The Atoms of Independence
Romania's Refusal to Import Soviet Nuclear Technology

George Dumitrescu

https://doi.org/10.33993/TR.2026.2.09

Romanian nuclear scientists opposed the import of Soviet nuclear technology from the outset, and political decision makers respected their scientific expertise.

Introduction

In the context of the Cold War, Romania's nuclear policy was one of the most significant instruments through which the Bucharest regime asserted its autonomy from Moscow. Far from being a strictly technical matter, the choice of civil nuclear technology reflected the tensions between formal loyalty to the socialist bloc and the Romanian leadership's obvious desire to define its own line in international relations. Starting in the mid–1960s, with Nicolae Ceauşescu's rise to power, Romania adopted a strategy of "balancing" between East and West, using the Soviet economic offer of civil nuclear technology as a diplomatic bargaining chip, but consistently refusing to actually accept it.

George Dumitrescu
Ph.D. candidate at the Faculty of History, University of Bucharest.

I would like to thank Societatea Naţională Nuclearelectrica SA for their support in the completion of this scientific paper.

For more than two decades, the Soviet Union tried to draw Romania into a joint civil nuclear development program, offering VVER reactors, technical assistance and integration into a scientific research and production system coordinated at CAER level. However, Bucharest's response was a calculated one: while maintaining a loyal discourse and avoiding direct confrontation, the Romanian leadership systematically postponed making a decision and invoked technical and economic arguments to reject the offer. In reality, the decision was eminently political: accepting Soviet technology would have meant not only technological dependence, but also strategic subordination in a field considered essential for the modernization of the Romanian energy system and for national prestige.

In this context, Romania explored several Western offers, and in 1977 it signed the agreement on the adoption of Canadian CANDU technology. This option represented more than a technology transfer: it was a political declaration of autonomy in a strategic field, which amplified tensions with Moscow but consolidated Romania's position as a distinct actor within the socialist bloc.

The aim of this study is to analyze in depth this long-term strategy, through which Romania managed a balancing act with the Soviet nuclear offer for over two decades. It highlights the diplomatic, technical, and political mechanisms that made this complex game possible: repeated negotiations with the USSR, the involvement of the Romanian scientific community, the tactic of ambiguous discourse, and, finally, the deliberate turn towards the West. Based on archival documents, diplomatic correspondence, and technical reports from Romanian and Soviet archives, the study contributes to the understanding of the relationship between science, technology, and politics in a communist regime that was semi-independent from Moscow.

Context

When Nicolae Ceauşescu[1] came to power in 1965, Romania had nuclear energy ambitions but a very small budget allocation for research. In 1964, only 0.88% of GDP was spent on research, while the USSR allocated 2.4% (1962), the USA 2.8% (1962), Great Britain 2.4% (1961), France 1.8% (1961), and Japan 1.4% of GDP (1961).[2] The number of researchers per 100,000 inhabitants was also unfavorable for Romania. There were only 51 researchers per 100,000 people, compared to 233 researchers in the USSR (1963). In the US, there were 170 researchers per 100,000 inhabitants (1962), while Great Britain invested so much in this field that in 1963 it reported 590 researchers per 100,000 people.[3]

A research institute in the field of atomic physics had been operating in Romania since 1949, but the road to implementing civil nuclear technology was winding and long. Young researchers took several years to train, the opportunities to specialize abroad were minimal, and even trips to the Joint Institute in Dubna, the stronghold of nuclear scientists in the communist countries of the Soviet political bloc, were a luxury. In addition, political interference in the administration of nuclear research was becoming increasingly frequent, and most jobs could only be obtained if you already had a party membership card. On top of all this, the Securitate, the Romanian state's secret police, exerted pressure under the guise of protecting state secrets, with many researchers being placed under surveillance on suspicion of spying for Western countries.

As for fissile material, Romania had exploited all its uranium mines from 1952 to 1965 serving the economic interests of the USSR. All the uranium ore had been sold to the Soviets at a price well below the world price, and the ore extracted after 1965 was of inferior quality. Romania did not have a uranium processing plant, and its attempts to build one were doomed to failure due to the opposition of decision-makers in Moscow to transfer technology and provide industrial support.

The Romanian–Soviet Nuclear Odyssey

At the 9th Congress of the Romanian Communist Party in July 1965, in the *Report on Energy Development over the Next Ten Years*, Chivu Stoica, President of the State Council of the RSR,[4] emphasized the importance of using nuclear energy for the production of electricity and heat. The aim was to ensure the energy balance, given that conventional fuel stocks were becoming insufficient for Romania's rapid industrial development. Uranium, which was no longer exported to the USSR, was to become one of the main sources of energy. The construction of nuclear power plants with a total capacity of 1,000 MW was considered fully feasible and justified, given that Romania had uranium deposits and that the price of nuclear energy was competitive with that of conventionally produced energy. Chivu Stoica spoke of two nuclear power plants that would be operational by 1975. For geological prospecting, which also included uranium deposits, the communists decided to allocate 16 billion lei for the next five years alone, 1966–1970.

