

# Tomcat and Mouse: Iranian Illicit Procurement of U.S. Legacy Military Technologies, 1979-2016

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## Abstract

*Since the 1979 revolution, Iran has sought to illicitly procure parts for the U.S. origin fighter aircraft sold to the country under the rule of the Shah. The U.S. has taken steps to quash this trade—these efforts have constituted a relatively large proportion of U.S. export control enforcement over the past near-to-four decades. This paper provides insights into the smuggling rings which have sought to procure these parts for Iran’s Air Force, seeking to draw conclusions regarding the evolving shape of these networks and the types of actors involved in this trade. It also provides a snapshot of U.S. export control enforcement efforts. In doing so, the paper seeks to contribute to the limited existing literature on Iranian illicit procurement of military goods. This area has received less attention than illicit procurement efforts for the country’s nuclear or missile programs.*

## Keywords

Aerospace, aircraft, arms embargo, illicit trade, Iran, military goods, procurement, Tomcat

*Catching traffickers – “a giant game of cat and mouse”<sup>2</sup>*

## Introduction

In the 1970s, the United States sold extensive weaponry to Iran, including some of the most advanced aircraft available at the time, such as the F-14 Tomcat. By the end of the decade, as

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2 John Shiffman, *Operation Shakespeare: The True Story of an Elite International Sting* (U.S.: Simon and Schuster, 2014), p. 241.

many as 95% of Iran's aircraft were U.S. manufactured.<sup>3</sup> The 1979 revolution saw the pro-American monarchy led by the Shah replaced with an increasingly anti-American and hostile theocracy. Following the revolution, the U.S. government sought to prevent the transfer of military goods to the new regime. This put the Iranian military in possession of several systems, important to the national security of the young Islamic Republic, and without the prospect of spares and support.

This article considers Iran's efforts to acquire goods to maintain these assets. Drawing on cases surrounding a series of U.S. weapons systems—notably the F-14, F-4 and F-5 aircraft—it seeks to provide insights into Iran's illicit military procurement. It also considers U.S. efforts to disrupt Iran's activities, exploring the near four-decade-long game of “cat and mouse” between smugglers and law enforcement. The article draws on declassified Central Intelligence Agency (CIA) assessments and a wealth of open source material including reporting and indictments relating to almost 60 cases of attempted and successful illicit trade between 1980 and 2016.<sup>4</sup> In doing so, the article seeks to move beyond the predominant case study-based approach to the study of illicit trade and to contribute to the limited existing literature on the Iranian military—as opposed to nuclear or missile—illicit procurement.

The article provides context to Iran's illicit procurement, considers Iranian demand for aircraft parts, and considers significant examples of successful illicit procurement. It then draws conclusions regarding the shape of, and participants in, Iranian illicit procurement. In doing so, it compares this snapshot of procurement with examples from Iran's nuclear and missile programs. Finally, the paper considers U.S. enforcement actions, highlighting the prominence of sting operations, and notes the limits to the understanding of U.S. enforcement effort effectiveness more broadly.

## **Background: Iran and Illicit Procurement**

Iran's illicit procurement has received a good deal of attention over the past decade as the country sought to supply its United Nations (UN) sanctioned nuclear and missile programs. However, Iran's efforts to procure goods for its military since the 1979 revolution in the face of a U.S. arms embargo in place since 1980, other unilateral embargos, and finally UN measures put in place in 2006, 2007 and 2010, have received less attention.<sup>5</sup>

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3 Douglas Frantz and James O'Shea, “U.S. Plugged into Weapons Network,” *Chicago Tribune*, November 23, 1986.

4 These cases all include technology related to these three aircraft, often amongst other military goods (usually aircraft parts, for example for Iran's U.S.-origin helicopters and transport aircraft). Useful detail is available for around 40 of these 60 cases, while in the other 20 details are limited.

5 The U.S. immediately halted shipments of arms to Iran in the aftermath of the 1979 revolution and put in place further legal measures in 1984 and 1995. Other countries also put in place unilateral restrictions, particularly during the Iran-Iraq war, and even full embargoes—for example, the UK put in place an embargo in 1993, having previously limited transfers during the 1980s. UNSCR 1737 (2006) put in place restrictions on exports of nuclear and missile technologies to Iran—some of which could be of use in conventional military programs. UNSCR 1747 (2007) called on states to “exercise vigilance and restraint” in the supply of goods on the UN Register of Conventional Arms. UNSCR 1929 (2010) upgraded this to a full arms embargo.

Iran's purchase of U.S. combat aircraft—a highly technologically advanced product to manufacture indigenously—placed the country in the top tier of Middle Eastern militaries. In the 1960s and 1970s, Iran purchased many F-4 and F-5 aircraft. The first deliveries of the F-5 *Tiger*—a relatively cheap to procure and operate, light fighter jet—occurred in 1965, with just over 300 of different variants being delivered up to 1977.<sup>6</sup> The F-4 *Phantom II* fighter-bomber was first delivered to Iran in 1968. Over 200 airframes were delivered to the country before the revolution.<sup>7</sup> The most advanced aircraft Iran purchased from the U.S. was the F-14 *Tomcat*—a fighter aircraft—which Iran received 79 of before the revolution in 1979.<sup>8</sup> The F-14 first arrived in Iran in 1976, only two years after it entered U.S. Navy service. Iran's F-14s were armed with long-range AIM-54 *Phoenix* missiles—air-to-air missiles (AAMs) providing a formidable capability.

The technological supremacy provided by these assets also put Iran in a difficult position following the revolution. The Tomcat especially was a maintenance intensive aircraft, supposedly requiring around fifty hours of maintenance for each hour flown.<sup>9</sup> Without spare parts, technical and maintenance support, and assistance for upgrades, the Iranian Air Force's assets would degrade and ultimately become inoperable. With no steady supply of spare parts, difficulties indigenizing manufacture of spares, and the inability to purchase similar aircraft from other sources, Iran would become reliant on illicit procurement. Against debates regarding Iran's indigenization of manufacturing capability, it seems clear that Iran's illicit procurement has been somewhat successful, with estimates that 43 F-14s, over 64 F-4s, and over 75 F-5s are still “combat capable” in 2017, although admittedly it is unclear whether these aircraft would constitute much of a threat to more advanced militaries.<sup>10</sup>

## Looking into Iran's Illicit Procurement

States look to illicit procurement when unable to obtain required goods through normal channels due to various restrictions. Illicit procurement methods—for example, the use of front companies and agents, falsifying the end-uses of goods, mislabeling goods, physically hiding them amongst others—have been used by a wide range of state WMD and military programs. When successful, by its very nature illicit procurement efforts are secret or opaque, only coming to light when uncovered by governments or researchers at the time, or in retrospect.

Much existing work on Iran's illicit procurement has focused on nuclear and missile programs. The most extensive study relating to military goods focuses on an elaborate sting operation

6 The Stockholm International Peace Research Institute (SIPRI) suggests that 307-309 F-5A, F-5B, F-5E, and F-5F were ordered. All SIPRI data comes from the “SIPRI Arms Transfer Database,” <<https://www.sipri.org/databases/armstransfers>>.

7 SIPRI suggests that 213 were delivered of F-4D, F-4E, and RF-4E variants, with 31 ordered in 1976 not being delivered after the revolution.

8 SIPRI suggests that 79 were delivered, 80 having been ordered, with 1 not making it to Iran prior to the 1979 revolution.

9 Jon Lake, “Northrop Grumman F-14 Tomcat,” *International Air Power Review* Vol. 3, (Winter 2001-2), pp. 42-75.

10 International Institute for Strategic Studies (IISS), *Military Balance 2017* (UK: Routledge, 2017) p. 379.

undertaken by the U.S. authorities between 2004 and 2007.<sup>11</sup> Accounts of Iran's Air Force have also been limited, generally focusing on the Iran-Iraq war rather than on maintenance or procurement.<sup>12</sup> One piece provides some coverage of illicit procurement for Iran's Tomcats, but notes "American authorities became aware of the illicit trade as early as 1998," not the 1980s as will be argued below.<sup>13</sup> This lack of scholarship is intriguing, given that cases related to Iran's procurement of aircraft parts have historically constituted a relatively large proportion of U.S. export control enforcement cases. For example, between 2007 and 2009, 30% of enforcement cases relating to Iran involved parts for U.S.-built aircraft.<sup>14</sup>

Secrecy makes probing Iran's activities difficult. However, a wealth of information in open sources still merits consideration. Declassified government documents, court records such as criminal complaints and indictments, and reporting by national, and especially local media, can provide insights into more recent cases. Our understanding of illicit procurement is undoubtedly skewed by the fact that this data is largely derived from enforcement actions. The cases that are the most known are, at least ultimately, unsuccessful, having been disrupted by enforcement efforts. In addition, as will be demonstrated, the types of enforcement efforts such as "sting operations" can shape the opportunities for illicit transactions. However, despite these limitations, important insights can still be garnered.

