Culture of Command & Control of Nuclear Weapons in the Middle East

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Executive Summary

A number of Middle Eastern states are potential candidates for acquisition of nuclear weapons after Iran has achieved this goal. These include: Saudi Arabia, Turkey, Egypt, Syria, Iraq and Libya. This study is an attempt to portray possible paradigms of C3 (Command, Control and Communications) of nuclear weapons in these countries if and when they acquire those assets. The study explores not only the paradigms that may emerge in the present regimes (or continuity regimes), but also in potentially revolutionary Muslim Brotherhood or Jihadi-Salafi regimes.

The factors that will influence the C3 paradigms of nuclear weapons in the region include a wide range of political, military, bureaucratic, religious and technological issues. The basic building block for C3 of nuclear weapons will be the country's perception of what they are meant for; are they perceived as "taboo" and so destructive and terrible that they must be controlled far past any other weapon? While the public discourse in the Middle East perceives nuclear weapons as a means that will allow their owner to deter its enemies by threat of total annihilation, it does not reflect the sense of a "taboo" on the actual use of nuclear weapons that developed in the international community. This is particularly evident in Islamic writings – both Jihadi-Salafi and mainstream – which tend to analyze nuclear weapons as extrapolations of weapons which existed in the early days of Islam and were permitted by the Prophet, and hence their use is permissible. The absence of this "taboo" will impact on the stringency of the C3.

The historical record shows that nuclear aspirations in the Middle East have been motivated by a number of considerations. One is derived from the issue of honor, and the desire of successive regimes to demonstrate a measure of stature, regional and international standing, and prowess, so as to garner the esteem of a wider audience, inside and outside direct national constituencies. Looking at Egypt's Nasser in the distant past, seeking recognition as the leader of the Arabs, albeit without nuclear weapons; Saddam Hussein in the more recent past, invoking mythological images to establish his particular form of dominance over others; Qaddafi, or Iran in the future – evoke this factor in trying to understand the future nuclear posture of the states concerned. Iran, Saudi Arabia, Egypt, Turkey, Syria, Libya or others, therefore all have motives that are beyond the scope of pure strategic deterrence associated with nuclear prowess. It is evident that nuclear weapons thus invoke a degree, a modicum, of mysticism that reinforces images of ideological fervor seeking to undermine the status-quo, or anxieties regarding these states' integrity and survival. They are thus subject to entirely rational calculations regarding their utility, but in an environment of values quite different from that of the Cold War.

A country – such as Iran – that views nuclear weapons not only as a deterrent against its enemies (in the case of Iran – the United States and Israel), but also as weapons to be brandished in order to achieve a predominant – even hegemonic – status in the region, will be more likely to integrate this capability in its day to day strategic posture. Such operationalization of the nuclear assets will create a need for more elaborate models of command and control. Other countries, such as Saudi Arabia, may view the weapons as

quintessentially deterrents, and hence to be stored away until extreme circumstances warrant their deployment. Such an operational concept will facilitate C3 measures. However, the attitude of one party to its nuclear assets will affect that of its potential adversaries. Those states who may initially not opt for operationalization of the weapons may be forced to adopt a more operational (and hence more demanding in C3 procedures) attitude as a response to the behavior of their neighbors.

A key conclusion of the project is that the C3 paradigms that will probably emerge in the early stages of a nascent nuclear power in the region will probably be closer to the early structures of the veteran nuclear powers, with adaptations for regional cultural, political and religious idiosyncrasies, and will not necessarily reflect the accumulated lessons of those powers. The latter developed their paradigms gradually as nuclear weapons became more abundant, and in a thoroughly different strategic and cultural context. Furthermore, the suspicion towards the West in the region is likely to bring them to reject solutions that are based on "off the shelf" Western technology, and to try to develop local solutions, which will be, initially at least, less sophisticated. They may, however, turn to willing supplier states with which they have long-standing strategic relationships, or other commonalities of interest, for assistance in expertise and hardware, to establish the required C3 infrastructures – Iran, North Korea (DPRK), Pakistan and the People's Republic of China (PRC) all come to mind as supplier thereof, in one possible context or another, for one or another of the states examined.

Furthermore, the nuclear capability, once achieved, will be an important lever for influence within the regimes because it is viewed in these societies as confirming the prowess of the leadership, thus enhancing regime survival. This may well create solutions based on "constructive" ambiguity to solve internal conflicts which will leave loopholes for the actual C3 of the weapons.

Thus, although it is the assumption that even ideologically, or religiously, highly charged leaderships will remain rational, by and large cognizant of the effects of nuclear weapons and the fundamentals of nuclear deterrence stability – yet the possibility of catastrophic miscalculation, for a multiplicity of reasons, is disconcerting. An initial evolving of a low-probability-high-consequence danger of nuclear weapons being in the possession of the regimes which rule the states scrutinized in the study, could then embody dynamics that might lead to escalation, volatility, crisis brinkmanship, and ultimately deterrence instability. This would, then, possibly occur in a manner quite different from that which evolved during the Cold War in its latter stages, and to which much reference is commonly made in current studies, especially after the Cuban Missile Crisis of 1962 served to superimpose mutual rules, regulations, and caution.

The personalized leadership style common in the Middle East will also have a determining effect on C3. All the regimes and military establishments in question are averse to delegation of authority in matters relating to strategic weapons and strategic interests. In contrast to the Western system, of delegation of authority and de-centralization of information on a need to know basis, we will probably encounter in the Middle East a more individualized chain of command consisting of fewer, but highly loyal and trusted individuals, with less compartmentalization between them. The delegation of authority will be based on collective identity (tribal, familial, "old boys" networks, religious schools). The tradition of hyper-centralism of some of the regimes, and the tendency for deep involvement in military affairs by the political leadership, would probably extend to its involvement in the very identity of each link in the chain of command over nuclear weapons.

The purported Soviet style "dead man's hand" system would, theoretically, be acceptable to many of the regimes in the region, and particularly to autocratic authoritarian regimes. However, the logic behind this system – the total destruction of the country in the wake of a nuclear attack, warranting an all-out second strike and the *a priori* knowledge of the identity of the attacker – will not be true in the Middle East. In the Middle East, a nuclear attack may be perceived as survivable, especially if such a notion were to be legitimized by religious edict (*fatwas*), and elements of the regimes involved may, therefore, not necessarily accept the idea that the incapacitation of the incumbent leadership should automatically escalate to an all-out nuclear war. This concern may bring regimes to pre-delegate authority to particularly loyal pre-designated trusted field commanders. In authoritarian regimes with an "*après moi le deluge*" mentality, there will be more of a propensity to adopt these means. However, it may also be compatible with a leader or regime that has a strong apocalyptic, or messianic, belief, and views such action not as merely revenge but as an act which may hasten the apocalyptic or messianic stage of history, and ultimate victory.

In most of the regimes in the region, custody of the weapons and the delivery systems will have to be put in the hands of organizations whose loyalty to the leaders is beyond doubt. This constraint may lead to weapons and delivery systems being under unified command, or at least held in units which are subordinate to one common field command. Research and development (R&D) establishments in the Middle East are also liable to play a role in the decision-making processes even after completing development of the weapons, similar to that of A.Q. Khan in Pakistan. Since these are usually linked to military organizations, they may emerge as "back doors" to the C3 system for the weapons they devised. Thus, these organizations may become "loose cannons" in scenarios of breakdown of the states.

