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'When Pigs Fly': Britain, Canada and Nuclear Exports to Israel, 1958-1974

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ABSTRACT

Britain and Canada, two major nuclear Cold War actors, refrained from establishing close nuclear ties with Israel from 1958 to 1974, despite Israel's consistent interest in importing civilian nuclear technology. This was true both before and after the nuclear Non-Proliferation Treaty came into force in 1970, even though the treaty allowed for the export of safeguarded nuclear reactors. In comparison, the other two leading nuclear exporters of the period, France and the United States, were much more involved in the initial stages of the Israeli nuclear programme, exporting research reactors to Israel in the 1950s. How did Britain and Canada view Israel's military and civilian nuclear programme from 1958 to 1974? How did they form their nuclear export policy towards Israel and what considerations motivated them? This analysis examines these questions using archival material from British and Canadian archives.

Israel's nuclear programme has been the focus of academic interest in the past two decades, an interest largely fuelled by the shroud of state-mandated secrecy surrounding it. The bulk of existing research has been devoted to exploring two major aspects of this phenomenon: an effort both to uncover the history of the programme and explore its impact on the development of Israeli-American relations,[1] with some additional attention devoted to examining Franco-Israeli nuclear dynamics.[2] Whilst the nuclear dimension of Israel's relationship with the United States and France has been explored in the academic literature, the parallel nuclear dimension of Israel's relations with Britain and Canada has received limited attention.[3] The analysis addresses this lacuna. The key questions are therefore: how did these two nuclear actors view Israel's military and civilian nuclear programme between 1958 and 1974? How did they form their nuclear export policy towards Israel and what considerations motivated them? Why did these two nuclear actors refrain from exporting civilian nuclear exports to Israel, on what grounds, and how did the emergence of the nuclear Non-Proliferation Treaty [NPT] effect these policies?

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Why is the interaction of these three nuclear actors important? On the nuclear front, both Britain and Canada collaborated with the United States in the Manhattan project.[4] Whilst Britain opted to 'go nuclear', motivated by the ideas and opinions of its political and scientific elite,[5] Canada rejected nuclear weapons development. However both Powers were early developers of civilian nuclear technology;[6] and each attempted to become a major global nuclear supplier, with Canada dramatically more successful than Britain.[7] Significantly, Britain and Canada closely collaborated with the United States in establishing the non-proliferation regime, playing significant roles in creating the International Atomic Energy Agency [IAEA] in the 1950s,[8] the NPT in the late 1960s,[9] and the Nuclear Suppliers Group [NSG] in mid-1970s.[10] During this process, reliance on safeguards was gradually adopted as a key feature of the global nuclear order.[11]

On the Israeli side of the equation, Britain and Canada, alongside the United States, were important allies throughout the Cold War, in addition to France in Israel's early years. Significantly, Anglo-Isreali relations were markedly more complicated compared with Canada's, given British involvement in Israel's establishment and negative Israeli views of this involvement.[12] Anglo-Israel relations reached their nadir on 7 January 1949 when British and Israeli warplanes engaged in a fight on the Sinai border.[13]

Despite Israel's consistent interest in importing civilian nuclear technology,[14] Britain and Canada refrained from establishing close nuclear ties with Israel between 1958 and 1974, primarily because of concern that they would upset their relations with Arab states. This was true both before and after the NPT came into force in 1970 – and even though the NPT allowed the export of safeguarded nuclear reactors. In comparison, the other two leading nuclear exporters, France and America, were much more involved in the initial stages of the Israeli nuclear programme. In the late 1950s, France famously sold Israel the nuclear reactor built at Dimona, whilst the United States supplied a small research reactor erected in Soreq.[15] The Richard Nixon and Gerald Ford administrations also went on to negotiate and sign contracts to supply nuclear power reactors to Israel between 1974 and 1976 – these reactors were never exported.[16]

Anglo-Canadian reluctance to engage in nuclear commerce with Israel touches on a recent debate in nuclear studies: what motivates states to export nuclear technology? One view is that 'economic profit' does not encourage potential exporters when such trade 'undermines their own security' and occurs only if the commodity 'is consistent with underlying strategic conditions'.[17] Another posits that nuclear exporters, which are also democracies, co-operate with clients due to three motivations: consolidating existing alliances, re-enforcing ties with the 'enemy of my enemy' for strategic reasons, and bolstering ties with other democracies.[18] This analysis assesses the salience of these claims.

A key issue is the evolution of nuclear exports regulation. These transfers were not initially regulated by the international community in the 1940s and 1950s, and it remained so until NPT's entry into force in March 1970.[19] The

NPT did not ban any kind of nuclear commerce *per se*, rather, it obligated all treaty members to attach IAEA safeguards to certain nuclear exports.[20] In other words, members were allowed to transfer listed nuclear items under IAEA safeguards to any party accepting them, whether the client was a treaty member or not – in this case, Israel. The list of items requiring safeguards included nuclear reactors, reactor equipment, fuel reprocessing plants, and nuclear fuel.[21] An additional element of the non-proliferation regime was introduced with the establishment of the NSG in the mid-1970s. NSG's purpose centred on creating a framework that would streamline nuclear export regulations and 'catch in its net' non-NPT suppliers like Japan and France, which ratified the NPT in 1976 and 1992, respectively.

