

Getting rid of the Swedish BOMB

Thomas Jonter

Early in the Cold War, Sweden's leaders planned to acquire nuclear weapons. By the 1960s the country was an international leader of the disarmament movement.

Why do states develop nuclear weapons, and how can they be discouraged from doing so? That has been a central question in world affairs since the US dropped the first atomic bombs on Hiroshima and Nagasaki in Japan in 1945. Today that question has gained increased attention as the world seems to be heading into a new nuclear arms race after a period of successful arms reduction. Many international experts fear that more states will develop nuclear weapons in this new era. Can a further spread of nuclear-armed states be avoided or, at least, mitigated?

Thomas Jonter is a professor of international relations in the department of economic history and international relations at Stockholm University.



The Riksdagshuset, seat of Sweden's parliament.

One way to answer that question is to look at nations that have abandoned their nuclear weapons ambitions. Sweden is one especially interesting example. A nuclear aspirant in the 1950s, it eventually changed its course and became one of the most recognized advocates for international disarmament.¹ By signing the Treaty on the Non-Proliferation of Nuclear Weapons on 19 August 1968 as a nonnuclear weapons state, Sweden publicly agreed not to acquire nuclear weapons, even though for more than 20 years it had been working on a program capable of producing its own arsenal.

This article explores why Sweden initiated nuclear weapons research but ultimately gave up those plans. One vital factor was how Prime Minister Tage Erlander (see figure 1) handled the issue. The Social Democrat was in power from 1946 to 1969 and was the most important player in the debates about Sweden's nuclear future. Erlander was initially in favor of equipping Sweden with nuclear weapons, but he eventually changed his mind after a decade of study and discussions with military, foreign policy, and nuclear experts.

The beginning of the Swedish nuclear program

The military was the first Swedish institution to look into the possibility of producing nuclear weapons. Only a couple of weeks after atomic bombs were dropped on Japan, military leadership asked the newly founded Swedish National Defense Research Agency (Försvarets forskningsanstalt, FOA) to write a report on how Sweden might use the new technology. In 1948 the first FOA report on the nuclear issue concluded that the prospects for starting a nuclear weapons program were bright: Even though huge financial investments would be needed to build a nuclear infrastructure, Swedish scientific know-how was fairly advanced and Sweden possessed large uranium deposits, although of low-grade quality. There was also strong consensus in Sweden that the nation should develop a civilian nuclear energy program. In 1947 a government-controlled company, AB Atomenergi (AE), was created to develop such a program.

In 1949 the FOA and AE signed an agreement for continued R&D work. The FOA was responsible for the overall nuclear weapons research, and AE would build reactors and a reprocessing plant to enable the production of weapons-grade plutonium and of fuel elements. In other words, the civilian nuclear power program would be designed so that it could easily enable the building of nuclear weapons if the Riksdag, Sweden's Parliament, decided to pursue them.

During the 1950s and 1960s, Sweden invested a large amount of resources into the dual-use program. AE built two heavy-water reactors to produce plutonium of weapons-grade quality and set up a uranium plant and a fuel element facility,



FIGURE 1. SWEDISH PRIME MINISTER TAGE ERLANDER IN 1952. (Courtesy of Wikimedia Commons, PD-US-1996.)

and the FOA designed a program for weapons carrier systems. As early as 1955, the FOA concluded that with access to plutonium, it was technically feasible for Sweden to produce its own nuclear weapon. FOA scientists designed a nuclear weapons program with a goal to produce 100 tactical nuclear weapons.

One aim for Swedish politicians and researchers was to attain self-sufficiency for the nuclear program. Importing uranium was considered too difficult, given the strict US export control of nuclear materials and equipment, especially when the intention was to use them to manufacture nuclear weapons. For that reason, Sweden chose a technology that would allow the reactors, moderated with heavy water, to be loaded with natural, unenriched uranium. AE intended to import the heavy water

from Norway. However, there were no guarantees that Norway would be able to meet Sweden's needs. The Swedes therefore hoped to build a full-scale heavy-water facility at Ljungaverk, in the northern part of the country.