Integration of Western-style technologies (the American "football", the Russian Cheget, or permissive action links [PALs]) into the command and control structures of regimes in the Middle East is doubtful, at least in the early stages. The natural suspicion that the enemy may be capable of planting Trojan horses in technological systems in order to manipulate them, may inhibit the use of such means, and increase the reliance on physical communication, verbal codes understood only by the addressees, trusted emissaries and runners, and security vetting. The inhibitions behind the use of such technology would derive also from the fact that a country with only a small nuclear arsenal would probably not endanger it by integrating a system which may cause permanent damage to the weapons in case of improper use. Reliance on such means, though, would have an adverse effect on the regime's ability to maintain flexible time-sensitive response mechanisms and hence would influence other elements of the nuclear doctrine. With this, high alert levels desired to reinforce deterrence, intimidate, establish escalation dominance, and demonstrate prowess for domestic regime survival motive – would require extra efforts to build reliable C3I (Command, Control, Communications and Intelligence) capabilities, perhaps beyond the capacities of the states concerned to do independently without outside assistance.

The fact that the same types of delivery systems may be used for both conventional and non-conventional warheads will further complicate C2 (Command and Control), as different standard operating procedures (SOPs) will probably be applied to those delivery systems which are dedicated for nuclear weapons. Furthermore, the possibility that nuclear weapons may be delivered in un-orthodox ways – by truck, civilian ship or airliner, neighbouring countries' territory – to obfuscate responsibility will also reduce the use of technological means of command and control.

It is very unlikely that any of the regimes in the region will adopt human

verification of the orders of the Head of State. In the authoritarian regime model, the leader would probably not accept any restrictions on his authority to launch weapons – even authentication by a "trusted" deputy. Regimes such as the Iranian or future Jihadi-Salafi regimes in which the leader is perceived as the "*Amir al-Muminin*" (Commander of the Believers) or (as in Iran) the *Vali-Faqih*, the leader is thought to have a certain inspiration from *Allah*, and restriction of his discretion by a lesser individual would be tantamount to imposing restrictions on the will of *Allah*. Even the argument that the verification is not meant for regular situations but for contingencies during which the leader may be incapacitated, for any reason, would be difficult to support in these regimes.

A state that acquires a military nuclear capability will have to make a substantial investment in means of delivery of those weapons. The preferred means of delivery will be surface-to-surface missiles (SSMs). The logic that brought existing nuclear states to deploy assets in sparsely populated non-central locations may not be applicable in some of the regimes under discussion. Distant areas are, in many cases, populated by minority groups who are perceived as *a priori* disloyal to the regime. The advantage of deployment in these areas – drawing enemy attacks to areas which are not the "heartland" of the nation – must be considered in contrast with the question of the security of the installations in those areas.

The fear of infiltration and betrayal may encourage separation of weapons from delivery systems. Keeping warheads unassembled, with parts stored in different locations or in the same location but one step, "a turn of the screw", away from operational status would make the stealing of fully operational weapons difficult, but would extract a price in terms of operational flexibility, and hinder frequent or permanent high alert. Hence, it is more likely that these regimes will opt for storage of warheads under control of highly reliable keepers. The limited number of such loyal and reliable keepers will oblige the regime to keep nuclear assets together – compromising their security and raising the chances of unauthorized use or theft. In regimes for which the nuclear capability is viewed as a strategic capability for possible use, the security consideration may be subordinated to the necessity for flexible response, and hair-trigger readiness.

Preface

This paper is a summary of a series of country studies and roundtable discussions on potential paradigms of command and control over nuclear weapons that may be adopted by Middle Eastern countries if they acquire such weapons. The objective of the project was to bring a broader understanding of the implications of a "nuclearized" Middle East in the wake of the acquisition of a military nuclear capability by one or more countries in the region.

There are various views regarding which countries may be the first to enter the nuclear arms race in the wake of Iran. In the course of the discussion, the following points were raised:

Saudi Arabia will have the highest motivation to acquire a nuclear capability in the wake of Iran. Conventional wisdom suggests that Saudi Arabia will not, and cannot, undertake an independent nuclear weapons R&D effort, but will likely take advantage of its links to the Pakistani nuclear program (which it funded in the distant past), and will attempt to purchase a capability from any willing supplier. Disconcerting is the possibility, however remote at this point, that such a capability might devolve to a successor regime of unspecified type, particularly a Jihadi-Salafi one.

There is a basis for assessing that the first state that will attempt to attain a nuclear capability after Iran is **Turkey**. The Turkish case is complicated: in spite of its indigenous capability for developing a nuclear program, Turkey is a member of NATO and seeks to become a member of the European Union. As such, it theoretically has access today to US nuclear weapons stationed on its soil, at Incirlik, and which are designated as being at its disposal. But this does not constitute an independent deterrent, and does not bestow it with the regional nuclear status that would be desired in response to a regional poly-nuclear environment. Thus, it faces a number of limitations. However, in a scenario following the collapse of regional non-proliferation firebreaks, and consequently perhaps the global non-proliferation regime, Turkey may find itself forced to go on this course, particularly if other countries in the region, including Saudi Arabia or Egypt, begin to develop nuclear weapons, and if Russia were to revert to old stances.

Egypt undoubtedly has the most advanced scientific, technological and industrial infrastructure of the Arab states. It has the best scientific array for operating nuclear reactors and implementing a dedicated nuclear program. It is inconceivable that Egypt, which sees Iran as the key threat to its own interests and to Arab-Sunni interests in general, would allow Iran to become a nuclear power without attempting to acquire a comparable capability. Egypt, which also sees itself as the strategic defender of the Arab world, would find it hard to abandon the defense of the Arabs to the Saudis and Gulf States, even if they were to acquire nuclear weapons of their own. Rogue elements inside the Egyptian ruling elite (Abu Ghazala), and outside of it (Haykal), are reported to have sought to acquire or establish a nuclear weapons capability at various stages, and it is possible that in the late 1980s or mid-1990s, Egypt may have been on the threshold of attempting to seek a nuclear capability. Another danger with respect to Egypt lies in the possibility that the Muslim Brotherhood will gain power in the state, and take control of a nuclear program in an advanced stage of development, or initiate one if it is not already underway when assuming power.

• **Iraq** was twice close to establishing the wherewithal for attaining a nuclear weapons capability, first until Israel's action against the Osiraq reactor in 1981, and again the first Gulf War of 1991 interrupted its plans, as first US military intervention, and then UN inspection teams, put a stop to the Iraqi nuclear weapons program. The new order in Iraq after Saddam Hussein's regime is still coalescing, and it is difficult to say what Iraq's identity will be under Shiite dominance – whether it will adopt the Arab identity and seek to fill a key role in the Arab world, or whether it will adopt the Shiite identity and an intimate connection with Iran. If Iraq seeks to develop a nuclear weapons capability, it will have to start from scratch in terms of the hardware that it will need, because most of its equipment was destroyed, and there is tight international monitoring of everything it possessed prior to the US-led invasion. However, as regards the expertise required, some of the personnel who established Iraq's nuclear program up to 2003 are still present and ready to mobilize for this effort, even if Security Council resolutions imposing severe restrictions on Iraq remain in effect after the US withdrawal. In addition, Iraq might also be able to purchase the necessary wherewithal, perhaps even nuclear weaponry off-the-shelf from willing suppliers, such as the DPRK perhaps, or Pakistani elements, rogue or official.

