



Preparing the Ground for Regional Arms Limitations Operations, Deployment, and Testing of Medium-range Ballistic Missiles in the Israeli-Iranian-Saudi Triangle

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In this POLICY BRIEF, we make the case for a multilateral confidence- and security-building process in the area of medium-range ballistic missile (MRBMs) systems. These missiles have a number of distinctive characteristics. They reach their targets much more quickly and are much harder to defend against than are manned aircraft. They are ideally suited for delivering nuclear payloads, including in a surprise first strike scenario. Also, once they are launched, they cannot be recalled.¹ In a crisis situation these characteristics can increase the probability of serious miscalculations, and reduce the margin of error for all parties to the conflict, thus contributing to regional instability. Because of their potentially destabilizing features and their negative impact on threat perceptions, we believe that medium-range ballistic missiles deserve considerable attention as part of a regional arms control and disarmament process. Confidence- and security-building measures (CSBMs) can provide an important stepping stone for such a process, which will necessarily be incremental in nature.

The Constructive Contribution of Missile-related Confidence- and Security-building Measures

We define far-reaching CSBMs as “militarily significant measures that are mutually agreed upon by the participant states, and viewed as contributing to their common sense of security, without impinging upon their core security interests and concerns.”² They can reduce “the dangers of armed conflict and of misunderstanding or miscalculation of military activities which could give rise to apprehension, particularly in a situation where states lack clear and timely information.”³ In this respect,

CSBMs can make a distinct contribution to the maintenance of regional peace and security. Even more importantly, they have a demonstrated potential for instituting a basic level of trust without which more comprehensive arms control or disarmament initiatives, such as the Helsinki Conference on the establishment of a zone free of weapons of mass destruction (WMD) and their delivery vehicles (DVs), are impossible.

The Starting Point for CSBMs: Security Concerns and Motives behind Weapon Programs

According to the conceptual framework for a confidence- and security-building process outlined in POLICY BRIEF No. 18, trust-building initiatives would be the third step in dealing with the complex subject of military asymmetries in the Middle East. The first two steps, presented in POLICY BRIEFS Nos. 13 and 14, listed security concerns and motives behind weapon programs of the most relevant states in the region. These are the main stumbling blocks that must be overcome on the path towards a WMD/DVs Free Zone. The concrete trust- and stability-building measures, which are the focus of this issue, are considered an integral part of this overall attempt to design a gradual way of reductions towards zonal disarmament. While weapons themselves also influence decision making in important ways, conflict formations are usually paramount in explaining state behavior in the security area. Recalling the central findings of POLICY BRIEFS Nos. 13 and 14 is therefore instrumental in designing constructive proposals in the area of missile-related CSBMs in the Israeli-Iranian-Saudi triangle.

Abstract

In this POLICY BRIEF, we discuss options for far-reaching confidence- and security-building measures in the areas of operations, deployment, and testing of medium-range ballistic missiles, and apply them to the Israeli-Iranian-Saudi triangle.

In the area of missile operations, we suggest that each state in the triangle declare that its medium-range missiles are not permanently targeted at any specific neighbor and are not maintained on permanent ready-to-launch alert. We further entertain the possibility of forgoing or limiting certain modes of deployment that are considered particularly destabilizing as well as introducing ceilings on deployed missile forces beyond the actors' current capabilities. With regard to the modernization and expansion of missile capabilities, we promote a regional flight-test ban on longer-range ballistic missiles as an effective preventive measure.

These robust CSBMs can increase the level of strategic stability and form an important part of a regional norm-building process. With both regional and extra-regional actors still working towards a WMD/DVs Free Zone, missile-related proposals offer the prospect of selective cooperation beyond the intractable core challenges in the WMD area. Thus, the proposed measures offer benefits not only to Israel, Iran, and Saudi Arabia but to all states of the region and could facilitate negotiations in Helsinki. ■

This POLICY BRIEF is based on the results of the ACADEMIC PEACE ORCHESTRA workshop held in Valetta, Malta, from January 23-25, 2013. Members of the working group came from Austria, Germany, Hungary, Iran, Israel, Jordan, Russia, Switzerland, the United Arab Emirates, and the United States.

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Despite the recently changed rhetoric, which followed the election of President Hassan Rouhani, Iran's suspected development of nuclear weapons is seen by some regional governments as a major threat to their security. Iran also supports regimes and non-state actors hostile to the regional status quo. The relationship between the Islamic Republic and Israel, in particular, must be described as highly adversarial with considerable potential for further escalation. Meanwhile, Tehran and Riyadh are competing for dominance in the Gulf region, with a medium potential for conflict escalation. The security concerns of Saudi Arabia are mostly focused on Iran and its nuclear and missile programs. The alleged meddling in the Gulf states' internal affairs is seen as an Iranian effort to alter the overall regional balance of power and is a steady concern of Riyadh. The kingdom continues to rely on U.S. security commitments.

Although Saudi Arabia and Israel have no official diplomatic ties, bilateral relations are cold rather than openly hostile and the potential for militarized conflict is low. Iran's perceptions of its international environment are partially shaped by the composition of its domestic politics as well as its revolutionary legacy. The United States is viewed as the primary menace to the survival of the revolutionary order. Iran's stance towards Israel is predicated on ideological dogmatism as well as pragmatic state interests: Israel is an enemy of choice, rather than geopolitical necessity. Saudi Arabia has long been perceived as a regional rival, and the close cooperation of the members of the Gulf Cooperation Council (GCC) with the United States in the area of armaments and military deployments is considered a threat that requires a response on Tehran's part.

With regard to the motives and interests behind weapon programs, POLICY BRIEFS Nos. 13 and 14 revealed that the Holocaust and the Arab-Israeli wars are main factors behind Israel's major weapon programs. Israel has developed a strong sentiment of self-help and, with considerable foreign support, has been able to set up a military-industrial complex, including in the nuclear and missile sectors, in order to secure its regional military supremacy. For the GCC states in general and Saudi Arabia in particular, military modernization is focused on the acquisition of cutting-edge American technology, i.e. modern fighter jets and missile defense capabilities,

which possess a certain 'glitter factor'. Complex and often diverging considerations – historical, political, and strategic – impact Iran's decision making in the area of delivery vehicles and non-conventional weapons. The experiences of the First Gulf War, when Saddam Hussein employed chemical weapons against Iranian soldiers and civilians, and the U.S. military interventions in Iraq, have been particularly powerful forces, shaping the Islamic Republic's missile programs and its stance on various categories of WMD. Its quest for regional leadership and prestige, the notorious instability of its neighbors, and the presence of U.S. forces in its immediate vicinity have all been identified as drivers of Tehran's missile programs and suspected nuclear ambitions.

The Structure of This POLICY BRIEF

Building upon the conceptual framework for a confidence- and security-building process and earlier proposals for modest CSBMs (see POLICY BRIEF No. 20), we will outline a number of generic options for more far-reaching measures in the areas of operations, deployment, and testing of medium- and long-range ballistic missiles, and apply them to the complex situation found in the Israeli-Iranian-Saudi triangle today.⁴ Besides the analysis of the predominant conflict constellations in the Middle East presented above, the emphasis on this triangle of actors is also informed by our assessment that the medium-range ballistic missiles which are found only in the arsenals of these three actors can be singled out as a distinct challenge within the overall framework of the 2010 Mandate for a WMD/DVs Free Zone in the Middle East.⁵

The measures explored in the following target various aspects of regional states' missile operations, deployments, and flight-test programs, without however touching upon existing material capabilities. While some of the proposed measures blur into the area of operational arms control, they stop well short of any actual *reductions* in the quantity or quality of available weapons.⁶ The underlying questions with regard to the envisaged process leading to a WMD/DVs Free Zone – as outlined in POLICY BRIEF No. 18 – is how far such measures can make a constructive contribution in terms of:

- decreasing deep-rooted mistrust between the relevant actors and de-escalating crisis situations;



- initiating a regional dialogue on arms control signalling greater flexibility and seriousness;
- getting a missile-related norm-building process on track;
- realizing spill-over effects to the WMD area as well as to other DVs; and
- exploring opportunities for trade-offs regarding missiles and other delivery systems as well as nuclear, biological, and chemical warheads.

