information. Libyan security problems and news regarding the armed forces are shrouded with the utmost secrecy. No publications deal with these problems on an overall basis and official sources are always very reserved about the matter. Journalistic reports do not exist and there are no interviews available with important exponents of the military establishment. Furthermore, since the middle of the 1970s, details of Libya's defense budget have no longer been disclosed.

(43) Even more significant than budget figures are the quantities of materials purchased, in that a part of arms imports were paid in oil supplies.

(44) All figures relative to the Libyan armed forces are taken from The Military Balance by IISS of London, published annually.

(45) In mid-1978, it was estimated that of the approximately 559,000 men between the ages of 15 and 49, approximately 327,000 were probably suitable to serve in the military. See H.D.Nelson, ed.,op.cit., p;252.

(46) See Paul Balta, La Libye ou le défi permanent. Vers le "peuple en armes", Le Monde, Dec.28-29,1980.

(47) See Keesing's Contemporary Archives, Sept. 1983, p.32413.

(48) See Middle East Economic Digest, Dec. 17, 1982, p.58.

(49) Qaddafi's decision was officially approved at the GPC's meeting of March 1-2, 1979. See Keesing's Contemporary Archives, June 15, 1979, p. 29665.

(50) See Middle East Economic Digest, April 29, 1983, p.34

(51) Some concern has been shown lately with regard to his physical and mental conditions and his ability to carry the full burden of power on his shoulders. See Bob Woodward, "Although Qadhafi is still the leader, problems may be closing in", International Herald Tribune, May 2, 1984, p.8.

(52) After the two Libyan fighter aircraft were shot down in 1981, Qaddafi declared that he was ready to defend the Gulf of Sirte transforming it, if necessary, into another Red Sea with Libyan blood and to repel any violation with "ships, aircraft, missiles and any other weapon system".

(53) Obviously, real imperialism is that carried out by the United States, not only because it is ideologically "capitalist", but also because it is inextricably bound to the Israeli cause.

(54) The 2.5 billion dollars spent for purchase of Soviet weapons in 1977, according to American government sources, could well remain unique.

(55) Concerning the accusations against Libya of the governments of Dominica and Saint Lucia of having supplied opposition movements with money and terrorist training, see Keesing's Contemporary Archives, vol.XXX, January 1984,p.32621.
With regard to the closing of the Libyan People's Bureau at Port Louis and about accusations against Libya of interference and attempts at destabilization, see Middle East Economic Digest, Jan. 20, 1984, p.47.

(56) It should be pointed out that the Italian firm AGIP discovered an oil field off the coast of Tripoli which should, as of 1987, supply around 7.5 million tons of oil per year. See La Repubblica, August 1, 1984.

(57) See H.D.Nelson, ed.op.cit.,p.147. But other estimates are less optimistic. According to Andrew Lycett, American geologists have predicted depletion of oil reserves within 7 to 10 years. See A.Lycett,"Libya: is the sun setting on Muammar Gaddafi's day?" New African, October 1982, p.17.

(58) The oil companies' commitment for research amounted to 500 million dollars for the 1975-1980 period. See H.D.Nelson, ed.op.cit., p.144. In Lycett's opinion, the chances of finding other large fields are remote.

(59) See C.A.Eberhard and W.H.Donnelly, op.cit.,p.CRS-26.

(60) See Ann MacLachlan, op. cit., Nucleonics Week, September 27, 1984.

(61) Besides those made at the General Conferences of the IAEA, only Qaddafi has made declarations about Libyan nuclear policy and program.

(62) See Ann MacLachlan, op. cit., Nucleonics Week, September 27, 1984.

(63) Two new unsuccessful attempts to assasinate Qaddafi were reportedly carried out by dissident segments of the Libyan military in 1985. See International Herald Tribune, April 13-14, 1985.

(64) It is worth remembering: the killing of the police woman outside of the People's Bureau in London, the alleged implantation of mines in the Red Sea and the support reportedly given to terrorist activity in the Middle East and Persian Gulf countries.