

# The Slovakian “Inspirasi” for Indonesian Nuclear Power: The “Success” of a Permanently Failing Organization\*

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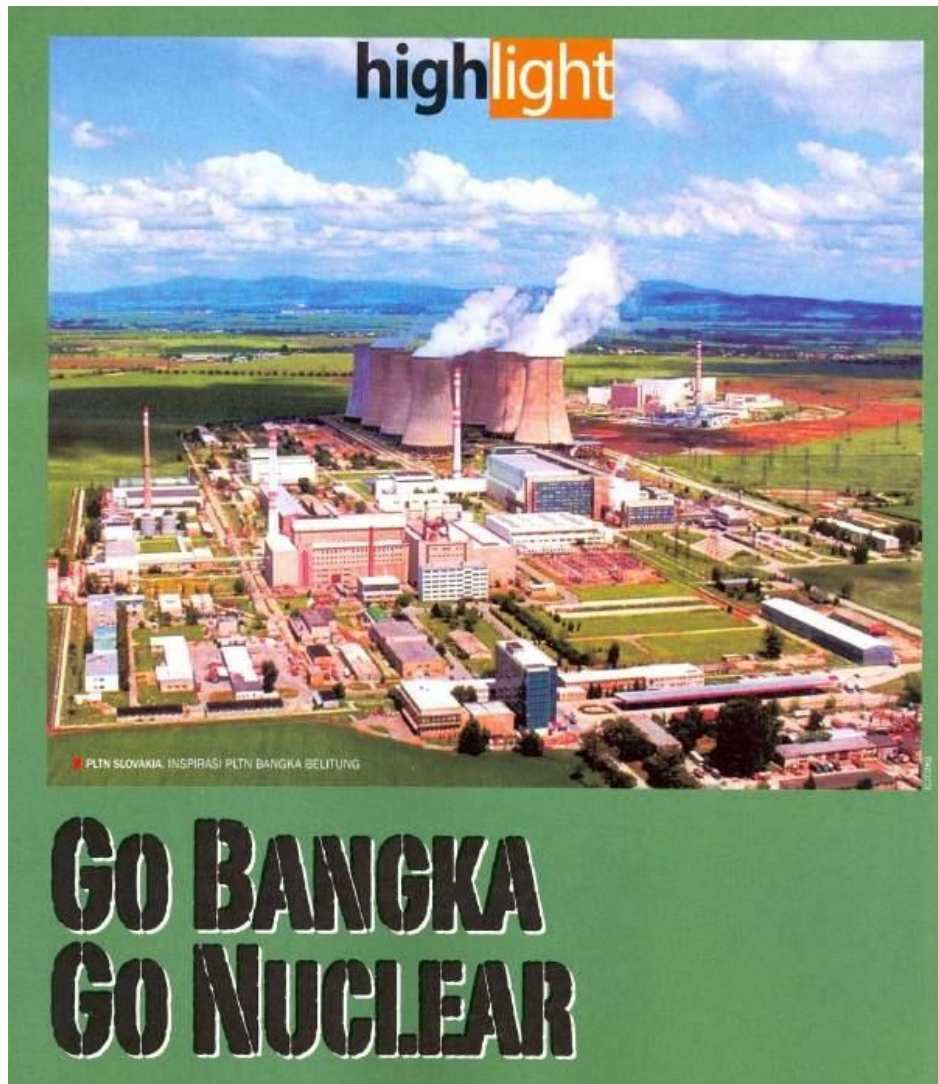


Figure 1. ‘Go Bangka Go Nuclear: PLTN Slovakia Inspirasi PLTN Bangka Belitung’  
[‘Slovakian NPP, Inspiration for Bangka-Belitung NPP’]  
Source: *Majalah Trust*, No.12, Tahun IX, 27 Januari 2011, p. 52