Nicolae Ceauşescu, the new general secretary of the new Romanian Communist Party, also referred to Romania's future nuclear industry. In the party's Central Committee report, presented to the congress, he announced the use of nuclear energy for the production of electricity and heat in the coming years. Furthermore, Ceauşescu stated that the entire electricity production of 1938 would be achieved in 1970 in just 12 days, and in 1975 in less than a week.

In Romania, all scientific activity in nuclear physics was initially concentrated at the Institute of Atomic Physics, established in 1949 as the Institute of Physics of the Academy. The institute commissioned and developed the first large Romanian nuclear research facilities: the VVR-S nuclear reactor and the U-120 cyclotron,[5] in 1957–1958. Romania was the eighth country in the world to have scientific research reactors.[6] Given the advanced technology of the USSR and Moscow's political influence over Bucharest, it was only natural that the two essential components were Soviet-made and installed by specialists from the USSR and Romania.

Shortly after Nicolae Ceauşescu took office as the supreme leader of the PCR, discussions on the nuclear issue began with the Soviets. The high-level visit to Moscow on 3–11 September 1965 allowed for the first official discussion between Nicolae Ceauşescu and Leonid Brezhnev on the import of Soviet nuclear energy technology. The USSR leader offered the new general secretary of the Romanian communists assistance in the form of specialists who would travel to Romania to implement the technologies, process the enriched uranium needed for the power plant, and a 400 MWe (megawatt electrical) reactor.[7] It was the same type of reactor that Romania had requested two years earlier, but which had now passed safety tests. Brezhnev recalled that Czechoslovakia and other communist states had also requested to purchase this type of nuclear reactor from the USSR.

The issue of nuclear power plants had also been raised in August, when Alexandru Bîrlădeanu, Vice-President of the Council of Ministers, stated firmly in Moscow that Romania knew too little about Soviet nuclear technologies, while capitalist facilities could be visited and understood. He mentioned the visits of delegations to the United States, France, and Great Britain. Bîrlădeanu also complained that Romania had not been presented with a plan for Soviet technology transfer and, moreover, that the action had been postponed until 1970.

The Romanian–Soviet dialogue remained difficult and fruitless, as was the case on 12 November 1966, when N. S. Patolichev, the USSR's Minister of Foreign Trade, was received by Nicolae Ceauşescu. The Russian side was informed that Romania was building a metallurgical plant for the processing of uranium ore. Uranium enrichment was to be carried out jointly with the Soviet side. Patolichev expressed his support for the production of conventional electricity, although the Romanian side informed him of its decision that, by 1970, 13 per cent of the electricity produced by the national economy would be generated by the future nuclear power plant.[8] The discussions ended without any commitment, a sign that Patolichev's visit to Bucharest was merely a diplomatic gesture of goodwill on the occasion of the anniversary of the October Revolution in

Romania, and an opportunity to convey good wishes from Comrades Brezhnev and Kosygin. Nothing more than that.

On 17 and 18 March 1967, talks at the highest level took place again in Moscow. The discussions between Leonid Brezhnev and Nicolae Ceauşescu were also attended on the Romanian side by Ion Gheorghe Maurer,[9] President of the Council of Ministers, and Paul Niculescu-Mizil,[10] a member of the Executive Committee, of the Permanent Presidium, and Secretary of the CC of the PCR. Brezhnev was accompanied by the head of government, A. N. Kosygin, and A. A. Gromyko, a member of the Central Committee of the Communist Party of the Soviet Union and Minister of Foreign Affairs of the USSR. The main topics of discussion were global nuclear armament, the prospect of signing the Nuclear Non-Proliferation Treaty (NPT), and the use of nuclear energy in civil technologies for the production of electricity.

On 31 October 1967, the Council of Ministers decided to set up and run an interdepartmental commission to coordinate the preparations for the construction of the first nuclear power plant in the Socialist Republic of Romania. The new body was tasked with handling and contracting projects, equipment, machinery, and other means necessary for the construction of the first nuclear power plant, the fuel element factory, the uranium ore concentration plant, and the heavy water factory. Plans were made for the gradual domestic manufacture of the equipment necessary for the nuclear industry and for the training and specialization of the necessary personnel.

Romania, which through Nicolae Ceauşescu's foreign policy was showing signs of economic rapprochement with the West, continued its parallel discussions with the US. Between 19 June and 8 July 1968, Alexandru Bîrlădeanu, Deputy Prime Minister and President of the National Council for Scientific Research, travelled to the United States at the head of a delegation that included six scientists. Among the institutions visited were the Stanford Linear Accelerator Center (California) and the Commonwealth Edison Company's group of nuclear power plants (Dresden, Illinois).[11] Discussions had also begun with the Canadian side, which promised funding for the Romanian nuclear project and put forward the idea of a 300 MWe unit. The commercial offer was to be presented in September 1968.