### **Iranian Demand: Dependency and Embargo**

Between 1972 and 1976, Iran purchased \$10.4 billion of arms from the U.S. and planned to purchase a further \$10-15 billion before 1981.<sup>15</sup> By the mid-1970s, Iran was the "largest single purchaser of U.S. military equipment."<sup>16</sup> Iran's interests as a buyer, and U.S. interests as an exporter, were driven by several factors including security concerns regarding Iraq and the Soviet Union and Iran's desire to further strengthen its relationship with the U.S. The quadrupling of oil prices in 1973 provided Iran the financial resources to ramp up its purchases significantly. One journalist described Iran in the mid-1970s as "the salesman's dream," noting that the Shah was "the kind of patron that salesmen dream of—a war-lord who understands the same shoptalk, as fascinated by the gadgets as they are."<sup>17</sup>

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11 John Shiffman, *Operation Shakespeare: The True Story of an Elite International Sting* (U.S.: Simon and Schuster, 2014), p. 241.

12 Tom Cooper and Farzad Bishop, *Iranian F-14 Tomcat Units in Combat* (UK: Bloomsbury Publishing, 2012).

13 David Axe, "Grounding the Ayatollah's Tomcats," *War is Boring*, September 8, 2015, <<http://warisboring.com/grounding-the-ayatollahs-tomcats/>>.

14 "Iran Sanctions: Complete and Timely Licensing Data Needed to Strengthen Enforcement of Export Restrictions," U.S. Government Accountability Office, GAO-10-375, March 2010, <<http://www.gao.gov/products/GAO-10-375>>, p. 15.

15 Ephraim Kam, "Iran's Defense Spending and Arms Procurement," in Andrew T. H. Tan, eds., *The Global Arms Trade: A Handbook* (UK: Routledge, 2009) pp. 124-5.

16 "U.S. Military Sales to Iran," A Staff Report to the Subcommittee on Foreign Assistance of the Committee on Foreign Relations, United States Senate, July 1976, vii.

17 Anthony Sampson, *The Arms Bazaar* (New York: Viking Press, 1977), p. 14.

Iran supplemented its purchases of F-4 and F-5 jets from the U.S. with the Grumman F-14 Tomcat, the most advanced fighter aircraft available in the 1970s. Two contracts for a total of 80 F-14s, Phoenix AAMs, and a large quantity of spare parts and replacement engines were signed in 1974 totaling \$2 billion.<sup>18</sup> Iran's procurement of the F-14 was unique, with early plans to sell the fighter to other countries going unfulfilled.<sup>19</sup>

In June 1974, the month that the second of the F-14 contracts was signed, the CIA noted that "The arrival of so much equipment is certain to strain the capacity of the Iranian armed forces to absorb it."<sup>20</sup> The Imperial Iranian Air Force faced considerable issues in maintaining the very complex F-14 during its first years in Iran.<sup>21</sup> By 1976, 800 Grumman expatriates (technicians and their families) were based in Iran.<sup>22</sup> As one Iranian pilot noted:

*The Pentagon would not permit any of the "sensitive" systems to be repaired or maintained in Iran, nor would it train our technicians to maintain or repair them. All those parts had to be packed up and sent to the U.S. for maintenance.*<sup>23</sup>

An elaborate "logistics pipeline" was set up with an office in the U.S. coordinating the supply of parts and support to Iran.<sup>24</sup> Rather than aid Iran in maturing its understanding of procurement at an early stage, dependency on this U.S.-managed system was to prove problematic following the revolution. In the late 1980s, one U.S. official noted that the Shah had "bought enormous quantities of spare parts filling up countless warehouses," although these were "overlooked" or "misplaced" after U.S. technicians withdrew.<sup>25</sup>

## Revolution and Embargo

In early 1979, the Shah's rule collapsed, and Iran became the Islamic Republic in late March. In February, the Chairman of the U.S. Joint Chiefs promised that American technology in Iran was secure.<sup>26</sup> Allegedly, following the revolution in 1979 there were "low intensity" secret negotiations

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- 18 Tom Cooper and Farzad Bishop, *Iranian F-14 Tomcat Units in Combat* (UK: Bloomsbury Publishing, 2012), p.11.
- 19 Saudi Arabia, Japan, Canada, and Australia were earmarked as possible markets constituting 30% of total production. See Anthony Sampson, *The Arms Bazaar* (New York: Viking Press, 1977), p. 14.
- 20 "Iran: Building Up the Military," Declassified CIA Report, CIA-RDP79-00927A010800110003-0, June 7, 1974, p. 2.
- 21 Tom Cooper and Farzad Bishop, *Iranian F-14 Tomcat Units in Combat* (UK: Bloomsbury Publishing, 2012), p. 14.
- 22 Anthony Sampson, *The Arms Bazaar* (New York: Viking Press, 1977), p. 247.
- 23 Quoted in Tom Cooper and Farzad Bishop, *Iranian F-14 Tomcat Units in Combat* (UK: Bloomsbury Publishing, 2012), p. 15.
- 24 Paul Gilchrist, *Tomcat!: The Grumman F-14 Story* (Atglen, Pennsylvania: Schiffer Publishing, 1994), p. 56.
- 25 "Interview with U.S. Government Officials 30 January 1989 @ 1330," in Charles Gail Roller and Dorothy May Major, "Ramifications of Illegal U.S. Arms Exports," MA diss, Naval Postgraduate School, 1989, p. 94.
- 26 Vernon A. Guidry Jr. and John J. Fialka, "U.S. Equipment Still in Hands of Iranians," *The Washington Star*, February 13, 1979.

between the U.S. and Iranian governments for the U.S. to buy-back the F-14s.<sup>27</sup> However, it soon became clear that there was little that the U.S. could do to prevent these advanced systems from falling into the hands of the new and increasingly anti-American regime.

The seizure of hostages in the U.S. Embassy in November 1979 resulted in an arms embargo and cancellation of existing orders.<sup>28</sup> This also saw the U.S. cease provision of spare parts, ammunition and technical assistance. In 1981, a letter requesting spare parts was sent by an Iranian agent to Grumman causing the U.S. Navy to comment that “It is the present policy of the United States Government not to permit Grumman or any other defense contractor to obtain a license to provide Iran with these materials.”<sup>29</sup>

Soon after the revolution, U.S. intelligence suggested that the capability provided by Iran’s U.S. manufactured systems was already degrading. In May 1980, the CIA cited a purge of pilots, reduction of training, inadequate maintenance, and “a shortage of spare parts” as reasons for the IRIAF’s declining effectiveness.<sup>30</sup> The report also suggested that “problems with equipment and maintenance” continued to disrupt F-14 flight operations, noting:

*Equipment problems have had a major impact on the F-14 program, sometimes forcing ground crews to adopt extraordinary measures. Because of a severe shortage of spare parts and inadequate maintenance, the Air Force has been forced to cannibalize many of the F-14s.<sup>31</sup>*

Later in 1980, the CIA assessed Iran’s resupply needs to include “jet fuel and spare parts, particularly for electric and hydraulic systems on its U.S.-made fighter aircraft.”<sup>32</sup>

### **The Iran-Iraq War**

18 months into the Iran-Iraq war in 1982, the CIA suggested a serious reduction in IRIAF capability, with 175 fighter aircraft lost and 175 grounded of an inventory of 450.<sup>33</sup> A reduction in Iranian air activity, according to the CIA, “reflects a policy of conserving resources” driven

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27 Tom Cooper and Farzad Bishop, *Iranian F-14 Tomcat Units in Combat* (UK: Bloomsbury Publishing, 2012), p. 20.

28 “Iran-Iraq: Buying Weapons for War,” Declassified CIA report, CIA-RDP85T00283R000500120005-5, May 1984.

29 Richard Halloran, “Iran Rebuffed by U.S. in Bid for Parts for its F-14s,” *New York Times*, December 13, 1981.

30 “Iran: Decline in Air Force Capability,” Declassified CIA report, CIA-RDP81B00401R0005000030011-5, May 1980.