In addition, this POLICY BRIEF also asks what the to-be-discussed CSBMs can achieve with respect to the political core challenges within the Israeli-Iranian-Saudi triangle. In the Israeli-Saudi relationship this regards the question of how to bring in line the non-existing diplomatic ties with the relatively relaxed military situation. For Israel and Iran this amounts to handling the highly adversarial relations, which also lack official dialogue, while the relationship between Tehran and Riyadh centers around competing claims for dominance in the Gulf region (see POLICY BRIEF No. 18).

We will proceed by analyzing the actual missile capabilities of Israel, Iran, and Saudi Arabia and the respective strategies and doctrines.⁷ We will then outline a number of generic options for far-reaching CSBMs in the areas of operations, deployment, and testing of long-range ballistic missiles. In the next step, we will assess these measures' applicability within the Israeli-Iranian-Saudi triangle. Based on these findings, we will make a number of concrete policy recommendations.

The Strategic Missile Forces of Israel, Iran, and Saudi Arabia

While most countries in the Middle East have acquired missiles of some type, only four of these countries – Iran, Israel, Saudi Arabia, and Syria – can be credited with strategic missile forces (SMF), properly defined, i.e. missile-equipped military organizations tasked with holding at risk and, in case of war, attacking directly the sources of an opponent's capacity and political will to wage war.⁸ Due to specific geographical conditions, the short-range rocket arsenals of Hezbollah and Hamas also provide these actors with a strategic attack potential vis-à-vis Israel. However, the possession of medium-range ballistic missiles with ranges in excess of 1,000 km is so far confined to the Israeli-Iranian-Saudi triangle. Saudi Arabia's missiles



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do not fulfil the same primary purpose (namely, deterrence of a direct attack on the state's sovereign territory) that has motivated the missile build-ups of Iran and Israel. Also, the longer-range missile segment does offer significant opportunities for confidence-building in that it allows for the implementation of stabilization measures in a somewhat less sensitive area and under conditions of – admittedly very rough – parity between the region's three main military powers.

Israel's Missile Forces

At the center of Israel's ballistic missile force stands the Jericho-2, a presumably nuclear-tipped, two-stage, solid-propellant ballistic missile with an estimated range of 1,500 km with a 1,000 kg payload. However, based on the Jericho-2's dimensions and the likely propellant loads

and type, the missile's range could be up to 2,500-2,800 km.⁹ The Jericho-2 is deployed at the Zachariah MRBM base near Sdot Mikha, about 20 km east of Jerusalem. The number of hardened missile shelters, capable of supporting operational Jericho-2s deployed on transporter-erector-launcher (TEL) vehicles, is believed to be between 25 and 50. It is possible that two drive-through garages could support a number of additional TELs.¹⁰

Some reports suggest that Israel has already completed development of the three-stage Jericho-3, with a range in excess of 3,000 km. Two possible flight tests have been reported in 2008 and 2011. However, the very small number of flight tests so far suggests that the Jericho-3 is not operational at this stage.¹¹ It is also somewhat unclear whether Israel already maintains a workable, submarine-based second-strike capability. Its German-built Dolphin-class submarines are believed to carry a handful of sea-launched cruise missiles (SLCMs), which are reportedly derived from the Popeye/Have Nap air-launched stand-off weapon. It is also reported that the Israeli Navy secretly carried out an SLCM test launch in the Indian Ocean in 2000, with an observed range of 1,500 km.¹² While a single test launch would be insufficient to produce an operationally reliable missile, other tests of the system or system components might well have gone unnoticed or unreported.

The Israeli missile posture is configured for deterrence of a catastrophic attack on its sovereign territory. Road-mobile deployment grants a degree of survivability to its land-based missiles, even within the very narrow geographical confines of the country. However, as long as a truly secure second-strike capability is not available, the potential for a significant reduction in either readiness or numbers is probably limited. Once a sufficient number of warheads is deployed on submarines – as might or might not currently be the case – the ballistic missile leg of the nuclear triad could be reduced or perhaps even eliminated without compromising the arsenal's core rationale. This would still leave Israel with a highly flexible nuclear dyad including the dual-capable assets of its superior air force.

It should be noted that, as a corollary to its policy of nuclear ambiguity (*amimut*), the Israeli government has never publically

acknowledged its possession of nuclear-capable ballistic or cruise missile systems. As a result, any confidence- and security-building process currently faces considerable hurdles in terms of transparency and reciprocity. Some of the measures that might be instrumental in overcoming this challenge have been outlined in POLICY BRIEF Nos. 21/22.¹³

The Missile Forces of Iran

Iran's central MRBM asset is the conventionally-armed Shahab-3, a single-stage, liquid-fueled ballistic missile based on the North Korean NoDong. There are several variants of this type with diverse designations. The basic version is credited with a range of 1,000-1,300 km. The Ghadr-1 is an upgraded variant of the baseline Shahab-3 with a range of roughly 1,600 km. It is also thought to be part of the operational arsenal. The Shahab-3/Ghadr-1 is capable of carrying a 750-1,000 kg warhead, with warhead options potentially including unitary conventional, cluster, and WMD payloads.¹⁴ It is believed that Iran operates 50-100 of these missiles. While it has proved its ability to deploy medium-range missiles on TELs, Iran has also constructed a number of missile silos and underground launch facilities, mainly at a missile complex near Tabriz and at the Imam Ali Missile Base near Khorramabad.¹⁵ Given the location of these facilities and of potential targets, it is likely that they are fitted with Shahab-3 missiles. Given its recent revelation of several dozen new TEL vehicles, we estimate that Iran now operates up to 30 Shahab-3/Ghadr-1 mobile launchers.¹⁶

Currently under development is the Sajjil-2, a solid-fueled, two-stage ballistic missile with an estimated range of 2,000 km. However, in the last three and a half years, the missile has been flight-tested only once and there are doubts about Iran's ability to obtain vital ingredients for the necessary solid propellants.¹⁷ If and when the Sajjil-2 does come online, it will presumably be deployed in a ground-mobile configuration which will be considerably less vulnerable to preemptive attack than the currently available types, thanks to the missile's much shorter reaction time. There are a number of unconfirmed reports according to which Iran has also been working on solid- or liquid-fueled, two- or three-stage ballistic missiles with ranges beyond 3,500 km.



Box No. 1: The Strategic Missile Forces of Israel, Iran, and Saudi Arabia

Country	Missile	Range (km)	Payload (kg)	Mode of Deployment	Status
Israel	Jericho-2	>1,500	1,000	TEL	Operational
	Jericho-3	>3,000	1,000-1,300	TEL	Development
	Popeye SLCM	<1,500	200-300	Submarine	Operational (?)
Iran	Shahab-3	1,300	760-1,000	TEL, Silo, Launch Pad	Operational
	Ghadr-1	1,600	1,000	TEL, Silo, Launch Pad	Operational
	Sejil-2	2,000	1,300	TEL	Development
	Shahab-4/5/6	>3,500	N.A.	N.A.	Cancelled (?)
Saudi Arabia	DF-3	2,600–2,800	2,000	Land-mobile	Operational (?)
	DF-21	2,000	600	TEL	

Sources: Elleman (2012), International Institute for Strategic Studies (2010; 2013).