Following Soviet instructions, in 1968, ISCE Industrialimport requested a quote for a 400 MW enriched uranium-water nuclear power plant from the State Committee for Economic Relations (GKES) of the USSR. In June, ISCE Tehnoproexport USSR sent an offer for this type of reactor, similar to the one presented to other socialist countries. It referred to a power plant with two 400 MWe reactors. The negotiations were very complicated: the Romanian side requested fuel supplies for the entire lifetime of the power plant, without providing equivalent quantities of uranium concentrate in return. The Soviet side did not agree to supply enriched uranium under these conditions and demanded that Romania supply natural uranium in the corresponding quantities. Unlike CANDU technology (enriched uranium-heavy water), Soviet reactors, based on enriched uranium and ordinary water, consumed twice as much uranium. The Bucharest regime intended to commission the nuclear power plant in 1977, but the Soviets were delaying the supply of equipment, which meant that the first kilowatt of nuclear energy would be produced two years later than planned. Finally, there was a real financial problem: Romania requested a 15-year loan from the USSR at 2% interest, while the Soviets proposed payment in goods, in accordance with the bilateral agreement on the exchange of goods and payments. Under these conditions, the Russian side did not agree to send the technical documentation and manufacturing technology for the fuel elements and control rods.[12]

However, a year later, a decision by the Permanent Presidium of the Central Committee of the Communist Party of Romania on 10 November 1969 called for the acceleration of negotiations for the purchase of such a power plant. An interdepartmental commission was to go to Moscow for discussions on technical, economic, and financial aspects, nuclear fuel supply, design, construction, staff training, and technical guarantees.[13]

On 13 May 1969, the Executive Committee of the CC of the PCR debated the draft national nuclear program for the period 1969–1980. The program, based on political guidelines, started from the framework idea that, by 1980, nuclear power plants in Romania would cover 65% of the country's energy needs. Realizing that such a development was practically impossible, Nicolae Ceauşescu said that it would be difficult to build one 300 MWe power plant and five 600 MWe power plants within this timeframe. The total cost would have been 43 billion lei, of which 11 billion would have been for imports. He therefore proposed something more "realistic:" four power plants, one 300 MWe and three 600 MWe.[14] Ultimately, Ceauşescu's conclusion, which was proposed and approved, was that the program should include 3–4 600 MWe nuclear reactors. Unaware of the complexity and uniqueness of the project, political decision-makers set deadlines that were difficult to meet: by 1980, three or four nuclear power plants, each with a capacity of 600 MWe, were to be built. The first reactor was to produce energy starting from 1974.

In a declassified secret document, the United States Central Intelligence Agency (CIA) estimated that in March 1970, due to pressure from the USSR, Romania had agreed to build a nuclear power plant using Soviet technology. The plant was to produce 440 MWe. The plant was not to become operational until 1985.[15]

The USSR had been operating a 365 MWe reactor in Novovoronezh since 1964, and a second reactor of the same capacity was scheduled to come online at the end of 1969. Based on these reactors, plans were drawn up for slightly larger units, with a capacity of 400 MWe, intended for the national economy but also for export. In 1972 and 1973, reactors 3 and 4 of the Novovoronezh Power Plant, with a capacity of 400 MWe, were connected to the Soviet energy grid.

In early 1970, the new coordinator of the national nuclear program, Professor Ioan Ursu, met with A. M. Petrosiants, chairman of the USSR State Committee for the Use of Atomic Energy, to relaunch Romanian–Soviet cooperation, which had remained only on paper. The Romanian side drafted an initial agreement, which was quite surprising in its political and categorical wording: "The draft agreement provides for collaboration and cooperation in this field, based on the principles of sovereignty and independence, non-interference in internal affairs, equal rights, mutual benefit, and comradely assistance." Romania ensured that a joint strategic economic project with the Soviets would in no way affect the course of the economy and politics in Bucharest, which were reiterated as independent. The draft agreement provided for the development, design, construction, installation, and operation of power and research reactors of common interest, the supply of nuclear reactors, nuclear fuel and nuclear materials, related equipment and stations, and the development of isotope and radiation source applications in science, industry, and other economic sectors.

In February–March 1970, a Romanian delegation discussed the conditions under which Romania could acquire a 400 MWe nuclear power plant. The Romanian side discussed the framework of the government agreement to be concluded for the construction of the facility, as well as the conditions and terms of delivery.

On 13 April 1970, the Permanent Presidium of the Central Committee of the Romanian Communist Party decided to purchase an enriched uranium-water nuclear power plant from the USSR. However, Romania did not intend to pay in cash, but with Romanian equipment and machinery. Importantly, the delivery date was shortened by one year, from 1976–1977 to 1975–1976. On the other hand, the high consumption of uranium in Soviet reactors, twice as high as in heavy water reactors, raised another problem. For the 25-year lifetime of the plant, 1,400 tons of natural uranium ore were needed, and the data showed that Romania still had 6,700 tons of category C1 and C2. There were 13,300 tons of prospective reserves and 20,000 tons of potential reserves. Therefore, the Romanian side proposed, this time, that the Soviets and Romanians provide equal quantities of nuclear fuel. The reasoning behind this was that between 1951 and 1965, no less than 19,000 tons of radiometrically sorted uranium ore had been delivered to the Soviet economy.

