



CENTRE FOR THE  
NEW MIDDLE EAST  
At The Henry Jackson Society

# Going Ballistic: Responding to Iranian Missile Advances

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Timothy Stafford

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## Executive Summary

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- Iran's ballistic missile programme poses a distinct threat to international peace and security. There is broad agreement that Tehran has adhered to restrictions imposed upon its nuclear programme by the Joint Comprehensive Plan of Action (JCPOA). However, Iran has used the relaxation of international sanctions, brought into effect by the agreement, to invest heavily in modernising its ballistic missiles. In particular, it has gone to great lengths to update its short-range ballistic missiles (SRBMs) and medium-range ballistic missiles (MRBMs).
- With the lifting of the UN-mandated moratorium on ballistic missile testing, Iran has engaged in a number of live fire exercises. Iranian officials claim such tests systems are not covered by the terms of the JCPOA. At the same time, Iranian officials assert that any national or international response to such tests that encompasses the imposition of economic sanctions, would constitute a violation of the agreement.
- In recent years, Iran has broken with a longstanding pledge not to employ its ballistic missiles in an offensive capacity. It has also engaged in substantial proliferation, providing Houthi rebels in Yemen with Iranian-made missiles that have been fired into Saudi Arabia, endowing Hezbollah with one of the Middle East's most sophisticated missile arsenals, and constructing missile production factories in Lebanon. These provocative moves threaten to disrupt the delicate balance of power in the Middle East.
- Iran is suspected of testing intermediate-range ballistic missiles (IRBMs) that could – in theory – place German, French and British territory within range of its offensive systems. Definitive proof of these efforts has yet to be attained, in part because Iran has sought to mask its most sophisticated systems by limiting their maximum range to 1,243 miles, or 2,000km.
- Though currently protected by the frontier of Iranian technology, as well as missile defence systems, British and European decision-makers should adopt new measures to deter Iran from seeking to acquire ever more sophisticated capabilities. To begin with, they should state clearly that imposing economic sanctions against individuals and entities associated with Iran's ballistic missile programme would not constitute a violation of the JCPOA, or the UN resolutions that incorporate the agreement.
- In addition, Britain and other key European states should threaten to impose a new round of economic sanctions against Iranian individuals and entities associated with the ballistic missile programme, should the country test or develop any platform capable of striking their territory. Such a step is vital to repulsing Iran's effort to demolish transatlantic consensus on the appropriate way to respond to possible breaches of its JCPOA obligations.
- British and European officials should confirm that they regard Tehran as the custodian of any and all ballistic missiles produced within its borders, or manufactured by Iranian entities. In accordance with this policy, they should make clear that they will regard any Iranian-produced or manufactured missile launched against a third party as a deliberate attack upon that entity by the Islamic Republic. This warning should be accompanied by an explicit threat to impose economic sanctions against individuals and entities associated with the country's ballistic missile programme.

- Finally, in order for these measures to be seen as credible, British and European policymakers must locate, assemble and exhibit the political will to impose meaningful economic sanctions should Tehran fail to heed calls for restraint.

# 1. Background: Europe's Response to Iranian Missiles Takes Centre Stage

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Writing in *The New York Times* in December of last year, Iranian Foreign minister Javad Zarif criticised the United States' imposition of economic sanctions in response to Iranian tests of ballistic missiles. Attacking the "arsonists in our region", Zarif singled out the role to be played by European nations, cautioning them against "wavering on issues beyond the scope of the nuclear agreement and following in lock step behind the White House".<sup>1</sup>

Zarif's public diplomacy is indicative of the extent to which affecting European decision-making now preoccupies Iran's strategic thinking. Between 2013 and 2016, the Iranian regime's efforts to break out of its international isolation relied heavily upon the support of the Obama administration, which adopted a policy characterised by conciliation and compromise. In negotiating the P5+1 international nuclear agreement, known as the Joint Comprehensive Plan of Action (JCPOA), the administration conceded Iran's retention of a limited nuclear enrichment programme.<sup>2</sup> In addition, the White House went to unprecedented lengths to navigate the agreement through treacherous domestic political waters.<sup>3</sup> This approach prioritised nuclear non-proliferation, while de-emphasising the importance of non-nuclear issues<sup>4</sup> such as Iran's support for proxy groups throughout the wider Middle East,<sup>5</sup> and its provision of military assistance to the Assad regime in Syria.<sup>6</sup>

However, under the Trump administration, US policy has reverted to an approach that relies heavily upon economic and political pressure, and which emphasises countering Iranian adventurism. President Trump made Saudi Arabia – Iran's chief regional rival – the destination of his first overseas trip, and used the occasion to criticise the "safe harbour, financial backing, and the social standing" that Iran provides to terrorist groups.<sup>7</sup> Since then, the administration has adopted a series of forceful measures, instituting additional economic sanctions against Iranian entities,<sup>8</sup> and offering vocal support for the popular protests that began in December of last year.<sup>9</sup> In addition, Iran has been included within the so-called "Muslim Ban", which restricts entry into the United States by citizens of seven countries.<sup>10</sup>

Crucially, the administration has sought to rectify what it considers to be the key weaknesses of the JCPOA. Though President Trump has thus far refrained from withdrawing the United States from

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<sup>1</sup> Zarif, J., 'Mohammad Javad Zarif: Europe must work with Tehran', *The New York Times*, 10 December 2017, available at: <https://www.nytimes.com/2017/12/10/opinion/mohammad-javad-zarif-europe-iran.html>, last visited: 19 March 2018.

<sup>2</sup> Joint Comprehensive Plan of Action (JCPOA), *United States Department of State*, 14 July 2015, available at: <https://www.state.gov/documents/organization/245317.pdf>, last visited: 19 March 2018.

<sup>3</sup> Stafford, T., 'How Obama Beat Congress on Iran', *Royal United Services Institute*, 2 September 2015, available at: <https://rusi.org/commentary/how-obama-beat-congress-iran>, last visited: 19 March 2018.

<sup>4</sup> 'Full text: Obama gives a speech about the Iran nuclear deal', *The Washington Post*, 5 August 2015, available at: [https://www.washingtonpost.com/news/post-politics/wp/2015/08/05/text-obama-gives-a-speech-about-the-iran-nuclear-deal/?utm\\_term=.c85af10ddb77](https://www.washingtonpost.com/news/post-politics/wp/2015/08/05/text-obama-gives-a-speech-about-the-iran-nuclear-deal/?utm_term=.c85af10ddb77), last visited: 19 March 2018.

<sup>5</sup> Spyer, J., 'Tehran's Servants: Iraq's Shia Militias Emerge as the Key Armed Force Facing Islamic State in Iraq', *Centre for the New Middle East at The Henry Jackson Society*, October 2015, available at: [http://henryjacksonsociety.org/wp-content/uploads/2015/10/Spver-Final\\_web.pdf](http://henryjacksonsociety.org/wp-content/uploads/2015/10/Spver-Final_web.pdf), last visited: 19 March 2018.

<sup>6</sup> Fulton, W., J. Holliday and S. Wyer, 'Iranian Strategy in Syria', *Institute for the Study of War*, May 2013, available at: <http://www.understandingwar.org/sites/default/files/IranianStrategyinSyria-1MAY.pdf>, last visited: 19 March 2018.

<sup>7</sup> Callas, J., 'President Trump's Full Saudi Arabia Speech', *Time Magazine*, 21 May 2017, available at: <http://time.com/4787609/donald-trump-saudi-arabia-speech-2/>, last visited: 19 March 2018.

<sup>8</sup> Morello, C., 'U.S. sanctions five Iranian entities, signals more measures', *The Washington Post*, 4 January 2018, available at: [https://www.washingtonpost.com/world/national-security/us-sanctions-5-iranian-entities-for-work-on-ballistic-missile-program/2018/01/04/905a8b84-f198-11e7-b390-a36dc3fa2842\\_story.html?utm\\_term=.204d2e1c575c](https://www.washingtonpost.com/world/national-security/us-sanctions-5-iranian-entities-for-work-on-ballistic-missile-program/2018/01/04/905a8b84-f198-11e7-b390-a36dc3fa2842_story.html?utm_term=.204d2e1c575c), last visited: 19 March 2018.

<sup>9</sup> Pence, M., 'Unlike Obama, Trump will not be silent on Iran', *The Washington Post*, 3 January 2018, available at: [https://www.washingtonpost.com/opinions/this-time-we-will-not-be-silent-on-iran/2018/01/03/d1fc34e-f0cc-11e7-97bf-bba379b809ab\\_story.html](https://www.washingtonpost.com/opinions/this-time-we-will-not-be-silent-on-iran/2018/01/03/d1fc34e-f0cc-11e7-97bf-bba379b809ab_story.html), last visited: 19 March 2018.

<sup>10</sup> Trump, D., 'Executive Order Protecting The Nation From Foreign Terrorist Entry Into The United States', 6 March 2017, available at: <https://www.whitehouse.gov/presidential-actions/executive-order-protecting-nation-foreign-terrorist-entry-united-states-2/>, last visited: 19 March 2018.

the agreement altogether, he has withheld Presidential certification,<sup>11</sup> a move that gives Congress the opportunity to amend the legislation that governs the administration's ability to provide Iran with sanctions relief. At the administration's urging,<sup>12</sup> Congress is now considering measures that would limit its ability to waive key sanctions and, in turn, its ability to comply with the JCPOA. Under consideration are restrictions that would make the administration's ability to offer continued sanctions relief contingent upon Iran adhering to the key nuclear restrictions beyond their formal expiry, and refraining from developing an intercontinental ballistic missile.<sup>13</sup> Collectively, these steps have undermined Tehran's hopes that Washington can be persuaded to deviate from a hard-line position.

As a result, officials in Tehran now regard European actors as a bulwark against Washington's efforts to restrain Iran's regional activities. Accordingly, officials in London, Paris and Berlin now find themselves caught between an American administration seeking to institute a robust policy of containment that goes far beyond denying Iran a nuclear weapons arsenal, and Iranian efforts to break out of pariah status through greater political and economic engagement.

Iran's determination to develop, test and deploy an extensive missile arsenal sits at the fulcrum of this maelstrom. Since the end of the Iran-Iraq War, Tehran has sought to deter external aggression by developing a strike capability that can target neighbouring states, as well as foreign military forces located in its immediate environment. However, in the two years since the JCPOA was agreed, Tehran has given added priority to these efforts, testing new systems and adjusting its military posture in ways that make offensive use of its arsenal more likely. These developments threaten peace and stability in the Middle East, by disrupting the region's delicate balance of power. They also carry a symbolic significance, given that their legality – and the way they connect to the JCPOA architecture – is disputed.

Iran's missile activity has prompted the Trump administration to institute additional economic sanctions against a range of Iranian individuals and entities.<sup>14</sup> Yet thus far, European governments have exhibited little willingness to follow Washington's lead, limiting their response to Iranian missile tests with rhetorical condemnation.<sup>15</sup> Such caution can be attributed to a desire to improve relations with Iran through the deepening of economic ties, a fear that targeting Iran with additional non-nuclear sanctions will prompt Tehran to discontinue its compliance with the JCPOA, and sympathy with the argument – advanced by Iranian officials – that additional economic sanctions would violate the spirit of the agreement.

This paper makes the case for those concerns to be set aside in favour of a more assertive position. By detailing evolutions in Iranian capabilities and posture, it demonstrates that Iran's missile programme represents a growing threat to regional and international stability. In addition, it warns that exercising restraint is likely to result in Iran attaining missile capabilities that it can use to “decouple” European and American decision-making, something that increases the likelihood of the JCPOA unravelling in the long term. It also counters the arguments advanced by Iranian officials, reaffirming the legality of imposing additional sanctions in response to missile tests. As a result, this

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<sup>11</sup> Landler, M. and D. Sanger, 'Trump Disavows Nuclear Deal, but Doesn't Scrap It', *The New York Times*, 13 October 2017, available at: <https://www.nytimes.com/2017/10/13/us/politics/trump-iran-nuclear-deal.html?mtrref=www.google.com&gvlh-BBAC3B6E9BE2912122D7109123DE20D2&gwt=pay>, last visited: 19 March 2018.

<sup>12</sup> Haley, N., 'Nikki Haley Address on Iran and the JCPOA', *American Enterprise Institute*, 5 September 2017, available at: <https://www.aei.org/publication/nikki-haley-address-on-iran-and-the-jcpoa/>, last visited: 19 March 2018.