These missiles have been designated the Shahab-4/-5/-6 in open source reports. From today's perspective, it is likely that these earlier programs have been assimilated into other ballistic missile and space launch programs.¹⁸

Iran's medium-range missile posture is the core element of its deterrent vis-à-vis Israel. Its arsenal of MRBMs is best seen as a substitute for the long-range air power that Iran's military forces direly lack. Given that conventional ballistic missiles are a rather inefficient means of projecting military power (unless they are highly accurate), Iran has a requirement for a large arsenal to be able to produce sufficient strategic effects against a potential adversary. Because each missile is likely to cause a very limited amount of damage, Iran's deterrence depends on the volume of fire that it can bring to bear on its prospective enemies. Therefore, Iran's missile arsenal is not directly comparable to Israel's. The fact that the same missiles could at some point carry nuclear payloads further complicates the picture.

In addition to its central arsenal, Tehran can also draw on the substantial resources of its proxies, namely Hezbollah and Hamas, whose short-range artillery rockets provide the Islamic Republic with a much more cost-effective way of threatening Israel's population centers. However, the level of direct political control that Tehran can exert over these actors should not be overestimated.

Saudi Arabia's Missile Forces

Saudi Arabia's ballistic missile force consists of Chinese-made DF-3s – liquid-propellant, single-stage ballistic missiles with an estimated range of roughly 2,600-2,800 km and a 2,000 kg conventional warhead. The exact number of DF-3 missiles in Saudi Arabia's inventory is unknown, with estimates ranging between 30-50 missiles, and 9-12 launchers.¹⁹ The DF-3 is a road-mobile system, but requires prepared launch sites. The preparation time for erecting and fueling the missile is approximately two hours. Two Saudi missile bases have long been known to experts, one at Al Joffer and another at Al Sulayyil, approximately 90 km and 450 km southwest of Riyadh, respectively.²⁰ A third, at Al Watah, in the center of the country, has only recently been identified.²¹ The DF-3 is based on obsolete technology, highly inaccurate, and therefore unsuitable for strikes on specific military installations. It could, however, be used to attack large area targets, including an opponent's major cities.

Saudi Arabia has never test-fired the DF-3 and most experts believe that the missiles are probably no longer fully serviceable. There are persistent rumors that Saudi Arabia is interested in replacing it with the Chinese-made, two-stage, solid-propellant DF-21, which is much more accurate and reliable, and offers greater mobility. These newer missiles would, however, come with a shorter range of about

2,000 km.²² There are no indications that an agreement has been reached between Riyadh and Beijing on this matter. International pressure, including from other Middle Eastern states, could further deter China from providing the Saudis with missile systems exceeding the Missile Technology Control Regime (MTCR) thresholds of 300 km.²³

Information about Saudi Arabia's missile posture (if any) is very limited. It is generally believed that the kingdom's missiles were acquired for reasons of prestige, rather than military capability. How little operational considerations mattered to the Saudi leadership is demonstrated by the fact that the medium-range DF-3 was acquired only after the U.S. had refused to export the Lance short-range ballistic missile, with a maximum range of 100 km.²⁴

Options for Missile-related CSBMs in the Saudi-Israeli-Iranian Triangle

Robust confidence- and security-building measures can target several aspects of the actors' missile capabilities. Operational-level measures regulate states' ability to employ their weapons in ways that are considered particularly threatening to others. Measures related to the deployment of missile systems aim to reduce the risks that are associated with basing weapons in ways that provide incentives for reckless behavior, be it to the state deploying them, to other countries, or both. Finally, CSBMs that regulate flight-testing prevent rapid increases in the quality of the opponents' missile arsenals. All three types of measures can increase the level of strategic stability and thus help to improve the overall political climate.

De-targeting and De-alerting of Strategic Missile Forces

Generic Aspects and Past Experiences

De-targeting and de-alerting are well known CSBMs in the military sphere with a history of successful implementation. Technically, de-targeting can be viewed as the first step on the way to a more comprehensively de-alerted posture. In theory, these measures can be applied to most ranged weapons. Though de-targeting and de-alerting are listed by the UN among "far-reaching CSBMs,"²⁵ their actual 'reach' in operational terms is quite different.

De-targeting temporarily eliminates the capability of a weapon to engage a certain target on command, based on its inherent combat aiming features. For different weapon systems it can range from the simple change of its physical position to blocking the data feed into on-board guidance computers. For sophisticated missile systems, de-targeting would mean de-activating a standing command link to pre-loaded data on specific target in the memory of the on-board control system, disabling its intended independent flight path after launch, or even the launch itself, or indicating remote ocean areas as a target for those systems which require permanent targeting.

De-targeting does not have much impact and practical importance at the lower, operational level. This is mainly for two reasons: first, it is not reasonably verifiable, and secondly, it can be reversed in the matter of minutes during the weapon activation sequence. It can, however, have some value for preventing eventual accidental or unauthorized use. At the same time, at the higher, political level de-targeting has demonstrated substantial confidence-building value.

De-alerting is rendering strategic missiles forces unavailable for operational use within the time parameters required for combat applications, through technical and/or organizational measures. With time being the key element here, one distinguishes different levels of alert (or combat readiness). De-alerting results in an extension of the time interval that elapses before a weapon can be fired in anger. That interval can range, dependent on the level of alert, from minutes to weeks. The longer the time frame, the less likely becomes an accidental or unauthorized use of the weapon system. De-alerting can be implemented through de-targeting, disconnecting control systems, detaching the payload, detaching the delivery vehicle from the launcher, terminating 24/7 alert duty of operating personnel, removal of critical system elements (CSEs) from the efficient combat operations area, placing CSEs in separate storage locations, or the elimination of some or all CSEs.

Numerous examples of de-targeting can be found, the most relevant and successful coming from the 1990s. In January 1994, a 'De-targeting Agreement' was concluded by Presidents Bill Clinton and Boris Yeltsin, in which both countries agreed

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not to target strategic nuclear missiles at each other. The British made a unilateral decision to de-target their strategic missiles. In addition, China and Russia signed a joint statement not to use nuclear weapons first against each other, including the de-targeting of strategic nuclear weapons in 1994. All of these examples worked extremely well at the political level. In the first two years after the U.S.-Russia agreement was signed, President Clinton reportedly brought it up over 130 times while talking to different American entities and the public as a major breakthrough in bilateral relations and, overall, it was very positively received.

There are also several well-known examples of de-alerting in recent history, though some of them are not immediately apparent. Signed in 1988 and 1991 respectively, the Intermediate-Range Nuclear Forces Treaty (INF) and Strategic Arms Reduction Treaty (START) began by de-alerting a number of WMD systems as the first step leading to the final step of their elimination. As a result of the drastic strategic changes after the end of the Cold War, France unilaterally and without any outside verification eliminated its entire ground-launched nuclear force component – from the obsolete Pluton tactical surface-to-surface missile (SSM) and the more sophisticated Hades SSM to the silo-based S-3D intermediate-range ballistic missile. That process was started by de-alerting all of these weapons and then eliminating them from the operational posture. In 1991, the so-called ‘Presidential Nuclear Initiative’ by Presidents Mikhail Gorbachev and George H. W. Bush came up with unilateral steps to withdraw non-strategic nuclear weapons from operational use by army and air force units, as well as surface vessels and submarines and re-located them to central storage facilities. These steps included a classical de-alert as well.