Adopted in 1977, the first set of guidelines also included its own 'trigger list' of items requiring safeguards. Significantly, mainly due to French opposition, the guidelines did not embrace a demand for the recipient to agree to safeguards on 'all its nuclear facilities', a condition known as 'full scope safeguards'.[22] Such a request would require the recipient country to agree to place its entire nuclear facilities under international safeguards, even those unrelated to the nuclear deal at hand – say, facilities imported from a different supplier or indigenously built. In Israel's case, such a demand would mean agrement to open Dimona for inspections, a demand that Israel rejected when presented by the Jimmy Carter Administration in the late 1970s.[23]

Whilst the NSG as a group rejected the adoption of 'full scope safeguards' in the 1970s, two important suppliers moved ahead unilaterally to adopt them. In December 1976, the Canadians adopted an official policy that insisted all recipients of nuclear exports accept 'full scope safeguards'.[24] The United States joined Canada when it adopted a similar measure contained in its *Nuclear Non Proliferation Act* of 1978.[25] The British expressed support for the safeguards in NSG talks in 1974–1976,[26] and the condition was adopted officially by the suppliers in 1992 when the NSG revised its official guidelines.[27]

In Britain and Canada, the 'initial concern' phase about Dimona and Israel's nuclear intentions began in 1958 with news of Israel's intention to construct a nuclear reactor and ended in 1966 when Dimona's reactor was in operation. In this period, both Britain and Canada experienced a similar concern regarding Israel's nuclear programme. On one hand, both suspected that Israel was covertly developing weapons and attempted to gather intelligence on this effort. Each feared antagonising the Arab world should they assist Israel in civilian nuclear expansion. On the other, each had nuclear establishments interested in exporting their respective nuclear technologies to prospective clients like Israel.

Both London and Ottawa kept a keen eye on Israeli civilian and military nuclear developments. In the late 1950s the British nuclear sector had high expectations regarding its future, expecting to become a major exporter. As a proud member of the Manhattan project and possessing nuclear weapons, Britain was 'firmly committed to a nuclear future'.[28] British scientists developed

the Magnox reactor, fuelled with natural uranium, moderated by graphite, and cooled by gas; industry officials hoped to export this technology globally following initial sales to Japan and Italy in 1959.[29] Against this backdrop, reports of Israeli interest in developing nuclear power capacity received British attention. In August 1958, the Embassy at Tel Aviv reported to the British Board of Trade that Israel's finance minister, Levi Eshkol, had given a speech detailing his country's interest in such technology. According to the report, Eshkol declared that within five years, 'we shall make our first steps towards actually setting up an atomic power plant'.[30] Focusing on possible exports to Israel, the report stated that due to lack of finance, Britain's 'best chances' to sign a deal depended on its ability to show that its technology was 'better geared and more efficient' for Israel's needs.[31]

In February 1961, London agreed to share information it had gathered on Dimona with Ottawa, including a questionnaire presented to Tel Aviv.[32] Explicitly leaving the option open for an Israeli nuclear weapons programme, the director general of Israel's Foreign Ministry, Chaim Yahil, told the British, 'The Israeli government has no intentions of producing atomic weapons. It could not be expected that any government would give firmer assurances. *Circumstances may change and meanwhile Israel is surrounded by hostile neighbors*' [emphasis added].[33] Yahil left the door open to a future Israeli nuclear weapons programme, but his clear message stands in contradiction to the premier's, David Ben Gurion's, almost inaudible talk with President John Kennedy in New York on 30 May 1961: Ben-Gurion spoke 'rapidly and in a low voice' in a way that 'some words were missed'.[34]

On this international trip scheduled for May-June 1961, Ben-Gurion planned to meet, by order, Canadian Prime Minister John Diefenbaker,[35] Kennedy, and British Prime Minister Harold Macmillan. Prior to the trip, Canada and Britain shared intelligence on Israel's nuclear programme and discussed 'possible western initiatives'.[36] Ottawa and London expected to be briefed by Washington.[37] At this point, Israel was roughly half-way through the five-year construction of its French-bought Dimona nuclear reactor.[38] Following Ben-Gurion's agreement to let American visitors inspect Dimona, Margaret Meagher, the Canadian ambassador to Israel, also expected an invitation, commending the Canadian military *attaché*, 'whose photographs of the Beersheba reactor have been the most informative secured thus far'.[39]