<sup>13</sup> Trump, D., 'Remarks by President Trump on Iran Strategy', 13 October 2017, available at: <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-iran-strategy/>, last visited: 19 March 2018.

<sup>14</sup> 'Countering America's Adversaries Through Sanctions Act', *United States Congress*, 2 August 2017, available at: <https://www.congress.gov/115/plaws/publ44/PLAW-115publ44.pdf>, last visited: 19 March 2018.

<sup>15</sup> Sanchez, R. and S. Swinford, 'Theresa May holds her ground as Benjamin Netanyahu calls for Britain to impose new sanctions on Iran', *The Telegraph*, available at: <http://www.telegraph.co.uk/news/2017/02/06/theresa-may-holds-ground-netanyahu-calls-britain-impose-new/>, last visited: 19 March 2018.

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paper argues that British and European decision-makers should take new steps in an effort to curtail Iranian missile activity.

This paper is divided into five parts. It begins by providing historical context for Iran's decision to develop an offensive missile capability, a strategic decision forged during the Iran-Iraq war of the 1980s. This section also details Iranian missile development prior to the finalisation of the JCPOA in 2015, and describes the steps that the international community took to restrict Iran's missile activity during this period. The next section clarifies the divergent assessments that Tehran and others have adopted with regard to the way in which the JCPOA applies to Iranian missile testing and development. The paper then considers the specific steps that Iran has taken to enhance its offensive capabilities since the agreement was finalised. The penultimate section addresses the issue of proliferation by examining the extent to which Tehran's allies have been provided with Iranian-made armaments, and considers evolutions in Iranian doctrine and posture. The concluding section outlines the measures that British and European officials should adopt over the coming months and years.

## 2. The Origins and Evolution of Iran's Ballistic Missile Programme

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Iran's determination to acquire a working ballistic missile arsenal dates back to the 1980s, when the country was left vulnerable as a result of its inability to project force beyond its immediate borders. In September of 1980, Iraqi military forces invaded western Iran, seeking to overturn a border arrangement agreed in 1975<sup>16</sup> and seize control of the oil-rich province of Khuzestan.<sup>17</sup> Despite initial success, the operation ran into severe difficulties owing to a series of tactical missteps, and by 1982 Iranian military operations had compelled Iraqi forces to retreat. At that stage, Iranian forces counter-attacked, crossing into Iraqi territory with the intention of "ejecting the Iraqis from Iran ... extending the revolution to Iraq, liberating the Shia holy cities of Karbala and Najaf, and overthrowing the Baathist regime".<sup>18</sup>

Suddenly placed on the defensive, Iraqi forces engaged in horizontal escalation, targeting Iranian oil facilities along its western coast, as well as Iranian-flagged oil tankers. Starting in late 1983, Iraqi forces complemented this approach by initiating a series of ballistic missile strikes against targets within Iran. By the end of 1984, Iraq had fired 58 SCUD B missiles into Iran.<sup>19</sup> Lacking a ballistic missile capability of its own, and owing to the weakness of its air force,<sup>20</sup> Iran's capacity to respond to these attacks was almost negligible. By 1985, Tehran had managed to rectify this, having acquired a retaliatory capability through the import of SCUD missiles from Libya and North Korea. However, this arsenal remained both quantitatively and qualitatively inferior to that possessed by its adversary. Whereas Iraq was able to fire 85 missiles into Iran in 1984, Iran was able to fire little more than a dozen missiles in response.<sup>21</sup> In addition, Iran still lacked the ability to exercise proper command and control over its arsenal. For instance, the armaments provided by Libya could only be fired with the assistance of Libyan advisers.<sup>22</sup> The imbalance was exacerbated by Iraq's acquisition of Soviet-made SCUDs which, when modified, were capable of reaching targets up to 300 miles (483km) beyond its borders.<sup>23</sup> In early 1988, Iraq fired more than 200 missiles against Iran, four times as many as fired by Iran. Of these, 140 struck sites in and around Tehran.<sup>24</sup>

Though the military impact of these attacks was limited, their psychological significance was immense. Saddam Hussein's willingness to use chemical weapons on the battlefield led to fears that the Iraqi military would incorporate the use of chemical agents into its SCUD launches when targeting Iranian cities. This fear promoted several million citizens to flee Tehran in 1988,<sup>25</sup> something that contributed significantly to Iran's decision to terminate the conflict. As noted Iran analyst Ray Takeyh argues, the fear of "chemical weapons attacks ... proved instrumental in the [Iranian] decision to conclude the conflict", which "remains alive in the public's consciousness and the government's calculations".<sup>26</sup>

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<sup>16</sup> 'Iraq and Iran Sign Accord to Settle Border Conflicts', *The New York Times*, 7 March 1975, available at:

<https://www.nytimes.com/1975/03/07/archives/iraq-and-iran-sign-accord-to-settle-border-conflicts-iraq-and-iran.html>, last visited: 19 March 2018.

<sup>17</sup> Ottoway, D. B., 'Iraqi Army Aids Autonomy-Minded Arabs in Seized Iranian Land', *The Washington Post*, 2 May 1981, available at: <https://www.washingtonpost.com/archive/politics/1981/05/02/iraqi-army-aids-autonomy-minded-arabs-in-seized-iranian-land/cead007c-3e6a-4b36-90c5-7e86c63e5d74/>, last visited: 19 March 2018.

<sup>18</sup> Ward, S., *Immortal: A Military History of Iran and its Armed Forces* (Washington DC: Georgetown University Press, 2009) p. 258.

<sup>19</sup> *ibid.*, p. 271.

<sup>20</sup> *ibid.*

<sup>21</sup> *ibid.*

<sup>22</sup> 'Iran-Iraq: Ballistic Missile Warfare and its Regional Implications', *United States Central Intelligence Agency* (1986), available at:

<https://www.cia.gov/library/readingroom/docs/CLARDP88T00096R000100120003-6.pdf>, last visited: 19 March 2018.

<sup>23</sup> Ward, S., *Immortal*, pp. 291-292.

<sup>24</sup> *ibid.*

<sup>25</sup> *ibid.*, p. 292.

<sup>26</sup> Takeyh, R., *Guardians of the Revolution: Iran and the World in the Age of Ayatollahs* (Oxford: Oxford University Press, 2009), pp. 105-106.

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The effect of Iraq's ability to achieve escalation dominance through the use of missiles extended well beyond the conflict itself, shaping the thinking of defence planners in Tehran, and setting in motion an emphasis upon ballistic missiles that has defined Iranian policy ever since. Ever since the war, Iranian officials have sought to develop and obtain a missile arsenal that is unmatched by its regional rivals.

Despite recognising the importance of acquiring a working missile arsenal, Iran exited the conflict with no capacity to produce such weapons domestically. Accordingly, much of the following decade was devoted to acquiring suitable imports from abroad. In the late 1980s and early 1990s, North Korea emerged as a key supplier,<sup>27</sup> providing Iran with short-range ballistic missiles (SRBMs<sup>28</sup>) in the form of the SCUD-B and SCUD-C missiles, which were in turn designated the Shahab-1 and Shahab-2 by Iranian officials.<sup>29</sup> By 1998, Iran had perfected its capacity to produce both missiles domestically,<sup>30</sup> and by 2004 had also introduced the Fateh-110,<sup>31</sup> an SRBM which, unlike the Shahab-1 and Shahab-2, relies on solid rather than liquid fuel.<sup>32</sup> Despite these developments, Iran's ballistic missile arsenal remained tactical in nature, with the maximum range of its arsenal falling within 310 miles, or 500km.<sup>33</sup>

Accordingly, Iranian defence planners went to great lengths to acquire medium-range ballistic missiles (MRBMs), which have a range in excess of 621 miles, or 1,000km.<sup>34</sup> To do so, they sought, acquired, and modified the North Korean Nodong-1 missile, which they re-designated as the Shahab-3. Unlike earlier variants of the Shahab, the Shahab-3 is a two-stage<sup>35</sup> missile capable of supporting a re-entry vehicle, enabling it to achieve longer ranges by entering and exiting the earth's atmosphere.

Subsequent Iranian missile activities have focused on enhancing the range and accuracy of its MRBMs. For instance, after the Shahab-3 came into service in 2003, Iran undertook a range of modifications. Following tests conducted in 2008, officials claimed that the missile's range had been extended to 1,243 miles, or 2,000km<sup>36</sup> (see Figure 1). In addition, Iran spent much of the first decade of the new millennium working on a number of Shahab-3 variants. In 2004, it introduced the Ghadr-1, which improved upon the accuracy of the Shahab-3, reducing the circular error probable (CEP<sup>37</sup>) to as low as 300 metres.<sup>38</sup> Between 2008 and 2011, Iran also engaged in multiple tests of a solid-fuelled variant of the Shahab-3, initially named the Ashoura and subsequently renamed the Sejjil.<sup>39</sup> In addition, Iran developed the Emad warhead for use with its Shahab and

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<sup>27</sup> 'Iran', *Nuclear Threat Initiative*, July 2017, available at: <http://www.nti.org/learn/countries/iran/delivery-systems/>, last visited: 19 March 2018.

<sup>28</sup> Short-range ballistic missiles (SRBMs) have a range of less than 621 miles, or 1,000km. For full details of the categorisation of ballistic missiles and their respective ranges, see 'Ballistic and Cruise Missile Threat', *National Air and Space Intelligence Center*, March 2006, available at: <http://www.nukestrat.com/us/afn/NASIC2006.pdf>, last visited: 19 March 2018.

<sup>29</sup> Keck, Z., 'Iran's Military Is Armed To The Teeth With Missiles', *The National Interest*, 25 June 2017, available at: <http://nationalinterest.org/blog/the-buzz/irans-military-armed-the-teeth-missiles-21294>, last visited: 19 March 2018.

<sup>30</sup> 'Iran', *Nuclear Threat Initiative*, July 2017.

<sup>31</sup> 'Fateh-110', *Missile Threat: CSIS Missile Defense Project*, 9 August 2016, available at: <https://missilethreat.csis.org/missile/fateh-110/>, last visited: 19 March 2018.

<sup>32</sup> Enabling a ballistic missile to use solid fuel represents a qualitative improvement when compared to the maintenance of liquid-fuelled variants. The development enables the missile to be transported more easily, positioned at locations far removed from support apparatus and readied for use within a shorter period of time.

<sup>33</sup> Keck, Z., 'Iran's Military Is Armed To The Teeth With Missiles', *The National Interest*, 25 June, 2017.

<sup>34</sup> Medium-range ballistic missiles (MRBMs) have a range greater than 621 miles, or 1,000km, but less than 1,864 miles, or 3,000km. For full details of the categorisation of ballistic missiles and their respective ranges, see 'Ballistic and Cruise Missile Threat', *National Air and Space Intelligence Center*, March 2006.

<sup>35</sup> Staging is a process used to advance a missile's maximum trajectory. By establishing more than one stage, part of the missile used for initial propulsion can be jettisoned in flight, resulting in a reduction of weight and an increase in range.

<sup>36</sup> Novosti, R., 'Iran says Shahab-3 missile has longer than reported range', *ASIA-Plus*, 15 July 2008, available at: <http://news.ti/en/news/iran-says-shahab-3-missile-has-longer-reported-range>, last visited: 19 March 2018.

<sup>37</sup> Circular error probable (CEP) is a method used to estimate the radius within which a missile will fall when seeking to strike its target. As a result, reductions in CEP represent improved accuracy.

<sup>38</sup> 'Emad, Ghadr-3 (Shahab-3 Variants)', *Missile Threat: CSIS Missile Defense Project*, 9 August 2016, available at: <https://missilethreat.csis.org/missile/emad/>, last visited: 19 March 2018.

<sup>39</sup> Mizokami, K., 'Why The World Should Fear Iranian Missiles', *The National Interest*, 24 June 2017, available at: <http://nationalinterest.org/blog/the-buzz/why-the-world-should-fear-irans-missiles-21297>, last visited: 19 March 2018.