31 Ibid.

32 “Memorandum: Some Implications of Renewed U.S. Arms Deliveries to Iran,” Declassified CIA memorandum, CIA-RDP85T00287R000102520001-3, November 2, 1980.

33 “Operational Status of Iranian Aircraft,” Declassified CIA report, CIA-RDP91T01115R000100160002-6, March 1984.

primarily by, amongst other factors, “a scarcity of parts for U.S.-built aircraft.”<sup>34</sup> The Agency assessed that:

*Political factors—the cut off aid from its primary supplier, the United States, and purges of its most experienced personnel—have limited Iran’s air combat capability more than factors related to the war with Iraq.*<sup>35</sup>

An assessment in 1984 suggested that just 65 to 80 fighters were operational, with 150 (two-thirds) non-operational because of poor maintenance or shortage of parts.<sup>36</sup> Of the 150 non-operational fighters:

*Most of these aircraft have been cannibalized and are strewn around Iranian airfields... the Iranians have nearly exhausted the spare parts available on cannibalized aircraft.*<sup>37</sup>

By this point, required spares were said to “run the gamut from tires to advanced avionics and weapons components... avionics, engine components, flight control systems, and radar systems were the most critical shortages.”<sup>38</sup>

The missiles that armed Iran’s fighters also suffered due to a lack of spare parts and expertise. In 1982, the CIA assessed many Phoenix AAMs to be “almost certainly rendered inoperative or marginally operative by improper storage and lack of maintenance expertise, test equipment and parts.”<sup>39</sup>

### **Demand into the 21<sup>st</sup> Century**

Following the war’s end in 1988, Iran was still reporting similar issues with acquiring spare parts. In 1993, the Iranian Defense Minister Akbar Torkan noted in an interview with the *Financial Times* that “The first priority is spare parts, the second priority is spare parts, and the third priority is spare parts.... Unfortunately, because our fleet is mainly made up of American products, providing spares is very difficult.”<sup>40</sup> These remarks conflicted with those made the following year by the Iranian Air Force Chief who suggested the IRIAF had “reached self-sufficiency in all fields, including pilot training, missiles, radar, air defense, maintenance and

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34 “The Iranian Air Force: A Diminishing Threat,” Declassified CIA report, CIA-RDP83B00232R0001001 20001-9, May 1982.

35 Ibid.

36 “Iran’s Air Force: Frustrations of a Former Power,” Declassified CIA report, CIA-RDP85T00314R0003 00020001-7, September 1984.

37 Ibid.

38 Ibid.

39 “The Iranian Air Force: A Diminishing Threat,” Declassified CIA report, CIA-RDP83B00232R0001 00120001-9, May 1982.

40 Roger Matthews, “Survey of Iran,” *Financial Times*, February 8, 1993, iv.

repair, manufacture of parts and basic repair of facilities.”<sup>41</sup> U.S. experts have suggested these claims to be little more than “whistling in the dark.”<sup>42</sup>

By 1996, the U.S. Office of Naval Intelligence assessed that only 22% of Iran’s 175 “third generation” aircraft, including the F-4 and F14, were operational.<sup>43</sup> Although, as one U.S. analyst noted, Iran had done “an impressive job at maintaining at least minimal operational rates under difficult circumstances.”<sup>44</sup> Iran’s Air Force was supplemented with French-origin Mirage fighters which had left Iraq during the 1991 Gulf War, and MiG-29 aircraft from Iraq and Russia, despite U.S. efforts to prevent Iran’s procurement from other sources such as Moldova.<sup>45</sup> These alternative sources provided some capability, although current assessments suggest U.S.-origin aircraft still make up the bulk of Iran’s operational inventory.<sup>46</sup>

In the face of a clear need for U.S. spares, and patriotic statements of self-sufficiency, discussion continued over the Iranian aerospace industry’s indigenous manufacturing capability. Reports in the 1990s suggested it was limited, with just 167 parts of 1,027 required to repair a damaged F-4 being indigenously produced.<sup>47</sup> Commenting on sanctions in 2001, the Managing Director of Iran’s aerospace procurement organization suggested that three factors were responsible for the organization’s success: “God’s will,” “in depth market research to source the required components,” and “necessity” which “urged [Iran] to manufacture our own spare parts for our fleet to the point where we are proficient in this field.”<sup>48</sup>

By the mid-2000s, external estimates of the proportion of F-14 parts Iran could manufacture varied between 70 and 15%.<sup>49</sup> Since the late 1990s, there had been unsubstantiated suggestions that Iran was making efforts to work around shortfalls. In 1997, there were claims that Iran was attempting to adapt surface-to-air missiles to an AAM role.<sup>50</sup> A later assessment suggested that

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41 Anwar Faruqi, “Iran General Says Command Rebuilt his Comments of “Self-Sufficiency” Gave Support to Western Reports of a Major Arms Buildup,” *Philadelphia Inquirer*, February 3, 1994.

42 Anthony Cordesman and Ahmed S. Hashim, *Iran: Dilemmas of Dual Containment* (U.S.: Westview Press, 1997), p. 230.

43 Office of Naval Intelligence, *Worldwide Challenges to Naval Strike Warfare* (U.S. Office of Naval Intelligence, 1997), p. 31.

44 Michael Eisenstadt, *Iranian Military Power: Capabilities and Intentions* (U.S.: Washington Institute for Near East Policy, 1996), p. 46.

45 Steven Lee Myers, “U.S. Buying MIGs to Stop Iran Deal,” *New York Times*, November 5, 1997.

46 Institute for International Strategic Studies, *Military Balance 2017*, Vol. 117 (2017), p. 379.

47 “Iran – Air Force,” *Jane’s World Air Forces*, January 31, 2017.

48 “Interview with Mohandess Nasser Marzbani,” *Jane’s Defense Weekly*, August 2, 2001.

49 70%, for example, provided by an unstated source in Anthony Cordesman and Martin Kleiber, *Iran’s Military Forces and Warfighting Capabilities: The Threat in the Northern Gulf* (U.S.: Praeger Security International, 2007), p. 91. 15% suggested by an official from U.S. Immigration and Customs Enforcement (ICE) in “Iran, China Seek Military Equipment from Pentagon Surplus Auctions,” *Associated Press*, January 16, 2007.

50 Anthony Cordesman and Ahmed S. Hashim, *Iran: Dilemmas of Dual Containment* (Boulder: Westview Press, 1997), p. 224.



while Iran had kept its Tomcats flying “by reverse-engineering critical parts,” efforts to adapt other missiles to the AAM role had failed.<sup>51</sup>

Following concerns regarding Iran’s nuclear program, a partial UN arms embargo was placed on the country in 2007 and a full embargo in 2010. These sanctions followed an increased focus on enhancing national export control systems following the discovery of the Khan network. United Nations Security Council resolution 1540 passed in 2004 required states to put in place export control systems to prevent WMD proliferation. While likely having little direct effect on the supply of F-14 parts since a U.S. embargo had been in place since November 1979, concern regarding Iran’s nuclear activities, the universalization of the embargo on military procurement, and efforts to implement the 1540 agenda saw more attention placed on Iran’s illicit procurement by governments around the world.

The restriction on exports of dual-use goods to Iran was also likely damaging for the country’s indigenous aerospace industry. The types of goods of utility in aerospace programs can also be of use in WMD programs—for example, structural materials used in missile manufacture such as aerospace-grade aluminum and composites are also used to manufacture and repair aircraft. However, Iran’s aircraft industry has continued to allege successes, rolling out four “new” fighters based on the F-5 since 2009.<sup>52</sup> Reports in the mid-2000s suggested the IRIAF had completed an upgrade of its F-14s, with some suggestion that U.S. origin parts had been substituted for more easily obtainable Russian origin parts.<sup>53</sup>

## Successful Illicit Procurement

As early as 1980, the CIA hinted that the IRIAF would have to look to illicit procurement for much needed spare parts. It was noted that “the government will be forced to face critical questions about how to obtain desperately needed spare parts and technical assistance.”<sup>54</sup> The difficulty in securing spares varied between aircraft because of their prevalence. Spares for the F-5s and F-4s, exported by the U.S. to 35 and 11 countries respectively, would be easier to come by than the F-14 which, besides the IRIAF, was solely operated by the U.S. Navy.