The Soviets agreed on a list of equipment to be manufactured in Romania. This included lifting equipment, tanks, pumps, fans, indoor electrical distribution stations, and embedded parts from the reactor and the machine room. Romanian specialists were also to benefit from specialization internships in the USSR. The schedule put forward by the Soviets was as follows: 1976–1977, delivery of basic equipment for the power plant, design, construction, and assembly; fourth quarter of 1978–first quarter of 1979, trial run; and 1979, final commissioning of the power plant. No agreement was reached on the following issues:

- the Romanian side had requested fuel supplies for the entire lifetime of the plant, without providing equivalent quantities of uranium concentrate in return. The Soviet side had not accepted this;
- the request for the delivery of equipment for 1974–1975, with the plant scheduled to become operational at the end of 1976;
- Romania's proposal to receive a 15-year loan at 2% interest to pay for supplies and services provided by Soviet organizations was rejected. The partners proposed that payment be made through deliveries of goods in accordance with the Romanian–Soviet agreement on the exchange of goods and payments;
- the Soviets did not accept the transfer of technical documentation for the manufacture of fuel elements and control rods and wanted Article 3 of the Nuclear Non-Proliferation Treaty to be applied to the issue of control guarantees, which meant more stringent conditions than those imposed by the International Atomic Energy Agency's safeguards system for the construction of nuclear power plants.

In May 1970, the Soviets announced that they agreed to shorten the delivery period for the power plant equipment by six months, between 1975 and 1977; that they could not grant credit, with payment to be made from installations and equipment produced by the Romanian economy; that they did not agree that the Romanian side should provide only half of the fuel, the rest to be paid for. Thus, Romania had to deliver 3,000 tons of raw uranium to the USSR to provide enriched fuel for the entire period of operation of the nuclear power plant. The proposals from Moscow resembled an ultimatum, as Romania had to respond within 24 hours, on 14 May 1970. Bucharest rejected the Soviet conditions and proposed continuing negotiations. Romania insisted on payment for deliveries and services in facilities and equipment; equal shares of fuel raw materials throughout the plant's lifetime; and a one-year reduction in the delivery time for basic machinery and equipment (1975–1976 instead of 1976–1977). Discussions continued in Moscow until 20 May 1970.

Political relations between Romania and the USSR were becoming increasingly complicated, as evidenced on 19 May 1970 during Nicolae Ceauşescu's visit to Moscow. From the outset of the bilateral dialogue with the Soviets, Leonid

Brezhnev's string of accusations seemed endless. Romania's independence in international relations and even its indifference towards a common position with the USSR and the communist bloc deeply dissatisfied Moscow. The Romanian delegation was rebuked for having developed economic relations with the Federal Republic of Germany, for not opposing Israel's policy on the Middle East, and even for facilitating the emigration of many Jewish citizens. Brezhnev reproached Romania for benefiting from loans from the Jewish state in exchange for sending young people to serve in the Israeli army. The visit of US President Richard Nixon to Bucharest was considered a provocation to "progressive humanity," and the postponement of the 10th Congress of the Romanian Communist Party in August 1969 to welcome the leader in Washington was incomprehensible to the Soviets. The conclusion was clear: Romania was flirting with imperialism. The cessation of economic aid to Vietnam was another reproach levelled at Romania. The Soviets were also dissatisfied with the Bucharest regime's refusal to participate in the proceedings of an anti-imperialist world congress and with the fact that, in the Soviet–Chinese disputes, Romania openly supported Beijing's actions, including through the official press. Romanian–Soviet cultural relations were also unsatisfactory for the Kremlin, with Brezhnev criticizing the closure of the Romanian–Russian Institute of the Academy, the Maxim Gorky Institute and the Russian Bookshop (The World of Books), as well as the significant reduction in the activities of ARLUS.[16] All this was said to have affected Romania's prestige and demonstrated its isolation from the socialist countries. In a context in which he analyzed European security and even proposed the dissolution of both military blocs, the Warsaw Pact and NATO, Leonid Brezhnev accused Nicolae Ceaușescu of opposing a meeting of the foreign ministers of the communist countries to decide on some of the allies' priorities.

Given these accusations and political pressure, Romanian and Soviet specialists agreed, one day after the official dialogue, on 20 May 1970, on most of the clauses of the Government Agreement on cooperation with the USSR for the construction of a 440 MWe nuclear power plant in the Socialist Republic of Romania. The issue of Romania's payment of the Soviet contribution to design, installation, and fuel preparation had not been resolved, with Bucharest proposing payment in full through machinery and equipment.

Significantly, also for economic relations, the Soviets and the Romanians were preparing the conditions for a high-level visit to Bucharest. On 1 July 1970, a special envoy informed the Romanian side that Leonid Brezhnev's health prevented him from leading the delegation, which was to be coordinated by Alexei Kosygin, Chairman of the Council of Ministers of the USSR. Nicolae Ceaușescu did not take the news well, considering it to be a fabricated illness, a political signal that once again highlighted the tensions between Bucharest and

Moscow. Only the political maturity of Romanian Prime Minister Gheorghe Maurer convinced the young communist leader to accept the option proposed by the USSR. Finally, the treaty was signed on 7 July 1970 by the two prime ministers. In the absence of Leonid Brezhnev, Ceauşescu did not have the right to sign the document, which he ironically called a mere "piece of paper." Under these political circumstances, negotiations were taking place on the construction of a nuclear power plant using Soviet technology, and Moscow's hostile attitude and rejection of many of the Romanian side's proposals during the negotiation process came as no surprise.