Ghadr type missiles, a development that afforded yet more accuracy, as well as a greater payload capacity.<sup>40</sup>

Alongside its efforts to develop MRBMs with greater range and accuracy, Iran continued to invest heavily in perfecting the effectiveness of its SRBMs. For instance, in 2011 the country inaugurated the Khalij Fars, a missile designed to strike naval vessels.<sup>41</sup> Its development provided Iran with additional capacity to restrict access to ships and foreign naval vessels seeking to traverse the Strait of Hormuz. Accordingly, by 2015, Iran had effectively acquired the ability to domestically manufacture the “foundational tier” of a ballistic missile arsenal, by establishing an operational arsenal comprised of SRBMs and MRBMs.

Iran’s efforts to develop MRBMs during this period were of enormous geopolitical significance. Firstly, by extending the range of its missile arsenal beyond 621 miles, or 1,000km, Iran acquired the capacity to strike targets in Israel directly, giving real meaning to the anti-Israeli rhetoric advanced by Iran’s then President, Mahmoud Ahmadinejad.<sup>42</sup> In addition, the manner in which Iranian missiles were modified suggested that they were being tailored to carry nuclear warheads. For instance, by affixing the Shahab-3 with a triconic warhead, Iran ensured that the missile, which is primarily geared towards delivering a conventional payload, became capable of carrying a nuclear device.<sup>43</sup> This point was underscored by the fact that most analysts adjudged that Iran would have been incapable of making the advances it did without the assistance of four existing nuclear weapons states: Russia,<sup>44</sup> China,<sup>45</sup> Pakistan<sup>46</sup> and North Korea.<sup>47</sup> Accordingly, developments within Iran’s ballistic missile programme were intrinsically linked to suspicions about the validity of Tehran’s oft-repeated claim that its nuclear enrichment efforts did not form part of a nuclear weapons programme.

It was these suspicions that led to ballistic missile development being included within a restrictive international sanctions regime. The United States had long maintained robust economic sanctions against Iran, dating back to the mid 1990s when the Clinton administration banned all US entities from engaging in trade and investment with the country.<sup>48</sup> However, other permanent members of the United Nations Security Council exhibited little willingness to take similar steps. It was only when Iran’s ballistic missile programme came to be seen as a fundamental corollary to the Iranian nuclear programme that other states were stirred to action. In 2006, the United Nations Security Council passed Resolution 1737, which called on member states to withhold the sale of items that could contribute to “nuclear weapon delivery systems”, and imposed sanctions on individuals involved in their proliferation,<sup>49</sup> steps which hindered Iran’s capacity to import components for its missile systems.

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<sup>40</sup> ‘Emad, Ghadr-3 (Shahab-3 Variants)’, *Missile Threat: CSIS Missile Defense Project*, 9 August 2016.

<sup>41</sup> Keck, Z., ‘Meet Iran’s “Carrier Killer”: The Khalij Fars’, *The Diplomat*, available at: <https://thediplomat.com/2013/05/meet-irans-carrier-killer-the-khalij-fars/>, last visited: 19 March 2018.

<sup>42</sup> Charbonneau, L., ‘In New York, defiant Ahmadinejad says Israel will be “eliminated”’, *Reuters*, 24 September 2012, available at: <https://www.reuters.com/article/us-un-assembly-ahmadinejad/in-new-york-defiant-ahmadinejad-says-israel-will-be-eliminated-idUSBRE88N0HF20120924>, last visited: 19 March 2018.

<sup>43</sup> Coughlin, C., ‘Iran has missiles to carry nuclear warheads’, *The Telegraph*, 7 April 2006, available at: <http://www.telegraph.co.uk/news/worldnews/middleeast/iran/1515104/Iran-has-missiles-to-carry-nuclear-warheads.html>, last visited: 19 March 2018.

<sup>44</sup> Bruno, G., ‘Iran’s Ballistic Missile Program’, *Council on Foreign Relations*, 23 July 2012, available at: <https://www.cfr.org/background/irans-ballistic-missile-program>, last visited: 19 March 2018.

<sup>45</sup> *ibid.*

<sup>46</sup> ‘Missiles of Pakistan’, *Missile Threat: CSIS Missile Defense Project*, available at: <https://missilethreat.csis.org/country/pakistan/>, last visited: 19 March 2018.

<sup>47</sup> Ramani, S., ‘A Closer Look At Iran And North Korea’s Missile Cooperation’, *The Diplomat*, 13 May 2017, available at: <https://thediplomat.com/2017/05/a-closer-look-at-iran-and-north-koreas-missile-cooperation/>, last visited: 19 March 2018.

<sup>48</sup> Clinton, W., ‘Executive Order 12959 - Prohibiting Certain Transactions With Respect To Iran’, 6 May 1995, available at: <https://www.gpo.gov/fdsys/pkg/WCPD-1995-05-15/pdf/WCPD-1995-05-15-Pg784.pdf>, last visited: 19 March 2018.

<sup>49</sup> ‘Security Council Imposes Sanctions on Iran For Failure To Halt Uranium Enrichment, Unanimously Adopting Resolution 1737 (2006)’, *United Nations Press Release*, 23 December 2006, available at: <https://www.un.org/press/en/2006/sc8928.doc.htm>, last visited: 19 March 2018.

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This step was followed by the passage of two blanket bans on the sale of defence equipment. In 2007, the Security Council took steps to bar Iranian exports of military equipment, and a ban on the sale or provision of major conventional arms to Iran followed in 2010. The latter embargo, mandated by UN Security Council Resolution 1929, explicitly obligated states to introduce domestic legislation barring the sale of missiles to Iran, as well as “related systems or parts”.<sup>50</sup> It also barred the provision of related services such as technical training, advice or maintenance.<sup>51</sup> In addition, Resolution 1929 mandated a complete moratorium on tests of ballistic missiles capable of carrying nuclear weapons.<sup>52</sup>



**Figure 1:** Maximum range of nuclear-capable *Shahab-3* MRBM fired from north-western Iran (1,243 miles, 2,000km).

In addition to the arms embargo assembled between 2007 and 2010, sanctions aimed at forcing Iran to the negotiating table over its nuclear programme had an indirect effect upon the country’s ballistic missile programme. In 2011, the US,<sup>53</sup> Canada<sup>54</sup> and the UK<sup>55</sup> moved to deny Iranian entities access to their financial systems. The following year, the US introduced secondary sanctions against international purchasers of Iranian oil,<sup>56</sup> leading to a near complete embargo of the country’s exports.<sup>57</sup> By depriving Iran of access to financial services, as well as a key source of income and

<sup>50</sup> ‘Security Council Imposes Additional Sanctions on Iran, Voting 12 in Favour to 2 Against, with 1 Abstention’, *United Nations Press Release*, 9 June 2010, available at: <https://www.un.org/press/en/2010/sc9948.doc.htm>, last visited: 19 March 2018.  
<sup>51</sup> ‘Resolution 1929 (2010)’, *United Nations Security Council*, 9 June 2010, available at: [https://www.iaea.org/sites/default/files/umsc\\_res1929-2010.pdf](https://www.iaea.org/sites/default/files/umsc_res1929-2010.pdf), last visited: 19 March 2018.  
<sup>52</sup> *ibid.*  
<sup>53</sup> Mohammed, A. and D. Lawder. ‘U.S. to name Iran area of “money laundering concern”’, *Reuters*, 21 November 2011, available at: <https://www.reuters.com/article/us-iran-usa-sanctions/us-to-name-iran-area-of-money-laundering-concern-idUSTRE7AH2K920111121>, last visited: 19 March 2018.  
<sup>54</sup> Payton, L., ‘Iran cut off from Canada, U.S., U.K. banking systems’, *CBC News*, 21 November 2011, available at: <http://www.cbc.ca/news/politics/iran-cut-off-from-canada-u-s-u-k-banking-systems-1.1010092>, last visited: 19 March 2018.  
<sup>55</sup> ‘Chancellor announces new financial restrictions against Iran’, *Her Majesty’s Treasury Press Release*, 21 November 2011, available at: <https://www.gov.uk/government/news/chancellor-announces-new-financial-restrictions-against-iran>, last visited: 19 March 2018.  
<sup>56</sup> Lowrey, A. and D. Sanger, ‘U.S. Bets New Oil Sanctions Will Change Iran’s Tune’, *The New York Times*, 30 June 2012, available at: <http://www.nytimes.com/2012/07/01/world/middleeast/new-sanctions-on-iran-aim-at-its-oil-industry.html>, last visited: 19 March 2018.  
<sup>57</sup> The near blanket ban included exceptions, brought into effect by the US administration’s decision to offer waivers to a number of countries that were heavily dependent upon oil imports.

foreign currency, these measures had a tremendous impact upon the Iranian economy. Over the course of 2012, the Iranian rial lost more than 80% of its value.<sup>58</sup>

While the intention of such efforts was to force Iran to suspend nuclear enrichment as a first step in wider negotiations regarding its nuclear programme, the consequences of international sanctions had an acute effect on Iran's ballistic missile development. Economic sanctions made it impossible for Iran to acquire key components - even from its traditional partners - let alone afford them. Accordingly, continued missile advances became dependent upon domestic expertise and manufacturing, as well as the components that Iran was able to acquire covertly through illicit channels.

The result was a paradox. By 2015, the year in which the JCPOA was negotiated, Iran's ballistic missile arsenal was at a more developed stage than at any point in its history. At the same time, so too were the international enforcement mechanisms aimed at preventing further advances.

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<sup>58</sup> 'Iran's rial hits an all-time-low against the US dollar', *BBC News*, 1 October 2012, available at: <http://www.bbc.co.uk/news/business-19786662>, last visited: 19 March 2018.

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### 3. Ballistic Missiles and the JCPOA

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At the outset of the P5+1 negotiations that led to the Joint Comprehensive Plan of Action (JCPOA), the United States resisted any effort to ease restrictions on Iran's ballistic missile programme as part of any final settlement. However, as the talks progressed, it quickly became clear that the issue would be afforded much less priority than Iran's possession of centrifuges and its existing holdings of enriched uranium. Testifying before the Senate Foreign Relations Committee in February of 2014, State Department negotiator Wendy Sherman asserted that "if we are successful in assuring ourselves and the world community that Iran cannot obtain a nuclear weapon ... then them not having a nuclear weapon makes delivery systems almost - not entirely - but almost irrelevant".<sup>59</sup> Likewise, while seeking to preserve the status quo during the negotiations, Secretary Kerry informed Iranian counterparts that the United States' desire to retain the restrictions upon Iran's ballistic missile programme was unrelated to inherent concern about the threat it posed. Rather, US negotiators feared that failure to retain the restrictions would strengthen domestic opposition to the final agreement, making the process of securing its passage more difficult.<sup>60</sup>

This position contained a certain logic, in that Iran's ballistic missile capabilities had only become the subject of international sanctions in light of Iran's decision to reject UN demands that it curtail its nuclear programme. However, one consequence of this approach, in addition to making formal relaxation of existing restrictions more likely, was that it weakened enforcement measures as the negotiations progressed. The tendency of P5+1 negotiators to play down the likelihood of ballistic missile sanctions remaining in place beyond the culmination of the negotiations, prompted US prosecutors to be more reticent when mounting legal proceedings against individuals accused of violating existing sanctions. According to unnamed US officials quoted by *Reuters*, "uncertainty among prosecutors and agents on how the terms of the deal would affect cases made them reluctant to commit already scarce resources with the same vigour as in previous years".<sup>61</sup>

Recognising the uneven nature of the support for making ballistic missile testing and development a red line in the negotiations, Iranian officials made a determined effort to ensure that the restrictions on both were lifted as part of any final agreement.<sup>62</sup> In this they were supported by both Russia and China. As a result, negotiation of the JCPOA resulted in a compromise, which preserved some of the existing sanctions architecture while stripping it of much of its significance.

The resulting compromise is contained within United Nations Security Council Resolution 2231<sup>63</sup>, which both incorporates the agreements contained within the JCPOA and supersedes past sanctions resolutions. The resolution replaced the blanket prohibition on Iranian imports of sensitive technology for its missile programme with a system in which such imports are monitored by the Security Council on a case-by-case basis. Moreover, this provision was made subject to an eight-year "sunset" clause, and scheduled to expire in 2023. In addition, Resolution 2231 severely weakened the prohibition on Iranian ballistic missile tests. Under the terms of Security Council Resolution 1929, passed in 2010, the Security Council "decides that Iran shall not undertake any activity related to ballistic missiles capable of delivering nuclear weapons, including launches using ballistic missile

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<sup>59</sup> 'Negotiations on Iran's Nuclear Program: Hearing before the Committee on Foreign Relations United States Senate', *US Government*, 4 February 2014, available at: [https://www.foreign.senate.gov/imo/media/doc/020414\\_Transcript\\_Negotiations%20on%20Iran's%20Nuclear%20Program.pdf](https://www.foreign.senate.gov/imo/media/doc/020414_Transcript_Negotiations%20on%20Iran's%20Nuclear%20Program.pdf), last visited: 19 March 2018.