Professor Ernst David Bergmann, chair of the Israel Atomic Energy Commission [IAEC], insisted in conversations with Meagher that Dimona was not intended for weapons but for studying 'the industrial side of atomic energy' with the 'ultimate goal of producing atomic power'.[40] Despite these statements in a memorandum for Diefenbaker, Ottawa's Department of External Affairs officials reckoned that Israel might decide to 'develop a nuclear weapons capability' should the Egyptians forge ahead in conventional strength.[41] Similarly, the counsellor at the British Embassy in Israel, Henry Pakenham, told the Foreign Office that the

Israelis were 'reserving their option' to decide to develop nuclear weapons 'nearer the time when the reactor goes critical'.[42]

Washington, London, and Ottawa all briefed each other on the May-June talks with Ben Gurion.[43] The British concluded that on the nuclear front, Ben Gurion's reply to Macmillan 'was rather discouraging' as he stuck to his refusal to accept international inspections but agreed to contemplate 'inspection by neutrals'.[44] Similar to the explanation given Kennedy,[45] Ben Gurion explained to Macmillan that the Israeli goal was to train personnel 'in preparation for an atomic energy programme' expected in ten to 15 years' time to provide 'cheap power for taking salt out of sea water to irrigate the Negev'.[46] Ben Gurion's agreement to 'inspection by neutrals' translated to on-the-ground American inspection-visits at Dimona, which took place throughout the decade.[47] Israeli insistence on restricting American visits only meant that throughout the 1960s, the British, and to a lesser degree the Canadians, were scrambling to gather intelligence on Israel's programme. After Ben Gurion's trip, Canadian interest in closely following Dimona diminished, whilst British intelligence gathering persisted.

In August 1962, after the first American visit to Dimona, the British pressed Washington to share information.[48] Two months later they were briefed that 'the installation appeared to be intended for peaceful purposes only'.[49] The Canadians were also informed of two visits,[50] yet the British were much more interested in receiving information. In September 1963, the Americans informed the British of Israeli agreement to a third inspection to take place 'before the reactor comes into operation'.[51] The British were simultaneously trying to glean information from the French, particularly on the safeguards they had applied, although the French insisted on not giving an 'entirely straight answer'.[52] The British ambassador to Israel, John Beith, recommended showing 'constant concern on the subject', erroneously believing that the Israelis would stop short at the 'ability to design a device'.[53]

A key question in the debate surrounding Dimona involved uranium. The South Africans had infomred Ottawa of their intention to export 'Ten Metric Tons of Uranium Oxide' to Israel, which Tel Aviv promised to use 'for peaceful purposes';[54] later, American and British intelligence on alleged Israeli attempts to procure uranium in Argentina raised further concerns.[55] Any conditions attached to French supplied uranium would not be applicable for uranium bought elsewhere. The Americans appealed to British diplomats in Washington, telling them, 'we should keep our eyes open for, and exchange information on, any Israeli intentions in the nuclear field'.[56]

British diplomats in Washington were briefed on a third visit and, this time, the Americans were only '90 percent certain that nothing suspicious was going on'.[57] To D. Arkell, an official with the Defence Intelligence Staff at the British Ministry of Defence, the American inspection report gave 'no cause for any relaxation of interest in Israeli intentions'.[58] The Canadians and

the British exchanged assessments, and one analyst at the Canadian Directorate of Scientific Intelligence calculated that Israel could conduct 'one or two underground tests of low yield' with relatively 'little risk of detection' by late 1966.[59] A bilateral Anglo-Canadian intelligence discussion painted a 'far from reassuring' picture.[60]

A second key query concerned plutonium. The question of the existence of a plutonium reprocessing plant in Dimona was acute, and Arkell correctly assumed that Israel had secretly built one, hiding it from the American inspectors.[61] Other British defence analysts stressed that the existence of a plutonium separation plant is 'the crux of the whole problem',[62] noting that even if such a plant was not yet operating, Israel could start preparations for equipping the 'laundry building' as a chemical reprocessing plant on short notice.[63] The Foreign Office instructed the Embassy in Israel to find more information on this subject, but the consul-general, Alexander Kellas, more realistic about the secrecy enshrouding Dimona, responded, 'it is not likely that this Embassy will be able, either by fair means or foul, to find out exactly what is going on in Dimona'.[64]

The French now expressed concerns about Dimona in talks with the British. Significantly, French companies were allowed by President Charles De Gualle to complete existing contracts at Dimona in a private capacity – following Ben Gurion's request – the last reportedly in June 1965.[65] Notwithstanding France's on-going involvement, French sources told a British diplomat in Paris that 'every time an Israeli spoke to a Frenchman about military matters he always tried to get something or other which would help towards this end' of exploding a bomb.[66] French diplomats ruled out any further nuclear assistance to Israel; they stated that De Gaulle was 'anxious' to restore the French position in the Arab world and 'he would not think of helping the Israelis to realise their atomic ambitions'.[67]