• **Syria** is incapable of achieving a nuclear capability on its own, but until 2007 it almost succeeded in clandestinely constructing a nuclear reactor acquired covertly from the DPRK, obviously intended for the production of weapons grade plutonium for a modest nuclear weapons program, similar to its role in the North Korean program, and is suspected by the International Atomic Energy Agency (IAEA) of possibly also having engaged in undeclared uranium enrichment activity. The very fact that the Syrian regime

had already begun a clandestine nuclear weapons program should be taken as indication that it may do so again in the future, the more so if regional non-proliferation firebreaks are breached, and regional rivals like Saudi Arabia, Egypt or Turkey appear to be going nuclear.

• **Libya** embarked on a nuclear weapons program by the acquisition of "turnkey" uranium enrichment facilities from the A.Q. Khan network, which also supplied it with the blueprints of an early PRC atomic bomb design, and therefore it is only plausible that once the dam had been breached, it could attempt to return to previous efforts halted by US and UK intervention in late 2003.

The questions that were posed to the participants include, *inter alia*, the following:

• What is the motivation of the countries of the region to develop, test and declare possession of nuclear weapons, and how does the motivation affect the envisaged future C2 and nuclear posture of those countries after they acquire them?

• What are the influences on C2 paradigms of religious, local-political, cultural, and social-organizational culture on nuclear policy in the various potential nuclear states under scrutiny in the project? In this context, what is the influence of domestic stability, regime politics, sectorial (tribal, sectors within the defense and security establishments) interests, religious authority and other internal factors?

• What lessons may be learned from conventional command and control paradigms, and C2 of current "strategic weapons" (SSMs or chemical and biological weapons [CBW] arsenals which have been around for many years in some of the states being examined – Egypt, Syria, Iraq, Iran, Saudi Arabia, Libya)?

• What cultural and political features of potential nuclear states in the Middle East may affect future C2 of nuclear weapons, and of nuclear posturing?

• The decision-making process regarding the use of nuclear weapons; who is involved (functionally; personal inclinations)? Rivalries (between functions; personalities)? Likely options regarding the chain of command?

• What existing C2 procedures may be compatible with the military and political culture of the countries of the region and which will be rejected? Examples of these may be:

• Means for authentication of identity and legitimacy of commands (codes, authentication by second-in-command, etc.);

• Triggers and methods for delegation of authority;

• PALs (Permissive Action Links);

• What checks and balances – by human control or technological enhancement – could be instituted to prevent unauthorized launch of nuclear weapons?

• "Plan B" scenarios envisaged for C3 in case the legitimate leadership is incapacitated, or the primary chain of command is disrupted (salience of the Iraqi example in 1991 and 2003 to other states, and lessons possibly learned?).

• Relevance of potential multilateral control, involving partnerships and alliances between Arab states (Egypt/Saudi Arabia/Gulf Cooperation Council [GCC] States) – either in normal situations or in situations when the national command structure collapses.

• Communication (thus, C3) issues; and intelligence issues (thus, C3I) issues with respect to a coherent system that such states might be obliged to develop, at least over time, even if during the initial stages it may be assumed that these would be perhaps somewhat "primitive" and centralized.

• In which cases will there be a higher risk of transfer of nuclear weapons to non-state (terrorist, proxy) players, by either authorized official decision, or by renegade or rogue elements acting at behest?

During the project various political scenarios were discussed in which countries in the region may be in danger of nuclear confrontation. These scenarios served to test the different assumptions regarding the C2 paradigms of the different countries, and the outcome of the interaction between them. This facet of the project has not been summarized and may serve as raw material for future discussion.

The project commissioned separate studies on a number of key Middle Eastern countries, regarding which these questions were posed: Iran, Saudi Arabia (assuming the continued rule of current ruling elite represented by the Saudi royal family), Egypt (assuming the current, or continuity, ruling regime elite), Iraq, Syria, and Libya. In addition, studies were prepared on C2 of nuclear weapons by a possible Muslim Brotherhood regime in Egypt, and by a possible Jihadi-Salafi regime, principally in Arabia if the Sa'ud line were to be displaced. Three roundtables were held in which the issues above were discussed. The list of participants in these roundtables appears in Appendix 3.

Overview

As far as is known, none of the regimes in this study currently possess nuclear weapons, and there are no indications that any of them have even begun to develop a doctrine for command and control of such weapons if and when they acquire them, except perhaps Iran that already has a well established operational SSM infrastructure under the auspices of the Iranian Revolutionary Guard Corps (IRGC) Air Force, which might be expected to be designated as the trustee of nuclear weapons assets too. However, there exist cultural, political and organizational features of these countries, which can shed light on possible command and control paradigms for nuclear weapons that may emerge if these regimes acquire them. These features include:

• Islamic views embraced by some of these regimes regarding the acceptability of nuclear weapons for deterrence, and the permissibility of using nuclear weapons to advance the cause of victory. These views may provide for insight into the level of flexibility and access to the weapons that these regimes may desire, and hence the type of C3 they may establish and develop.

• Present C2 of existing weapons which are perceived in the context of the region as "strategic weapons", and therefore call for a higher level of command and control may also shed light on future C2 of nuclear weapons. All these regimes have or had other types of weapons of mass destruction (WMD) – chemical (CW), and in some cases reportedly biological (BW), and strategic SSM delivery systems, mostly for conventional warheads – the Iraqi case provided extensive information regarding SSM CBW munitions, based on UNSCOM reporting. Some of the guiding principles which may affect command and control of nuclear weapons may be inferred from the cases of these. The Iraqi example may also provide insight into the guiding principles of control of CBW WMD and SSM delivery systems by an autocratic Middle Eastern regime headed by a centralist and highly

suspicious leader.

- Paradigms of C2 in conventional situations – levels of centralization, culture of delegation of authority, levels of trust in the regular military as opposed to special praetorian guards forces – like the IRGC, or the "Republican Guard", or Saddam's "Special Republican Guard", tendencies towards brinkmanship, and methods or practices to control situations which emerge from such actions.

- Willingness to risk civilian casualties by deployment of weapons in highly populated areas on the one hand, due to regime survival considerations, and suspicion towards certain elements in the population which may restrict deployment in remote parts of the state.

- Personalized leadership – may lead to small circles of highly trusted individuals on whom the political leadership will rely, and restrictions on the ability to implement control through expansion of delegated authority to additional echelons.