<sup>60</sup> Parsi, T., *Losing An Enemy: Obama, Iran, and the Triumph of Diplomacy* (New Haven: Yale University Press, 2017), p. 310.

<sup>61</sup> Torbati, Y., 'U.S. enforcement of Iran arms embargo slipped during nuclear talks: sources', *Reuters*, 5 October 2015, available at: <https://www.reuters.com/article/us-iran-sanctions-enforcement-insight/u-s-enforcement-of-iran-arms-embargo-slipped-during-nuclear-talks-sources-idUSKCN0RZ09O20151005>, last visited: 19 March 2018.

<sup>62</sup> Solomon, J., 'Iran Wants U.N. Arms Embargo Lifted', *The Wall Street Journal*, 6 July 2015, available at: <https://www.wsj.com/articles/iran-says-nuclear-deal-must-include-lifting-of-u-n-arms-embargo-1436191080>, last visited: 19 March 2018.

<sup>63</sup> 'Resolution 2231 (2015)', *United Nations Security Council*, 20 July 2015, available at: [http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/s\\_res\\_2231.pdf](http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/s_res_2231.pdf), last visited 6 April 2017

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technology”.<sup>64</sup> By contrast, under the terms of Security Council Resolution 2231, Iran is only “called upon not to undertake any activity related to ballistic missiles designed to be capable of delivering nuclear weapons, including launches using such ballistic missile technology”.

The revised language relaxes restrictions upon Iranian ballistic missile tests in two key respects. First, by replacing “decides” with “called upon”, the Security Council stripped any international legal consequences from an Iranian decision to engage in further ballistic missile tests that are carried out in violation of Resolution 2231. Accordingly, unlike sanctions against Iranian violations of restrictions upon its nuclear enrichment, which can be snapped-back into place automatically by any member of the P5+1, responding to Iranian missiles tests falls within the realm of national decision-making.

More importantly, by replacing “capable of delivering nuclear weapons” with “designed to be capable of delivering nuclear weapons”, the Security Council watered down the threshold for assessing Iran to be in violation of its missile obligations, thereby providing Tehran with the legal scope to resume testing all of its ballistic missiles. For instance, the Shahab-3 is capable of carrying a nuclear payload, meeting the definition used by the Missile Technology Control Regime (MTCR), a coordinated partnership that enjoys the membership of 35 nations.<sup>65</sup> However, serving as a delivery vehicle for nuclear weapon is not the system’s sole, or even primary, purpose.

This has given rise to contested legal terrain. US officials have asserted that the legal case for responding to Iranian missile tests with economic sanctions is sound, on the basis that Iran has engaged in tests of missiles that are “inherently capable of delivering a nuclear warhead”.<sup>66</sup> However, the “designed to be capable” threshold is almost impossible to surmount, given that the dual-use nature of the Shahab-3 missile and similar platforms enables Iranian officials to assert that tests are not a violation of existing sanctions. Addressing the Iranian Parliament in July 2015, Iranian Foreign Minister Zarif asserted that Resolution 2231 “speaks about missiles with nuclear warheads capability and since we don’t design any of our missiles for carrying nuclear weapons ... this paragraph is not related to us at all”. According to this interpretation, Tehran would be justified in discontinuing compliance with the nuclear restrictions imposed upon it by the JCPOA, or withdrawing from the agreement entirely, should any P5+1 member adopt sanctions in response to its ballistic missile developments or tests.

A more persuasive argument is that the imposition of non-nuclear sanctions in response to Iranian tests of ballistic missiles does not constitute a breach of the JCPOA. In August 2017, President Trump signed into law the Countering America’s Adversaries Through Sanctions Act (CAATSA),<sup>67</sup> which targeted entities assisting Iran’s ballistic missile programme, as well as members of the Iranian Revolutionary Guards Corps, the entity that has operational control of Iran’s missile arsenal.<sup>68</sup> In response, Ali Larijani, the speaker of the Iranian Parliament and former secretary to the country’s national security council, stated that “Iran’s JCPOA supervisory body assessed the new U.S. sanctions and decided that they contradict parts of the nuclear deal”.<sup>69</sup> This claim rests upon the view that because the relaxation of ballistic missile restrictions is contained within UN Resolution 2231, which itself incorporates the obligations states made under the terms of JCPOA, any efforts

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<sup>64</sup> ‘Resolution 1929 (2010)’, *United Nations Security Council*, 9 June 2010, available at: [https://www.iaea.org/sites/default/files/unsc\\_res1929-2010.pdf](https://www.iaea.org/sites/default/files/unsc_res1929-2010.pdf), last visited: 19 March 2018.

<sup>65</sup> Lynch, C., ‘Washington Made It Easy for Iran to Fire Its Ballistic Missiles’, *Foreign Policy*, 16 March 2016, available at: <http://foreignpolicy.com/2016/03/16/washington-made-it-easy-for-iran-to-fire-its-ballistic-missiles/>, last visited: 23 March 2018.

<sup>66</sup> Gladstone, R., ‘Now U.S. Has Company in Raising Pressure on Iran over Missile’, *The New York Times*, 2 August, 2017, available at: <https://www.nytimes.com/2017/08/02/world/middleeast/iran-missiles-nuclear-sanctions-united-nations.html>, last visited: 19 March 2018.

<sup>67</sup> ‘Countering America’s Adversaries Through Sanctions Act’, *United States Congress*, 2 August 2017, available at: <https://www.congress.gov/115/plaws/publ44/PLAW-115publ44.pdf>, last visited: 19 March 2018.

<sup>68</sup> Dewan, A., ‘What US sanctions will do to Russia, Iran and North Korea’, *CNN*, 4 August 2017, available at: <https://edition.cnn.com/2017/08/04/politics/us-sanctions-russia-iran-north-korea/index.html>, last visited: 19 March 2018.

<sup>69</sup> Sharafedin, B., ‘Iran accuses United States of breaching nuclear deal’, *Reuters*, 1 August 2017, available at: <https://www.reuters.com/article/us-iran-usa-sanctions/iran-accuses-united-states-of-breaching-nuclear-deal-idUSKBN1AH43Q>, last visited: 19 March 2018.

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made by national governments to strengthen economic sanctions on the basis of Iranian ballistic missile tests must constitute a violation of the JCPOA itself.

This line of argument conflates the JCPOA and the UN resolution that obligates member states to enforce it, rather than regarding the two documents as separate. Yet that logic contradicts the arguments deployed by Iranian officials when defending ballistic missile tests. Speaking after Iran test-fired a medium-range ballistic missile in January 2017, Iranian Foreign Minister Zarif stated that “as all parties present in the negotiations on the nuclear deal know, the missile issue is not a part of the Joint Comprehensive Plan of Action (JCPOA)”.<sup>70</sup> In short, Iranian officials assert that ballistic missiles are not covered by the JCPOA when defending individual tests, but that they are covered by the agreement when opposing the imposition of economic sanctions: an untenable position.

Accordingly, when considering the possibility of enforcing sanctions against Iran’s ballistic missile programme, including individuals and entities associated with the programme, emphasis should be placed upon the fact that ballistic missiles are not covered by the JCPOA. The threshold for demonstrating this reality is far lower than that needed to demonstrate that Iran is engaged in tests of missiles that are “designed to be nuclear capable”, and affords sufficient scope to apply sanctions in response to the test of any ballistic missile, rather than just tests of missiles that are nuclear capable.

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<sup>70</sup> ‘Iran Confirms Missile Test’, *Fars News Agency*, 1 February 2017, available at: <http://en.farsnews.com/newstext.aspx?nm=13951113001086>, last visited: 19 March 2018.

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## 4. Iranian Missiles Advances in the JCPOA Era

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Since UN Resolution 2231 entered into effect in January 2016, Iran has engaged in a number of significant missile tests. These can be divided into five main categories: live-fire exercises involving improved SRBMs, further tests of existing MRBM systems, experiments with previously untested MRBM systems, possible tests of an intermediate-range ballistic missile (IRBM<sup>71</sup>), and tests of missiles designed to deploy Space Launched Vehicles (SLVs). This has been enabled by Iran's decision to devote 5% of public spending to defence,<sup>72</sup> and to place significant emphasis on missile advances.<sup>73</sup>

The frequency with which Iran has engaged SRBM tests demonstrates Tehran's determination to improve and ultimately perfect its capacity to strike targets in its immediate environs. In March 2016, Iran initiated a series of military exercises which saw test fires of the Qiam-1,<sup>74</sup> an updated variant of the Shahab-2 SRBM with a range of 497 miles, or 800km.<sup>75</sup> Iran has also tested and deployed the Zulfiqar missile, an SRBM system ideally suited to holding vulnerable the capitals of the Gulf Cooperation Council (GCC) states, all six<sup>76</sup> of which fall within its 435-mile, or 700km, range.<sup>77</sup> This followed on from the development of the Fateh-313 in 2015, an updated version of the Fateh-110, with a range of 311 miles, or 500km.<sup>78</sup> It is worth noting that Iran has complemented these SRBM tests with tests of its Nasir cruise missile, an anti-ship missile installed on Iranian naval vessels,<sup>79</sup> as well as a test of a submarine-launched cruise missile.<sup>80</sup>

As well as increasing the frequency of its SRBM tests, Iran has returned to regular testing of MRBMs. It has reverted to its practice of testing the Shahab-3, initiating launches in March 2016.<sup>81</sup> In addition, Iran used the March 2016 exercises to test new MRBM platforms, including the Ghadr-F and Ghadr-H.<sup>82</sup> Collectively, these efforts represent an effort to modernise its arsenal of SRBMs and MRBMs, qualitatively improving the platforms that it possessed prior to the passage of the JCPOA.

However, perhaps more significant is Iran's experimentation with missiles that sit at the juncture of medium range and intermediate range, generally set at 1,864 miles, or 3,000km.<sup>83</sup> Two tests – one in July 2016 and another in January 2017 – suggest that Iran is seeking to develop a missile with a greater range than its traditional MRBM systems. There remains a lack of consensus among the analytic community about the precise nature of the weapons that were tested. In the case of the July

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<sup>71</sup> Intermediate-range ballistic missiles (IRBMs) have a range greater than 1,864 miles, or 3,000km, but less than 3,418 miles, or 5,500km. For full details of the categorisation of ballistic missiles and their respective ranges, see 'Ballistic and Cruise Missile Threat', *National Air and Space Intelligence Center*, March 2006.

<sup>72</sup> Sharafedin, B., 'Iran to expand military spending, develop missiles', *Reuters*, 9 January 2017, available at: <https://www.reuters.com/article/us-iran-military-plan/iran-to-expand-military-spending-develop-missiles-idUSKBN14T15L>, last visited: 19 March 2018.

<sup>73</sup> 'Iran eyes more funds for missiles, guards after US sanctions', *CNBC*, 13 August 2017, available at: <https://www.cnbc.com/2017/08/13/iran-eyes-more-funds-for-missiles-guards-after-us-sanctions.html>, last visited: 19 March 2018.

<sup>74</sup> 'Iran "conducts new ballistic missile tests"', *BBC News*, 8 March 2016, available at: <http://www.bbc.co.uk/news/world-middle-east-35752974>, last visited: 19 March 2018.

<sup>75</sup> 'Qiam-1', *Missile Threat: CSIS Missile Defense Project*, 28 September 2017, available at: <https://missilethreat.csis.org/missile/qiam-1/>, last visited: 19 March 2018.

<sup>76</sup> Manama (Bahrain), Kuwait City (Kuwait), Muscat (Oman), Doha (Qatar), Riyadh (Saudi Arabia) and Abu Dhabi (United Arab Emirates).

<sup>77</sup> Rubin, M., 'Iran launches new Zulfiqar ballistic missile', *American Enterprise Institute*, 16 November 2016, available at: <http://www.aei.org/publication/iran-launches-new-zulfiqar-ballistic-missile/>, last visited: 19 March 2018.