But that production plant was never built; by the mid 1960s heavy-water technology had been replaced by light-water technology. Ågesta, a heavy-water reactor south of Stockholm (see figure 2), used heavy water from both Norway and the US, but only for civilian purposes. A second heavy-water reactor, Marviken, was built outside the city of Norrköping but never put into production.

The debate over acquiring nuclear weapons

Until the mid 1950s, plans for Swedish nuclear weapons were only discussed within a small circle of politicians, military officers, and scientists. A serious public debate started in 1954 after the publication of a report by the Swedish commander-in-chief, Nils Swedlund. In the study, known as ÖB-54, Swedlund advocated for the acquisition of nuclear weapons. According to him, nuclear weapons could first and foremost be used in the event of a foreign invasion, but they could also serve deterrent purposes.

As a direct consequence of the public debate, Sweden's political parties were forced to choose a side. In 1955 the Conservative Party was in favor of nuclear weapons acquisition, the Liberal Party was moderately amenable to the idea but remained uncommitted, and the Centre Party had not yet taken a position. Leading members of the prime minister's Social Democratic Party were divided, with some coming out in favor and some against. The Social Democratic Party also included a pacifist wing that was against any expansion of the armed forces. The Federation of Social Democratic Women (Sveriges socialdemokratiska kvinnoförbund, SSKF), headed by Inga Thorsson, was part of that wing, and it later became the strongest voice against nuclear acquisition.



FIGURE 2. THE ÅGESTA NUCLEAR POWER PLANT outside Stockholm. (Photo by Holger Ellgaard, CC BY-SA 3.0.)

Erlander was in many ways uniquely equipped to handle the challenge. Although his degree was in economics and political science, he had studied physics at university and was interested in nuclear research even before the atomic bombs were used. During World War II, he discussed the latest nuclear research results with his old college friend Torsten Gustafson, a professor of physics at Lund University. After the war, Gustafson served as Erlander's personal adviser in nuclear matters. In his memoirs, Erlander relates how he read scientific papers and talked to Gustafson and leading scientists, such as Nobel laureates Niels Bohr and Patrick Blackett, about both civilian and military uses of nuclear research.²

At the time, Erlander wanted to avoid an open public debate on the issue. In his view, the best option would be if his party could reach a consensus before negotiating with the Liberals and Conservatives. However, when the Conservative Party started to push more radically for nuclear weapons acquisition, it put Erlander in a difficult position. Since his own party was split on the issue, he was not sure how to respond.

Even though the FOA had been discussing the possibility of Swedish nuclear weapons for quite some time, it was not until November 1955 that the government held its first meeting on

the issue and not until February 1956 that the Social Democratic Party Board formally sat down to discuss it. Before the board meeting, Erlander had several conversations with leading party colleagues representing different viewpoints to get a clearer picture of the situation. Based on those talks, Erlander prepared a proposal that he hoped would forestall deadlocks and conflicts.

In his recommendation, Erlander argued that Sweden could postpone making a decision on nuclear weapons. He presented two reasons: First, there was no need to decide at this time, since the government did not yet have sufficient knowledge about the technical prerequisites for nuclear weapons production. Second, international nuclear disarmament negotiations between the US and the Soviet Union were ongoing, and Sweden should not make them more complicated by deciding to produce nuclear weapons, which would likely lead to further global proliferation. If he could persuade both factions to wait for a firm decision, Erlander would gain some freedom of action. Meanwhile, opponents of Swedish nuclear weapons would continue to mobilize and to work toward international disarmament, and proponents would have the chance to make technical preparations for nuclear weapons production.