- Traditional tendencies by ideologically or religiously highly charged authoritarian decision-making leaderships towards miscalculation – as a result of insufficient acquaintance with the issues of nuclear weapons technology and effects, nuclear deterrence, nuclear strategy, concepts and terminology in their regard, nuclear brinkmanship, crisis management, the characteristics and values of adversaries, excessive disdain for the moral integrity or resolve of Western cultures, misunderstanding, misperception, misinformation, warped prisms caused by deliberately manipulated information, or just plain human frailties (such as stress, fatigue, psychological quirks, cognitive dissonance, stupidity, or the effects of medication or drugs).

The motivation to acquire nuclear weapons, and the considerations that will guide the operational concept, may change over time. Primarily, it is believed that the security considerations for the acquisition of nuclear weapons are led by the states involved being obsessed with issues of regional competition, dominance, hegemony, domination, honor and standing. Iran, Egypt, Iraq, Saudi Arabia, or Turkey are all deeply involved in these – for example, it is believed that Saddam Hussein's quest for nuclear weapons was clearly led by prestige considerations, above security ones. Similarly, Iran, or Persia before it, has historically perceived its role as one of a regional superpower deserving of a hegemonic standing in its region. Moreover, and very significantly, questions of support for, or opposition to, the status-quo are crucial – a nuclear Iran would pose a severe challenge to other states in the region because it seeks, under the current regime's ideology and belief system, to undermine, nay overthrow, the status-quo, regionally and globally, using any means, bar none. Other states in the region may be obliged to react defensively to retain as far as possible the status-quo, and to retain their influence and standing in the view of the masses, domestic or Arab, Islamic, or what have you.

Once the nuclear weapons trend snowballs, a state whose main motivation to become a member of the nuclear "club" may have originally been deterrence (Syria) might - upon joining that club – be tempted to take advantage of its newfound capability to promote both old and new strategic ambitions (to change the status-quo in its favor). The nuclear weapons snowball may also be subject to a dynamic environment, which evolves on a "rolling" basis, rather than establishing rigid rules and conditions. Therefore such a change may also be a result of the need to adapt security doctrine to adversaries' changing reality,

and to the ways they perceive the threats and risks that a nuclear neighbor's signals. Thus a state that achieves a nuclear capability, and by doing so motivates its rival-neighbor to achieve such a capability as well, will update its nuclear doctrine to address the actions of its neighbor.

Thus it may be expected that in a poly-nuclear Middle East, even after states acquire nuclear weapons, the strategic ramifications will be exceedingly dynamic, perhaps volatile. In this sense the environment would differ from the deterrence stability attributed to the superpower relationship in the latter part of the Cold War – and possibly more like the nervousness exhibited during its early years, but with many nuclear players, not only two, including mutual alarm regarding first strikes and pre-emption, escalation dominance, the rationality of adversary leaderships, and the integrity of C3I.

The ways by which a state reaches a military nuclear capability will affect its operating concept and its C3 methods. For example, a state that acquires a nuclear capability through struggle – perhaps even involving violent expressions – with either the international community, or with its neighbors, will be forced right from the start to develop an operating concept, and a C3 doctrine, that will address possible attempts to destroy its nuclear facilities during preliminary stages of the establishment of the nuclear system; and to demonstrate full control over this nuclear system in order to assure its rivals-neighbors that it is in good hands in terms of prevention of unauthorized use by renegade or rogue elements.

In the veteran nuclear powers, command and control systems were perfected over the years through constant processes of design, planning and exercises. However, such processes entail a wide range of military and civilian participants to be privy to a certain extent to the capabilities of the state, and the intelligence on which the simulations are based on. In closed regimes, such extensive gaming is difficult if not impossible, leaving the decision-maker to make instinctive decisions with a small circle of trusted advisors.

A key conclusion of the project is that the C3 paradigms that will probably emerge in the early stages of a nascent nuclear power in the region will probably be closer to the early structures of the veteran nuclear powers, in the dawn of the nuclear age, and will not necessarily reflect the lessons that those powers have accumulated. The learning curve will be different from that of the original nuclear powers; the latter developed their paradigms gradually as nuclear weapons became more abundant, and in a thoroughly different strategic and cultural context. Furthermore, the suspicion towards the West in the region – particularly among current, and possible future, radical regimes – is likely to bring them to reject solutions that are based on "off the shelf" Western technology, and to try to develop local solutions, which will be, initially at least, less sophisticated.

Common Elements of Regional Culture that Affect C2

Attitudes toward Nuclear Weapons

The basic building block for C2 of nuclear weapons will be the country's perception of what they are meant for; are they perceived as *sui generis* – so destructive and terrible that they must be controlled far past any other weapon? Or are they just more powerful manifestations of existing weapons? Will these countries assimilate the view of use of nuclear weapons as a "taboo" which must be avoided at all cost? Many of the leadership elites of the emerging, or potential, nuclear states in the region, have not internalized the collective traumas of World War II

and the Cold War that brought most of the international community - and particularly the Western world - to subscribe to such a taboo. To the extent that the design of command and control structures in the veteran nuclear states was influenced by the sense of enormity of the use of nuclear weapons, a less acute sense of the same will also influence C3 paradigms - perhaps in the direction of less robust safeguards for prevention of mistakes. In addition, for many of these states, the perceived legality of the use of certain weapons will not be evident from "international law" – which may even be seen as "discriminatory infidel conventions" imposed on the Muslims in order to weaken or exploit them – but from Islamic values (discussed below) and regional interpretations.

The potential nuclear states in the region will not universally adopt the same attitude towards the role of nuclear weapons in their strategic posture, but the interaction between these attitudes will have a seminal impact on the design of C2 structures; will the emphasis be on easy facilitation of their operation in certain contingencies, including frequent or permanent high alert (defense readiness condition, or DEFCON) levels, or on safeguards to prevent them from being used by mistake? Schematically, we can portray three possible roles that nuclear weapons may be seen to play:

- **As weapons of deterrence** – this attitude resembles that of the West during most of the Cold War, at least from the late 1950s onward. The underlying assumption would be that the weapons probably will not be used, and that the country may not have to deal with a second strike scenario, deterrence stability having been established, or a need to respond after the political leadership has been incapacitated or "decapitated".

- **As "last resort" weapons** for use only when threatened with, or attacked by, the same weapons. In light of the mutual perceptions of the countries in the region, the belief that the weapons may ultimately have to be used will probably be more prevalent than between the nuclear powers of the Cold War, at least during the latter stages of the Cold War once deterrence stability was well established, and more similar to perceptions held in the early nuclear age that nuclear weapons would indeed be used early in hostilities – at least until the mid-1950s, only gradually abating as the learning curve developed. This implies a certain volatile environment for at least the first decade after nuclear weapons are acquired, and as learning curves develop.[1]

- **As weapons of choice** to brandish as a means to achieve regional hegemony, or to realize religiously or ideologically deterministic victory. To adopt such an attitude it would not be necessary for the regime leadership to be devoid of a sense of the enormity of use of nuclear weapons, or to be irrational; rather it would suffice for it to suffer from the hubris of the belief that it can "handle" nuclear brinkmanship situations. This scenario opens up a vast expanse of potential nuclear exchanges, war by catastrophic miscalculation, elsewhere discussed, partly gleaned from historical experience with the record of authoritarian regimes' decisions on war and peace over the past century (WW1, WW2, the Falklands, Kuwait, etc.), which signify catastrophic miscalculation through unfounded disdain for the adversary, and utter misunderstanding

of Western democracries' integrity and resolve, albeit, significantly, so far limited to the conventional context.