Differing views and a lack of intelligence also had a major role. Conflicting assessments in 1965 on where the Israelis were heading produced a sharp divide in British opinion between the Foreign Office, and especially Beith, on one side, and Defence officials, on the other. Beith reported that the Americans had achieved a 'reasonable degree of control' over the Israeli nuclear programme, and the Israelis were 'in the American pocket' since they needed American finance for a major desalination project.[68] Philip Joseph, an official at the Ministry of Defence, wrote Adam Goodison, at the Foreign Office, stressing that Israel was only likely to abandon the 'idea of a nuclear weapon' if offered 'guarantees of security of her borders by the major powers'.[69] Defence Ministry officials also wondered whether the Americans really had aquired 'a reasonable degree of control' over Israel's programme. The lack of information on the flow of 'safeguard free uranium' to Israel proved this notion false.[70]

In September 1965, R.S Bishop, a diplomat stationed in the British Embassy at Washington, was informed of yet another American inspection

visit to Dimona by Rodger Davies, head of the State Department's Bureau of Near Eastern Affairs.[71] Admitting that the first American inspection was 'limited in time', Davies stressed, 'there have been no limitations on the more recent visits'. He told Bishop that although the reactor was critical, and Israel was capable, 'she was not actively making a weapon' and had 'no facilities to extract plutonium'. As conveyed to Bishop, the State Department assessment was that Israel could 'obtain a nuclear bomb' in three to five years depending on how much uranium it bought from Argentina. Davies stressed that Washington was 'very anxious to stop the proliferation' and that it was 'prepared to take a very tough line with Israel to stop her developing her own bomb'.

As Dimona began full operation, the intelligence failure regarding Israel's nuclear potential gradually became clearer. Specifically, the paucity of information about Israel's uranium imports proved to be crucial. In April 1966, the Foreign Office was informed of another inspection of Dimona, this time the source was Jim Spain, the State Department's director of the Office of Research and Analysis for the Near East and South Asia.[72] According to Spain, the Israelis proposed returning spent fuel to the French 'in the near future' and had even asked whether 'the Americans might like to witness the hand over as further evidence of Israel good faith'. As for French safeguards attached to Dimona, Spain stated that the French had repeatedly asked in vain that the Israelis 'give the first charge back'. According to Spain, the French were now both contemplating to 'demand its return' and consider witholding supplies of 'future fuel charges … if they did not get the first fuel charge back'. Implied in the Anglo-American dialogue was the lack of clarity about how much uraniun Israel had managed to import from Argentina and elsewhere; if enough, it would not need future French fuel supplies. As with previous reports, British diplomats in Washington had to petition the Americans yet again to receive a detailed report of the inspection, which was transmitted the following month.[73]

Parallel to efforts about gathering intelligence on Dimona, Britain and Canada also contemplated whether to export reactors and other nuclear items to Israel. In autumn 1962, following Canada's successful initiation of its first nuclear power reactor, a 'Nuclear Power Demonstration', many countries, including Israel, expressed interest in importing this natural uranium, heavy water reactor.[74] An official working for the Canadian nuclear utility, Atomic Energy of Canada, wrote to Albert Ritchie, the assistant under-secretary for External Affairs, asking for the government's green light for talks with Israel; he noted that the company 'would not wish to indicate any such willingness if political considerations would override any business assessment'.[75] Political considerations did in fact supersede the economic ones. The External Affairs' African and Middle Eastern Division stipulated that such co-operation with Israel would potentially be met with

'hostile criticism from Arab propaganda sources'.[76] Although good relations with Israel were desirable, damage to relations with Arab states 'ought to be kept to a minimum'; the sale was not vetoed, but it was stressed that no 'special credit' would be offered.[77] The Canadian ambassador to Israel, Arthur Andrew, disagreed with this approach, but was overridden.[78]

From 1956 to 1966, Canada signed three contracts with India and one with Pakistan on the export of its CANDU model heavy water reactor capable of producing weapons grade plutonium.[79] Israel was interested in Canadian nuclear exports, and Canada's nuclear co-operation agreement with India was seen as an indication for a possible successful outcome.[80] Yet, despite the positive approach in exporting reactors to India and Pakistan, Israel's case was handled differently. In June 1964, R.E. Collins, an under-secretary in External Affairs, informed Andrew that the Canadian Atomic Energy Advisory Panel had concluded, 'it was politically undesirable for Canada to entertain negotiations for the sale of reactors in that part of the world', although this decision was not to be made public.[81]