<sup>78</sup> 'Iran unveils new missile, says seeks peace through strength', *Reuters*, 22 August 2015, available at: <https://www.reuters.com/article/iran-military-missile/iran-unveils-new-missile-says-seeks-peace-through-strength-idUSL5N10X03320150822>, last visited: 19 March 2018.

<sup>79</sup> O'Connor, T., 'Iran's Military Fires New Cruise Missiles Amid Gulf Tensions with U.S.', *Newsweek*, 26 April 2017, available at: <http://www.newsweek.com/iran-military-fire-cruise-missiles-gulf-tensions-us-590462>, last visited: 19 March 2018.

<sup>80</sup> Tomlinson, L., 'Iran attempted missile launch from submarine, US officials say', *Fox News*, 3 May 2017, available at: <http://www.foxnews.com/world/2017/05/03/iran-attempted-missile-launch-from-submarine-us-officials-say.html>, last visited: 19 March 2018.

<sup>81</sup> Taleblu, B. B., 'Iranian Ballistic Missile Tests Since The Nuclear Deal', *Foundation for the Defense of Democracies*, 9 February 2017, available at: [https://www.defenddemocracy.org/content/uploads/documents/20917\\_Behnam\\_Ballistic\\_Missile.pdf](https://www.defenddemocracy.org/content/uploads/documents/20917_Behnam_Ballistic_Missile.pdf), last visited: 6 April 2018.

<sup>82</sup> 'Iran successfully test-fires Ghadr missiles', *Mehr News Agency*, 9 March 2016, available at: <https://en.mehrnews.com/news/115104/Iran-successfully-test-fires-Ghadr-missiles>, last visited: 19 March 2018.

<sup>83</sup> 'Ballistic and Cruise Missile Threat', *National Air and Space Intelligence Center*, March 2006.

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2016 test, the missile itself exploded shortly after launch,<sup>84</sup> making identification difficult. The test was initially reported to be a first attempt to test-fire a Musudan intermediate range ballistic missile (IRBM).<sup>85</sup> The second test, undertaken in January of 2017,<sup>86</sup> was more successful, resulting in a flight path of 621 miles, or 1,000km,<sup>87</sup> before the missile exploded. These two launches are mired in lingering uncertainty. German intelligence assessed the January 2017 test to be have been a test of Iran's Soumar cruise missile.<sup>88</sup> Likewise, other analysts have suggested that the test could have been a failed satellite launch<sup>89</sup> or simply a further test of Iran's Shahab-3.<sup>90</sup>

However, Iranian officials have reported that the tests were experimental launches of the Khorramshahr missile system,<sup>91</sup> a platform based upon the North Korean intermediate-range Hwasong-10, sometimes referred to as the BM-25/Musudan system.<sup>92</sup> If successfully operationalised by Iran, the system would extend the upper range of its arsenal to at least 1,367 miles, or 2,200km.<sup>93</sup> However, estimates of the Hwasong-10's range vary considerably, with some assessments estimating a maximum range of closer to 2,175 miles, or 3,500 km.<sup>94</sup> Other estimates place the range of the Musudan as high as 2,485 miles, or 4,000km<sup>95</sup>. Thus far, Iranian officials have refused to acknowledge that the Khorramshahr's trajectory can extend that far. One possible reason for this could be that Iranian officials have modified the missile significantly in order to purposefully limit the missile's full potential.<sup>96</sup> In October 2017, the head of the Iranian Revolutionary Guard Corps confirmed that Iran has added heavier payloads to its missiles in order to prevent them from exceeding a range of 1,243 miles, or 2,000km.<sup>97</sup>

Lastly, Iran has undertaken two major tests of its Simorgh rocket, once in April 2016<sup>98</sup> and once more in July 2017.<sup>99</sup> The rocket is designed to carry a space launch vehicle, or SLV, in the form of a civilian satellite. However, as Farzin Nadimi of the Washington Institute for Near East Policy notes, the Simorgh "incorporates many common technologies with intercontinental ballistic missiles (ICBMs<sup>100</sup>), and a Simorgh-type ballistic missile is estimated by rocket engineers to have a 4,660

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<sup>84</sup> 'Iranian Missile Launches: 1988-Present', *Missile Threat: CSIS Missile Defense Project*, 12 October 2017, available at: <https://missilethreat.csis.org/iranian-missile-launches-1988-present/>, last visited: 19 March 2018.

<sup>85</sup> Tomlinson, L., 'Exclusive: Iran conducts 4th missile test since signing nuke deal', *Fox News*, 15 July 2016, available at: <http://www.foxnews.com/world/2016/07/15/exclusive-iran-conducts-4th-missile-test-since-signing-kuke-deal.html>, last visited: 19 March 2018.

<sup>86</sup> Tomlinson, L. and J. Griffin, 'Iran tests ballistic missile in defiance of UN resolution, US officials say', *Fox News*, 30 January 2017, available at: <http://www.foxnews.com/world/2017/01/30/iran-conducts-ballistic-missile-test-us-officials-say.html>, last visited: 19 March 2018.

<sup>87</sup> Ali, I., 'Iran tested medium-range ballistic missile: U.S. official', *Reuters*, 30 January 2017, available at: [https://www.reuters.com/article/us-usa-iran-missiles/iran-tested-medium-range-ballistic-missile-u-s-official-idUSKBN15E2EZ?feedType=RSS&feedName=worldNews&utm\\_source=Twitter&utm\\_medium=Social&utm\\_campaign=Feed%3A+Reuters%2FworldNews+%28Reuters+World+News%29](https://www.reuters.com/article/us-usa-iran-missiles/iran-tested-medium-range-ballistic-missile-u-s-official-idUSKBN15E2EZ?feedType=RSS&feedName=worldNews&utm_source=Twitter&utm_medium=Social&utm_campaign=Feed%3A+Reuters%2FworldNews+%28Reuters+World+News%29), last visited: 19 March 2018.

<sup>88</sup> Surkes, S., 'Iran said to test second nuclear-capable missile', *The Times of Israel*, 2 February 2017, available at: <https://www.timesofisrael.com/iran-said-to-test-second-nuclear-capable-missile/>, last visited: 19 March 2018.

<sup>89</sup> Nadimi, F., 'Iran's Latest Missile Test: Scenarios and Implications for the New Administration', *The Washington Institute for Near East Policy*, 3 February 2017, available at: <http://www.washingtoninstitute.org/policy-analysis/view/irans-latest-missile-test-scenarios-and-implications-for-the-new-administra>, last visited: 19 March 2018.

<sup>90</sup> Elleman, M., 'Iran's Missile Test: Getting the Facts Straight on North Korea's Cooperation', *38 North*, 3 February 2017, available at: <https://www.38north.org/2017/02/melleman020317/>, last visited: 19 March 2018.

<sup>91</sup> Taleblu, B. B., 'Iranian Ballistic Missile Tests Since The Nuclear Deal', *Foundation for the Defense of Democracies*, 9 February 2017.

<sup>92</sup> Ramani, S., 'A Closer Look At Iran And North Korea's Missile Cooperation', *The Diplomat*, 13 May 2017, available at: <https://thediplomat.com/2017/05/a-closer-look-at-iran-and-north-korea-s-missile-cooperation/>, last visited: 19 March 2018.

<sup>93</sup> Savelsberg, R., 'Iran's New Missile: A Tweak, Not A Breakthrough', *Breaking Defense*, 4 October 2017, available at: <https://breakingdefense.com/2017/10/irans-new-missile/>, last visited: 19 March 2018.

<sup>94</sup> 'North Korean Ballistic Missile Models', *Nuclear Threat Initiative*, 21 March 2016, available at: <http://www.nti.org/analysis/articles/north-korean-ballistic-missile-models/>, last visited: 19 March 2018.

<sup>95</sup> 'Khorramshahr', *Missile Threat: CSIS Missile Defense Project*, 29 September 2017, available at: <https://missilethreat.csis.org/missile/khorramshahr/>, last visited: 19 March 2018.

<sup>96</sup> 'Iran Missile Test May Have Been Variant of NK Musudan', *Missile Threat: CSIS Missile Defense Project*, 2 February 2017, available at: <https://missilethreat.csis.org/iran-missile-test-may-variant-nk-musudan/>, last visited: 19 March 2018.

<sup>97</sup> Karimi, N. and J. Gambrell, 'Iran's supreme leader limits range for ballistic missiles produced locally', *Defense News*, 31 October 2017, available at: <https://www.defensenews.com/global/mideast-africa/2017/10/31/irans-supreme-leader-limits-range-for-ballistic-missiles-produced-locally/>, last visited: 19 March 2018.

<sup>98</sup> Gertz, B., 'Iran Conducts Space Launch', *The Washington Free Beacon*, 20 April 2016, available at: <http://freebeacon.com/national-security/iran-conducts-space-launch/>, last visited: 19 March 2018.

<sup>99</sup> 'U.S. says Iran rocket test breaches U.N. resolution', *Reuters*, 27 July 2017, available at: <https://www.reuters.com/article/us-iran-satellite/u-s-says-iran-rocket-test-breaches-u-n-resolution-idUSKBN1AC1YY>, last visited: 19 March 2018.

<sup>100</sup> Intercontinental Ballistic Missiles (IRBMs) have a range greater than 3,418 miles, or 5,500km. For full details of the categorisation of ballistic missiles and their respective ranges, see 'Ballistic and Cruise Missile Threat', *National Air and Space Intelligence Center*, March 2006.



mile, or 7,500-km range”.<sup>101</sup> Accordingly, Iran’s investment in SLV rocketry could contribute significantly to any decision to construct an intercontinental ballistic missile (ICBM), a missile that carries a range in excess of 3,418 miles, or 5,500 km.

Collectively, all of these tests demonstrate that Iran has responded forcefully to the lifting of the 2010 prohibition on missile testing and engaged in a concerted effort to drive forward all aspects of its ballistic missile programme, owing to a reduced fear of economic sanctions being imposed in response.

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<sup>101</sup> Nadimi, F., ‘Iran’s Space Program Emerges from Dormancy’, *The Washington Institute for Near East Policy*, 1 August 2017, available at: <http://www.washingtoninstitute.org/policy-analysis/view/irans-space-program-emerges-from-dormancy>, last visited: 19 March 2018.

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## 5. Developments in Iranian Missile Proliferation and Doctrine

Though Iran's return to regular missile testing is significant, so too is the manner in which Iran has deployed and employed its weapons in the years since the JCPOA was agreed. Iran has maintained a longstanding policy of proliferating its armaments to proxy groups and regional allies. This approach has taken on new significance in recent years, owing to Iran's assertive regional policy, which has seen it increase its presence throughout the wider Middle East. At the same time, Iran has subtly adjusted its missile posture, away from a policy of deterrence towards a more expansive policy of self-defence.

### 5.1 Lebanese Hezbollah

For many years, the primary foreign recipient of Iranian missiles was Hezbollah, the Lebanese-based Shi'a militia group forged by Iran in the 1980s. During the 2006 Lebanese War, Hezbollah's missile capacity took the Israeli defence establishment by surprise.<sup>102</sup> Over the course of the 34-day conflict, Hezbollah fired close to 4,000 rockets,<sup>103</sup> some of which were Iranian-made Fajir-3 and Fajir-5 Katyushas.<sup>104</sup> The group also struck an Israeli vessel using a C-802 anti-ship missile.<sup>105</sup> Since the conflict, Iran has taken steps to rearm Hezbollah, upgrading its arsenal to include ballistic missiles. Central to this proliferation has been the provision of the Fateh-110 SRBM, a development which gives the group the ability strike targets in Israel with greater precision.<sup>106</sup> The road-mobile<sup>107</sup> nature of the Fateh also enables its swift manoeuvre, enhancing survivability by complicating military targeting. Israeli officials also suspect that Iran has supplied Hezbollah with the Fateh-313, an SRBM that would enable the group to target sites throughout the country (see Figure 2). As a result of Iranian assistance, Hezbollah has acquired one of the most prolific rocket and missile forces in the wider Middle East, an arsenal Israeli officials estimate to encompass some 130,000–150,000 rockets, missiles and other projectiles.<sup>108</sup>

Of particular significance are the steps Iran has taken to ease its provision of missiles to Hezbollah, by constructing missile factories within Lebanon itself.<sup>109</sup> These include the construction of two underground facilities, one in the town of Hermel in northern Lebanon where it is less vulnerable to Israeli airpower,<sup>110</sup> and a second along the Lebanese coast.<sup>111</sup> According to Israeli sources, the former site is being used to manufacture Fateh-110 missiles.<sup>112</sup>

<sup>102</sup> Erlanger, S. and R. O'Connell, 'A Disciplined Hezbollah Surprises Israel With Its Training, Tactics and Weapons', *The New York Times*, 7 August 2006, available at:

<http://www.nytimes.com/2006/08/07/world/middleeast/07hezbollah.html?mtrref=www.google.com&gwh=EE0E8F2DB5D2E1591AF24806B23878F1&gwt-pay>, last visited: 19 March 2018.