It is important to note that de-alerting works very differently depending on whether the systems in question are considered to fulfill strategic or non-strategic functions – no matter if they are WMD-related. Strategic systems are usually a high-priority target for any adversary. Against the threat of losing them to a disarming first strike, those systems are typically kept at high alert levels to be launched-on-warning or launched-under-attack. Until the need for such hair-trigger postures disappears, de-alerting strategic systems does not look militarily feasible

and can be brought about only through a strong political decision, and by a situation which is considered controllable and safe.

Applying De-targeting and De-alerting to the Israeli-Iranian-Saudi Triangle

Our analysis of open source data suggests that the strategic missile systems of Israel, Iran and Saudi Arabia are not usually maintained at high-alert-status. This means that, in as far as they rely on missiles for deterrence, the military planners of these countries do not consider a ‘bolt out of the blue’ disarming first strike a realistic scenario and expect sufficient strategic warning time to fully generate their forces. The understanding that neither of the states of the triangle has missile systems in a permanently targeted 24/7 launch-on-alert state serves as an important basis for the assessment and applicability – if any – of de-targeting and de-alerting. Some may say that if medium-range missiles are not permanently targeted and are not in permanent launch-ready alert, de-targeting and de-alerting are not applicable and some other, lower-level CSBMs should be considered. This is only partially accurate. De-targeting, as discussed above, already has a low technical and military impact, but can generate a strong positive political ‘shock wave’ in the public environment. Hence, even a unilaterally declared confirmation by any country of the triangle of the fact that its missiles are not permanently targeted at a specific neighbor or all the countries of the region could be an excellent starting point for a confidence- and security-building process. Such an effort would not entail any costs, as far as military and financial aspects are concerned.

The same applies to de-alerting as well. The three countries could easily declare that they do not have and are not planning to have any of their MRBMs on permanent ready-to-launch alert. Like any prospective declaration on de-targeting, such a statement would not entail any financial or security costs as it would not alter in any way the existing military situation.

It should be noted that these two types of declarations can have a positive political impact even in conditions of ambiguity regarding regional missile arsenals and do not require a high degree of transparency. At the same time such small steps forward may pave the way to a ‘give and take’

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attitude and help start a confidence- and security-building process. Especially with regard to de-alerting, various follow-on steps come to mind – resulting in a further reduction of force generation rates, alert levels, and the associated risks. A more substantial step would be in the separate storage of critical components, which could eventually be subject to verification. In this scenario, warheads would be kept separately from the missiles such as to make their immediate use impossible.

The analysis of the prevailing situation in the region shows that the countries of the triangle consider their missiles not as first-strike offensive weapons, but rather as a means of deterrence and retaliation. Such an attitude leaves room for the gradual implementation of measures aimed at the de-targeting and de-alerting of strategic missile forces, and the introduction of subsequent and more far-reaching measures.

Options for Deployment, Re-deployment, Non-deployment

Generic Aspects and Past Experiences

Force deployment describes where and how an actor's military forces are stationed. Basing considerations have clear implications for strategic stability, and thus for the likelihood of conflict escalation (see Box No. 2).²⁶

The first option for far-reaching confidence- and security-building measures in this area is re-deployment. This can either refer to the geographic re-location of missiles, launcher, or bases, or to changes in the modalities of their deployment. The former variant, aimed at verifiably moving actors' SMF to areas from which they cannot reach vital parts of an adversaries' territory, may or may not be feasible depending on missile ranges, and is politically viable only if a degree of reciprocity is ensured. The level of SMF mobility is another obvious factor here: e.g. TELs are highly mobile and can be re-deployed within hours. Hence, any CSBMs in this area would be entirely reversible, if only at a certain political cost (presupposing adequate verification). Any permanent and irreversible re-location of militarily significant assets to areas beyond relevant range could also contribute to a 'negative' outcome in terms of strategic stability as it could create an incentive to increase the

ranges of future missile systems. The alternative option of cooperatively manipulating the modalities of SMF basing, aimed at ensuring crisis stability by increasing the survivability of the opponents' arsenals, would also have to be carefully balanced against possible negative ramifications in terms of arms race stability.

A second set of deployment-related CSBMs comprises the temporary or permanent removal of existing systems from operational use, and agreements on the non-deployment of new missile systems. The former option focuses on existing missile systems, and does not touch on these capabilities themselves, but entails their removal from the active force posture and, thus, from short-term operational planning and use. Existing missiles would be mothballed so as to allow for their reactivation in case of major contingencies, while substantially increasing the time needed to actually employ them. This option would seem to overlap with, but actually goes beyond, some of the more extensive proposals for de-alerting. The second variant of non-deployment would include an agreement on the non-introduction of systems, which have not yet been integrated into actors' missile forces, possibly in the form of a moratorium. Furthermore, accords on the non-deployment of new systems in certain basing modes, e.g. on submarines or in hardened silos, could also be considered.

A third set of far-reaching CSBM options, which begins to narrow the gap between confidence-building and structural arms control, encompasses various ways of restricting the number and/or quality of missile deployments (as opposed to the number and quality of the weapons themselves, which is a task for a much more robust arms control process). States may restrict their deployments to certain areas and basing modes, and may agree to introduce ceilings on deployments according to either geographical or qualitative criteria.²⁷ As the purpose of these measures would be confidence building, rather than arms reductions as such, these ceilings could lie well beyond existing levels of capability. While it is theoretically possible to set ceilings at different levels for each party to an agreement, equal ceilings for all participants would be much easier to achieve in practice. Similarly, examples of restrictions along these lines would include the specification and numerical limitation of approved deployment areas, which

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could be linked to further restriction of the type and number of launchers that may be deployed within these areas. An additional option would be a ban on certain modes of deployment, with those regarded as the most dispensable offering the greatest potential for confidence building.

All of these CSBMs could be adopted for a limited time frame, or (eventually) for an indefinite period. They would, of course, have to be accompanied by an adequate political framework to ensure compliance with the agreed-upon provisions, and by verification measures, which could be undertaken by an international body, or on a bi-/multilateral basis. In principle, all of the options outlined above should be technically verifiable, but they entail differing levels of intrusiveness.

Past experiences with deployment-related CSBMs are more limited and more ambivalent than those relating to de-targeting and de-alerting. However, some successful examples come to mind. Thus, in the aftermath of the 1962 Cuban Missile Crisis, the Soviet Union and the U.S. implemented one of their most substantial CSBMs up to that date – they moved forward-deployed strategic nuclear missiles back to their respective home territories and thus out of range of each other's population centers. While the Soviet Union first de-alerted and then re-deployed its SRBMs, MRBMs, and Ilyushin Il-28 bombers from Cuba, the U.S. de-alerted and removed 45 Jupiter IRBMs from Turkey and Italy.

The U.S.-Soviet Anti-Ballistic Missile (ABM) Treaty, signed in 1972, is another case in which deployment-related measures were successfully implemented. Article II introduced deployment ceilings in excess of existing capabilities, limiting the number of deployment areas to two, and the number of interceptor missiles to 100 per site. In 1974, this was reduced to a single ABM site with no more than deployed 100 missiles. Article II also limited the number of, and specified permitted deployment modes for, associated early warning radars. Meanwhile, Article V of the treaty prohibited the deployment of sea-, air-, space-, or mobile land-based interceptor missiles or other system components.