After the signing of the Agreement with the USSR on the construction of a nuclear power plant in Romania on 26 May 1970, intense discussions took place between the two parties for two years. On 24 July 1972, Romania sent a letter to Moscow stating the need to build the Olt nuclear power plant with increased security measures, namely, the encasement of the nuclear reactor. Although, at least until the summer of 1972, it seemed that there were some favorable conditions for reaching a compromise, on 10 November 1972, the Soviet side sent its official response, stating that Soviet companies were not prepared to take on the obligations that would allow the construction of the nuclear power plant in the cladded version.

A second, unfavorable option was to build the nuclear power plant without additional protective measures and without a containment structure, as requested by the Soviet side. Accepting a VVER-440 series reactor without a containment structure entailed major risks. In the event of a nuclear accident, a large area could be affected, extending to a radius of 50–60 km around the plant, with the risk of radioactive contamination for the population, fauna, economic objectives, and material goods located within this area. This solution was contrary to the nuclear safety concept adopted in all countries that had installed nuclear power plants, with the exception of the USSR and some socialist countries that had purchased similar types of plants without a containment building. The safety requirements for nuclear power plants had become stricter worldwide, and the Soviets had moved on to designing reactors with enhanced safety features, i.e., with a containment structure. The conclusions of studies carried out in Romania and the opinions of specialists rejected the solution of a reactor without a containment building, even if a site far from populated areas, such as Northern Moldova, the Prut Valley or the lower course of the Danube, was chosen. The estimated number of people affected in the event of a nuclear accident remained unacceptably high, so the final option was to abandon the construction of the nuclear power plant on the Olt River with equipment from the USSR for the time being and replace it with another conventional or nuclear power plant.

The country's fuel balance was deficient, and the failure to build the Olt nuclear power plant exacerbated this deficit starting in 1978. As for the type of reactor, studies conducted up to that point showed that, from this point of view, the most suitable were power plants with natural uranium and heavy water reactors, i.e., Western rather than Soviet ones, and the recent experience of commissioning and operating such a power plant confirmed the expected performance of this type of reactor.

The best option was a nuclear power plant with an installed capacity of around 800 MWe, with the foreign currency expenditure doubling. Adopting this nuclear power plant solution had the following advantages:

- it was economically competitive and involved a lower foreign currency expenditure;
- it contributed substantially to restoring the fuel/energy balance starting in 1980, if the decision was made by mid–1973;
- it allowed Romanian industry to better capitalize on its capabilities by assimilating high-tech products early on.

Therefore, this option represented a last attempt to build the plant in accordance with Romania's requirements, despite the fact that the answer was very likely to be the same negative one.

Under these circumstances, a group of representatives from several ministries was to present proposals by mid-February 1973 on the nuclear energy program, the construction of energy equipment, and the manufacture of nuclear materials. Within 10 days, by Government Decision, all these details were put into practice.

On 10 November 1972, I. Arkhipov, Deputy Chairman of the USSR State Committee for Foreign Economic Relations, sent a letter to Bucharest stating that the Soviet side was ready to continue discussions with the Romanian side on cooperation in the construction of the nuclear power plant in accordance with the existing agreement based on the technical project submitted. With regard to providing technical assistance for the construction of the plant in the shell version, the Soviets stated that their companies were not prepared to take on the obligations related to the design and delivery of the plant's equipment. The information was addressed to Adrian Georgescu, Deputy Minister of Electricity of Romania.

A new attempt to convince the Soviet Union to accept the construction of the plant with a containment building was made by Ion Gheorghe Maurer, President of the Council of Ministers, who in turn sent a letter to the President of the Council of Ministers of the USSR. According to the provisions of the existing agreement between Romania and the USSR, the power plant, which had a 440 MW VVER reactor, was to be commissioned in 1978. In order to create optimal conditions for the work to be carried out, all the necessary measures had been taken in Romania to ensure that the construction site could be opened as early as 1972. Unfortunately, the work had not begun because, for almost two years, the specialist organizations of the two parties had failed to agree on the specific way in which they would work together to build the power plant.

In 1974, negotiations were not progressing, and Nicolae Ceauşescu expressed his dissatisfaction at the meeting of the Permanent Bureau of the Central Committee of the Romanian Communist Party on 8 April. Given that energy imports (electricity) from the USSR were beginning to cause problems, the volume requested by the communist partners was increasing, and the need for a nuclear power plant was becoming increasingly obvious. The General Secretary emphasized that Romania was in a bad position, did not have a signed contract, wanted cheap imported energy, and it was unclear how long this situation could continue. It was decided to expedite the signing of the contract with the Soviets and to begin construction of the power plant, tasks assigned to the State Planning Committee and the Government Commission for Economic and Technical Collaboration and Cooperation.

A few years later, on 5 August 1977, the Central Committee of the Romanian Communist Party approved some proposals regarding the cooperation between Romania and the USSR in the production of equipment for nuclear power plants. The situation changed radically, in the sense that Romania proposed the manufacture and delivery to the USSR between 1978 and 1980 of equipment necessary for nuclear power plants, as well as the import of materials using free foreign currency between 1977 and 1980 for the production of this equipment, with a view to finalizing negotiations with the USSR for the conclusion of a cooperation agreement on the production of equipment for nuclear power plants.