<sup>103</sup> 'Civilians under Assault', *Human Rights Watch*, 28 August 2007, available at: [https://www.hrw.org/report/2007/08/28/civilians-under-assault/hezbollahs-rocket-attacks-israel-2006-war#\\_ftn12](https://www.hrw.org/report/2007/08/28/civilians-under-assault/hezbollahs-rocket-attacks-israel-2006-war#_ftn12), last visited: 19 March 2018.

<sup>104</sup> Harnden, T., 'Iran admits it gave Hezbollah missiles to strike all Israel', *The Telegraph*, 6 August 2006, available at: <https://www.telegraph.co.uk/news/1525741/Iran-admits-it-gave-Hezbollah-missiles-to-strike-all-Israel.html>, last visited: 19 March 2018.

<sup>105</sup> Harel, A., 'Soldier killed, 3 missing after Navy vessel hit off Beirut coast', *Haaretz*, 16 July 2006, available at: <https://web.archive.org/web/20060718032259/http://haaretz.com/hasen/spages/738695.html>, last visited: 19 March 2018.

<sup>106</sup> 'Iran said to give Hezbollah missiles that "can reach Dimona"', *The Times of Israel*, 22 November 2014, available at: <https://www.timesofisrael.com/hezbollah-has-iranian-made-missiles-that-can-reach-dimona/>, last visited: 19 March 2018.

<sup>107</sup> 'Fateh-110', *Missile Threat: CSIS Missile Defense Project*, 9 August 2016, available at: <https://missilethreat.csis.org/missile/fateh-110/>, last visited: 19 March 2018.

<sup>108</sup> Issacharoff, A., 'Israel raises Hezbollah rocket estimate to 150,000', *The Times of Israel*, 12 November 2015, available at: <https://www.timesofisrael.com/israel-raises-hezbollah-rocket-estimate-to-150000/>, last visited: 19 March 2018.

<sup>109</sup> Cohen, G., 'Iran Reportedly Built Weapons Factories in Lebanon for Hezbollah', *Haaretz*, 14 March 2017, available at: <https://www.haaretz.com/middle-east-news/report-iran-built-arms-factories-in-lebanon-for-hezbollah-1.5448394>, last visited: 19 March 2018.

<sup>110</sup> Gross, J. A., 'Report sheds light on Iranian missile factories being built in Lebanon', *The Times of Israel*, 9 July 2017, available at: <https://www.timesofisrael.com/report-sheds-light-on-underground-iranian-missile-factories-being-built-in-lebanon/>, last visited: 19 March 2018.

<sup>111</sup> 'Hezbollah builds weapons factories', *Intelligence Online*, 5 July 2017, available at: <https://www.intelligenceonline.com/government-intelligence/2017/07/05/hezbollah-builds-weapons-factories,108252946-bre>, last visited: 19 March 2018.

<sup>112</sup> Gross, J., 'Report sheds light on Iranian missile factories being built in Lebanon', *The Times of Israel*, 9 July 2017.

The key driver of these developments is Israel's increased determination to strike missile shipments flowing from Iran to Lebanon through Syria. Last year, the outgoing head of the Israeli Air Force confirmed that there have been close to 100 separate Israeli airstrikes within Syria against shipments of missiles – primarily Iranian-made – destined for Hezbollah.<sup>113</sup> In addition, Israel has begun to target Iranian-made infrastructure in the country. A permanent Iranian compound constructed at El-Kiswah,<sup>114</sup> west of Damascus, was targeted in December 2017.<sup>115</sup>

Israeli military actions intended to deny Hezbollah possession of advanced Iranian missiles have thus far been limited to operations within the Syrian theatre. Since 2006, Israel and Lebanese Hezbollah have forged a tacit understanding that military strikes against each other's territory would trigger a broader conflict.<sup>116</sup> However, Iranian officials have sought to exploit that understanding by moving away from a policy of overground missile shipments, towards a policy of constructing such armaments within Lebanon itself.



**Figure 2:** Maximum range of a Fateh-313 SRBM fired from southern Lebanon (310 miles, 500km).

Doing so makes a broader conflict more likely, disrupting the balance of power in the Levant and undermining the delicate understanding that has undergirded peace across the Israeli-Lebanese border. By establishing missile factories in Lebanon, Iran not only increases the likelihood of forcing the Israeli Defence Forces (IDF) to undertake military action within the country, but also emboldens Hezbollah to mount cross-border operations due to increased confidence in its capacity to deter retaliation.

<sup>113</sup> Harel, A., 'Israel Struck Syrian and Hezbollah Arms Convoys Nearly 100 Times in Five Years, Top General Says', *Haaretz*, 17 August 2017, available at: <https://www.haaretz.com/middle-east-news/israel-struck-syrian-hezbollah-convoys-nearly-100-times-in-five-years-1.5443378>, last visited: 19 March 2018.

<sup>114</sup> Corera, G., 'Iran building permanent military base in Syria - claim', *BBC News*, 10 November 2017, available at: <http://www.bbc.co.uk/news/world-middle-east-41945189>, last visited: 19 March 2018.

<sup>115</sup> 'Israeli missiles said to hit Iranian military base being built near Damascus', *The Times of Israel*, 2 December 2017, available at: <https://www.timesofisrael.com/israeli-jets-reportedly-target-syrian-base-near-damascus/>, last visited: 19 March 2018.

<sup>116</sup> Pollak, N., 'Israel's forthcoming security dilemma', *War on the Rocks*, 7 July 2017, available at: <https://warontherocks.com/2017/07/israels-forthcoming-security-dilemma/>, last visited: 19 March 2018.

The potential for Iran's destabilising policy of missile proliferation to provoke a broader conflict was demonstrated in February of this year. On 7 February, Israeli aircraft targeted a suspected ammunition depot and chemical weapons production facility north of Damascus.<sup>117</sup> During another operation three days later, the Israeli Air Force targeted the Tiyas air base in Syria, after an Iranian drone launched from the site was shot down after entering Israeli airspace.<sup>118</sup> Following the operation, one of the Israeli F-16s that had participated in the operation was struck by Syrian air defences and crashed in northern Israel. In retaliation, Israel undertook the largest military intervention in Syria since 1982,<sup>119</sup> striking air defence assets held by the regime,<sup>120</sup> as well as sites operated by the Iranian Revolutionary Guard Corps.<sup>121</sup>

### 5.2 Yemen's Houthi rebels

In addition to its provision of advanced missiles to Hezbollah, evidence has emerged of Iranian weapons provision to Yemeni groups engaged in conflict with Saudi Arabia. Since 2015, Saudi military forces – together with the forces of other Gulf States<sup>122</sup> – have engaged in ongoing military operations in Yemen,<sup>123</sup> aimed at preventing the country's Shi'a Houthi rebels from establishing control over the country. After two years of intense and often indiscriminate air strikes,<sup>124</sup> Houthi forces have lost control over the southern and eastern portions of the country, though they still retain a strong presence in the country's capital, Sanaa.<sup>125</sup>

Yemen's long coast line has afforded Iran avenues to provide advanced weapons to the Houthi rebels. Western navies have sought to deny such shipments and have succeeded in seizing Iranian-produced antitank missiles as well as ballistic missiles.<sup>126</sup> However, interdiction efforts have only partially succeeded in preventing Iranian weapons transfers. As a result, Houthi forces have mounted increasingly frequent missile attacks against Saudi Arabia, firing more than 30 missiles over the course of the conflict.<sup>127</sup>

In July of 2017, a missile fired by Houthi rebels struck a major oil refinery near Yanbu, a port city north west of Mecca.<sup>128</sup> In November, Saudi forces intercepted a missile targeting Riyadh's main airport.<sup>129</sup> The latter attack drew international attention, when the remnants of the wreckage were displayed by Nikki Haley, the United States Ambassador to the United Nations.<sup>130</sup> However, further launches have been undertaken since. A missile targeting the al-Yamamah palace in Riyadh was

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<sup>117</sup> 'Syria war: Israel "strikes Damascus military complex"', *BBC News*, 7 February 2018, available at: <http://www.bbc.co.uk/news/world-middle-east-42973662>, last visited: 19 March 2018.

<sup>118</sup> Cooper, T., 'The February 2018 Air War between Israel, Syria and Iran Was Brief and Violent', *The National Interest*, 26 February 2018, available at: <http://nationalinterest.org/blog/the-buzz/the-february-2018-air-war-between-israel-syria-iran-was-24647?page=show>, last visited: 19 March 2018.

<sup>119</sup> 'Israeli air strikes against Syria "biggest since 1982"', *BBC News*, 10 February 2018, available at: <http://www.bbc.co.uk/news/world-middle-east-43019682>, last visited: 19 March 2018.

<sup>120</sup> Kershner, I., A. Barnard and E. Schmitt, 'Israel Strikes Iran in Syria and Loses a Jet', *The New York Times*, 10 February 2018, available at: <https://www.nytimes.com/2018/02/10/world/middleeast/israel-iran-syria.html>, last visited: 19 March 2018.

<sup>121</sup> Cooper, T., 'The February 2018 Air War between Israel, Syria and Iran Was Brief and Violent', *The National Interest*, 26 February 2018.

<sup>122</sup> 'Yemen crisis: Who is fighting whom?', *BBC News*, 30 January 2018, available at: <http://www.bbc.co.uk/news/world-middle-east-29319423>, last visited: 19 March 2018.

<sup>123</sup> Roberts, D. and K. Shaheen, 'Saudi Arabia launches Yemen air strikes as alliance builds against Houthi rebels', *The Guardian*, 26 March 2015, available at: <https://www.theguardian.com/world/2015/mar/26/saudi-arabia-begins-airstrikes-against-houthi-in-yemen>, last visited: 19 March 2018.

<sup>124</sup> Wintour, P., 'Saudi-led airstrikes kill 68 in one day of Yemen's "absurd" war', *The Guardian*, 28 December 2017, available at: <https://www.theguardian.com/world/2017/dec/28/saudi-led-airstrikes-yemen-war-uk-iran>, last visited: 19 March 2018.

<sup>125</sup> 'Yemen crisis: Who is fighting whom?', *BBC News*, 30 January 2018.

<sup>126</sup> Saul, J., P. Hafezi and M. Georgy, 'Exclusive: Iran Steps up Support for Houthis in Yemen's War – Sources', *US News and World Report*, 21 March 2017, available at: <https://www.usnews.com/news/world/articles/2017-03-21/exclusive-iran-steps-up-support-for-houthis-in-yemens-war-sources>, last visited: 19 March 2018.

<sup>127</sup> Binnie, J., 'Yemeni rebels enhance ballistic missile campaign', *IHS Jane's Military And Security Assessments Intelligence Centre* (2017), available at: [http://www.janes.com/images/assets/330/72330/Yemeni\\_rebels\\_enhance\\_ballistic\\_missile\\_campaign.pdf](http://www.janes.com/images/assets/330/72330/Yemeni_rebels_enhance_ballistic_missile_campaign.pdf), last visited: 19 March 2018.

<sup>128</sup> Browne, R., 'US officials: Iranian-backed group fired missile deep into Saudi Arabia', *CNN*, 27 July 2017, available at: <https://edition.cnn.com/2017/07/26/politics/iranian-group-fired-missile-saudi-arabia/index.html>, last visited: 19 March 2018.

<sup>129</sup> Kentish, B., 'Saudi Arabia intercepts missile fired from Yemen targeting main airport', *The Independent*, 4 November 2017, available at: <http://www.independent.co.uk/news/world/middle-east/saudi-arabia-missile-king-khalid-international-airport-fired-from-yemen-a8038051.html>, last visited: 19 March 2018.