In 1980, the CIA assessed that regarding the F-4 and F-5:

*Iran will try and obtain additional aircraft and spare parts as well as assistance with maintenance, primarily from Western Europe, using both overt and clandestine methods. As the country becomes more isolated, these efforts may become prohibitively difficult.*<sup>55</sup>

51 Ibid, p. 230.

52 Gareth Jennings, “Iranian Fighter Programs: Bona fide or Bluff?,” *Jane’s Defense Weekly*, March 4, 2015.

53 Tom Cooper and Ian Devlin, “Iran Returns Upgraded F-14As to Service,” *Jane’s Defense Weekly*, August 15, 2007; “New Engines and Digital Avionics for Iran’s Tomcat Fighters?,” *International Defense Review*, July 16, 1999.

54 “Iran: Decline in Air Force Capability,” Declassified CIA report, CIA-RDP81B00401R0005000030011-5, May 1980.

55 Ibid.

In 1982, the CIA assessed that Iran “does not appear to have acquired dependable sources of aircraft spare parts,” with aircraft kept airworthy largely through cannibalization.<sup>56</sup> Possibly referring to the F-4s and F-5s, as well as transport aircraft, the CIA noted that Iran has:

*...received limited amounts of parts for U.S. aircraft from Western Europe and selected Third World countries from time to time, but Iran's efforts to purchase parts...are poorly managed, continue to seek a wide range of parts, and are largely unsuccessful.*<sup>57</sup>

By 1984, the CIA assessed that:

*To circumvent the U.S. embargo, Iran established an elaborate network of purchasing agents and brokers to procure the material needed to maintain its large inventory of U.S. equipment. Iran has had only limited success, because of U.S. efforts to stem the flow, in obtaining sufficient equipment to keep its inventory of U.S. weapons operational.*<sup>58</sup>

Iran was assessed to have obtained aircraft parts from Israel as well as communications equipment from South Korea and Spain.<sup>59</sup> Indeed, in 1984, an Iranian pilot defected with an F-4, landing in Saudi Arabia. Analysis of the serial numbers of key components on the plane found that many had originated in Israel—an F-4 operator—and that others had previously been purchased by Greece and other “NATO countries.”<sup>60</sup> There is some suggestion that the IRIAF was also able to procure a few complete F-5s from Ethiopia and Vietnam in the mid-1980s.<sup>61</sup>

The CIA reports also suggest that Iran was relying on outside maintenance expertise. A 1984 document suggests that 120 foreign technicians, including Filipinos, Koreans, and Taiwanese, were assisting with the more difficult maintenance, alongside technicians from “at least one West European country.”<sup>62</sup> The foreign engineers were said to be assisting Iran in efforts to manufacture F-4 engine parts “without much success.”<sup>63</sup> A 1984 report based on satellite

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56 “The Iranian Air Force: A Diminishing Threat,” Declassified CIA report, CIA-RDP83B00232R0001001 20001-9, May 1982.

57 Ibid.

58 “Iran-Iraq: Buying Weapons for War,” Declassified CIA report, CIA-RDP85T00283R000500120005-5, May 1984.

59 Ibid. While the document suggests Israel supplied parts for U.S. aircraft, it does not clarify which U.S. systems the communications equipment was for.

60 John Carey, “Khomeini’s Jets: The Israeli Connection,” *Newsweek*, January 28, 1985.

61 Allegedly Including 11 F-5s from Ethiopia in 1985. The F-5s from Vietnam were captured when South Vietnam was overrun by the North in 1975. “Northrop Grumman F-5A – Iranian AF Simorgh Trainer Conversion,” *Jane’s Aircraft Upgrades*, March 1, 2017.

62 The Philippines, the Republic of Korea, and Taiwan acquired F-5s in the 1960s. ROK acquired F-4s in the 1960s alongside several Western European countries. See “Iran’s Air Force: Frustrations of a Former Power,” Declassified CIA report, CIA-RDP85T00314R000300020001-7, September 1984.

63 Ibid.

imagery suggested that maintenance on the F-4 was taking twice as long as before the Iran-Iraq war.<sup>64</sup>

Summing up in 1984, the CIA noted that “Iranian efforts to secure parts for its U.S.-designed aircraft through the gray arms market have achieved mixed results.”<sup>65</sup> It went on to note that:

*Parts that can be obtained only from U.S. weapons manufacturers have been the most difficult to acquire... Nontechnical equipment—such as tires and seats—have been the easiest to procure because they are less sensitive and more loosely controlled. Iran has been able to secure some avionics and electronic equipment but usually at inflated prices and through circuitous channels... Many parts are ordered simply by contacting companies listed in the Swiss defense publication “Interavia.”*<sup>66</sup>

### Successful Smuggling Rings

F-14 parts, in theory solely available from the U.S., were said to be “almost impossible to obtain.”<sup>67</sup> However, there is evidence of substantial illicit procurement efforts underway from the early to mid-1980s. In 1985, U.S. authorities uncovered a smuggling ring which had been tapping into the U.S. Navy’s supply network since 1981. A wide variety of items were ordered from warehouses in Virginia and the Philippines and stolen from three U.S. aircraft carriers, and shipped as “auto parts” and “medical supplies” to an Iranian agent in London and onto Iran.<sup>68</sup> The ring was said to have stolen around \$25 million USD (approximately \$58 million USD in 2017) of parts, with over \$3 million USD-worth being seized at the home of the London-based Iranian agent alone.<sup>69</sup> There were even suggestions in the press that the ring was planning to receive broken parts from Iran and return them to the Navy for repair, in order to steal them again.<sup>70</sup>

Another network, allegedly centered on Florida-based Hercaire International Inc., also sent 149 shipments of aircraft parts valued at \$3.2 million USD (approximately \$7 million USD in 2017) to Iran between 1980 and 1987.<sup>71</sup> The parts, allegedly including components for the F-14, the F-4, and cargo aircraft, were mislabeled as civil aircraft parts and shipped through

64 “Operational Status of Iranian Aircraft,” Declassified CIA document, CIA-RDP91T01115R000100160002-6, March 1984.

65 “Iran’s Air Force: Frustrations of a Former Power.” Declassified CIA report, CIA-RDP85T00314R000300020001-7, September 1984.

66 Ibid.

67 Ibid.

68 Glenn F. Bunting and Gaylord Shaw, “U.S. Cracks Ring Sending Stolen F-14 Parts to Iran,” *Los Angeles Times*, July 16, 1985.

69 Ibid.

70 Douglas Frantz and James O’Shea, “New Parts Smuggled to Iran,” *Chicago Tribune*, August 17, 1986.

71 Allegedly the ring also served South Africa with cargo aircraft parts. Evidence could not be found of successful prosecution. “Five are Interdicted in Smuggling of Military Hardware to Iran,” *New York Times*, October 29, 1987.

intermediaries in Hong Kong, Switzerland, and the UK.<sup>72</sup> A further effort in the early 1980s saw at least \$200,000 USD worth of components for F-14, F-4, and F-5 shipped to Iran by a Florida-based company.<sup>73</sup> The Navy smuggling operation and the Hercaire International case, allegedly having transferred \$25 million USD and \$3.2 million USD respectively, constitute possibly the most substantial cases in the public domain.<sup>74</sup>

Details are only available regarding one smuggling ring which clearly resulted in large quantities of goods reaching Iran in the 1990s.<sup>75</sup> This was the network created by the Homayouni brothers, United Kingdom-headquartered Multicore, and its California-based branch office. The ring had been operating since 1996 or earlier, with parts procured worth at least \$2.26 million USD (approximately \$3.2 million USD in 2017), and goods being shipped through Singapore to Iran.<sup>76</sup> “Thousands” of parts were seized from Multicore’s California property, with evidence of 270 procurements from U.S.-based suppliers.<sup>77</sup> Following a U.S. court case in 2000, Saeed Homayouni and one of his associates were jailed in 2001.

The Multicore ring demonstrated great “resilience” when further investigations showed that Saeed’s brother Soroosh Homayouni and Multicore had continued to supply Iran from the UK after 2000.<sup>78</sup> In 2002, raids on three UK-based properties belonging to Multicore—by which time was noted “conducts no legitimate business”—again uncovered “thousands” of aircraft and missile components, as well as “documents from the government of Iran requesting that Multicore in London purchase military components.”<sup>79</sup> As part of the investigation, it was established that 50 U.S. companies had supplied goods to Multicore since the 2000 raid in California, and resultantly searches were undertaken of 18 companies in ten U.S. states on a single day in 2003.<sup>80</sup> Soroosh Homayouni plead guilty in London in 2005, finally ending the scheme.<sup>81</sup>

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72 Ibid.