The public discourse in the Middle East reflects a contradictory view of the capability of nuclear weapons. On the one hand, they are indeed perceived as "doomsday weapons" - a "silver bullet" that will allow the country that has access to them to no longer need to project conventional power, and it will be able to threaten its enemies with total annihilation, thus providing for deterrence and its ultimate security. On the other hand, despite this perception, the public discourse does not reflect the sense of a "taboo" on the actual use of nuclear weapons that developed in the international community as the result of fear of worldwide nuclear conflagration – "peace is the sturdy child of terror", as Churchill would have it. The absence of this "taboo" will impact on the stringency of the C3 procedures – particularly measures to prevent unauthorized or accidental use and to guarantee full control in escalatory situations.

The attitude towards nuclear weapons will be determined not only by "rational" strategic considerations (these would normally encourage a view of nuclear weapons as almost exclusively weapons of deterrence), but by cultural, religious and political factors which may override the former. In fact, the issue of rationality is far more complex: the worst wars in history were initiated by sane, rational, intelligent, sober and realistic leaderships, but holding extremist ideological agendas that sowed unfounded disdain for adversaries, resulting in catastrophic miscalculation; and the most heinous crimes in history were perpetrated by perfectly sane and rational individuals, to methodically realize an atrocious agenda shaped by ignorance and vilification of the other, a belief in the absolute supremacy of one set of beliefs over the other's, destiny's promise of inevitable victory, and the other's pre-ordained defeat.[2] In the Middle East, radical leaderships that may acquire control of nuclear assets, and salient strategic considerations, may include:

- The Sunni or Shiite Islamic element within the regime – its influence on regime strategic decision-making and on the military. The clerical establishment in countries like Saudi Arabia and Iran – or a future Muslim Brotherhood regime in one of the countries – will have a pivotal role in determining how the utility of nuclear weapons will be perceived.

- The relationship with the US and the West – pro-Western regimes will be more prone to succumb to Western pressures to maintain strong controls over their weapons, and to accept Western guidance in this regard.

- Prior proclivity towards risk – countries with a history of conventional brinkmanship are more likely to view nuclear weapons as additional tools in such a policy toolbox.

- Regional aspirations that can be achieved through political use of nuclear weapons – intimidation, domination, blackmail, coercion.

- The relations and threat-image of the other nuclear states.

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[1] Thomas Schelling has suggested that it might take an Iranian leadership at least a decade to learn the pitfalls of possession of nuclear weapons, and gain the required degree of understanding of the complexities in their regard, since it took the United States and the Soviet Union almost two decades to do so before instituting robust C3 and PALs.

[2] Similarly, it was perfectly rational for Saddam Hussein to believe that he could occupy and annex Kuwait, and get away with it – it would have been irrational for him to believe that President George H.W. Bush would send half a million troops to liberate Kuwait, especially given America's Vietnam trauma, and that the US and its allies would then hound him unrelentingly until he was swinging at the end of a rope. The Argentine junta was rational to believe that it could invade and confiscate the Falkland / Malvinas Islands, and that the UK would no more than protest vociferously – it would have been irrational for its members to believe that Mrs. Thatcher would send the British armed forces 10,000 miles across the Atlantic to kill, maim or capture every single Argentinean that set foot on the islands, to the last one.

- Confidence that the regimes have in their own capability to operate the weapons on short notice, or to posture a plausible second strike capability if attacked.

- Reciprocal attitudes of the "threat" countries towards which the nuclear weapons are directed. Thus, while a country such as Saudi Arabia may view nuclear weapons as primarily a "status symbol", it will find it difficult to maintain that attitude in the face of provocations and nuclear "one-upmanship" of other powers in the region (particularly Iran). Command and control structures in the different countries of the region will have a reciprocal influence on each other. Staging of nuclear exercises in one country will be met by similar exercises in the neighboring countries; each side will be learning, imitating and trying to counter the doctrine of the other. A country with a neighbor which demonstrates a highly flexible command and control structure will feel the need to meet those standards.

- All the above may have an effect on the level of central control and safeguards of the weapons:

- A regime which views nuclear weapons as purely a deterrent may have a greater tendency towards a centralized structure: deployment in few high security areas; direct lines of control to the political leadership cutting out the intermediary echelons; little reliance on authentication systems and "fail-safe" mechanisms. In the extreme, the nuclear arsenal may be treated as a "status symbol" and not as an operational system. The emphasis in this case will therefore be on simplification of the storage and operation of the arsenal, since the situations for operational activity of the units controlling the weapons will be few. This attitude may encourage total separation of weapons and delivery systems. The number of people with access to the weapons could then be very limited and the security issues they raise would be less acute.

- On the other hand, if the threat assessment of the regime in control of the weapons brings it to believe that it may have to brandish, or use, its nuclear weapons, then the complexity of the command and control system will be much greater.

- The regime which views nuclear weapons as a lever for regional hegemony and imposing its dominance over its neighbors will need a much higher level of command and control and supervision to prevent accidental or unauthorized use of the weapons.

- A regime that will wish to exercise its nuclear status to intimidate adversaries on an ongoing basis, may wish to maintain elevated alert levels, either intermittently or on a routine basis (much as the US maintained nuclear airborne alerts, of strategic bombers in the air and poised to strike, for decades).

An important issue in this regard will be the option for nuclear ambiguity, along the lines of the Israeli model. Although an ambiguous stance by Iran cannot be ruled out, due to its international obligations and considerations, it now seems that the chances of Iran acquiring a military nuclear capability and maintaining ambiguity are slim – both for reasons relating to the Iranian regime itself, and since Iran's adversaries in the region will expose Iran's capabilities. Therefore, it seems that the option for nuclear ambiguity for the rest of the countries in the region will not be on the table for long.

This will have a profound effect on the structuring of C3 models; a military establishment with an overt nuclear weapons capability will be more likely to integrate this capability in strategic exercises, and to establish a structure that will have to cope with scenarios arising from such strategic planning. Such "outing" of the nuclear capability by a regime will also oblige it to reassure the international community, and its neighbors, that it has a C3 structure which can prevent erroneous use of the weapons. This will perhaps be a key driver for building more sophisticated models of command and control.

Traditions of Delegation of Authority

In the veteran nuclear states the issue of "ownership" of the nuclear arsenal was decided – even if modified over the years – and was, for the most part, not an issue for large scale struggles within the respective regimes. The democratic countries separated the responsibility over the R&D of the weapons from the operational responsibility, and the R&D bodies had no grounds to demand a voice in the operational forums. Similarly, after the initial adaptation of the nuclear countries to the new nuclear era, there was little debate (certainly not violent debate) over who will participate in the control of the weapons. This will not be the case in any of the regimes discussed here. The nuclear capability, once achieved, will be an important lever for influence within the regimes.