At the meeting, heated discussions followed, and the divide between opponents and proponents led to further splits in the



FIGURE 3. THE PALACE OF NATIONS IN GENEVA, European headquarters of the United Nations and, beginning in the 1960s, an important center for disarmament talks. (Photo by Becks, CC BY 2.0.)

Social Democratic Party. Most notably, SSKF chair Thorsson declared that her organization would publicly oppose the nuclear option. In the end, Erlander persuaded the party board to postpone a final decision until 1958. But the path to that vote was far from smooth. Thorsson and another female member of the party board, cabinet minister Ulla Lindström, left the meeting in protest. Erlander knew that the question of whether to equip the Swedish defense with nuclear weapons would be difficult to answer.

Decision time

By 1958 scientists were confident Sweden could, if it wanted, build nuclear bombs. Meanwhile, the political issue had only become thornier for Erlander and his government. Growing criticism within his own party and in the media, along with a grassroots campaign against nuclear weapons, forced Erlander to work out a compromise with other political parties in the Riksdag.

The Erlander government presented two proposals. The first, known as the device program, would be implemented if the Riksdag chose to acquire nuclear weapons. The second, the protection program, would be used if the Riksdag voted against their acquisition. It would focus on defense preparations against possible nuclear attack rather than on designing a nuclear device. Extensive research on civil defense and on other nations' nuclear weapons capabilities would be necessary to enable Sweden to protect itself against a nuclear-armed enemy.

Erlander's government recommended adopting the protection program, arguing that it was not yet time to make a final decision about developing offensive nuclear weapons.

In July 1958 the Riksdag approved a bill granting the FOA more funds to conduct protection research. The Liberal Party and the Centre Party agreed with Erlander's government that a decision on nuclear weapons would be premature. The Conservative Party declared that it was in favor of acquiring tactical nuclear weapons even though it would not seek a final decision on the matter at that time.

Meanwhile, growing opposition to nuclear weapons within the Social Democratic Party placed pressure on Erlander, as reflections from his diary reveal. He was unsure how to handle the conflict, which seemed to have the potential to split his party. As early as 1957, Erlander himself began to have doubts about the nuclear option. As he put it in his memoirs, he "needed considerable years of reading, discussing and thinking before I came to a position that I considered satisfactory."³ One reason for Erlander's careful handling of the issue was his scientific competence and knowledge. His natural-science background and interest in physics enabled him to understand the possibilities and obstacles of nuclear power and nuclear weapons better than most statesmen at the time.

Erlander did not come out publicly against the acquisition of nuclear weapons, even to other Social Democratic leaders. Instead, he prioritized gaining broad political consensus on nuclear weapons among the Social Democratic, Centre, and Liberal Parties. To maintain his neutrality, Erlander opened up the issue for a public discussion between politicians, media, peace organizations, and opposition groups.

Erlander's decision to step back from the debate allowed his party's strongest critics to start campaigning against nuclear weapons. Thorsson organized political grassroots meetings, while Östen Undén, the minister of foreign affairs, pushed for disarmament initiatives in the United Nations (UN; see figure 3). Nuclear opposition was also found outside the political parties. Labor unions, churches, temperance movements, and peace groups started to publicly oppose the nuclear option.

In 1958, 21 renowned authors, academics, and church leaders signed a petition that would become the foundation of the Action Network Against Swedish Nuclear Weapons (Aktionsgruppen mot svensk atombomb, AMSA). It recruited members from a relatively broad political spectrum, although in order to avoid being discredited by opponents and in the media, they banned communists from participating as speakers or having a prominent position in the organization. AMSA sent renowned academics and cultural figures to present the case against nuclear weapons in talks and debates. The media was also instrumental in getting the issue before the public. Between 1954 and 1959, nearly 3000 articles were published in Swedish newspapers and magazines.⁴

Starting in January 1957, Sweden held a seat on the UN Security Council, and was heavily involved in the committee charged with nuclear disarmament issues. In the same month, Sweden advanced a proposal for a nuclear test moratorium. Undén worked energetically to promote international disarmament during the next few years and greatly influenced public opinion in Sweden.