73 “Customs Seizes Goods Bound for Iraq, Kuwait,” *Journal of Commerce*, August 28, 1990.

74 It should be noted that the value of F-14 parts in the Hercaire case, as opposed to other aviation parts, was not stated.

75 Several cases allegedly saw “large quantities” of aircraft parts shipped to Iran but details are scant. See “Significant Export Control Cases, June 1989 – April 2002,” U.S. Department of Justice, <<https://fas.org/asmp/campaigns/control/ExportControlCases-apr02.pdf>>.

76 USA v. Multicore Ltd., Indictment 00 CR 3843 J (United States District Court, Southern District of California, February 2000); Vernon Loeb, “Two Charged in Plot to Export Jet Parts,” *Washington Post*, December 10, 2000.

77 “ICE Agents Search 18 Firms in 10 States Suspected of Illegally Exporting Military Components to Iranian Arms Networks,” U.S. Department of Homeland Security Press Release, July 10, 2003, <<https://www.hsdl.org/?abstract&did=476805>>.

78 Aaron Arnold, “A Resilience Framework for Understanding Illicit Nuclear Procurement Networks,” *Strategic Trade Review*, 3:4 (Spring 2017), pp. 3-23.

79 “ICE Agents Search 18 Firms in 10 States Suspected of Illegally Exporting Military Components to Iranian Arms Networks,” U.S. Department of Homeland Security Press Release, July 10, 2003, <<https://www.hsdl.org/?abstract&did=476805>>.

80 Ibid.

81 “Exporter Caught by Customs Trying to Send Military Components to Iran,” UK Government Press Release, July 12, 2005, <<http://blogs.bis.gov.uk/exportcontrol/prosecution/exporter-caught-by-customs-trying-to-send-military-components-to-iran/>>.

In the 2000s, several significant cases saw the transfer of Tomcat and other aircraft parts. Jilani Humayun allegedly transferred F-14, F-5, and Chinook helicopter parts—seemingly to Malaysia—on at least 11 occasions between 2004 and 2006 receiving \$357,085 USD of payments.<sup>82</sup> It is unclear that the goods were destined for Iran, but the IRIAF's sole use of the Tomcat is suggestive. In 2006, F-14 maintenance kits were seized by U.S. authorities having been sent by Reza Tabib from the U.S. to Iran via Germany.<sup>83</sup> A search of Tabib's home uncovered 13,000 aircraft parts with a value of \$540,000 USD.<sup>84</sup> In 2009, two individuals plead guilty in another significant case, with the Complaint—which highlighted transfers of F-14 parts—suggesting that “investigators found evidence of *many purchases, sales and shipments* of U.S. made commodities from aircraft parts suppliers.”<sup>85</sup> A further case saw three UK-based individuals prosecuted in 2009 for transferring over \$1 million USD of parts to Iran.<sup>86</sup>

Around 2010, two significant smuggling rings which transhipped goods through the UAE were broken up. The first, indicted in 2009, involved the transfer of at least thirteen types of aircraft parts, including those for the F-14.<sup>87</sup> A second ring was indicted in 2011 and involved the transshipment of aircraft parts through France to Iran.<sup>88</sup> A U.S. attorney suggested that this case could have involved the transfer of “millions of dollars” of parts.<sup>89</sup>

### The Shape of Iran's Procurement Networks

Iran had a complete technical library for the F-14 and therefore understood what to order.<sup>90</sup> During the 1980s, lists were drawn up and circulated to procurement agents—a generic 39-page list of arms and more targeted lists for F-14 and other aircraft parts.<sup>91</sup> These lists seem to be prevalent amongst cases and are often cited in reporting as a clear sign that the traffickers

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82 “United States Arrests Long Island Man for Illegally Exporting Aviation Parts for F-5 and F-14 Military Fighter Jets,” U.S. Department of Justice, July 19, 2007, <<https://www.justice.gov/archive/usao/nys/pressreleases/July07/humayunarrestpr.pdf>>.

83 USA v. Re Tabib, [aka “Reza Tabib”] Indictment (United States District Court for the Central District of California, October 2005).

84 “Fact Sheet: Major U.S. Export Enforcement Actions in the Past Year,” U.S. Department of Justice, October 11, 2007, <[https://www.justice.gov/archive/opa/pr/2007/October/07\\_nsd\\_807.html](https://www.justice.gov/archive/opa/pr/2007/October/07_nsd_807.html)>.

85 Emphasis added. See “US v. Hassan Saied Keshari and Traian Bujduveanu” Criminal Complaint, United States District Court, Southern District of Florida, stamped April 19, 2008.

86 Keri Wagstaff-Smith, “Three Men Jailed in London for Arms Trafficking to Iran,” *Jane's Defense Weekly*, June 4, 2009.

87 “USA v. Amir Hossein Atabaki et al.” Superseding Indictment 09-20298 (United States District Court Southern District of Florida, stamped August 6, 2009).

88 “United States of America v. Michael Edward Todd et al.” Indictment 11-15482 (The United States District Court for the Middle District of Georgia, filed September 30, 2010).

89 Chris Joyner, “Supplier to Iran Guilty in Scheme,” *Atlanta Journal Constitution*, June 24, 2011.

90 “Interview with U.S. Government Official 01 February 1989 @ 1330,” in Charles Gail Roller and Dorothy May Major, “Ramifications of Illegal U.S. Arms Exports,” MA diss, Naval Postgraduate School, 1989, p. 94.

91 “Interview with U.S. Government Officials 30 January 1989 @ 1330,” in *Ibid*, p. 97.

are working for Iran.<sup>92</sup> In other cases, request for quote (RFQ) correspondence from Iranian procurement organizations is mentioned.<sup>93</sup> Conversely in the 1980s, the U.S. Navy ring traffickers had access to a microfiche copy of U.S. Navy supply lists.<sup>94</sup>

The origins of the goods are an important factor in shaping the smuggling rings. The prevalence of F-4 and F-5 aircraft in different countries meant that those procuring them had more options. F-14 parts were initially limited to the U.S. Navy and Grumman, meaning early rings such as the U.S. Navy ring were “insider” efforts. A sting in 1989 provides a second example, where F-14 parts, packaged in original Grumman Corp. containers and marked with DoD stickers, were seemingly purchased by the traffickers from a middleman who allegedly obtained them as surplus from the manufacturer.<sup>95</sup>

As aircraft were withdrawn from service, parts increasingly made their way to used and surplus aircraft parts dealers. This occurred earlier for F-4 and F-5—these were likely the parts advertised in *Interavia*, the Swiss magazine. F-14 parts became available on the open market later. The final F-14 aircraft were withdrawn from U.S. service in 2006, and some questionable decisions were made regarding parts from decommissioned aircraft which will be discussed below.

The networks typically used transshipment to send their goods to Iran—attempting to obscure the actual end-user and add a layer of complexity. This was difficult for F-14 parts given Iran’s status as the only operator outside of the United States. London and the UK played an important role in the early networks.<sup>96</sup> This is not surprising given that London formed a hub for broader Iranian arms procurement activity in the 1980s. A procurement center operated out of the offices of the National Iranian Oil Company, which allegedly hosted the IRIAF’s “Logistics Support Center.”<sup>97</sup> As one press report noted, London was “a city of convenience for the Iranian arms procurement mission.”<sup>98</sup> It was only in 1993 that the UK placed a full arms embargo on Iran.<sup>99</sup>

Many of the other rings utilized other “traditional” transshipment hubs often used by traffickers—large port cities such as Hong Kong, Malaysia, and Singapore. From the mid-2000s onwards

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92 See for example the Tabib case: “Fact Sheet: Major U.S. Export Enforcement Actions in the Past Year,” U.S. Department of Justice, October 11, 2007, <[https://www.justice.gov/archive/opa/pr/2007/October/07\\_nsd\\_807.html](https://www.justice.gov/archive/opa/pr/2007/October/07_nsd_807.html)>.

93 See discussion of the Multicore case above. See John Shiffman, *Operation Shakespeare: The True Story of an Elite International Sting* (U.S.: Simon and Schuster, 2014), p. 87.