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*The Indonesian national nuclear power agency (BATAN) is a classic example of a permanently failing organization that survives due to external support and frequent announcements of imminent construction of a nuclear power plant (NPP). Between 2009 and 2013 BATAN claimed the Slovakian nuclear power industry as its mentoring partner and inspiration in building an NPP in Bangka-Belitung. BATAN failed to mention the scandal-ridden state of the now foreign-owned Slovakian nuclear industry, its catastrophic past, and its nonexistent construction capacity. The Slovakia/Bangka campaign, baseless though it was in reality, functioned as a kind of informational fog of fantasy that deflected attention from domestic critics of an Indonesian nuclear program.*

**Keywords:** *Indonesian nuclear power industry, Slovakian nuclear power industry.*

The most curious and telling episode in more than four decades of Indonesia's nuclear power planning was the nuclear establishment's promotion of the tiny European country of Slovakia as an "inspiration" and national industrial partner for a proposed Bangka Nuclear Power Plant (NPP). Between 2009 and 2013, Indonesia's national nuclear power agency, Badan Tenaga Nuklir (BATAN), actively promoted the Bangka Slovakian proposal within Indonesia, internationally with the International Atomic Energy Agency (IAEA) and the global nuclear media, and most importantly, in the province of Bangka-Belitung (Babel).

In a three-year spasm of government-originated publicity that included public education programs, diplomatic activities, and international industry and trade exchanges, the Indonesian nuclear establishment promoted the bizarre idea that what it implied to be Slovakia's leading role in the European nuclear industry would lead to a partnership that would build two nuclear power stations on the island of Bangka, producing more than 4,000 MW of electricity.

Proponents of the plan for the Slovakian nuclear industry to act as midwife for Indonesian nuclear development distributed erroneous information and, on occasion, outright disinformation. This effort failed to mention the scandal-ridden state of the now foreign-owned Slovakian nuclear industry, its catastrophic past, and the relationship of the Slovakian nuclear industry to what the country's prime minister described as the "octopus" of endemic corruption strangling her country (Terenzani-Stanková 2011).

By 2014, this coordinated promotion of the Slovakian inspiration of the Bangka NPP project had died to almost nothing, gone with as little in the way of truthful public explanation as had informed its arrival. But by then the campaign had done its job of launching the Bangka NPP idea, keeping alive the promise of safe nuclear power after Fukushima, helping BATAN secure an important alliance with the then Babel provincial

government, and most importantly, constructing a kind of informational fog of fantasy and uncertainty that deflected attention from increasingly effective domestic critics of an Indonesian nuclear power program.

Today, several years after the Slovakian plan collapsed, two reasons remain for examining this short but intense sequence of Indonesian government promotion of claimed inspiration. (Keep in mind that Slovakia has only about 5 million people, a tiny volume of trade with Indonesia, a long-standing postcommunist reputation for governmental and business corruption, and an appalling record of nuclear power safety.) The first reason is the case study it represents of three-way cooperation, if not collusion, between an agency of the national Indonesian government, a regional government, and elements of the global nuclear industry. The second reason has broader significance, reflected in the 2010 Nuclear Futures Project study of global nuclear power. That study concluded that “the existing regimes for nuclear safety, security and non-proliferation, despite improvements in recent years, are still inadequate to meet current challenges, much less new ones” (Frechette and Findlay 2010, 6).

In the wider context of the export of nuclear power technology to countries attempting to construct commercial nuclear power plants—whether in the developing world or elsewhere—sharp questions that must be asked of the first tier of nuclear power exporters (Japan, South Korea, and France) must now be asked with even greater vigor of would-be nuclear exporters in the second tier (Russia, China, and India). But below these is a third tier, essentially bottomfeeders in the nuclear pond: state and nonstate entities that may be involved, either on their own account or as cat’s paws for others, in the transfer of limited portions of nuclear power plant technology and expertise, but with even less transparency and effective regulation than is the case in the prevailing and profoundly inadequate global regime. Slovakia belongs to this third tier.