Meanwhile, the Social Democratic Party was undergoing changes. In December 1958 Erlander announced that his party would establish a committee to study and evaluate the nuclear option. Acting as its chair, he appointed members from both sides of the issue to seek a consensus position. In its far-reaching study, which was completed at the end of 1959, the committee discussed various technical obstacles to the possible production of nuclear weapons along with the international political situation. They concluded that the Riksdag could delay the decision until at least the mid 1960s, when international developments would provide an answer to whether Sweden could be safe without nuclear arms. In the meantime, defense research should continue.

Despite its difficulties drawing a precise boundary between offensive and defensive research, the committee did identify a limit: No research should be carried out that had a direct goal of enabling the manufacture of nuclear weapons. In practice, however, the FOA studied weapons design and calculated the possible cost of producing nuclear weapons. The concept of protection research served, for practical purposes, as a cover for continuing technical preparations that would enable Sweden to move quickly to nuclear weapons design should policy change. The Riksdag continued to support that freedom-of-action policy for several years.⁵

In the meantime, the campaign against acquisition was gaining steam. Public opinion started to lean more and more in the direction of no to Swedish nuclear weapons. Polls spoke for themselves: In 1957, 40% of the public supported the nuclear option, with 36% against it and 24% unsure. By 1965 only 17% were in favor, with 69% against and 14% unsure.

Disintegrating military support for nuclear weapons

As public opinion turned against nuclear weapons and Sweden became more engaged in international disarmament talks, the military command was preparing a new defense plan. The strong military consensus in favor of equipping the Swedish defense forces with nuclear weapons was beginning to disintegrate.

There were several reasons for the new disunity. One was that the doctrine of massive retaliation, in which nations would use nuclear weapons to cause massive destruction of enemy territory in the initial stages of a war, was beginning to fall out of favor with the Kennedy administration. The apparently reduced role of nuclear weapons in the US military's strategic thinking catalyzed a general reevaluation among Swedish military planners. In their emerging strategy, nuclear weapons would most likely be employed on a smaller scale based on ad hoc assessments of what the situation required.⁶ Despite the apparent retreat, however, military leaders still believed it was important to keep their options open and continued to discuss the possible production of tactical nuclear weaponry.

Another reason for the lack of consensus was a growing conflict among the military branches. Both the armed forces and the navy feared they would lose out in future struggles for



FIGURE 4. ALVA MYRDAL IN 1966. (Courtesy of the Dutch National Archives, CC BY-SA 3.0 NL.)

budget appropriations, since the air force was expected to be awarded the bulk of nuclear-related resources. But even in the air force, there were growing doubts about the advantages of nuclear weapons possession. It had other costly projects to defend, among them the development of a new fighter aircraft. If the nuclear weapons plans were implemented, one consequence might be the discontinuance or reduction of those aircraft. By 1965, the military had retreated even further from its earlier advocacy for nuclear weapons. In a 1965 report the commander-in-chief stated that the nuclear decision was a political matter, and merely requested funds to continue nuclear-related research.

Reactions from the US

The military retreat from pushing for nuclear weapons acquisition is best understood in the context of the US position on nuclear weapons. Nuclear collaboration between the two countries started at the end of 1940s, but it was not on equal terms. Sweden needed not only nuclear assistance from the US, but also help to strengthen its military capabilities. It gradually became clear that collaboration with the US came at the price of less independence and reduced possibilities of integrating the

plans for nuclear weapons manufacture within the civilian heavy-water program.⁷ The US feared that if a peaceful and democratic country such as Sweden were to acquire nuclear weapons, the risk of further proliferation throughout the world would substantially increase.