In addition to reactors, the Canadians had to consider how to contend with Israeli requests for nuclear equipment in general. Was Israel a legitimate client or should all Israeli requests be barred? In 1966, the Israeli Ministry of Defence contacted the Canadian Chalk River Laboratories to request the 'urgent' purchase of 'miniature warning dosimeters', devices that measure exposure to radiation. These devices were designed at Chalk River and mentioned in a scientific publication, explained by J.W. Greenwood, head of international affairs at Atomic Energy of Canada, to Don Dewar, of the Atomic Energy Control Board.[82] Considering the request, Dewar noted that although there were 'no legal limitations on exporting the dosimeters', doing so might be 'politically unwise'.[83] Dissenting views by officials in the African and Middle Eastern Division stressed that as dosimeters were health and safety items, they could only be used to measure radiation.[84] It was finally decided that there would be 'no objection' to exporting them; D.H. Kirkwood, an under-secretary at External Affairs, informed the Atomic Energy Control Board and Atomic Energy Canada of the decision.[85]

On a parallel track, British interest in exporting nuclear technology to Israel grew in 1964 in light of Israel's intention to explore the construction of a nuclear powered desalination plant in co-operation with America's Lyndon Johnson Administration.[86] In July 1965, British Atomic Energy Agency [UKAEA] officials met with a retired general, Zvi Zur, the Israeli Defence Force's former chief of staff and head of Israel's water utility, Mekorot, to discuss the possibilities. It was clear to all participants that establishing a nuclear desalination plant was a complicated project. Zur told his interlocutors that the American company, Westinghouse, was the only United States supplier 'capable of undertaking a plant of the required capacity', even if Westinghouse 'had never constructed anything of this size before'.[87] A British company with relevant desalination

experience, Weir Westgarth, peaked Israeli interest according to Zur.[88] But the feeling was not mutual. Weir Westgarth had several desalination contracts in Arab countries and showed a 'marked lack of enthusiasm for any dealings with Israel', fearing it would lose 'valuable Arab world connections'.[89] Some British diplomats, keen to create new contracts, brushed aside these concerns, seeing British participation in the Israeli project as 'decisive for our future progress in this field'.[90] They stressed that given the humanitarian and peaceful character of the project – desalinating water – it would likely proceed 'without serious damage to our Arab interests'.[91] Under pressure, Weir Westgarth reluctantly agreed to be represented in Israel by a front company.[92]

The Israeli desalination project got traction with the local Anglo-Jewish community, and several important figures 'expressed strong interest', including Lord Edmund de Rothschild,[93] Marcus Sieff, and, in the words of Beith, 'other British Jews'.[94] Hans Kronberger, an eminent Jewish nuclear phsicist who fled Austria to Britian in 1938, was also involved with promoting the nuclear desalination plant.[95] This involvement was not always welcomed by British officials, with one Treasury official, William Armstrong, protesting to the Foreign Office that Rothschild had no 'status as principal in the affair'.[96]

As talks on the desalination plant progressed, certain questions on the nature of the safeguards that would attach to the deal emerged. Would the Johnson Administration condition the sale on Israel's agreement to place Dimona under safeguards? M.I. Michaels of the British Ministry of Technology told the Foreign Office that based on the Israeli press, Israel was likely to reject any such linkage.[97] The general idea of demanding the attachment of safeguards to nuclear deals was not internationally popular; the Indians and Egyptians had already declared their opposition, with the Indians claiming them a 'form of economic blackmail'. The British assumption, stated by Michaels, was that the success of future safeguards would 'rest on an informal understanding between potential supplier countries of reactors and equipment'. But how should the British treat the American demand to inspect Dimona, a French supplied reactor, as a condition for future nuclear exports? Should the British accept the 'American extension of the safeguards doctrine', as termed by Michaels, legitimising the demands made by one supplier to extend safeguards over facilities supplied by another supplier? Michael's concern was that if Britain accepted this new extended doctrine, and the Israelis refused to agree, it would push them to buy French technology yet again: 'We would put the ball in French hands and I cannot see them dropping it'.

A British diplomat stationed in Washington, C.H.D Everett, was later informed by State Department officials that the Americans were not intending to create a linkage between Dimona and the American supplied desalination plant; Washington would only require the application of safeguards to the desalting nuclear plant itself.[98] But the question lingered on the British side:

'Should we encourage them [the Americans] to get safeguards applied on all nuclear plants in Israel, or would this embarrass us elsewhere?'[99] Contact between Israeli and British officials on possible co-operation on the desalination project continued with the open support of several Israeli officials,[100] and with the Israelis demonstrating 'serious interest' according to reports by the new British ambassador at Tel Aviv, Michael Hadow.[101] He urged the Foreign Office to 'make the first formal move' to assure that Britain could participate in the project.[102] His keen support motivated him to propose a rather radical initiative: by convincing Tel Aviv to go with British over American technology, Israel would be offered 'a share of future orders for desalination plants'.[103]