The Ministry of Machine Building proposed:

> *The delivery to the USSR, between 1978 and 1980, of the following equipment for nuclear power plants: hydraulic vessels for the cooling system in the active zone of the VVER reactor; embedding elements under the vessels; the main circulation pump body; general-purpose and special fittings; elements for concrete reactor wells.*
>
> *Resumption of negotiations with the Soviet side on the text and annexes to the agreement.*
>
> *Import of materials necessary for the manufacture of equipment to be delivered to the USSR using free foreign currency; 1,890 tons of special steel for the manufacture and cladding of vessels, worth 15 million lei in foreign currency, were to be imported using free foreign currency.*
>
> *The value of the nuclear equipment to be delivered between 1978 and 1980 was reduced to 91 million lei in foreign currency; this was due to an increase in the volume of equipment to be delivered to the USSR.*
>
> *The delivery of equipment for nuclear power plants was to continue until 1990, and the Convention was to specify the technical documentation and technical as-*

> *sistance to be provided by the USSR, as well as the possibility of delivering other, more sophisticated nuclear equipment*.[17]

However, the USSR's request was much greater than what Romania could offer. For example, the requested number of hydraulic containers for the cooling system in the reactor's active zone was 10 in 1978 and reached 32 in 1980. Romania proposed only two containers in the first year, with the possibility of reaching to 18 in 1980.

The chairman of the USSR State Committee for Nuclear Energy, A. M. Petrosiants,[18] came to Bucharest in 1981. On 16 May, he was received by Nicolae Ceauşescu. Although many years had passed since the political decision to import a Soviet nuclear power plant, with enriched uranium and natural water, the leader in Bucharest said with conviction, "We must now think about how to develop this collaboration more quickly and when to start building this nuclear power plant in Romania."[19]

The Soviets were very pleased with the progress of nuclear research and industry in Romania. The experimental heavy water plant produced one ton of heavy water per year, and Petrosiants noted that, from this point of view, some processes had been mastered from start to finish. Ceauşescu added that Romania needed 400 tons of heavy water for the CANDU plant built with AECL Canada. To this end, in 1983, Romanian industry was planning to build a new plant with four lines, each producing 90 tons of heavy water.

As for the uranium processing metallurgical plant, the Soviets noted that, in terms of the quality of the finished product, the processing activity was not among the most efficient. Moreover, they suggested that the plant be transferred from the Ministry of Mines, Petroleum, and Geology to the direct administration of the Committee for Nuclear Energy.

The production of fuel elements was very low, although the process was completely and scientifically correct. Ceauşescu asked the Soviets for support in developing other lines of production.

During this visit, a cooperation agreement in the field of controlled thermonuclear fusion was signed between CSEN and the USSR State Committee for the Use of Atomic Energy, which contained a concrete program of research, development, and experimentation.

Romania and the USSR collaborated in the field of laser construction for research and economic applications, and laser installations had been developed on machine tools. At the tandem accelerator at the National Physics Center in Măgurele, joint activities were carried out with the Institute of Physics and Nuclear Engineering and Soviet institutes in Moscow, Kharkov, and Yerevan. Between 1976 and 1980, the Institute of Isotopic and Molecular Technology in

Cluj-Napoca supplied the Soviet institute in Tbilisi with stable isotopes worth 2 million lei per year.

The construction of a VVER-1000 MWe nuclear power plant in Romania was under discussion,[20] to replace the VVER-440 MW plant, whose construction had been agreed upon through intergovernmental cooperation in the agreement of 28 May 1980.[21]

In conclusion, in order to build the 1000 MWe VVER power plant in Romania, discussions with A. M. Petrosiants also addressed the issue of fuel and the primary circuit of the future power plant. In March, in Moscow, the president of the Romanian State Committee for Nuclear Energy, Academician Ioan Ursu, and the first vice-president of the USSR State Committee for Foreign Economic Relations discussed topics related to the design of the 1000 MWe nuclear power plant, the delivery of equipment, and the supply of fuel for the plant.[22]

On 22 June 1981, the prime ministers of the USSR and of Romania, Nikolai Tikhonov and Ilie Verdeţ, agreed to supplement mutual deliveries of heavy machinery and equipment for the period 1982–1985, with a total value of 300 million rubles. The deficit of 50 million rubles was to be covered by the Soviets through deliveries of equipment needed for the construction of the VVER nuclear power plant. Three months earlier, on 18 March 1981, the Minister of Heavy Machinery Construction, Ioan Avram, and the ambassador to Moscow, Traian Dudaş, agreed with A. I. Mayorets, the USSR Minister of Electrical Engineering, that Romanian nuclear workers would specialize in the production of equipment for VVER 400 MWe and VVER 1000 MWe nuclear power plants. The documentation for the 1000 MWe reactor was to be submitted to the Romanian side in 1983, and deliveries of equipment were to begin in 1984. Economic discussions on nuclear energy recurred obsessively on the Romanian–Soviet agenda, without any practical results.