Applying Deployment-related CSBMs to the Israeli-Iranian-Saudi Triangle

We conclude that the geographic re-deployment of MRBMs with the purpose of

Box No. 2: Implications of Missile Deployments for Strategic Stability

Deployment in Fixed Sites

The basing of strategic missile forces at fixed locations inside an actor's territory is the most basic deployment mode. Basing in unhardened sites – such as ground-level launch pads – is the cheapest and technologically least demanding, but also the least survivable, option available. Hardened sites, on the other hand, require substantial know-how and expenditure, but result in improved survivability. However, even well-hardened facilities are now vulnerable to attack with both advanced conventional (i.e. precision-guided, bunker-busting) and nuclear weapons. Immobile, land-based deployments are thought to be particularly detrimental to crisis stability if the SMF so deployed constitute a highly potent and/or valuable element of the force posture. In this case, the opponent has a strong incentive to strike first and a 'use-or-lose'-dynamic may develop.ⁱ

Land-mobile Deployment

Adding mobility to land-based deployments is an obvious way of increasing SMF survivability. The placement of missiles on road-mobile transporter-erector-launcher (TEL) vehicles is the most common and economical option in this regard. While a TEL is highly vulnerable to direct attack, it combines the ability to change positions quickly and along variable lines of operation with a relatively low signature. Once the vehicle has left its garrison, it becomes a time-sensitive target and, as such, is inherently difficult to attack. Alternative to the TEL is the deployment of missiles on rail cars. This does not offer any major advantages in terms of vulnerability, and movements are more predictable. The impact of land-mobile deployment on crisis stability is somewhat ambivalent: because a preemptive strike against such forces (once under way) becomes much more difficult, the opponent may have an incentive to attack them while still in garrison. Also, intelligence suggesting that land-mobile forces are getting under way may exacerbate crisis dynamics. Once mobile SMF are deployed in the field, however, the "first-move advantage"ⁱⁱ disappears and the level of crisis stability is enhanced accordingly.

Submarine-based Deployment

Basing SMF aboard submersible ships is the most expensive, technologically complex, and logistically demanding deployment option, but also the most survivable. Due to their very low signature and high mobility, submarines are difficult to track and destroy once at sea. The impact of submarine basing on crisis stability is thought to be mostly positive, as it all but guarantees the survival of some level of retaliatory capability, rendering a disarming first strike very difficult. On the other hand, submarine-launched ballistic or cruise missiles may also be used in a 'bolt out of the blue'-attack. Thus, an asymmetrical situation with submarine-launched cruise or ballistic missiles available to some actors, but not others, may in fact have detrimental consequences for both crisis and arms race stability.

i. See Leo Sartori (1989) 'Nuclear Weapons and Strategic Doctrine', in Barbara G. Levi, Mark Sakitt, and Art Hobson (eds) *The Future of Land-Based Strategic Missiles*, New York, NY: American Institute of Physics, 17-19; Art Hobson (1991) 'The ICBM Basing Question', *Science & Global Security*, 2, 153-198.

ii. Stephen van Evera (1999) *Causes of War: Power and the Roots of Conflict*, Itaca, NY: Cornell University Press, p. 37.

removing the threat to other actors' population centers is the least promising option in the regional context. In the Israeli-Iranian-Saudi triangle, this option encounters a number of practical difficulties, mainly relating to reciprocity. To spell out the geostrategic realities, 'successful' re-deployment of MRBMs is simply not possible for Israel and Saudi Arabia. No matter where Israel decides to deploy its Jericho-2 missiles, both

Tehran and Riyadh would remain within range. Similarly, if Saudi Arabia were to re-deploy its DF-3s to the most remote areas of its territory, Tel Aviv and Tehran would still remain within range. Iran, meanwhile, could in principle re-deploy its long-range missiles in such a way as to remove the threat to Israel and most of Saudi Arabia. From the easternmost parts of Iran's territory, neither Tel Aviv nor Riyadh can be reached with existing capabilities. Even if Iran were to deploy its missiles in the central areas of the country, Tel Aviv would remain out of range. However, these scenarios merely beg the question of why Tehran should agree to such a non-reciprocal step. Within the framework of such an agreement, Iran would renounce its capability to target Israeli and Saudi vital centers, while both its potential opponents would still be able to strike all of Iran's major cities and could offer no reciprocal steps of their own. Thus, if one considers only the deployment of MRBMs and does not include possible linkages and package deals this proposal lacks substance.

More promising paths could be explored in the area of restrictions on deployment. Thus, the three countries could initially agree to specify the number and type of approved MRBM deployment areas. At a later date they could consider an agreement not to build any additional MRBM-related facilities. The participants would then be bound to their existing facilities, which they would be allowed to expand within the confines of a specified upper limit on deployed launchers. Such an accord could also incorporate sub-ceilings on individual modes of deployment. For example, the agreement could stipulate a limitation of the number of fixed, hardened launchers (and/or shelters containing a single launcher) that may be deployed within any one area to 50. Based on open source information, we conclude that this sub-ceiling would be beyond current capabilities for all three regional states. (For confidence-building purposes, the ceiling is, again, entirely flexible.) Consequently, the security costs for implementing such a proposal would be low. Finally, there remains the possibility of temporary or permanent bans on certain modes of deployment. A prohibition of rail-mobile MRBM launchers, which none of the three countries has included in its force structure, might be a viable first step in this regard, as it would not entail any security costs whatsoever.

With regard to the non-deployment of next-generation missile systems, Israel and Iran are currently developing follow-on systems of longer ranges. Saudi Arabia is reportedly keen to purchase the Chinese-designed DF-21. However, none of these systems is considered operational and they have not been deployed so far. Against this backdrop, an accord on the non-deployment of new ballistic missile systems with ranges in excess of 2,000 km could contribute to regional stability. While it would not preclude research and development, or the acquisition of technology from external sources, it would prohibit the introduction of next-generation systems into the armed forces and thereby constrain force modernization. The possession of a single operational sample for testing purposes could be allowed under such an agreement. For Israel, this could mean continued development of the Jericho-3 without, however, introducing it into its posture. The same holds true for Iran, especially with respect to the Sajjil-2. Given that the Sajjil program has probably run into trouble, a temporary agreement on the non-deployment of new systems might actually be in Tehran's interest.

While the far-reaching CSBMs outlined above would be designed to impose only modest limits on the modernization and expansion of regional strategic missile forces, they could nonetheless form an important part of a norm-building process in the missile sector. Any non-compliance with these verifiable technical measures would entail some, mainly political, costs. The proposals could easily be combined with, or complemented by other, more modest or equally far-reaching measures, such as a ban on long-range missile tests, which would further limit the three states' opportunities for force modernization. The menu of generic options presented above should also be transferable to other regional conflict formations. Once initial norm-building efforts have been successful, they could then be expanded to more sensitive areas, including WMD and actual arms reductions.

Limits on Testing of Long-range Ballistic Missiles

Generic Aspects and Past Experiences

Domestic development of long-range missiles, with or without foreign assistance, must include as part of the development process an extensive flight-test program

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to correct inevitable design and manufacturing flaws, validate performance parameters, verify reliability under operational conditions, and train military forces to operate the missile. Flight tests, which cannot be concealed from outside observers, are easily detected and tracked by countries with radar networks and satellites. Data from monitored flight tests can be used to characterize missiles under development, determine performance parameters, and forecast future capabilities.

A comprehensive review of ballistic missile development programs undertaken worldwide over the past seven decades reveals that a dozen, often many more, flight tests are required to complete the development process.²⁸ Germany, for example, flight-tested more than 300 A-4 (V-2) missiles before it began firing them at targets in Western Europe during the closing months of World War II. The United States tested the Atlas ICBM 125 times before it entered service, and the Soviet Union conducted 90 flight tests of the R-16 ICBM before it became operational. The Americans and Soviets minimized the flight trials as they became more experienced in missile development, though the Polaris A-3 and RS-14/SS-16 systems were tested 45 and 26 times, respectively. Similarly, France averaged about two dozen test launches when developing each of its ground- and sea-based strategic missiles. China conducted 18 flight tests during the development of the JL-1 missile. Even Iraq, while fighting a war with Iran in the 1980s – when striking Tehran was viewed as an immediate strategic imperative – tested the short-range al-Hussein missile 10 times over a two-year period before using it against the more distant cities in Iran. And the al-Hussein was not a new missile, developed from fundamentals. Rather, it was a modified missile made from Soviet-produced Scud components, demonstrating that missile modifications to extend range also require flight trials to confirm the efficacy and reliability of the enhancements.