As 1966 progressed, the Israelis gradually realised 'there had really been no progress' with the Americans.[104] Indeed, further talks with American officials made it clear to the British that 'the nuclear desalination plant would never be built'.[105] One vocal critic of the initiative was the American historian, Roberta Wohlstetter, who wrote to Michael Palliser, the private secretary to Prime Minister Harold Wilson, in July 1966. Returning from a visit to Israel with her husband, the nuclear strategist, Albert Wohlstetter, she was critical of the desalination plan, telling Palliser that 'ideals about heading off the arms race in the Middle East' by supplying large nuclear reactors 'defy satire'.[106]

The emergence of the NPT became another key development. The end of the decade brought dramatic changes to Israel's nuclear status as well as the nuclear proliferation regime as a whole. On the ground, covertly, the Israelis had crossed the nuclear threshold and assembled crude nuclear devices in the days leading to the Six Days War of June 1967.[107] As Canada's External Affairs Africa and Middle East Division explained to their minister, it was gradually becoming clear that Israel was 'one of the more advanced of the so called "near-nuclears"'.[108] The exact degree of Israel's nuclear capablities was not yet completely known, as 'evidence has never been conclusive',[109] but the country's nuclear trajectory was apparent. The Israeli leadership's insistance on emphasising that it had 'the people with the know-how' to build nuclear weapons, in the words of Eshkol during a January 1968 visit to Canada, served to underline this impression.[110]

The establishment of the NPT was a second landmark. The treaty opened for signature in August 1968, came into effect in March 1970, and Israel consistantly refused to sign.[111] In December 1968, R.C. Hope-Jones of the Foreign Office's Disarmament Department drafted instructions for Hadow of 'making it clear' to the Israelis that it remained 'vitally important to keep nuclear weapons out of the Middle East'.[112] Hope-Jones calculated that Israel wanted to 'keep open the option of producing nuclear weapons', noting that the Foreign Office should consider its policy in case 'the Israelis announced one day that they had achieved a nuclear capability'.[113]

A confidential and annotated paper by General R.E. Lloyd of the Arms Control and Disarmament Research Unit, entitled 'Israel and Nuclear Weapons', underlined the change in Israel's perceived nuclear status. The paper stated that Israel is 'believed to be close to achieving – if she has not already done so – the capability for designing an effective nuclear weapon'.[114] The working assumption was that Israel could produce a 'small stock' of weapons without 'the prior necessity of a test explosion', and that the bombs could 'effectively' be delivered by the Israeli air force against targets in 'Egypt and elsewhere'. The Disarmament Department also detailed both possible ways of 'inducing' Israel to join the NPT and recommendations on how to 'minimize the consequential threat to international stability' should these efforts fail. The report asserted that the 'only really certain way' of persuading Israel to give up its nuclear weapons was by offering 'a credible and explicit politico-military guarantee' against future attacks, noting that 'no lesser assurances' would be sufficient, and that 'the principal guarantor' would have to be the United States. The report also proposed launching a 'propaganda campaign', notably focused at 'American Jewry' but also in Israel and elsewhere, 'designed to frighten' against the introduction of nuclear weapons in the Middle East. Linking the civilian aspect to the military, one of the proposed leverages to pressure Israel was the 'withdrawal of assistance to her civil nuclear programme'. Concluding in a realistic tone, the report determined that if Israel's 'predicament' led its leaders to be 'so desperate' as to develop nuclear weapons, then it is 'most unlikely that any amount of arm twisting' would convince them otherwise.

As the decade drew to an end, plans to establish nuclear power plants for electricity production replaced Israel's nuclear desalination initiative. British and Canadian authorities now faced the question of whether they should bid to export power reactors to Israel given the evolution of Israel's nuclear status and the launch of the NPT. In Canada, the Ministry of Industry called for a 'general review of the possibility of sales of nuclear materials and equipment to various countries', with the express wish to 'test the temperature of the water in Israel'.[115] It was seconded by Charles McGaughey, the ambassador to Israel, who wondered 'is there any reason why Canada would not be prepared to sell a nuclear generating station to Israel?'[116] These initiatives were quashed. Atomic Energy of Canada 'was not prepared at that time to pursue a possible sale to Israel'.[117] Such a sale was seen as 'undesirable' given the 'unsettled political situation in the region', and Israeli approaches should be met with the reply that 'Canada does not consider itself to be a potential supplier'.[118] The Canadian diplomat in Israel conducting talks on the matter was reluctant to give such a blunt reponse to the Israelis, but the position was shortly confirmed.[119]