In the second half of the 1980s, the energy policy of communist Romania was at a turning point. The Cernavodă nuclear power plant project, based on Canadian CANDU technology, encountered serious technical and financial difficulties in an increasingly tense international context for the Ceauşescu regime. After 1980, Romania had accumulated considerable foreign debt, and access to Western technology was becoming increasingly difficult. Under these circumstances, Ceauşescu resumed talks with the Soviet Union on possible nuclear cooperation, even though in the 1970s and early 1980s he had consistently rejected the integration into the energy system coordinated by Moscow.

The first direct discussion between Nicolae Ceauşescu and Mikhail Gorbachev on this subject took place in Moscow on 4 September 1985, during an official bilateral meeting. According to the Romanian transcript, the Romanian leader raised the issue of "securing additional sources of energy," explicitly mentioning the nuclear field. He reiterated once again the issue of the delivery of a Soviet nuclear power plant, adding that he was prepared to discuss the offer in concrete terms. Mikhail Gorbachev responded favorably, evoking the Soviet experience in the construction of VVER-type power plants, but stressed that Romania had to accept closer cooperation within the CAER on energy issues. Ceauşescu, faithful to his policy of technological autonomy, avoided making a concrete commitment, limiting himself to stating that Romania would retain control over its own development. The discussion did not end with an agreement, but it opened a new stage in bilateral relations in the energy field.

After the meeting in Moscow between Gorbachev and Ceauşescu on 16 May 1986, it was agreed to conclude a convention on Romania's participation in the exploitation of deposits in the USSR (crude oil, coal, etc.) and another on the construction of a nuclear power plant with a view to establishing stable long-term imports of equipment and raw materials.

The topic was revisited during Gorbachev's official visit to Bucharest between 25 and 27 May 1987, during talks held at the Central Committee of the Romanian Communist Party. According to the transcript, the Soviet leader returned to the idea of cooperation in the nuclear field. The discussions did not lead to any concrete agreement. Romania never purchased a Soviet-type power plant, preferring to continue the CANDU project, even under increasingly difficult economic conditions. However, the episode illustrates the structural tension between the Romanian policy of technological autonomy and the Soviet efforts to economically reintegrate CAER member countries around the joint energy programs promoted by Gorbachev.

On 2 October 1989, in an article published in Izvestiya, the Soviet correspondent in Bucharest candidly highlighted the real state of Romanian–Soviet economic relations. Romania had announced that it was abandoning its collaboration with the Soviets on the construction of a nuclear power plant in favor of Western CANDU technology (construction had begun in 1982), a decision based on economic considerations such as lower costs and reduced nuclear fuel consumption. Between 1965 and 1980, the USSR's share in Romania's foreign trade had fallen from 39% to 17%, with the situation improving slightly after that year. Throughout this period, the author notes, as a bitter conclusion for Moscow, "the rapid development of Romanian industry required imports, especially loans, modern technologies, and equipment from Japan, the USA, West Germany, and France."[23]

The epic story of the construction of a Soviet nuclear power plant on Romanian territory ended in the last year of Nicolae Ceauşescu's dictatorship.

Conclusions

THE CONSTRUCTION of a Soviet-style nuclear power plant in Romania proved to be a protracted political and technical dialogue that lasted for decades. Even though the USSR was the first country in the world to build a nuclear power plant, and the first steps in Romanian nuclear research had been taken together, through the import of a Soviet-built reactor and cyclotron, the technologies offered to Romania from the outset of the collaboration were not the safest. This allowed Romanian specialists, under the cover of a foreign policy of openness towards the West, to visit Western countries that were performing well in the nuclear field. Romanian nuclear scientists opposed the import of Soviet nuclear technology from the outset, and political decision makers respected their scientific expertise. Aware that the vanity of the Kremlin leaders had to be constantly fed, Nicolae Ceauşescu and his team let it be understood until the last moment that Romania was interested in the Soviet power plant. In reality, every time a new cooperation agreement was presented, the terms written in the documents on the Romanian side were unacceptable. Subsidies and loans that were extremely advantageous only to the Romanian side, the provision of a considerable amount of fuel at Soviet expense, and other economic demands, which seemed deliberately exaggerated, delayed the actual start of specific economic relations for many years. Romania had decided to purchase its first nuclear power plant built with Canadian technology (CANDU) and could no longer economically support another one of Soviet design. Despite his increasingly pronounced political independence from Moscow, Ceauşescu could not afford to risk a categorical refusal in the face of the USSR's countless nuclear offers. On the other hand, the leaders in the Kremlin, from Brezhnev to Gorbachev, were informed and aware that Romania had once again chosen the West. The postponement or cancellation of high-level visits to Bucharest, the refusal to spend holidays in Romania, which was very common among the communist leaders of the Eastern Bloc, or the appointment of lower-ranking officials to head delegations meeting with the leader of communist Romania, Nicolae Ceauşescu, were clear signs of Moscow's hostility towards the continued development of economic relations with the West, including in the nuclear field. The seemingly endless odyssey of implementing Soviet technology in Romania came to an end with the collapse of the communist regime in Bucharest.