<sup>130</sup> Nicols, H. and M. Gains, 'Haley displays missile as evidence Iran violating nuclear deal', *NBC News*, 14 December 2017, available at: <https://www.nbcnews.com/politics/white-house/haley-displays-missile-evidence-iran-violating-nuclear-deal-n829761>, last visited: 19 March 2018.

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shot down in late December,<sup>131</sup> and two further missiles were intercepted in January of this year.<sup>132</sup> In March, Saudi Arabian forces moved to intercept seven missiles fired simultaneously, but were unable to avoid casualties when one person was killed due to falling debris<sup>133</sup>.

The more recent launches have involved the firing of ballistic missiles that Yemen is not known to be in a position to manufacture domestically. Though Yemen was able to import SCUD-B missiles from North Korea early in the new century, Saudi officials asserted that airstrikes had eliminated these systems by the end of 2015.<sup>134</sup> Accordingly, there is little doubt that the missiles utilised in the more recent attacks are Iranian in origin. The ballistic missile utilised by Yemen's Houthi rebels in the July 2017 attack is suspected to be a Burkan-2H,<sup>135</sup> sometimes referred to as the Volcano-2H, a platform derived from the SCUD-C and which closely resembles Iran's Qiam-1 and Shahab-2 SRBMs. By contrast, US officials believe that a Qiam-1 was used in the thwarted December attack against the al-Yamamah Palace<sup>136</sup> (see Figure 3).



**Figure 3:** Maximum range of a Qiam-1 SRBM fired from western Yemen (497 miles, 800km).

The effectiveness of Saudi Arabia's missile defence systems has limited the military impact of Houthi missile launches. However, Iran's willingness to supply the group with such weapons in the

<sup>131</sup> Wintour, P. and S. K. Dehghan, 'Saudi Arabia shoots down Houthi missile aimed at Riyadh palace', *The Guardian*, 19 December 2017, available at: <https://www.theguardian.com/world/2017/dec/19/saudis-shoot-down-houthi-missile-close-to-capital-riyadh>, last visited: 19 March 2018.

<sup>132</sup> 'Saudis "intercept" Houthi missile near Yemen border', *Al-Jazeera*, 5 January 2018, available at: <https://www.aljazeera.com/news/2018/01/saudi-intercepts-houthi-missile-yemen-border-180105101223971.html>, last visited: 19 March 2018. See also: 'Yemen's Houthis fire ballistic missile toward Saudi Arabia', *Reuters*, 20 January 2018, available at: <https://www.reuters.com/article/us-yemen-security-saudi/yemens-houthis-fire-ballistic-missile-toward-saudi-arabia-idUSKBN1F90GO>, last visited: 19 March 2018.

<sup>133</sup> 'Yemen's Houthi rebels fire missiles towards Saudi Cities, 1 dead', *Washington Post*, 26 March 2018, available at: [https://www.washingtonpost.com/world/middle-east/yemens-houthi-rebels-launch-ballistic-missile-attack-on-saudi-arabia-killing-one/2018/03/25/c2a411e4-3079-11e8-b6bd-0084a1666987\\_story.html?utm\\_term=.e871440efbcf](https://www.washingtonpost.com/world/middle-east/yemens-houthi-rebels-launch-ballistic-missile-attack-on-saudi-arabia-killing-one/2018/03/25/c2a411e4-3079-11e8-b6bd-0084a1666987_story.html?utm_term=.e871440efbcf), last visited 6 April 2018

<sup>134</sup> Binnie, J., 'Yemeni rebels enhance ballistic missile campaign', *IHS Jane's Military And Security Assessments Intelligence Centre* (2017).

<sup>135</sup> Qiblawi, T. and R. Hetherington, 'Yemen rebels fire ballistic missile on Saudi capital, state TV reports', *CNN*, 19 December 2017, available at: <https://edition.cnn.com/2017/12/19/middleeast/saudi-yemen-missile/index.html>, last visited: 19 March 2018.

<sup>136</sup> 'Press Release: Ambassador Haley on Weapons of Iranian Origin Used in Attack on Saudi Arabia', *United States Mission to the United Nations*, 7 November 2017, available at: <https://usun.state.gov/remarks/8090>, last visited: 19 March 2018.

first place underscores its liberal approach towards proliferation, and its willingness to use its weapons for offensive purposes in an effort to prosecute an assertive regional policy.

### 5.3 Offensive use of ballistic missiles by Iran

The willingness to permit regional proxies to engage in offensive missile launches is in keeping with a subtle yet distinct shift within Iranian military doctrine. For many years, senior Iranian officials routinely asserted that Iran's ballistic missile programme served only to deter external attack. Moreover, Iranian officials discounted the value of using ballistic missiles to re-establish deterrence should it suffer an attack against it. Addressing the issue of Iranian missile tests in January 2017, Iranian Foreign Minister Javad Zarif stated that "Iran will never use missiles produced in Iran to attack any other country."<sup>137</sup> However, within six months of Zarif's comment, Iran had broken this principle, employing its ballistic missiles in response to an ISIS terrorist attack against the Iranian Parliament and the Khomeini mausoleum in Tehran.<sup>138</sup> Iran's reply targeted ISIS positions in Syria (see Figure 4), and included the use of seven SRBMs, including the Zulfiqar and the Qiam-1.<sup>139</sup>



**Figure 4:** Iranian missile attack against ISIS targets in Deir ez-Zour, Syria, fired from Kermanshah, Iran.

The operation itself was not well executed. Three of the missiles failed to clear Iraqi airspace, and a further two missed their target.<sup>140</sup> Yet the fact of the missile launch was more important than its effect. Iran's use of ballistic missiles against ISIS targets in Syria represented a *de facto* break with the formula outlined by Zarif in January 2017, and an embrace of a more flexible posture. Moreover, it gave rise to the suggestion that Iran's longstanding doctrine regarding the use of ballistic missiles for offensive purposes is evolving. IRGC members subsequently claimed that retaliation for the Tehran attack was only one motive for the launch, and that the attack was also intended to serve as a warning to Saudi and American forces.<sup>141</sup> By responding to the attack with weaponry better suited to mounting large-scale attacks against neighbouring states, and defining the launch in

<sup>137</sup> Irish, J., 'Iran will not use ballistic missiles to attack any foreign country: foreign minister', *Reuters*, 31 January 2017, available at: <https://www.reuters.com/article/us-france-iran-missiles/iran-will-not-use-ballistic-missiles-to-attack-any-country-foreign-minister-idUSKBN15F0YI>, last visited: 20 March 2018.

<sup>138</sup> Erdbrink, T. and M. Mashal, 'At least 12 Killed in Pair of Terrorist Attacks in Iran' *The New York Times*, 7 June 2017, available at: <https://www.nytimes.com/2017/06/07/world/middleeast/iran-parliament-attack-khomeini-mausoleum.html>, last visited: 20 March 2018.

<sup>139</sup> 'Photos Show IRGC Used Zulfiqar, Qiam Missiles in Deir Ezzur Attacks', *Fars News Agency*, 19 June 2017, available at: <http://en.farsnews.com/newstext.aspx?nn=13960329000502>, last visited: 20 March 2018.

<sup>140</sup> Harel, A., 'Iran's Missile Attack on Syria Failed: 5 Missed, 3 Landed in Iraq', *Haaretz*, 21 June 2017, available at: <https://www.haaretz.com/middle-east-news/iran-s-missile-attack-on-syria-failed-5-missed-3-landed-in-iraq-1.5486503>, last visited: 20 March 2018.

<sup>141</sup> 'Iran launches missile strike into Syria in response to Tehran attacks', *The Times of Israel*, 18 June 2017, available at: <https://www.timesofisrael.com/iran-launches-missile-strike-into-syria-for-tehran-attacks/>, last visited: 20 March 2018.

aggressive terms, Iran has worsened regional stability by aggravating the security dilemma that engulfs itself and the Gulf states.

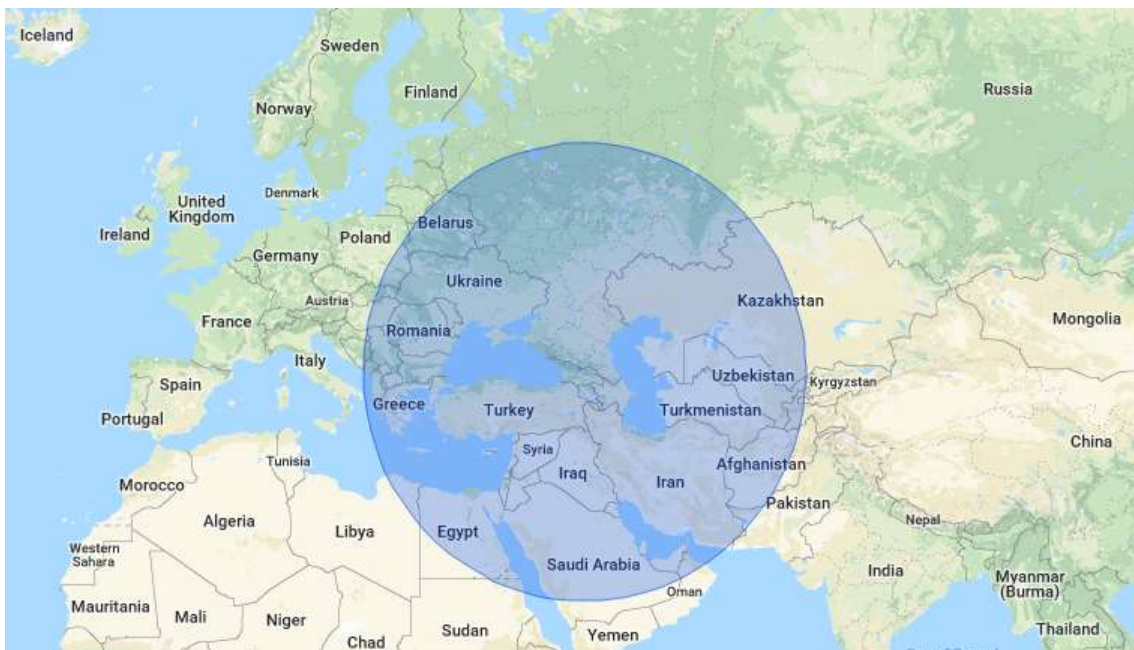
Accordingly, when taken as a whole, Iran's assertive approach to ballistic missile proliferation and usage is making the outbreak of a major interstate conflict much more likely. The provision of ballistic arms to Hezbollah, together with the construction of missile factories in Lebanon, increases the potential for conflict across the Blue Line demarcating the Lebanese-Israeli border. The provision of weapons to Houthi forces in Yemen, where it exercises very little command and control, risks turning the ongoing conflict in the country into a broader regional conflagration. Likewise, Iran's shift away from a deterrent policy to one of kinetic use fuels the Middle East's ongoing arms race, and heightens the potential for costly miscalculation.

## 6. Conclusions and Recommendations

Iran is in the process of modernising its existing ballistic missile arsenal, playing a more assertive role within the wider Middle East through the cultivation of loyal proxy groups, and endowing them with a number of its most modern missile platforms. These technological and geopolitical advances have been especially pronounced in the JCPOA era – from 2015 onwards – when Iran’s fear of being isolated by a robust international sanctions regime has dwindled.

Iran’s willingness to provide ballistic missiles to proxy forces – namely Lebanese Hezbollah and the Houthi rebels in Yemen – is indicative of the way in which the country is seeking to strengthen its hand across the region. In addition to provoking an arms race across the Middle East, this policy makes the outbreak of a conventional conflict more likely, by heightening the chances of miscalculation. Iran’s employment of its ballistic missile arsenal in an offensive capacity is also evidence of an increasing willingness to utilise its weaponry for geopolitical gain, in addition to deterrent purposes.

Of equal significance is Iran’s suspected experimentation with intermediate-range ballistic missiles (IRBMs). This means that in a best-case scenario, the maximum range of Iran’s nuclear capable missile arsenal falls somewhere close to 1,867 miles, or 2,200 km (see Figure 5). However, the precise details of its Khorramshahr missile have yet to be verified. The missile’s similarity to the BM-25/Musudan system, as well as the Hwasong-10, suggest that the frontier of Iran’s ballistic missile range is likely to lie closer to 2,175 miles, or 3,500 km. A worst-case scenario estimate would place the maximum range of Iran’s nuclear capable missiles at 2,485, or 4,000km. This would enable Iran to encompass almost all major European capitals within its range (see Figure 6).