Another important element in the delegation of authority is rooted in the personalized leadership style common in the Middle East. In the veteran nuclear powers, there is a tendency to lower the profile of nuclear tests, exercises and contingency planning out of concern that publication will result in possible escalation. Therefore, the political leaders will usually refrain from publicized presence at such events in order not to raise the profile. However, the very identification of the nuclear capability with the political leader is, in the Middle East, a source of legitimacy and public support. Therefore, we can expect that even technical issues relating to building, deploying or training the nuclear force will receive a high profile and publicized reference in these regimes, to enhance the legitimacy of the leadership in the eyes of the constituency.

All the regimes and military establishments in question have demonstrated an aversion towards delegation of authority in matters relating to strategic weapons and strategic interests. According to some sources, though, Saddam Hussein did delegate authority to field units to initiate the use of CBW WMD and SSM strikes if the chain of command was disrupted or he was incapacitated, to establish revenge, and thus to establish deterrence in the first place. The aversion to delegate authority, especially in sensitive matters, derives from a wide range of regime-specific characteristics in each case. However, a general cause that can be identified in almost all the regimes in the region dealt with in this study is the concept of loyalty, trust and the links that "really" matter. The Western system of delegation of authority, including but not only for strategic weapons, is based on the *ex officio* status of the officers who receive the orders, an assumption of loyalty (albeit based on a vetting system) and de-centralization of information on a need to know basis. This creates networks in which almost nobody is apprised of all aspects of the capability, and the system is expected to operate as a "*Gestalt*" (each part independently and with respect to its specifically designated mission). The working assumption is that they will obey orders – excluding "illegal" orders – and therefore can be trusted. The collective affiliation of the individual officers (ethnic, regional or family affiliation) is considered irrelevant.

This model was and is the rule in the US, the UK and France. While the Soviet system did, apparently, take into account ethnic background of senior officers, this was not, so it seems, a constant concern of the political leadership. It was relegated to the security services to perform appropriate weeding and vetting.

The model in the Middle East in this regard will be fundamentally different:

• In most of the countries in this study, tribal identification – including "old boys" networks, like the religious institutions of learning backgrounds or IRGC networking in Iran – remains strong, and such identification would probably determine who would have access to nuclear weapons, and to whom, and when, authority would be delegated.

• The tradition of hyper-centralism of some of the regimes – the late Ba'th regime in Iraq and the incumbent one in Damascus, and in Egypt – and the tendency for deep involvement in military affairs by the political leadership, would probably extend to its involvement in the very identity of each link in the chain of command over nuclear weapons. In contrast to the Western system described above, we may expect to encounter in the cases discussed here a more individualized chain of command consisting of fewer, but highly trusted, individuals, with less compartmentalization between them. Similarly, the field units entrusted with nuclear assets are likely to be fiercely loyal, disciplined and ideologically unshakable (IRGC).

Taking into account the aversion of most of the regime models in the region to delegation of authority, the solution for a breakdown of communications – likely in situations of nuclear warfare or high level electronic warfare (EW) attacks by the enemy, or even intensive conventional strikes – would probably have to be physical. These solutions can range from low-level physical communication (PTP telephone), through covert trusted civilian chains of communication, (Iranian or Saudi clergy channels for those states), dependable runners (on motorbike?), and others.

The key issue with respect to delegation of authority though is not the default authorization (Saddam Hussein's example of delegating authorization of WMD and SSM use in 1991, 2003 to field commanders) through the chain of command when the leader is alive and in the loop, but how to authorize use in case the normal channels of authorization are inoperative (the leaders are dead, or cannot communicate). In other words, what happens when the authorized leadership is incapacitated, and primary C3 assets, or the chain of command, are disrupted?

A Soviet style "dead man's hand" system, the infamous "doomsday machine", if it ever really existed, would, theoretically, be acceptable to many of the regimes in the region, and particularly to autocratic authoritarian regimes. However, the logic behind this system in the Cold War was a reflection of two assumptions: 1) since a nuclear war could only be total, if the leadership were destroyed, it would mean that a large part of the country had been decimated; and 2) that there was only one enemy who could carry out such an act, and therefore it was clear *a priori* against whom the automatic retaliation would be carried out (the US).

These two assumptions will not be true in the Middle East. For the near future, the nuclear arsenals of the states of the region will be limited, and will not have anything near the destructive capacity of the two Cold War superpowers. Therefore, as opposed to a Cold War nuclear confrontation, exchange of nuclear blows in the Middle East may be perceived, rightly or wrongly, as survivable, especially in the larger and more populous states, like Iran or Egypt. Elements of the regimes involved may, therefore, not necessarily accept the idea that the incapacitation of the incumbent leadership should automatically escalate to an all-out nuclear war.

The main solutions for such a situation would be:

• Pre-delegate authority to launch to pre-designated political command chain: political associates and "reliables" (Saudi royal family, Egyptian Vice President or Defense Minister, an Alawite relative of the Asad family in Syria);

• Pre-delegate authority to launch to pre-designated military/strategic command chain – IRGC high command, Presidential Guard in Syria, Egyptian Chief of Military Intelligence);

• Pre-delegate authority to launch to "responsible" field commanders, assuming that they cannot verify an order with their superiors. This can be likened to the example of Saddam, who reportedly, or allegedly, gave such authority for use of chemical weapons in case he was killed, or Soviet authorization to division commanders to use tactical nuclear weapons in the European theater, or Cuba.

The first two solutions will probably be more acceptable in regimes such as Saudi Arabia, Egypt and Turkey, where the consensus is that the state must survive the individual leader (if not the dynasty such as in the case of Saudi Arabia). The second solution is more fitting to the "*après moi le deluge*" mentality that typified Saddam Hussein. However, it may also be compatible with a leader or regime that has a strong apocalyptic, or messianic, belief. In such a case, adoption of this solution would not be seen as merely revenge without regard for the consequences, but as an act which may hasten the apocalyptic or messianic stage of history, and ultimate victory.

Custody of Weapons – the Security of Nuclear Assets

Command and control over nuclear capabilities is not restricted to authorization of their use, but also – and perhaps more on the day to day level – relates to the safeguarding of the know-how and materials relevant to those capabilities. A major factor which may emerge in the Middle East in this regard may be the R&D establishment which will develop the weapons. In the nations involved in the Cold War, R&D projects had no pretensions about maintaining their influence over the weaponry they worked to develop.[3] R&D establishments in the Middle East are liable to act differently; they may be more likely to act like the case of A.Q. Khan in Pakistan, and demand a role in the decision-making processes even after completing development of the weapons. Since these are usually linked to military bodies, they may emerge as "back doors" to the C2 system for the weapons they devised. Thus, these organizations may become "loose cannons" in scenarios of breakdown of the states. Ostensibly, this may be seen as analogous to the case of the former Soviet Union at the time of its melt-down. However, unlike the insular and isolated scientists and scientific institutions of the Soviet Union who had no prior interaction with potential customers for their know-how, and whose efforts to capitalize on their access could be relatively easily monitored and disrupted by the successor state (Russia) and the West, these elements have wide access to potential clients. The lesson of A.Q. Khan and North Korea therefore should be well studied.