The defense policy cooperation between Sweden and the US deepened during the second half of the 1950s. Eventually Sweden was given permission to procure and manufacture US missile systems. Dependence on US missile technology further curtailed its room to maneuver and gave US leaders leverage in persuading Sweden to abstain from the nuclear option. By 1960 the US government had adopted a firm policy of opposition to any Swedish acquisition of nuclear weapons.

Because of its civilian nuclear energy program, Sweden was also becoming more dependent on technological cooperation with the US. To constrain weapons proliferation, the US lowered the price of enriched uranium, which substantially reduced fuel costs for operating light-water reactors. That policy, enacted at the end of the 1950s, was put in place for two reasons: Weapons-grade material is harder to obtain from the spent fuel of a light-water reactor than of a heavy-water reactor, and any country that purchased enriched uranium from the US had to agree not to use it for nuclear weapons production.⁸ Even with those limitations, Sweden decided that it was too expensive to run a heavy-water program for civilian purposes if a cheaper light-water option was available. The US policy change opened the door for Sweden to switch to light-water plants.

From the US perspective, it would be in their national interest to help Sweden if it were to be attacked by the Soviet Union. A 1960 US National Security Council document declared that “in the event of Soviet Bloc aggression against Sweden alone,” the US would “be prepared to come to the assistance of Sweden as part of a NATO or UN response to the aggression.”⁹

There is no evidence that the US ever communicated that intention to the Swedish government. However, the Swedish military command seems to have perceived a change in US atti-

tudes and interpreted it to mean that Sweden was now covered by the US nuclear umbrella. That belief made it easier for the military to give up its nuclear ambitions and for proponents of a nuclear-armed Sweden, such as the Conservative Party, to abandon those plans.

The reversal is complete

At the beginning of the 1960s, international initiatives under Undén’s leadership strengthened the disarmament movement. In 1961 Erlander told Undén that he now thought that acquiring nuclear weapons would increase Sweden’s vulnerability and reduce both national and international security. Instead of passively adapting Swedish defense policy to international military–technical developments, Erlander and Undén decided that Sweden would seek to build a peaceful international order and support global disarmament.

Undén appointed Alva Myrdal (see figure 4) to develop and head a disarmament program. Myrdal was a prominent Social Democrat, sociologist, and diplomat. In her book *The Game of Disarmament*, she writes that she immediately began to sketch out a plan to develop strategies to enable Sweden to persuade nuclear powers to disarm. Under her leadership, Sweden in 1962 became a successful member of the new Eighteen Nations Disarmament Committee in Geneva. The committee was created by the UN to establish a dialogue between the US and the Soviet Union and set up disarmament negotiations. Sweden contributed greatly to the committee’s work and successfully advanced disarmament policy.¹⁰ In 1982 Myrdal received the Nobel Peace Prize for her work.

By the time Sweden signed the Nuclear Non-Proliferation Treaty and formally abandoned its nuclear weapons program in 1968, the FOA and AE had, in principle, assembled all the resources needed to produce nuclear weapons. However, some important ingredients were missing from a functioning production chain—namely, a uranium reprocessing facility and a supply of heavy water. Another unsolved problem was the weapons-carrier system. Although plans existed for two existing



FIGURE 5. A SAAB 32 LANSEN AIRCRAFT. Sweden considered using this Swedish-manufactured fighter plane as a potential nuclear weapons carrier. (Photo by Mattias Björklund, CC BY-SA 3.0.)

Swedish-made fighter aircraft, the Saab 32 Lansen (see figure 5) and the Saab 35 Draken, to deliver bombs, additional technical developments would have been necessary to carry them out.

Erlander's decisions were not the only reasons Sweden gave up its advanced nuclear weapons plans. A combination of reasons ultimately led to the abandonment of the nuclear option: rising public opposition toward the plans, tension between the goals of developing civilian nuclear power and maintaining freedom of action with respect to nuclear weapons, and the US policy of discouraging the Swedes from building the bomb. However, it is hard to imagine that Sweden would have reversed its plans to become a nuclear state without Erlander's skillful management.