94 Douglas Frantz and James O’Shea, “New Parts Smuggled to Iran,” *Chicago Tribune*, August 17, 1986.

95 Dan Jacobson, “U.S. Customs Agents on Long Island Wednesday seized a...,” *United Press International*, January 18, 1989; “Two Charged with Conspiring to Sell Plane Parts to Iran,” *Associated Press*, January 19, 1989. Grumman disputed this suggesting their only customer is the U.S. Navy: see “Two Accused in Scheme to Sell F-14 Parts,” *New York Times*, January 19, 1989.

96 Eight cases involving London’s use as a transshipment hub were found prior to 2000.

97 Gaylord Shaw & William C. Rempel, “Billion-Dollar Iran Arms Search Spans U.S., Globe,” *LA Times*, August 4, 1985.

98 Ibid.

99 Although this is not to suggest efforts were not undertaken earlier to prevent transfers from the UK to Iran using the UK’s export control system.

the UAE emerged as a key transshipment hub.<sup>100</sup> Several reasons account for this including Dubai's emergence as a major port and its proximity to Iran, and reflects the UAE's broader use as a hub to transfer materials to Iran often in breach of sanctions.<sup>101</sup> A 2009 U.S. government report on U.S. export control breaches involving transshipment showed that over 50% of cases involved intermediaries in the UAE.<sup>102</sup>

## Who are the Suppliers?

Beyond the cases which saw significant transfers described above, a large proportion of cases on the public record were sting operations. In fact, these stings numbered slightly fewer than those that involved actual transfers to Iran.<sup>103</sup> Stings are difficult to define, although a U.S. Department of Justice policing guide notes that such operations have:

*...a point that ends the operations with a "gotcha," when police suddenly reveal themselves and catch the offender "in the act," often on video or audio recording devices.<sup>104</sup>*

Sting operations can be run in two broad ways. First, the undercover agent (UC) can play the role of a buyer or broker—seeking to sting those possessing aircraft parts and a willingness to sell to Iranian customers. Second, the UC can play the role of supplier and sting authentic procurement agents or brokers acting on behalf of Iranian customers.<sup>105</sup> According to information on the public record, stings where the UC played a buyer or broker were slightly more prevalent than those where the UC played a seller.<sup>106</sup>

In reality, the majority of sting operations involve the UC playing the role of the seller, having been passed contact details of procurement agents by industry sources.<sup>107</sup> That fewer of these cases are seen reflected in the public domain is likely a result of two factors: First, the difficulty of detaining and prosecuting buyers, often based outside of the U.S., means these cases less

100 At least seven cases after 2000 involved the UAE as a transshipment hub.

101 Karim Sadjadpour, "The Battle of Dubai: The United Arab Emirates and the U.S.-Iran Cold War," Carnegie Paper, July 2011, <<http://carnegieendowment.org/2011/07/27/battle-of-dubai-united-arab-emirates-and-u.s.-iran-cold-war-pub-45193>>.

102 "Iran Sanctions: Complete and Timely Licensing Data Needed to Strengthen Enforcement of Export Restrictions," Government Accountability Office, GAO-10-375, March 2010, p. 16.

103 The author counted 18 "stings" and 28 authentic/attempted procurements. It should be noted that the distinction is not always clear-cut or meaningful, with intelligence from undercover operations frequently benefiting other enforcement efforts.

104 Graeme Newman and Kelly Socia, "Sting Operations," U.S. Department of Justice Office of Community Oriented Policing Series, Problem-Oriented Guides for Police, Response Guides Series No. 6, <<https://www.hsdl.org/?view&did=682381>>, p. 3.

105 It can also be difficult to distinguish between buyers, middlemen, and sellers. Most involved in this trade are both buyers and sellers within a longer supply chain.

106 The author counted ten cases where perpetrators sought to sell to a UC and seven where they sought to buy from a UC (including five where those implicated had clear links to Iran).

107 Private discussions with former enforcement officials.

frequently make the public record. Second, these cases often result in intelligence about Iran's procurement architecture, military programs, and procurement needs. These situations often result in trade-offs: whether to publicly out procurement agents, for example through indictment, or to allow their activities to continue to gather intelligence, or to wait for a greater payoff such as enticing them to a friendly country for arrest and extradition.

While sting operations clearly result in prosecutions, they are problematic for researchers. The opportunities and decisions faced by buyers and sellers, to an extent, are orchestrated by law enforcement. Stung U.S.-based sellers often have no clear Iranian connections. Although entrapment—law enforcement tricking someone into committing a crime to prosecute them—is not acceptable, mounting an entrapment defense is very difficult. However, at the very least, these “sting” cases alongside those involving successful transfers can give a sense of the types of people who might willingly deal with Iran.

***Iranians supplying Iran-*** Of the sting operations which involved buyers with actual Iranian connections, the buyers stung were themselves predominantly Iranian nationals, of Iranian heritage, or else had a track record of dealing arms with Iran.<sup>108</sup> The cases explored above which involved sizable and successful transfers to Iran (beyond the rings of the 1980s) also almost all involved Iranian nationals, or Iranian born individuals in some respect. This is not to say necessarily that those Iranians were motivated by allegiance to the government. Having Iranian business connections or ability to communicate in Farsi would help in seeking out illicit business. Conversely, those arrested after selling parts to undercover Homeland Security Investigations (HSI) agents under the impression that the goods would likely end up in Iran were primarily U.S. citizens or businesses, with some exceptions.<sup>109</sup>

***Old habits die hard-*** A number of cases, and possibly more than those where it is clear, involved individuals with a record of prior involvement in transferring military or dual-use goods to Iran, or in black and gray market arms dealing.<sup>110</sup> These cases include an individual who was imprisoned after (seemingly falsely) claiming he was transferring arms to Iran as part of Iran-Contra in the 1980s, another who has allegedly supplied Iran since the 1990s alongside governments in Africa and the Balkans, and a third who had been under investigation by the authorities six times over the past 12 years.<sup>111</sup>

***Blood runs thicker than water-*** A number of cases also suggested that those involved were happy to rely on or involve family members.<sup>112</sup> These examples include rings run by close relatives, to one stung individual attempting to bring his wife to a meeting with an undercover agent, to another making a desperate attempt to flee to Canada with her nine-year-old son who was later taken into care.<sup>113</sup> The prominence of cases involving family connections may be

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108 Of the five cases, one involved U.S. nationals and another involved a prolific arms dealer who had been interned in Iran on charges of espionage. The other cases (Lavi, Avassapian, Khalili) involved current or former Iranian nationals being stung.

109 HSI is the part of U.S. Immigration and Customs Enforcement (ICE) which deals with export enforcement cases.

110 The author counted at least five cases.

111 These cases involved Durrani, Monsieur and Cohen.

112 The author counted at least eight cases.

113 Examples of these cases include those involving Multicore, Knapp, and Yaohong Gong.



reflective of the prominence of family connections in business, and especially small businesses, in the U.S. and more broadly.<sup>114</sup>

### Comparisons with WMD-related Procurement

The snapshot of Iranian military procurement provided by the cases examined provides few examples of clear overlap between those procuring aircraft parts and those procuring goods for Iran's nuclear and missile programs. One of the more prominent Iranian procurement agents—Ardebili—did procure aircraft parts alongside missile components.<sup>115</sup> Some traffickers in aircraft parts have made transfers to Iran Aircraft Manufacturing Industrial Company (HESA), which the U.S. has portrayed as controlled by Iran's Ministry of Defense and Armed Forces Logistics (MODAFL), Iran's armed forces procurement organization, which in turn also oversees the Aerospace Industries Organization, Iran's primary missile production entity.<sup>116</sup>

However, limited evidence of direct connections does not necessarily mean that such overlaps do not occur. There is a great deal of overlap in technologies—especially between those required for military and missile programs. Otherwise in the cases examined, there was frequently a direct overlap with procurement of other aerospace parts—for U.S. manufactured cargo aircraft and helicopters—or other military goods for Iran and elsewhere.

Because of the narrow supply-base for the F-14, and to a lesser extent for the F-4 and F-5, attempting to make comparisons between the supply bases targeted for these aircraft parts and nuclear and missile procurement is redundant. However, there are clear similarities in the transshipment hubs used—particularly the UAE has been highlighted as a hub in Iran's nuclear procurement activities.<sup>117</sup> However, China, which also features prominently in Iran's nuclear and missile procurement, has not featured in such a way in cases examined here, possibly because the U.S. arms embargo on China would make its use as a transshipment point counter-intuitive in relation to military goods.<sup>118</sup>

One commonality between the military cases discussed here and WMD-related cases is found in the difficulty of holding the “inner core” of Iran's procurement networks responsible, rather than “outlying network operatives” based outside of Iran.<sup>119</sup> Amongst the significant networks, and naïve U.S. suppliers, few enforcement cases on the public record involve Iran-based

114 See for example Simon Bridge and Ken O'Neill, *Understanding Enterprise: Entrepreneurship and Small Business*, 4th Ed. (UK: Palgrave, 2012) pp. 110-111.