Historical data also show that flight-testing campaigns associated with the development of new missiles typically ran for more than three years. There were rare exceptions, when flight trials were completed in two years, but such programs represented minor modifications to existing systems, included multiple tests per month, and were performed by countries with rich experience developing missiles. These

conditions do not exist in countries in the Middle East today, and will not exist in the coming decade. The need to implement flight trials when developing operational systems suggests that if the countries in the region could be persuaded to forgo such activities, no country could create and field longer-range systems without assuming considerable, if not excessive, technical and operational risks.

Several ballistic missile flight-test bans have been implemented as part of more encompassing arms control initiatives. Thus, the 1972 ABM Treaty contained a test ban on interceptors capable of shooting down intercontinental-range missiles that was strictly adhered to until the treaty's abrogation in 2002, with the sole exception of the United States' 1985 anti-satellite test. The 1987 INF Treaty also contained a test ban on ground-launched shorter-range and intermediate-range missiles in the 500-5,500 km category. In addition, there is considerable positive experience with multilateral test bans in the nuclear arena, including the 1963 Partial Test Ban Treaty, and – as far as verification aspects are concerned – the Comprehensive Test Ban Treaty, which has yet to enter into force. A missile test ban would be similarly verifiable by technical means, and could follow some of the precedents established by other test-ban regimes, as far as organizational and verification matters are concerned.

Applying a Test Ban for Long-range Ballistic Missiles in the Israeli-Iranian-Saudi Triangle

With the exception of Saudi Arabia's purchase of the DF-3 from China, no country in the Middle East has been able to acquire missiles from a foreign supplier with a range greater than 2,500 km. It is therefore likely that countries in the Middle East wishing to acquire intermediate- or longer-range missile will have to develop them indigenously. This will require substantial flight-test campaigns, unless the actors are willing to incur prohibitive risks. There is nothing in Iran's history of missile development, for instance, to suggest that it would accept such risks. Tehran did not induct the Shahab-3 into the military service until 2003, five years after receiving NoDong missiles from North Korea and initiating test launches. Modifications to extend the range of the Shahab-3, resulting in the Ghadr-1, required three to five additional years of

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testing. Development of the Sajjil-2, which continues today, has been ongoing since it was first flight-tested in late 2007, more than five years ago. There is no evidence to suggest that Israel, Turkey, Egypt, Syria, or any other state in the region could defy the history experienced by others.

The flight-testing requirement should be exploited to promote a regional flight-test ban on intermediate- and longer-range ballistic missiles. The range-payload characteristics of an intermediate-range missile would have to be defined by all of the parties involved in the final agreement though an envelope of 3,000 km and 500 kg seems reasonable. States in the Middle East could confer and establish a monitoring authority to oversee missile-testing activities within the region, and perhaps facilitate reciprocal visits by member states to observe launch activities. To ensure compliance by member states, the United States, Russia, and possibly China could share data from their respective sensor networks with the monitoring authority. This body would serve as a verification center for the ban on intermediate-range flight tests. Participation by Russia and the United States would be key, as they are the only two countries with the suite of space-based sensors and ground-based radars capable of detecting and tracking ballistic missile tests or space launches from the Middle East. Experts from Washington and Moscow, working with partners from the Middle East, could also act as arbiters in determining the capabilities of missiles flight tested by a regional state.

Reaching agreement on a regional prohibition on flight-testing intermediate-range missiles is not an insurmountable task. Iran has publicly declared that it has no interest in developing a missile capable of more than 2,000 km. As recently as July 2011, Commander Amir Ali Hajizadeh, head of the Islamic Revolutionary Guard Corps' aerospace division, insisted to the Fars news agency in Iran that "the range of our missiles has been designed based on American bases in the region as well as the Zionist regime," adding that "the Americans have reduced our labours [...]. Their military bases in the region are in a range of 130, 250 and maximum 700 km in Afghanistan which we can hit with [our presently available] missiles."²⁹ There are of course valid reasons for doubting Hajizadeh's words. But, when one considers Tehran's strategic priorities, his claims seem reasonable. Iran's most

distant strategic target is Israel, about 1,000 km from launching points near Iran's border with Iraq. Operational security and prelaunch survivability, however, demand deployment zones far from the border. Extending the minimum range requirement to roughly 1,600 km, as Iran has achieved with the Ghadr-1, facilitates the launch of missiles from secure locations in the heart of Iranian territory. The Sajjil-2, once developed fully, will have a similar range capability when carrying significantly heavier payloads of up to 1,300 kg.

Iran might dismiss or reject a ban on intermediate-range missile tests as an infringement on its sovereign rights. However, taking such action would turn the country's nuclear diplomacy on its head. Iran already is the only country to have pursued development of a 2,000 km-range missile, the Sajjil-2, without first having acquired nuclear weapons. Seeking still longer-range delivery vehicles only would increase existing doubts about the country's nuclear intentions.

Iran might attempt to hedge or delay acceptance of a regional test ban by insisting that Israel and Saudi Arabia first verifiably eliminate their respective Jericho-3 and DF-3 missiles. Convincing Israel and Saudi Arabia to accept such plans will not be easy and cannot be assured. Nevertheless, success could be achieved if the incentives – and diplomatic pressures – were sufficient. Like Iran, Israel does not have a clear strategic requirement for missiles of more than 2,000 km range. Saudi Arabia, meanwhile, maintains its small and obsolete arsenal of MRBMs mainly for reasons of prestige and does not rely on them for deterrent purposes.

Space launch vehicles, which Israel and Iran are unlikely to relinquish, represent a potential stumbling block. However, they need not be included in the proposed regime. It is certainly true that space launchers and ballistic missiles are founded on similar technologies, however, there are fundamental differences between them. Space launchers are prepared for flight over a period of many days, if not weeks. Components and sub-systems can be checked and verified prior to launch, and the mission commander can wait for ideal weather before initiating the countdown. If during the countdown an anomaly is encountered, the launch can be delayed, the problem fixed, and the

»States in the Middle East could confer and establish a monitoring authority to oversee missile-testing activities within the region, and perhaps facilitate reciprocal visits by member states to observe launch activities.«



process restarted. Ballistic missiles, on the other hand, must perform reliably under a variety of operational conditions, and with little advance notification. These operational requirements must be validated through an extensive test program before a missile can be declared combat-ready.

Although space launch activities offer an opportunity to accumulate experience and generate data that could aid efforts to develop long-range ballistic missiles, the results have limited application to ballistic missiles and historically they have never decisively influenced a missile development effort.³⁰ Converting a proven space launcher into a ballistic missile would still require two to five years of additional testing in the ballistic missile mode. In fact, the universal trend has been to convert ballistic missiles into space launchers, not the opposite.³¹

Space launches, however, cannot be ignored and must be closely monitored by states within the region, as well as outside powers, precisely because they could contribute to a missile development program by offering validation of fundamental concepts, such as those for propulsion systems, stage separation, and testing procedures. Consequently, countries that insist on developing and operating space launchers must conduct these activities with maximum transparency to avoid suspicion. The protocols established under the Hague Code of Conduct Against Ballistic Missile Proliferation could serve as an initial foundation for promoting transparency and trust among all parties adhering to the regional ban on intermediate-range missiles. Moreover, the regional monitoring authority, if established as part of a long-range missile test ban, provides a mechanism for ensuring compliance, facilitating transparency and building trust.