What can be learned from Sweden's decision not to produce nuclear weapons? One lesson is that developing nuclear weapons capabilities is a time-consuming and technically complex process, even if a country already has a domestic nuclear infrastructure. The more open and democratic a country is, the more that process will allow for the mobilization of political opposition against nuclear weapons acquisition.

Because of the technical complications of the production process, a country with nuclear weapons ambitions may need to cooperate with other nations. That cooperation creates a dependence on more technologically advanced states or supranational organizations that may then influence the country to reconsider its nuclear weapons plans. Unfortunately, the recent US decision to withdraw from a nuclear deal with Iran suggests that President Trump and his advisers have not learned

that second lesson. As Sweden's experience shows, diplomacy and successive nonproliferation agreements are the way forward if the aim is to have fewer, not more, nuclear weapons states in the world.

This article was adapted from my 2016 book The Key to Nuclear Restraint: The Swedish Plans to Acquire Nuclear Weapons During the Cold War.

REFERENCES

1. T. Jonter, *The Key to Nuclear Restraint: The Swedish Plans to Acquire Nuclear Weapons During the Cold War*, Palgrave Macmillan (2016).
2. T. Erlander, *Tage Erlander, 1955–1960*, Tiden (1976), p. 245.
3. Ref. 2, p. 75.
4. P. Ahlmark, *Den svenska atomvapendebatten (The Swedish Nuclear Weapons Debate)*, Aldus/Bonnier (1965), p. 9.
5. T. Jonter, *Sweden and the Bomb: The Swedish Plans to Acquire Nuclear Weapons, 1945–1972*, SKI Report 01:33, prepared for the Swedish Nuclear Power Inspectorate (September 2001).
6. Kärnladdningsgruppen, *Kärnladdningsgruppens betänkande (Report of the Nuclear Device Group; February 1962)*, HH 006, FOA Archives, National Archives of Sweden, Stockholm.
7. T. Jonter, in *Security Assurances and Nuclear Nonproliferation*, J. W. Knopf, ed., Stanford U. Press (2012), chap. 10.
8. Ref. 7, p. 237.
9. US Department of State, Office of the Historian, "Statement of U.S. Policy Toward Scandinavia (Denmark, Norway and Sweden)," doc. 300 (6 April 1960), in *Foreign Relations of the United States, 1958–1960: Western Europe*, vol. 7, part 2 (1993).
10. A. Myrdal, *The Game of Disarmament: How the United States and Russia Run the Arms Race*, Pantheon Books (1976). PT

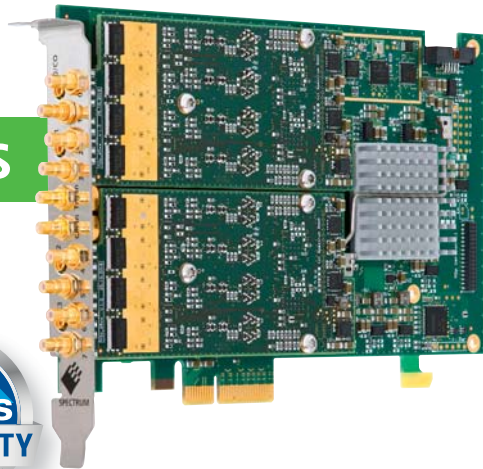
M2p
series

M2p.65xx
8 variations

Generate up to 8 signals

DN2.65x
6 variations

Ethernet



Generate up to 16 signals



SPECTRUM
INSTRUMENTATION

Perfect fit – modular designed solutions

- 16 bit AWGs with 40 or 125 MS/s
- Precise test signals from DC to 60 MHz
- 700 MByte/s FIFO streaming (PCIe)

www.spectrum-instrumentation.com | US: Phone (201) 562 1999 | Asia / Europe: Phone +49 (4102) 695 60