115 Ardebili dealt in F-14 parts, and expressed interest in F-4 parts. See John Shiffman, *Operation Shakespeare: The True Story of an Elite International Sting* (U.S.: Simon and Schuster, 2014), pp. 105, 154. The Gyro-Chip Sensors he attempted to procure had uses in “aircraft, missile and space applications.”

116 See for example “Don't Let This Happen to You! Actual Investigations of Export Control and Antiboycott Violations,” U.S. Department of Commerce, Bureau of Industry and Security, July 2015, p. 32.

117 Ian J. Stewart, Nick Gillard and John Druce, “Iran's Illicit Procurement Activities: Past, Present and Future,” Project Alpha, King's College London, UK, July 24, 2015, p. 24.

118 Ibid.

119 David Albright, Paul Brannan, and Andrea Scheel Stricker, “Busting the Members at the Core of Iran's Smuggling Networks for Nuclear, Missile and Conventional Military Goods,” Institute for Science and International Security, Washington DC, February 16, 2010, <<http://isis-online.org/isis-reports/detail/busting-the-members-at-the-core-of-irans-smuggling-networks/>>.

procurement agents which saw them face consequences. Of those of the “inner core” procuring aircraft parts amongst other goods, Ardebili and Khoshnevisrad have been jailed.<sup>120</sup> There have been difficulties in other cases. These include Hong Kong’s release of Yousef Boushvas in 2008, indicted for operating a company in UAE which procured F-14 parts, and difficulties in bringing Iran, and sometimes UAE-based, elements of smuggling networks to justice.<sup>121</sup>

## U.S. Government Attempts to Counter the Trade

In the early 1980s, the U.S. State Department launched “Operation Staunch,” seeking to persuade allies to halt arms transfers to Iran. Although directed at weaponry being used by Iran in its war with Iraq –particularly the ground war– it formed the backdrop to early efforts to prevent procurement of aircraft parts. Since the early 1980s, U.S. authorities have played an increasingly active role in export control enforcement related to the trade in U.S. legacy aerospace parts. The nature of the trade in aerospace parts provides both challenges and opportunities for enforcement.

All fighter aircraft parts were military goods for export control purposes until 2013 when export control reform saw many parts moved to “dual-use” status.<sup>122</sup> After the final Tomcats were retired in 2006, risk assessments were conducted of the 76,000 parts of the aircraft to establish what could be sold to the U.S. public.<sup>123</sup> This process suggested that 10,000 parts were unique to the aircraft and definitely not appropriate for sale. 43,000 were said to be “general hardware” and safe to sell. The remaining 23,000 parts fell into a gray area and were subject to further study of security and economic trade-offs.<sup>124</sup> Ambiguity regarding the risks and efforts to obtain financial returns from selling parts on the domestic market certainly benefited Iranian procurement efforts.

Parts can be nondescript and difficult for customs to identify, allowing traffickers to attempt to confuse agents by mislabeling goods. However, the use of standardized part numbers and many parts being unique to specific aircraft can aid enforcement efforts and increase the chance of prosecution.<sup>125</sup> For example, once identified, there is less ambiguity regarding the end-use of

120 These are listed as examples in Ibid.

121 For example, while a 2011 indictment saw a U.S. based individual jailed, no legal action could be taken against three defendants in Iran. “Members of International Procurement Network Indicted for Supplying Iran with U.S. Military Aircraft Components,” U.S. Immigration and Customs Enforcement News Release, June 23, 2011, <<https://www.justice.gov/opa/pr/members-international-procurement-network-indicted-supplying-iran-us-military-aircraft>>.

122 All fighter aircraft parts were listed on the U.S. Munitions List. Changes in 2013 saw parts not connected to certain aircraft with “low observable features or characteristics” (the B-1B, B-2, F-15SE, F/A-18 E/F/G, F-22, F-35, and future variants thereof; or the F-117) moved to the Commerce Control List. This means that the export of these parts will be less stringently controlled. See “Federal Register / Vol. 78, No. 73 / Tuesday, April 16, 2013” available from <<https://www.gpo.gov/fdsys/pkg/FR-2013-04-16/pdf/2013-08351.pdf>>. As noted below, Congress also legislated against providing export licenses for F-14 parts in 2007.

123 According to a U.S. Defense Logistics Agency official. See “Iran, China Seek Military Equipment from Pentagon Surplus Auctions,” *Associated Press*, January 16, 2007.

124 Ibid.

125 For example, specific part numbers are sometimes named in indictments.

these items as compared to many of the dual-use technologies used in WMD programs. That F-14 parts are solely used by Iran—and that the F-4s and F-5s have a diminishing group of operators—now also likely aids U.S. enforcement efforts.

U.S. government sources suggested that in the mid-1980s most investigations were triggered following information from paid informants and cooperating industry sources.<sup>126</sup> The way enforcement actions have often spawned further investigations in recent cases suggests that industry sources remain important. Requests for F-4, F-5, and especially F-14 parts likely raise red-flags amongst industry aware of Iran's aircraft inventory and procurement requirements.

The use of sting operations and “clandestine storefronts” in investigations has, as discussed above, been prominent. Sting operations have a long history in law enforcement, but only started to see extensive use in the late 1980s.<sup>127</sup> Stings on arms exporters took place as early as 1984 when a U.S. agent halted a procurement attempt for chemical protection suits.<sup>128</sup> The first sting on the public record relating to aviation parts was seen in 1985 and was the first of at least 18.<sup>129</sup> Successful “stings” offer several clear benefits. They see high probability of arrest and high conviction rates, allowing undercover officers to gather evidence showing perpetrator intent to supply, and knowledge that the activity is illegal.<sup>130</sup> They also allow officers to collect intelligence allowing for further enforcement activity, and can provide positive press coverage to enhance public and industry awareness.<sup>131</sup> The U.S. has also used undercover storefronts to entice buyers and sellers. For example, around 2000, U.S. Customs launched an undercover investigation including two “storefronts” in the U.S. and Austria.<sup>132</sup> The Austria-based store netted at least three prosecutions in 2002.

### Escalating Enforcement

In the mid-late 2000s, there appears to have been a noticeable upsurge in concern and enforcement activity by the U.S. authorities. This heightened concern emerged from a collision of several factors. The retirement of the F-14 from the U.S. Navy in September 2006 coincided with a sense, at least in publicly available sources, that the trade in decommissioned Tomcat

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126 In 1985, illegal exporters were said to be uncovered by paid informants in 54% of cases, and industry sources in 34%. “Interview with U.S. Government Officials 02 February 1989 @ 0900” in Charles Gail Roller and Dorothy May Major, “Ramifications of Illegal U.S. Arms Exports,” MA diss, Naval Postgraduate School, 1989, p. 114.

127 See for example the California stings in 1987-9. Steven K. Frazier, *The Sting Book: A Guide to Setting Up and Running a Clandestine Storefront Sting Operation* (Illinois, U.S.: Charles C. Thomas, 1994), p. 9.

128 Gaylord Shaw and William C. Rempel, “Billion-Dollar Iran Arms Search Spans U.S., Globe,” *LA Times*, August 4, 1985.

129 Joel Brinkley, “Man Accused of Conspiracy to Sell Aircraft Parts to Iran,” *New York Times*, September 28, 1985.

130 Steven K. Frazier, *The Sting Book: A Guide to Setting Up and Running a Clandestine Storefront Sting Operation* (Illinois, U.S.: Charles C. Thomas, 1994), pp. 9-17.