Conclusions and Recommendations

This POLICY BRIEF has proposed far-reaching CSBMs in the areas of operations, deployment, and testing of long-range ballistic missiles in the Israeli-Iranian-Saudi triangle. In short, these measures are framed by the following parameters:

- *De-targeting and De-alerting:* We propose that each state of the triangle declare that its missiles are not permanently

targeted at a specific neighbor, or neighbors. Such declarations have a rather low technical and military impact, but can generate a strong positive political ‘shock wave’. Even unilateral confirmations could be an excellent starting point. Such efforts would be relatively free of cost, which applies to de-alerting as well. We suggest that the relevant countries make unilateral or multilateral declarations, pointing out that they do not keep and are not planning to keep any of their long-range missiles on permanent ready-to-launch alert. They could also be complemented by more substantial steps like the separate storage of critical components of long-range ballistic missiles.

- *Deployment, Re-deployment, and Non-deployment:* We propose that Israel, Iran, and Saudi Arabia agree not to build any additional MRBM-related facilities and to expand existing facilities within the confines of an upper limit on MRBM launchers, which could be set at 100. Based on open sources, we conclude that such a limit would exceed current capabilities while considerably impeding an uncontrolled build-up. In terms of qualitative limitations, an accord could also include sub-ceilings on individual modes of deployment. Finally, certain modes of deployment could be temporary or permanently banned with a prohibition of rail-mobile launchers, which none of the three countries operates, being a first possible step. With regard to geographic re-deployment, we have shown that this option is infeasible on a trilateral basis. However, the possibility of linkages or package deals remains. Finally, a regional accord on the non-deployment of new ballistic missile systems could further increase the level arms race stability.

- *A Test Ban for Long-range Ballistic Missiles:* We propose the promotion of a regional flight-test ban on intermediate- and longer-range ballistic missiles. As for the range-payload characteristics, parameters of 3,000 km and 500 kg would seem reasonable. External actors could kick off the process by creating a regional monitoring center, which would house data on regional missile tests and satellite launches. The database might be later augmented by submissions from participating

»[T]hese measures can be of great utility, both by increasing the level of strategic stability and by improving the overall political climate – thereby fulfilling a de-escalatory function.«

regional countries. The transparency generated could establish the level of trust needed to spark negotiations on the basic parameters of a long-range missile test ban.

Overcoming the Main Challenges to Missile-related CSBMs and Handling the Political Core Challenges

With regard to the first of the five main challenge of CSBMs, i.e., decreasing deep-rooted mistrust between the actors involved, the missile-related trust building discussed above can make a distinct contribution to establish a cooperative security environment. However, the chances of their implementation should not be over-estimated as their implementation requires a basic level of political will. The highly adversarial relations and the absence of official dialogue, especially between Israel and Iran but also between Saudi Arabia and Israel, will make it extremely challenging to negotiate and implement any of these far-reaching confidence- and security-building measures. On the other hand, it is precisely such a situation in which these measures can be of great utility, both by

increasing the level of strategic stability and by improving the overall political climate – thereby fulfilling a de-escalatory function. Building on less demanding measures such as no-first use declarations, communications, and data exchange, as suggested in POLICY BRIEF No. 20, could lead eventually to the implementation of more far-reaching, and currently far-fetched, CSBMs – including, but not limited to, those outlined in this POLICY BRIEF.

In this respect, missiles and the proposed trust-building steps in this POLICY BRIEF could also be instrumental in overcoming the second main challenge, i.e., initiating a regional dialogue on arms control. While we have restricted our discussion to the Israeli-Iranian-Saudi triangle, any measures taken by these three actors in the area of medium-range ballistic missiles would have consequences for relationships with other regional actors. This is why it would be advisable to include any such steps in a more encompassing regional arms control dialogue, perhaps allowing for greater flexibility to discuss and implement CSBMs within the broader regional setting. This would also allow for

Endnotes

1. W. Seth Carus (1990) *Ballistic Missiles in the Third World: Threat and Response*, Westport, CT: Praeger, p. 10.
2. Emily B. Landau and Dalia Dassa Kaye (2012) 'Disarmament Efforts in the Region: Lessons from the Arms Control and Regional Security Talks', in Bernd W. Kubbig and Sven-Eric Fikenscher (eds) *Arms Control and Missile Proliferation in the Middle East*, London: Routledge, 27-38, here p. 29.
3. Zdzislaw Lachowski (2004) *Confidence- and Security-Building Measures in the New Europe*, Oxford: Oxford University Press, p. 11.
4. We are well aware of the fact that the actual difference between far-reaching confidence- and security-building measures and traditional arms control proposals is, depending on the conceptual approach to the issue, not always clear-cut.
5. Although the United States must be considered a regional power, we deliberately do not include U.S. intercontinental-range capabilities into our analysis to keep the task manageable.
6. Operational arms control "consists primarily of regulations affecting the operations and associated readiness of forces. [It] is a complement to structural arms control, which limits the size and composition of force structures." See Paul K. Davis (1988) *Toward a Conceptual Framework for Operational Arms Control in Europe's Central Region*, Santa Monica, CA: RAND Corporation.
7. We deliberately do not discuss WMD payloads as part of this first step, as we proceed from the assumption that, given the marked military asymmetries between the relevant actors, strict compartmentalization is the best way to get a Middle East CSBM/arms control process started.
8. It is important to note that such forces are strategic only in terms of the effects they produce. The framing of a weapon as part of an actor's strategic forces is thus contextual and quite unrelated to objective technical characteristics such as range or destructive potential. See Colin S. Gray (2008) 'Understanding Airpower: Bonfire of the Fallacies', *Strategic Studies Quarterly*, 2(4): 49-51.
9. Michael Elleman (2012) 'Banning Long-Range Missiles in the Middle East: A First Step for Regional Arms Control', *Arms Control Today*. Online, available at http://www.armscontrol.org/act/2012_05/Banning_Long-Range_Missiles_In_the_Middle_East_A_First_Step_For_Regional_Arms_Control (January 21, 2013).
10. 'Beit Zachariah', GlobalSecurity.org. Online, available http://www.globalsecurity.org/wmd/world/israel/sedot_mikha.htm (January 21, 2013).
11. Elleman (2012).
12. Federation of American Scientists (2000) 'Popeye Turbo'. Online, available at <http://www.fas.org/nuke/guide/israel/missile/popeye-t.htm> (January 21, 2013).
13. On the challenge of ambiguity, see also Avner Cohen (2010) *The Worst-Kept Secret: Israel's Bargain with the Bomb*, New York, NY: Columbia University Press.
14. International Institute for Strategic Studies (2010) *Iran's Ballistic Missile Capabilities: A Net Assessment*, London: Routledge, p. 20.
15. Steven A. Hildreth (2012) *Iran's Ballistic Missile and Space Launch Programs*, CRS Report for Congress, Washington, D.C.: Congressional Research Service.



package deals, which might make confidence- and security-building measures between Israel, Iran, and Saudi Arabia easier to achieve.

While the CSBMs outlined in this POLICY BRIEF are designed to impose only modest limits on the modernization and expansion of regional strategic missile forces, they could nonetheless form an important part of a norm-building process in the missile sector, which is considered the third main challenge. A unilateral or multilateral declaration, that one's own missiles are not permanently targeted and not on permanent ready-to-launch alert, would not alter fundamental military capabilities but facilitate agreement on 'appropriate behavior' in the missile area. The same holds true for deployment-related measures. An agreed-upon regional flight-test ban on intermediate- and longer-range ballistic missiles would constitute the perhaps strongest norm on which further proposals could be built. The longer the proposed confidence- and security-building measures – flanked by a no-first use agreement and other initiatives – would be in place,

the more unlikely their violation would become. Any agreement on missile-related CSBMs between the three states of the triangle could also have a positive impact on international regimes such as the UN Register of Conventional Arms, the Hague Code of Conduct Against the Proliferation of Ballistic Missiles or the Missile Technology Control Regime.