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3   In May of 1967 the Soviet Union used erroneous and bogus intelligence to convince Nasser of the false notion that Israel was about to attack Syria, and thus ignited the escalation that led to the 1967 war, as Nasser mobilized and dispatched his forces into the demilitarized Sinai, and Israel reacted by calling up its reserves. For honor reasons Nasser could by then not retreat, and responded by expelling the UN forces that intervened between Egyptian and Israeli forces, closed the Straits of Sharm al-Shaykh to Israeli shipping, adopted ever more belligerent postures, and so on.

In most of the regimes in the region, custody of the weapons and the delivery systems will have to be put in the hands of organizations whose loyalty to the leaders is beyond doubt. These may be relatives – like in Saddam Hussein's Iraq – or ideologically pure elements. However, this restriction may well lead to weapons and delivery systems being under unified command, or at least held in units which are subordinate to one common command – and not the supreme command. In Iran this will be the IRGC, and in Syria it may be the existing missile corps.

Intelligence

The confidence of the regime in C3I with the nuclear weapons will play a pivotal role in determining the spectrum of alert levels, and the routine in regards to those levels. Such an operational nuclear deployment will require strategic early warning and intelligence capabilities covering all relevant threats: day and night airborne visual intelligence (VISINT) and signals intelligence (SIGINT) assets, ground SIGINT and radar deployment in effective ranges, an advanced satellite deployment, and more. The early warning capabilities of all these countries to SSM threats in general – conventional, CBW, and then nuclear as projected by this study, are (with the exception of Israel, supported as it is by deployed US capabilities, and to some extent the Gulf States where the US has deployed some systems) weak to non-existent, and the potential for error is very high.

Since the threat of nuclear weapons comes from beyond the intelligence horizon of most of these countries, there may be more reliance on intelligence allies to the extent that these might be available to regional parties; the US, for example, might assist its allies in the region in early warning systems, if they retain the alliance with it (Saudi Arabia, Egypt, GCC, Turkey?) – including international players with highly developed satellite capabilities. Such reliance may bring about situations not dissimilar to the role the Soviet Union played in 1967,[ ] but with far more dire consequences, in which an external player feeds alarming information that provokes nuclear alert. Without ability to assess the information, the countries which receive the information will have no choice but to go on nuclear alert.

Cold War C3 took decades to fully develop, including the evolution of PALs, which has continued, in fact, beyond the Cold War's termination. Early Cold War intelligence capabilities were limited, and an early poly-nuclear Middle East may resemble this environment in some ways. The parties involved will maintain a high level of central control, and will probably refrain from the modes of delegation of authority that, in the Cold War, underscored the need for stringent command and control measures to prevent accidental use of nuclear weapons.

Technology

C3 systems in the veteran nuclear powers have gradually moved towards the technological, leaving behind slow cumbersome and potentially compromising human methods. Authentication redundancies of the authority to launch nuclear weapons developed over the years in the existing nuclear powers (the American "football", or the Russian Cheget).

However, integration of such technologies into the command and control structures of regimes in the Middle East is doubtful, at least in the early stages. On one hand, they will, no doubt, want to implement elaborate, robust technical systems for coded authentication of the identities of those who give the orders in order to prevent attempts by a technologically superior enemy to override orders by imposture of the leader in order to disable weapon systems. However, the same natural

suspicion that the enemy may be capable of planting Trojan horses in technological systems in order to manipulate them may preclude use of highly technological means and increase the reliance on physical communication, and verbal codes. Reliance on such means though would have an adverse effect on the regime's ability to maintain flexible time-sensitive response mechanisms and hence would influence other elements of the nuclear doctrine.

Another presumed factor that may inhibit or even preclude incorporation of certain technological controls for prevention of unauthorized use of nuclear weapons is the potential "poly-nuclear" nature of the region that the different parties will have to address. Unlike the bilateral relationship between the US and the USSR, early warning in the Middle East may be directed towards a number of potential adversaries. A radical Islamic takeover of any of the countries in the region (Egypt, Saudi Arabia, and other Gulf States), and Iranian influence in others may create new relationships both of alliances and adversity. If any of these countries will have possession of nuclear weapons, they will have to take into account use of those weapons against multiple potential enemies.

Each fledgling nuclear country will also initially have access to only small arsenals, rendering pre-designation of a given weapon and a given delivery system for a pre-determined target impossible in most cases. This scenario will inhibit use of PALs which preclude the accidental use of a weapon against targets which are not pre-defined.

The fact that the same types of delivery systems may be used for both conventional and non-conventional warheads will further complicate C2, as different SOPSs will probably be applied to those delivery systems which are dedicated for nuclear weapons. The victim will not know for sure whether the SSM launched against him is carrying a conventional or WMD warhead until it explodes, and the attacking leader may or may not take this into consideration – he may for example just assume that the defender understands that he is only using conventional warheads, or may deliberately use the ambiguity involved to intimidate the defender when placing his SSM units on increased alert, or on hair-trigger readiness, such as to increase the credibility of deterrence.

Furthermore, the possibility that nuclear weapons may be delivered in un-orthodox ways (from civilian ships, neighboring countries territory) in order to obfuscate responsibility will also reduce the use of technological means of command and control.

Verification - Authentication

Human verification may be implemented at operational levels (for example, the need to combine codes held by more than one senior officer in order to override safeguards and arm weapons). However, it is very unlikely that any of the regimes in the region would be able to adopt human verification of the orders of the Head of State. In the authoritarian regime model, the leader would probably not accept any restrictions on his authority to launch weapons – even authentication by a "trusted" deputy. Regimes such as the Iranian or future Jihadi-Salafi regimes in which the leader is perceived as the "*Amir al-Mu'minin*" (Commander of the Believers) or (as in Iran) the *Vali-Faqih*, the leader is thought to have a certain inspiration from *Allah*, and restriction of his discretion by a lesser individual would be tantamount to imposing restrictions on the will of *Allah*. Even the argument that the verification is not meant for regular situations but for contingencies during which the leader may be incapacitated, for any reason, would be difficult to support in these regimes.

Communication

Communication with nuclear weapons units is a potential major weakness in command and control of those units. The working assumption that in a nuclear exchange the higher command may itself by either obliterated or incommunicado creates potential for launching of weapons due to breaches in communication.

The safeguards for communication with the units in the countries of the region are far less advanced than in any of the other nuclear states. Communicating a command authorizing the launch of nuclear weapons at an adversary would probably mandate redundancy, including both modern as well as primitive means, given that communications in a crisis or war might be vulnerable to disruption. The tendency of Middle Eastern regimes to personalize the state may lead to broad authorization to launch nuclear weapons in case the leader is presumed dead – even if no nuclear attack has taken place. However, as mentioned above, the regime may not be confident in the resolve of those who remain after the leadership has been decimated to carry out such doomsday commands.

Deployment Considerations

A state that acquires a military nuclear capability will have to make a substantial investment in means of delivery of those weapons. The preferred means of delivery will be SSMs. Most of the states in the region already have significant capabilities in this aspect and some of these missiles have been adjusted to a chemical warhead. SSMs are also easier to control, and can be accurate. On the other hand, SSMs are more exposed to be destroyed or incapacitated in their stationary positions – both in operational storage and in launching sites.