131 Ibid.

132 Brian Burnsed and Brian Grow, “Camnetics Manufacturing’s Checkered Career,” *Bloomberg*, October 1, 2008.

parts had gone out of control.<sup>133</sup> In July 2006, a Government Accountability Office (GAO) study had found that Tomcat parts were for sale in government liquidation sales auctions. An undercover investigator had managed to purchase a variety of equipment, including “at least 12 digital microcircuits used in F-14 fighter aircraft.”<sup>134</sup>

A further GAO report suggested in December 2006 that 295 sensitive items, (requiring “demilitarization” through removal of key components or full destruction) including F-14 parts, had been sold to the public, and a further 1,400 F-14 components which were less sensitive had been sold to the public in February 2007.<sup>135</sup> This sense that the situation was out of control was furthered by reporting which suggested that parts seized in 2000 in the Multicore case had been found during another search in December 2005 with the original evidence tags still attached.<sup>136</sup>

The movement of the aerospace parts business online presents challenges and opportunities for enforcement. In April 2008, a further GAO report found numerous defense related items for sale on online marketplaces including an F-14 antenna.<sup>137</sup> Further illustrating this issue, in May 2006, British authorities seized a shipment of Iran-bound F-14 oxygen cylinders at Heathrow airport which had been sourced on Ebay.<sup>138</sup> Conversely, the movement of the trade online has likely made it easier to establish virtual storefronts and to find suppliers with the goods and a will to sell.

These concerns also manifested themselves as wider concerns about Iran’s nuclear program and illicit procurement grew. The 2000s had already seen an upsurge in investigations.<sup>139</sup> In 2006, U.S. enforcement officials noted that Iran was “becoming more organized” in its search for military technologies.<sup>140</sup> In 2007, the U.S. government launched a coordinated National Counter-Proliferation Initiative.<sup>141</sup> In the following two years, the Department of Justice oversaw

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133 Between 2005 and 2006, the U.S. retired around 200 of the jets, of around 633 produced for the U.S. Navy. International Institute for Strategic Studies, *Military Balance 2005* (UK: Routledge, 2005), p. 25.

134 A GAO employee used “a fictitious identity posing as a private citizen.” See “DOD Excess Property: Control Breakdowns Present Significant Security Risk and Continuing Waste and Inefficiency,” U.S. Government Accountability Office Report, GAO-06-943, July 25, 2006, p. 3.

135 “Sales of Sensitive Military Property to the Public,” U.S. Government Accountability Office Report, GAO-07-929R, July 6, 2007, pp. 5-7.

136 “Iran, China Seek Military Equipment from Pentagon Surplus Auctions,” *Associated Press*, January 16, 2007.

137 The vendor’s recent customers were allegedly in Bulgaria, Hong Kong, and Russia. “Internet Sales: Undercover Purchases on eBay and Craigslist Reveal a Market for Sensitive and Stolen U.S. Military Items,” U.S. Government Accountability Office Report, GAO-08-644T, April 10, 2008.

138 “HMRC Foils Plot to Provide Restricted Military Equipment to Iran’s F-14 Force,” HM Revenue and Customs Press Release, June 4, 2009.

139 Dave Sloggett, “The Global Reach of Iran’s Sanctions Evasion,” *Jane’s Defense Weekly*, May 30, 2012.

140 Stephen Bogni, acting Chief of the Arms and Strategic Technology Investigations Unit of ICE. Quoted in John Pomfret, “Iran has Raised Efforts to Obtain U.S. Arms Illegally, Officials Say,” *Washington Post*, April 17, 2006.

141 “Justice Department and Partner Agencies Launch National Counter-Proliferation Initiative,” U.S. Department of Justice Press Release, October 11, 2007.

nine major prosecutions involving procurement of parts for Iran's U.S. origin fighters—around a sixth of the cases found by the author in just a two-year period.<sup>142</sup>

This growth in enforcement cases was also reflected more broadly in a growth of the number of Homeland Security Investigations (HSI) counter-proliferation investigations and indictments in the years after 2007.<sup>143</sup> HSI also successfully concluded *Operation Shakespeare*, a large-scale sting against an Iranian military procurement agent, and as has been argued, “something of a watershed” for the organization.<sup>144</sup>

Other measures, besides prosecutions, were also taken around this time. In March 2007, following a 17 month investigation, U.S. agents seized four F-14 jets which had been transferred to private companies without being demilitarized, including three in museums and one held by a TV production company.<sup>145</sup> In the second half of 2007, the U.S. Congress passed symbolic legislation which placed a prohibition on Department of Defense (DoD) sale of Tomcat parts, except for exhibit in museums, and prohibition on export licenses for Tomcat parts to non-U.S. persons or entities.<sup>146</sup> In July 2007, reports suggested that the DoD was planning to destroy the remaining recently retired jets rather than send them to the boneyard.<sup>147</sup>

While extensive enforcement action has been undertaken, has it been effective? This depends on the criteria used to judge results. Obviously, some of Iran's aircraft have remained airworthy, although it is unclear how. The issue of Iran's ability to indigenize part manufacturing, as discussed, also remains unclear. Goods have clearly made their way to Iran despite enforcement efforts. Perhaps the most interesting aspect of these efforts is the amount of undercover operations. It is unclear to what extent stings have been effective given that they have sometimes targeted naïve U.S.-based suppliers, and these cases are often the ones we hear about because they yield prosecutions. There is also the question of the deterrent effect that these stings have had amongst elements of the broader aerospace spare parts industry.

## Conclusion

This study has pinpointed some major sources of supply for Iran's Air Force. The successful procurement rings outlined above have clearly been a source of numerous parts to keep the IRIAF's Tomcats, F-5s, and F-4s flying. However, the degree to which this is the case is unclear

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142 “Iran Sanctions: Complete and Timely Licensing Data Needed to Strengthen Enforcement of Export Restrictions,” U.S. Government Accountability Office Report, GAO-10-375, March 2010, p. 15.

143 It should be noted that this is an unclear measurement of the effectiveness of enforcement. See John Shiffman, *Operation Shakespeare: The True Story of an Elite International Sting* (U.S.: Simon and Schuster, 2014), p. 246.

144 Ibid.

145 “ICE and Defense Department Investigators Seize Four F-14 Fighter Jets,” ICE News Release, March 6, 2007.

146 National Defense Authorization Act for Fiscal Year 2008, U.S. House of Representatives, Section 1035, U.S. Government Publishing Office, December 2007, <<https://www.gpo.gov/fdsys/pkg/CRPT-110hrpt477/html/CRPT-110hrpt477.htm>>.

147 “U.S. to Junk Dozens of Outdated F-14s to Deny Iran Parts,” *San Diego Union Tribune*, July 3, 2007.

because of a lack of clarity regarding Iranian reverse engineering or indigenization of production of aircraft parts. Also, while some significant sources of supply have been pinpointed, those cases detailed in open sources are likely only the tip of the iceberg. The combined value of the successful cases (adjusted to 2017 value) is likely less than \$100 million USD, with a large proportion—over half—being transferred as part of the U.S. Navy ring in the early 1980s. More recent cases uncovered have constituted smaller successful rings.

Several factors have shaped Iranian trafficking rings, including the prevalence and location of the goods and the perceived benefits of transshipment hubs. Amongst the successful cases where goods were transferred to Iran, there are clear Iranian connections, often through nationality or former nationality. Several buyers stung also had clear Iranian connections. A couple of other common characteristics were identified across those willing to sell U.S. manufactured aircraft parts to Iran. This included cases involving family connections and several involving individuals with a previous history of involvement in transferring goods to Iran or black and gray market arms dealing.

Quashing the trade in aviation parts—particularly those for the Tomcat—has clearly been an area of focus for U.S. authorities. The main takeaway regarding U.S. enforcement efforts is the clear prevalence of undercover operations. The prevalence of sting operations in open sources, particularly against U.S.-based suppliers rather than those against Iranian procurement agents which make it into the public domain less frequently, has implications for researchers. Sting operations, while providing insights into those who might willingly sell to Iran, are to some extent opportunities orchestrated by law enforcement and are more telling of U.S. approaches to enforcement than Iranian illicit procurement activities.

The success of U.S. export enforcement efforts depends on the criteria against which they are judged. Such efforts have certainly not completely stopped the flow of U.S. aircraft parts to Iran. More resources could always be used to gather intelligence on illicit transactions, investigate violations, and conduct enforcement actions. However, it is unrealistic to think that enforcement efforts can detect and disrupt all perpetrators of criminal activity, and enforcement efforts can have other roles. For example, a key aspect of efforts to prevent criminal behaviour in relation to export controls—as well as crime more broadly—is deterrence through the threat of prosecution, prison terms, and fines. These deterrent effects of enforcement are difficult to quantify. More broadly, coming to a full judgement on the importance of illicit procurement to Iran's Air Force and the effectiveness of U.S. enforcement is impossible without a full picture of the networks that supply the program and an understanding of the success of Iran's indigenisation efforts, although valuable insights into Iran's military procurement networks can clearly be gained from open sources

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