While we deliberately have not discussed WMD payloads, the proposed CSBMs could also fulfill a 'bridge-building' function towards nuclear, biological, and chemical weapons – the fourth main challenge. MRBMs constitute valuable delivery systems for any of these categories. While Israel is the only country in the Middle East to possess nuclear weapons, none of the three states in the triangle have deployed biological or chemical weapons in their arsenals. Restraining missile activities through joint confidence building could significantly decrease their salience within the actor's military doctrines. As for Israel, the country could relatively easily eliminate the ballistic missile leg of its nuclear triad without compromising the country's security, since it could still count

»[I]t would be advisable to include any such steps in a more encompassing regional arms control dialogue, perhaps allowing for greater flexibility to discuss and implement CSBMs within the broader regional setting.«

16. 'Report: New Iranian Missile Launchers Could Overwhelm Israeli Defenses'. Online, available at <http://news.usni.org/2013/05/31/report-new-iranian-missiles-could-overwhelm-israeli-defenses> (June 10, 2013). Some of these TELs may be assigned to the Scud-derived Shahab-1/2, however.
17. 'Iran: sanctions halt long-range ballistic-missile development,' IISS Strategic Comment 18(22). Online, available at <http://www.iiss.org/publications/strategic-comments/past-issues/volume-18-2012/july/iran-sanctions-halt-long-range-ballistic-missile-development/> (June 10, 2013).
18. Hildreth (2012), p. 24.
19. International Institute for Strategic Studies (2013) *The Military Balance*, London: IISS, p. 401.
20. Sean O'Connor (2009) 'Saudi Arabia's Ballistic Missile Force'. Online, available at <http://geimint.blogspot.de/2009/02/saudi-arabias-ballistic-missile-force.html> (January 14, 2013).
21. Colin Freeman (2013) 'Saudi Arabia targeting Iran and Israel with ballistic missiles'. Online, available at <http://www.telegraph.co.uk/news/worldnews/middleeast/saudi-arabia/10172463/Saudi-Arabia-targeting-Iran-and-Israel-with-ballistic-missiles.html> (July 30, 2013).
22. Elleman (2012).
23. The Missile Technology Control Regime provides guideline to harmonize national export policies. Under the MTCR, adhering nations are to assume a 'strong presumption of denial' when considering the transfer of missile exceeding the performance threshold of 300 km when carrying a 500 kg payload.
24. Carus (1990), pp. 4-6.
25. United Nations General Assembly (2006) *The Issue of Missiles in All Its Aspects: Report of the Secretary-General*, July 20, A/61/168, New York: United Nations, p.19.
26. Strategic stability is a composite of two phenomena: arms race stability refers to a state in which the incentives for the parties to a conflict to quickly or radically increase either the level or quality of their forces – or certain elements of their force posture – are low. Crisis stability refers to a state in which the incentives for the parties to a conflict to escalate the conflict in a crisis situation, specifically by launching a preemptive military strike, are low.
27. A good example of the general principle is the Treaty on Conventional Armed Forces in Europe (CFE) which established comprehensive limits on key categories of conventional military equipment in Europe. See, e.g.: Stuart Croft (1994) 'Negotiations, Treaty Terms and Implications', in *ibid.* (ed.) *The Conventional Armed Forces in Europe Treaty: The Cold War Endgame*, Aldershot: Dartmouth, 19-40.
28. For details, see International Institute for Strategic Studies (2010), Chapter 3.
29. Parisa Hafezi (2011) 'Iran Fires 14 Missiles in 2nd Day of War Games', Reuters, June 28, pp. 67-89.
30. Michael Elleman (2013) 'Prelude to and ICBM? Putting North Korea's Unha-3 Launch into Context', *Arms Control Today*, 43(2): 8-13.
31. The Soviets, for example, used the R-7 intercontinental missile to launch its first satellite, Sputnik, in 1957. Likewise, the U.S. Redstone missile was modified and used to place into orbit the Explorer-1 satellite a few months after the unprecedented Soviet success.

**Further Reading**

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- Elbridge A. Colby and Michael S. Gerson (eds) (2013) *Strategic Stability: Contending Interpretations*, Carlisle, PA: U.S. Army War College/Strategic Studies Institute.

on a highly flexible nuclear dyad including its superior air force. This would indeed be a vital contribution on the way towards a WMD/DVs Free Zone in the Middle East and once again reiterates the importance of the missile sector in the rather early stages of the envisaged (yet postponed) Helsinki negotiations.

The deliberations above also show the character of missile arsenals as a potential field for trade-offs with regard to other categories of delivery vehicles, and even WMD warheads, which is considered the fifth main challenge within a confidence- and security-building process. We are well aware that eliminating weapons of mass destruction and their delivery vehicles from the Middle East within a zonal arrangement remains a distant prospect. Realizing a WMD/DVs Free Zone will require a series of incremental steps, which must initially be quite limited in scope, yet yield tangible results that establish precedents, break long-held taboos about arms control and disarmament, and build trust across the region. Although our proposals in the areas of operations, deployment, and testing of medium- and long-range ballistic missiles could possibly be implemented as

useful stand-alone measures, they should be seen as possible steps within a step-by-step disarmament process based on trade-offs and compromise.

Without any doubt, the successful implementation of the proposed CSBMs will not fundamentally alter the relations of the three states of the triangle. However, it could partially contribute to overcoming the identified political core challenges in the respective relationships. In this regard, it is important to note that both regional and extra-regional actors are still working towards the Helsinki Conference on the establishment of a WMD/DVs Free Zone. Within this process, missile-related CSBMs could play their part in easing regional tensions and thereby establishing a more cooperative environment. Hence, the envisaged Middle East Conference could represent a golden opportunity for discussing the proposals outlined in this POLICY BRIEF and for finding a 'modus vivendi' for their implementation. Thus, the proposed measures would offer benefits not only to Israel, Iran, and Saudi Arabia but to all states of the region and could facilitate negotiations on the way to a WMD/DVs Free Zone. ■

About the ACADEMIC PEACE ORCHESTRA MIDDLE EAST (APOME)

The ORCHESTRA is the follow-up project of the "Multilateral Study Group on the Establishment of a Missile Free Zone in the Middle East". The ACADEMIC PEACE ORCHESTRA MIDDLE EAST is a classical Track II initiative: it consists of some 100 experts – mainly from the Middle East/Gulf, one of the most conflict-ridden areas of the world. The ORCHESTRA is meeting regularly in working groups (CHAMBER ORCHESTRA UNITS) on specific topics in the context of a workshop cycle from 2011-2014. The main goal of this initiative is to shape the prospective Middle East Conference on the establishment of a zone free of weapons of mass destruction and their delivery vehicles agreed upon by the international community in May 2010.

For this reason, these experts develop ideas, concepts, and background information in a series of POLICY BRIEFS which are the results of intense discussions within the CHAMBER ORCHESTRA UNITS. In this framework, the broader normative Cooperative Security Concept will be further developed, embedded, and institutionalized in the region. At the same time, the ORCHESTRA meetings serve as venues for confidence building among the experts. The networking activities of PRIF's Project Group are documented by the ATLAS on Track II research activities in or about the Middle East/Gulf region.

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