**Figure 5:** Maximum range (lower estimate, assuming a range of 1,367 miles, 2,200km) of a nuclear capable Khorramshahr fired from north-western Iran.

While further study and more precise intelligence would be required to make a definitive judgement, Iran’s willingness to test systems that extend the range of its missiles would be of enormous import, and its acquisition of ballistic missiles with the notional capability of striking the UK, France and Germany – all P5+1 signatories – would be a “game-changer”.



Thus far, signalling to Iran that its continued efforts to acquire an ever more proficient arsenal are unacceptable has been seen by many in Europe as a step that might undermine the workings of the JCPOA. In reality, such signalling is essential if the agreement is to be sustained. Despite the safety and security afforded by proficient missile defences, it is inevitable that European decision-makers would be less likely to adopt robust responses to Iranian violations of the nuclear restrictions imposed by the JCPOA were their publics to fall within range of Iran's missile arsenal. Moreover, every Iranian missile advance increases the likelihood of the US imposing additional sanctions, which could prompt Iran to discontinue its compliance with the terms of the JCPOA. Accordingly, sustaining the transatlantic consensus on the need to hold Iran to the commitments it made as part of the JCPOA requires a more assertive response, in order to deny Iran the ability to use its ballistic missile capabilities to affect European decision-making.

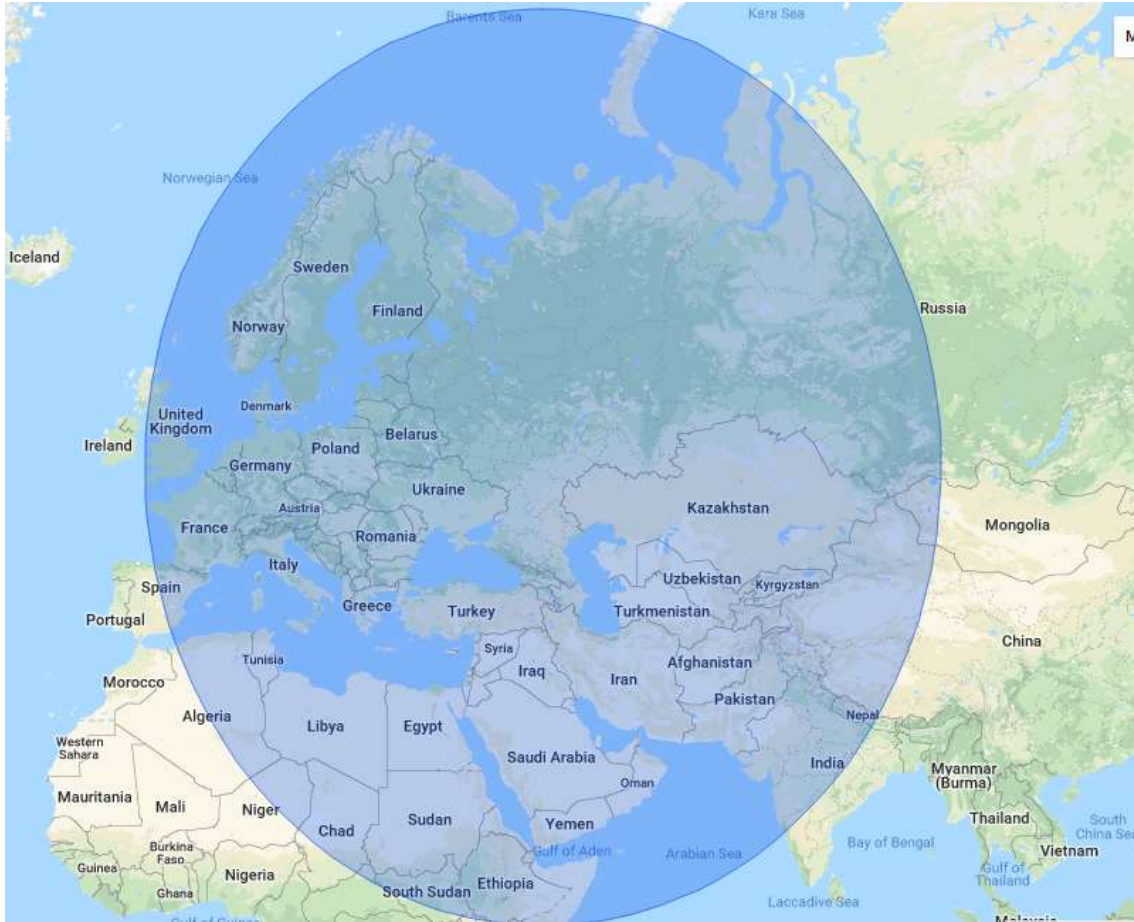
Should European officials wish to retain the current arms control architecture, adopting a strategy designed to curtail Iranian ballistic missiles ought to be a priority. For the UK and its European allies, the appropriate short- to medium-term strategy should therefore seek to deter Iran from making continued strides within its ballistic missile programme.

### **Recommendations:**

Endorsing this approach can be achieved without imposing additional economic sanctions at the present time. A key reason Iran has engaged in extensive ballistic missile tests over the last three years is that it does not assess the imposition of punitive economic measures by European states to be a likely response. British and European officials should therefore seek to alter that assessment, by taking steps that make the imposition of economic sanctions more likely. To be effective, steps should be taken to reiterate the legal basis for introducing sanctions, to introduce greater clarity as to when new sanctions would be adopted, to define what those sanctions would be, and to tie their imposition to specific Iranian actions.

In addition, European states should leverage the threat of sanctions in ways that lessen the likelihood of Iran continuing to engage in unchecked proliferation among its proxies. The distribution of weapons to Hezbollah, and Houthi rebels in Yemen, designed to pressure Israel and Saudi Arabia, make it more likely that both will be required to undertake military action. In order to lessen the chances of miscalculation or escalation, the UK and its European partners should seek to affect Iranian behaviour in ways that incentivise Iran to exercise restraint over the armaments it is prepared to supply, or at the very least, exercise greater command and control over their use.

Notably, the UK is best placed to demonstrate credibility. Threats of economic sanctions issued by London carry greater weight owing to the presence within its jurisdiction of a plethora of financial institutions. In addition, the UK's upcoming departure from the European Union is likely to result in British officials acquiring unilateral control over sanctions policy. That is not the case for their P5+1 counterparts in Berlin and France, where sanctions policy is – and will continue to be – determined by consensus at the European level.



*Figure 6: Maximum range (upper estimate, assuming a range of 2,485 miles, 4,000km) of nuclear capable Khorramshahr fired from north-western Iran.*

On the basis of these assessments, this paper advances the following five recommendations:

- **Recognise that Iran’s ballistic missile arsenal poses a threat to peace and security irrespective of Iran’s nuclear programme.** Iran’s ballistic missile programme only became subject to international sanctions when it came to be seen as producing platforms capable of hosting nuclear-capable delivery vehicles. British and European officials have thus far resisted calls by American counterparts<sup>142</sup> to identify Iran’s ballistic missile programme as a threat in and of itself, for fear that doing so would provide implicit backing to those who would wish to see the JCPOA scrapped altogether. However, Iran’s changing doctrine, the capacity of its programme to fracture transatlantic consensus on responding to JCPOA violations, and its distribution of such arms to a range of proxy groups in the Middle East make it vital that Iran’s ballistic missile programme be treated as an issue that warrants international attention and action in its own right.
- **Unequivocally reject the Iranian contention that economic sanctions imposed against individuals and entities associated with the Iranian ballistic missile programme, or imposed in response to ballistic missile tests, are in any way prohibited by the terms of the JCPOA or UN Security Council Resolution 2231.** Taking this step is essential if any signalling

<sup>142</sup> Mohammed, A., J. Irish and R. Emmott, ‘Exclusive: For now, U.S. wants Europeans just to commit to improve Iran deal’, *Reuters*, 18 February 2018, available at: <https://www.reuters.com/article/us-iran-usa-nuclear-exclusive/exclusive-for-now-u-s-wants-europeans-just-to-commit-to-improve-iran-deal-idUSKCN1G20LE>, last visited: 23 March 2018

strategy is to be effective. Iran's suggestion that economic sanctions against its ballistic missile programme constitute a violation of the JCPOA represents an argument of convenience that lacks any basis in the text of the agreement or the UN resolution that outlines all parties' obligations. However, Tehran will only be receptive to counter-arguments if they are advanced forcefully. When reiterating the legal basis for imposing additional sanctions against Iran's ballistic missile programme, British and European officials should draw attention to Iran's hypocrisy in contesting that its ballistic missile programme is not covered by the nuclear agreement when defending missile tests, while claiming that such tests are protected by the agreement when seeking to fend off measures taken in response.

- **Detail potential sanctions ahead of time, in order to signal the consequences of continued ballistic missile development and testing.** British and European officials should highlight the measures at their disposal, ranging from economic sanctions designed to prevent Iranian imports of technology capable of being utilised within specific missile platforms, to measures that would target individuals and entities connected with the ballistic missile programme. Should cause be found to implement such restrictions, the direct and indirect effect on Iran's ballistic missile programme would be considerable. However, in the immediate term, spelling out clear consequences would signal a higher level of seriousness than has been exhibited thus far, opening up the possibility that Iran might be encouraged to engage in self-restraint.
- **Set out clear red lines for the imposition of ballistic missile sanctions.** In order to counter Iran's efforts to decouple Europe from the United States, officials from the three European countries within the P5+1 – the UK, France and Germany – should make clear that they will seek to target individuals and entities associated with Iran's ballistic missile programme with economic sanctions, should Iran test or develop any missile that has the capacity to reach their territory. Such a move will not only offer much-needed clarity as to when key European states would adopt ballistic missile-related sanctions, but would also create a deterrent that discourages Iran from engaging in continued tests and development. This move is essential. At present, the Trump administration has identified the development of an intercontinental ballistic missile as a key “red line”. However, Iran could develop the notional ability to strike European states without crossing that threshold. Accordingly, it is vital that European states set red lines that correspond to their geographic locations.
- **Apply a policy of “extended responsibility”, on the basis that Iran is the custodian of all ballistic missiles it manufactures.** In order to deter use of the ballistic missiles distributed to proxy groups in Lebanon and Yemen, the UK and other European states should make clear that they will regard any Iranian-produced or manufactured missile launched against a third party as a deliberate direct attack upon that entity by the Islamic Republic. This warning should be accompanied by an explicit threat to respond to such an attack with significant economic sanctions against Iran's economy. This would represent the extension of a principle already established with respect to the proliferation of weapons of mass destruction, namely those that are Chemical, Biological, Radiological or Nuclear (CBRN) in nature. While adopting this policy is unlikely to prevent Iran from continuing its efforts to supply advanced missiles to proxy groups and allies in the region, it would incentivise Tehran to exercise greater command and control, thereby lessening the likelihood of these arms being used for offensive purposes.

Adoption of these recommended measures would signal the seriousness of Europe's willingness to confront and counter Iranian ballistic missile advances. Collectively, they represent a prudent, responsible and incremental form of escalation that puts the onus upon Iran to reverse its course. They also represent a means of preserving transatlantic unity in response to Iran's increased ballistic missile testing, while

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limiting the likelihood that Iran will be moved to discontinue its compliance with the nuclear restrictions agreed under the terms of the JCPOA.

However, despite these benefits, such an approach can only be successful if it is seen to be credible by decision-makers in Tehran. Accordingly, British and European policymakers must locate, assemble and exhibit the political will to impose meaningful economic sanctions against Iran's ballistic missile programme should Tehran fail to heed measured calls for restraint.

### **About the Author**

Timothy Stafford is a Senior Research Fellow at the Henry Jackson Society. He previously held research posts with the Royal United Services Institute (RUSI) in London and Pacific Forum-CSIS in Honolulu, Hawai'i, in addition to working in the Parliamentary offices of Theresa May and Sir Malcolm Rifkind. He holds an undergraduate degree in history and politics from the University of Oxford, and a master's degree in Security Studies from Georgetown University in Washington, DC.

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CENTRE FOR THE  
NEW MIDDLE EAST  
At The Henry Jackson Society

The Henry Jackson Society  
Millbank Tower,  
21-24 Millbank, London, SW1P 4QP  
Tel: 020 7340 4520

[www.henryjacksonsociety.org](http://www.henryjacksonsociety.org)  
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