❑

Notes

1. Nicolae Ceauşescu was elected first secretary of the Romanian Workers' Party in July 1965, following the death of leader Gheorghe Gheorghiu-Dej. On 24 July 1965, the PMR changed its name to the Romanian Communist Party, led by Nicolae Ceauşescu until 22 December 1989, when the communist regime in Romania collapsed.
2. Central Historical National Archives (Arhivele Naţionale Istorice Centrale, hereafter cited as ANIC), coll. CC al PCR, Secţia Propagandă şi Agitaţie, file no. 34/1965, fol. 107.
3. Ibid., fol. 113.
4. The State Council of the Socialist Republic of Romania was the supreme political governing body of the Romanian state. Chivu Stoica held the position of president of the Council for two years, from 1965 to 1967, after which Nicolae Ceauşescu took over the role.
5. http://andr.ro/domeniul-nuclear-in-ro/informatii-generale.
6. https://www.curentul.info/cultura/mari-personalitati-ale-stiintei-romanesti-si-mondiale-horia-hulubei-1896-1972.
7. ANIC, coll. CC al PCR, Secţia Cancelarie, file no. 124/1965, fols. 80–81.
8. ANIC, coll. CC al PCR, Secţia Relaţii Externe, file no.147/1966, fols. 2–14.
9. Ion Gheorghe Maurer (1902–2000), a lawyer by profession, was Minister of Foreign Affairs (1957–1958), President of the Grand National Assembly (Parliament) (1958–1961), and the country's longest-serving prime minister, president of the Council of Ministers from 1961 to 1974.
10. Paul Niculescu-Mizil (1923–2008), member of the CPEX of the PCR (1965–1989), vice-president of the Council of Ministers (1972–1981), Minister of Education and Training (1972–1976), President of Centrocoop (1981–1989).
11. The United States had substantial budgets for scientific research: $15.3 billion in 1966, $16.5 billion in 1967, and $16.7 billion in 1968.
12. ANIC, coll. CC al PCR, Secţia Cancelarie, file no. 44/1970, fols. 10–12.
13. ANIC, coll. CC al PCR, Secţia Economică, file no. 3/1969, fol. 116.
14. ANIC, coll. CC al PCR, Secţia Cancelarie, file no. 69/1969, fol. 11.
15. Nuclear Program of Eastern Europe, 1 March 1979, https://www.cia.gov/readingroom/docs/nuclear%20programs%20of%20easte%5B15313994%5D.pdf.
16. ARLUS was the Romanian Association for Establishing Relations with the Soviet Union, founded in 1944 by left-wing figures. Over time, Soviet influence and propaganda in Romania grew significantly, and paying ARLUS activists became very costly. ARLUS was dissolved in 1964.
17. ANIC, coll. CC al PCR, Secţia Economică, file no. 32/1977, fols. 6–8.
18. Andronik Melkonovich Petrosiants, graduate of the Uralsk Institute of Mechanics, former Deputy Minister of Medium Machine Building, CPSU activist, winner of the State Prize, and Hero of Socialist Labor.
19. ANIC, coll. CC al PCR, Secţia Relaţii Externe, file no. 53/1981, fol. 3.
20. The first VVER-1000 (Vodo-Vodyanoi Energetichesky Reaktor) nuclear power plant was built by the Soviets and commissioned at the Novovoronezh NPP (Unit 5) in

1980, on the territory of the then Soviet Union. It was the pilot model (V-187) of the 1000 MW high-power reactor, the basis for the further development of the VVER-1000 type. Other units followed, and the model became a standard design widely used in the USSR and its allied states.
21. ANIC, coll. CC al PCR, Secţia Relaţii Externe, file 53/1981, fol. 22.
22. Ibid., fol. 14.
23. Vasile Buga, *Lumini şi umbre: Relaţiile economice româno-sovietice (1965–1989)* (Bucharest: Institutul Naţional pentru Studiul Totalitarismului, 2019), 268–392.

Abstract

The Atoms of Independence:
Romania's Refusal to Import Soviet Nuclear Technology

This study explores Romania's strategic decision, under the leadership of Nicolae Ceauşescu, to progressively reject the import of Soviet VVER nuclear technology, in the context of the Cold War and given the desire to assert national autonomy. Although Romania's early nuclear scientific activity was based on Soviet influence and equipment, discussions on the acquisition of a high-power nuclear power plant (400 MWe, later 1000 MWe) became a political bargaining chip that lasted for 24 years. The documents analyzed reveal the tensions between Bucharest and Moscow. On the one hand, the Soviets offered VVER-1000 reactors, but imposed restrictive political and technical conditions. In turn, Nicolae Ceauşescu's experts proposed conditions that were difficult to accept, all of which were clearly to the detriment of the USSR: non-performing loans, the provision of part of the nuclear fuel with Soviet money, and other unacceptable conditions. Ultimately, Moscow's refusal to offer acceptable security guarantees and transfer critical technology led to the practical abandonment of the Soviet project, paving the way for the search for Western alternatives and the affirmation of a strictly national nuclear policy. After carefully studying the archive documents in Bucharest and the evolution of high-level political dialogues between Romania and the Soviet Union, at the end of this study we highlight and interpret the causes of the failure of this impossible economic collaboration.

Keywords

nuclear technology, Eastern Bloc, communist Romania, USSR