London also wondered what to do about exports to Israel. The failure to export Magnox reactors had led the British to focus in the mid-1960s on 'Advanced Gas-cooled Reactors', a more sophisticated version of Magnox, but this model, too, failed to become a commercial hit.[120] In the early 1970s, the British nuclear

industry was gearing towards a switch to a third model, the 'Steam Generating Heavy Water Reactor', thought to be more attractive to potential clients.[121] What should be the British government's position towards a possible bid to export a reactor and nuclear technology to Israel? Inside the Foreign Office, a debate raged. A 1967 'Standard Ministerial guideline' had stated that the Britain should under '*no circumstances*' [emphasis added] supply material or equipment to either Israel or the Arab states, 'which could contribute to the development of a nuclear capability'; this re-emerged on 12 June 1970.[122] The 'Standard Ministerial guideline' was now being questioned. Some officials argued that if British companies would not supply the reactor, then the Israelis would either buy elsewhere, 'perhaps from France, with minimal safeguards', or simply 'build one themselves'.[123] By exporting the reactor, Britain could 'insist' on satisfactory safeguards in addition to having 'good access to information' on the Israeli programme. As for any regulatory change introduced by the NPT, it was argued that safeguarded nuclear power plants were 'perfectly legitimate items of peaceful international trade, just as conventional power stations'; and IAEA safeguards demanded by the NPT were adequate.[124] Those who rejected this view maintianed that even if applying safeguards, it would not necessarily mean that the British 'would have any power whatsoever at the critical moment to prevent the Israelis doing what they wanted', and in the Israeli case, 'one can never carry suspicions too far'.[125]

Througout 1973, and more so during the Arab oil embargo that followed the October Yom Kippur War, the Israelis were 'pressing on quickly' with a plan to establish nuclear power plants, aiming to initiate the first reactor by 1982.[126] Since the British 'Steam Generating Heavy Water Reactor' was new, the Israelis suggested that British companies participate in separate tenders for 'conventional sections' of the reactor programme. But the British nuclear establishment refused to form close ties with Israel. The most UKAEA agreed to do was exchange information on desalination, and only if the exchange remained secret.[127] UKAEA was unwilling to establish a 'straight inter-organisational agreement' with its Israeli parallel, explained Barbra Maclean of the UKAEA to Nick Fenn at the Foreign Office.[128] The Foreign Office also recommended that any exchange with the IAEC remain secret.[129] Maclean noted that even the export of a safeguarded reactor to Israel, adhering with NPT obligations, 'would carry an element of risk' since it had the potential to contribute to 'the development of Israel's nuclear capability'.[130] It was argued that news of a British export would 'undoubtedly be exploited' by the Soviets and Arabs, and that Britain 'should not stimulate nuclear exports to Israel' as long as it refused to join the treaty – despite the fact that it was not a treaty condition for export.

In February 1974, reports of Tel Aviv's serious intention to invest in its civilian nuclear programme motivated yet again a reassessment of British policy towards nuclear exports to Israel. The Foreign Office Energy Department explained to Maclean that officials were now 'trying to clear our minds' on the line Britain

should take 'towards contacts of any kind in the nuclear field in the Middle East'.[131] Linkage to the Arab-Israeli dispute remained key, and the new 'rough guidelines' that were adopted maintained that whilst 'nuclear contacts' were accepted and normal around the world, there was a 'good deal of political difficulty' in the Israeli case due to the ongoing Arab- Israeli conflict and the fact that Britain did not want to be seen assisiting Israel's nuclear weapons programme. Despite the fact that it was perfectly legal under Britian's NPT obligations to export safeguarded reactors, the guidelines stated, 'the supply of complete nuclear power station and/or reactor … would almost certainly be unnacceptable to it on political grounds'. The supply of 'ancillary equipment' and 'know-how of a specific nuclear nature' could also cause 'political problems', and only the supply of 'non-nuclear equipment' for a nuclear power plant would be acceptable. Although some officials thought a 'less restrictive line' should be adopted, reasoning that 'nuclear power is here to stay',[132] the stricter view won the day.

America's 1974 nuclear export initiative presented a further consideration. Israeli plans to establish nuclear power plants received a boost in June 1974 when Nixon conducted his historical visit to Egypt and Israel.[133] He declared that his Administration would export nuclear power reactors to both states. The commercial counsellor at the British Embassy in Tel Aviv, E.V. Vines, assessed rather poetically – although in hindsight wrongly – that even though Israeli plans to build and operate 20 nuclear power plants by the end of the century 'may seem over ambitious', the Israelis posess the art of 'making dreams come true'.[134]

Nixon's declaration also saved the British from taking a stand on a related front.[135] Prior to his visit, the Israeli Embassy at London had approached Urenco,[136] the European nuclear utility of which Britian was a member, and enquired about 'a supply of nuclear enrichment'.[137] In this case as well, the NPT created no legal limitations on exporting enriched fuel to Israel, as long as it was 'subject to IAEA safeguards' and Israel gave a 'peaceful uses' assurance. However, for the British, the main problem was not a legal but 'the political one', and the lack of willingness to risk 'Arab hostility'.[138] Here, the British were inclined to reject the Israeli request, but since Nixon's offer included enrichment services to Israel, the Israeli approach was now void and British officials opted to leave the original enquiry 'lying on the table'.[139]