The tendency in the existing nuclear states has been to deploy nuclear weapons in distant areas, far from population centers. The logic behind such a deployment would be to impose on the enemy counter-force strikes to deal with a large and widely dispersed number of targets. This of course poses a greater challenge for the attacker in terms of initial intelligence for building target banks, and post attack BDA (Battle Damage Assessment), hence increasing the survivability of the nuclear assets. A secondary consideration may be to minimize collateral damage to civilian infrastructure as a result of counter-force attacks. However this logic may not be applicable in some of the regimes under discussion. Distant areas are, in many cases, populated by minority groups who are perceived as *a priori* disloyal to the regime. The advantage of deployment in these areas – drawing enemy attacks to areas which are not the "heartland" of the nation – must be considered in contrast with the question of the security of the installations in those areas. One example may be seen in "polite complaints" by residents of Natanz and Isfahan who found themselves, in their assessment, at "ground zero" of an American or Israeli attack on the nuclear installations and expressed their fear that they will be harmed. The Iranian regime, however, has shown confidence in the dispersal of its strategic assets and installations, including nuclear production facilities and SSM assets, over a wide geographical expanse, and shows relatively little concern regarding the threat of C3 reliability in their regard. This ambience may not hold true for other, less confident, regimes in the region.

A key issue in command and control of nuclear weapons is the storage of those weapons. This has a bearing on security issues, preventing their theft, flexibility of response to threats and alert levels, and the size of the force which will have access to the various components of the nuclear capability. In some of these regimes, the fear of infiltration and betrayal may encourage separation of weapons from delivery systems. The number of people who would be charged with securing the weapons themselves would be much smaller than the number needed to maintain the delivery systems. Keeping the two separate would be the proper security driven solution. This however will extract a price in terms of operational flexibility, and would preclude demonstrating frequent or permanent high alert levels for purposes of upgrading the credibility of deterrent threats, or to intimidate or coerce adversaries, or to guarantee escalation dominance. In regimes for which the nuclear capability is viewed as a strategic capability for possible use, the security consideration may be subordinated to the necessity for flexible response, and hair-trigger readiness, with all the implications that this would have for deterrence stability, first strike propensities, the danger of pre-emption, and so on.

Prevention of Unauthorized Transfer of Weapons/Materials – Security Issues

All the regimes in the region – when they finally acquire a military nuclear capability – will probably do so in contravention to the international accords to which they and the supplier countries are signatories. This way or that, they will be extremely sensitive regarding the possibility of unauthorized transfer of nuclear materials, expertise, hardware, components or weapons to adversaries. The presence of individuals in each country with ideological, ethnic or political affiliations with other countries will exacerbate this concern. The main concern will probably be that individuals with Islamist motivation will attempt to transfer weapons from a "conservative" pro-Western country to a regime or organization which they perceive as more "Islamic". Hence, the safeguards will have to address not only clandestine transfer of weapons to other countries by rogue or renegade elements that identify with an adversary, but with sabotage of a country's nuclear weapons by an insider with ideological motivation or external – not necessarily state-related – affiliations. This issue is a salient issue today in the Pakistani context, and is of utmost concern to the US.

Measures that the regimes in the region may take against such an eventuality may include:

1. To adopt US security standards – most regimes in the region would probably not be able to fully attain such standards; they will also be aware of this and would not trust their own establishments with such measures.

2. Keep warheads one step, "a turn of the screw", away from operational status – this solution would preclude transfer of fully operational weapons, but would not solve the problem and the danger of the theft of near-operational weapons, materials and expertise.

3. Keep warheads unassembled, with parts stored in different locations – this solution would enhance security but would only be feasible if the regime involved adopts the attitude of nuclear weapons as purely a deterrent or status symbol, and do not feel the need to integrate them operationally into their day-to-day strategic systems.

4. Store warheads under control of highly reliable keepers – such as IRGC buddies or family members. This would be the most probable solution in most of the regimes involved.

5. All of the above solutions contradict a stance in which high alert levels are desired so as to exploit the "benefits" of nuclear weapons status in the adversarial relationships with the other states in the region. In order to effectively deter, or coerce, or compel, or establish escalation dominance, the nuclear assets would have to be available for intermittent or regular demonstrations of high alert (the example of round the clock US airborne strategic bombers

comes to mind). This scenario appears to carry a relatively high probability given the dynamics of the region.

Prevention of Deliberate Unauthorized Use (DUU)

Prevention of deliberate unauthorized use will be a paramount concern for all the regimes in the region. The presence of radical, and even apocalyptic, or messianic, tendencies among the Islamic groups in all of these countries is likely to exacerbate this concern. Over the years, the means that have evolved for prevention of deliberate unauthorized use (and to prevent accidental use) have moved from the human to the electronic spectrum. In the absence of technical means to ensure that weapons will not be detonated without authorization – whether as a result of their having been stolen or commandeered by disgruntled military officers, or through a misunderstanding of instructions passed down the primary chain of command – regimes in the region may adopt systems based on split codes held by separate senior officers, so that launch of nuclear weapons would have to entail collaboration of all the officers with the codes. However, in a region plagued by military coups, the regimes may rightly take into account that an entire nuclear unit may mutiny, and take control over the weapons.

It is also conceivable that the new nuclear weapons states in the region might adopt some of the more readily available Permissive Action Links (PALs), however antiquated or "primitive" they may be in Western terms. The DPRK, Pakistan, Iran, the PRC, or possibly France could conceivably be trusted suppliers of PAL hardware and expertise. On the other hand, many of these states would be reluctant to incorporate PALs into the nuclear system and would probably prefer to rely on its own time-tested "human intelligence" and security vetting. The inhibitions behind the use of such technology would derive both from an innate suspicion towards Western technology in such a sensitive component of the country's national security, and from the fact that a country with only a small nuclear arsenal would probably not endanger it by integrating a system which may cause permanent damage to the weapons in case of improper use.

Potential Multi-Lateral Command and Control

One of the ramifications of a common interest of a number of Sunni Arab states facing the need for a fast track to a nuclear capability may be multilateral collaboration in R&D, and later in a form of joint custody and command and control of the nuclear weapons, possibly along the lines of the NATO example as between allies. Theoretically, this could create a unique relationship, and unique problems of command and control. The main candidates for such collaboration would be Egypt and Saudi Arabia and the GCC States, with Egypt providing the technological know-how and the military backbone, and the latter the funding for the project. However, we believe that even in such a scenario, Egypt would insist on establishing and maintaining the project totally on its own territory; to develop it by means of its own scientific, industrial and military capabilities; and to maintain full, direct and exclusive control over operational nuclear deployments. Thus, Egypt may be in the position of offering a form of extended deterrence, loosely based on the NATO example, and perhaps to either reinforce or displace US guarantees of extended deterrence, a scenario that could evolve as US strategic influence and credibility recede, given its withdrawal from the region or its failure to prevent Iran from going nuclear in the first place. Egypt and Saudi Arabia, both of which are primary candidates to follow Iran's going nuclear – and assuming the current or continuity regimes in both, in spite of some incompatibilities and skirmishes of the past – could collaborate on the basis of fundamentally shared interests: the necessity of stemming anti-status-quo tendencies in the region ignited by Iranian nuclearization.

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