In looking at the key insights from this analysis, several issues beg consideration. First, there is the issue of how Israel's nuclear programme, both its military and civilian aspects, was perceived. London and Ottawa correctly viewed it with suspicion and apprehension from its inception. These misgivings informed the identical policies adopted by each Power on the question of whether to export nuclear reactors and nuclear technology to Israel after 1958. Despite the fact that the export of nuclear reactors was gradually becoming a common practice, both nuclear suppliers refused to consider seriously such exports to Israel before and after the NPT came into force in March 1970. Nuclear sales to Israel were treated

before and after the NPT as a special case. The different treatment Israel received became apparent in the late 1960s after Canada signed deals to sell reactors to India and Pakistan – clients who resided in an unstable war-torn region – but refused to export to Israel. The difference for the Canadians was that Israel was clearly making progress towards being nuclear weapons capable, whilst India and Pakistan remained 'innocent' nuclear clients. The documents reveal an additional bias. British and Canadian diplomats stationed in Israel showed consistent support for nuclear exports to Israel and demonstrated generally more leniency to their host country compared with the officials stationed at the home capital, especially intelligence and defence officials.

Second, there is the question of the creation of nuclear exports policy. Both Ottawa and London formed their course of action concerning Israel based on their strategic perception of the Arab-Israeli conflict. They maintained close co-operation in intelligence assessments of Israel's nuclear progress during the 1960s, with Britain showing more involvement than Canada due to its historic and geo-strategic involvement in the region. As for motivations, both Powers wished to maintain close ties with the Arab states, believing that civilian nuclear exports to Israel would damage those relations. London and Ottawa wanted to avoid Arab and Soviet accusations of collusion with and assistance to Israel's weapons programme, and it was assumed that civilian nuclear co-operation would expose the exporter to such allegations. A key element in this assessment was the growing understanding in the late 1960s that Israel was virtually nuclear capable. Over time, it gradually became clear that the theoretical circumstances under which Canada and Britian would agree to export nuclear technology to Israel would never materialise or, in other words, would take shape 'when pigs fly'.

Third, the emergence of the NPT needs to be considered. The fear of damaging relations with the Arab world served as a motivation to avoid civilian nuclear co-operation both before and after Israel crossed the nuclear threshold, and before and after the NPT came into force from 1967 to 1970. Despite the fact that the NPT regulated and allowed its members to export safeguarded power reactors to non-NPT members, the calculus on the Israeli front did not change for both states. British documents reveal that the NPT was used internally to justify the denial of nuclear exports, barring civilian nuclear co-operation with Israel, in opposition to regulations created by treaty itself, and despite the fact it safeguarded such supplies.

Corroborating the theory that 'economic profit' does not motivate potential exporters, the potential commercial benefit of exports to Israel was consistently overridden in both London and Ottawa by a perception that such ties would undermine strategic interests by damaging relations with the Arab states. However, it is also possible to make an opposing argument: that the larger Arab market and fear of losing a potential stake in it was more appealing commercially than Israel's smaller one. Significantly, no nuclear power plants were exported to the Arab world in this period. Yet, the other theory, which similarly does not stress

economic considerations, is also relevant. That Israel was a democracy and an ally was not enough to tilt the balance in favour of nuclear commerce by both exporters. The importance of relations with the Arab world and the fact that this was not an 'enemy of my enemy' equation, forging closer ties with Israel and strengthening the alliance with it through nuclear commerce was not a dominant motivation.

The reluctance of nuclear exporters to aid Israel's civilian nuclear programme, coupled with the clear acknowledgement of its nuclear weapons capabilities and the changing landscape of the nuclear proliferation regime, contributed to Israel's inability to import additional reactors during the rest of the Cold War. As one British report concluded in 1985, 'despite more than 35 years of research and professions of peaceful intent notwithstanding, Israel has yet to put a civilian nuclear power program into operation'; and this statement is true as of 2019.[140]

A competing explanation should also be considered. Is it possible that by the time Britain and Canada were considering nuclear exports to Israel in the 1960s and the 1970s, they had already been overtaken by events? Was Israel, having developed nuclear weapons, not fundamentally interested in establishing its own nuclear power infrastructure?[141] Although 'lukewarm' in the 1960s, historical records demonstrate that by the 1970s, Israel was indeed interested in developing its own nuclear power plants for electricity production; it had initialled a formal contract with Ford's United States in August 1976 on the supply of two such reactors, and the Israel Electric Corporation was developing a massive deployment plan to this end.[142] The American nuclear power plants were never supplied due to the adoption of the Carter Administration's *Nuclear Non Proliferation Act* in 1978. Israel was interested in developing its own civilian nuclear infrastructure, but was more attentive in keeping Dimona unsafeguarded and, hence, refused any demands to open it for inspection. From 1958 to 1974, Israel prioritised above all other nuclear related considerations, its ability to maintain the Dimona reactor as an unsafegaurded reactor, and this prime directive has survived to this day.

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