### **BATAN: The Survival of a Permanently Failing Organization**

With a complete lack of success, BATAN has been promoting the construction of nuclear power plants as essential to Indonesia’s electricity needs for more than four decades, urging successive cabinets to adopt its recommendations to begin construction. To be sure, the organization does operate three research reactors, and carries out research work in health and agriculture, but these are subordinate, both technically and politically, to its primary goal—building a national nuclear power industry. Half a century after its creation in 1965,

BATAN is still unsuccessful in its primary mission of promoting nuclear power in Indonesia. BATAN is a classic case of what organization analysts call a permanently failing organization.

The classic study of permanently failing organizations sought to explain why certain companies, divisions of corporations, community groups, and government agencies survive despite clearly failing to meet their stated objectives and consistently underperforming (Meyer and Zucker 1989). These organizations are “successful” in simply surviving by finding support from sources external to them or by deploying a repertoire of internal practices that aid organizational survival. A more powerful government department or an external agency may provide funding, legitimation, or managerial support. Internal practices (or externally oriented practices) manage to keep the day of reckoning almost perpetually at bay—for example, by endlessly reiterating an established rationale, however threadbare (“our *raison d’être* is . . .”); repeating contradictions between discourse and action (plans never fulfilled); or simply by systematically withholding appropriate information from stakeholders (Rouleau, Gagnon, and Cloutier 2008).

While BATAN is a very junior actor in the Indonesian national government, the organization receives critical external support. Its most important protector is the IAEA, which has a similar mission at a global level. BATAN collaborates with the IAEA on a wide range of activities, not least of which are numerous preliminary and “preparatory” studies for building a nuclear power plant. The IAEA’s support comes in the form of providing budgetary assistance, expertise, training, and ideological and political support and advocacy for the nuclear power mission, as well as for ancillary missions. BATAN’s work is similarly supported by regional intergovernmental organizations such as the Asian Nuclear Safety Network, with the laudable aim of improving the “safety of Nuclear Installations in the South East Asia, Pacific and Far East Countries.” But in the process, such groups also buttress the management and legitimacy of organizations like BATAN (ANSTO n.d.). Beyond intergovernmental support, BATAN’s pursuit of its primary mission is supported by elements of the highly concentrated global nuclear industry, both from industry representative bodies and from nuclear manufacturing companies and their export-oriented government supporters.

These external sources of legitimation and assistance have been essential for BATAN’s survival despite persistent failure. But its most important survival tools have been

internal practices, or more accurately, internal practices oriented toward the Indonesian political system, the media, and civil society. BATAN's approach to public accountability has been characterized by manipulation of information flows—withholding significant information or data, and distributing information that is simply incorrect or highly implausible (Tanter and Imhoff 2009; Tanter, Imhoff, and von Hippel 2009). Most important of all has been BATAN's practice of repeatedly announcing “new” nuclear power plant construction projects and locations, with plans and timelines that prove to bear little or no relation to reality.

*Promises, Promises as Ideological Fog*

BATAN's first and most persistent NPP proposal, and the one most likely to succeed at some point in its almost forty-year history, was to construct a large nuclear power plant on the north coast of Central Java on the Muria peninsula. In fact, BATAN has been thwarted by decades-long local resistance in Jepara, increasing skepticism about seismic safety claims, and lack of support from the larger bureaucratic players within the Indonesian government (Tanter 2007; Tanter and Imhoff 2009; Tanter, Imhoff, and von Hippel 2009; Fauzan and Schiller 2011). This resistance has led BATAN to make new rounds of announcements of alternatives to the Muria site.

Between 2010 and 2015 BATAN, either alone or in collaboration with ministries in the national government or with provincial governments, announced plans for the construction of no fewer than sixteen apparently separate nuclear power plants (see Table 1). These announcements in turn generated large numbers of Indonesian and foreign language media reports, repetitions, sitings, and elaborations—all despite no reported assessment of the likelihood of actual construction to follow.

**Table 1. Indonesian nuclear power reactors, under governmental consideration, 2010 - 2015<sup>2</sup>**

	Location	Region	Purpose	Size	Partners/ Collaborators	Status
1	Tanah Abang, Desa Balong	Muria peninsula, Central Java	LWR NPP	4 x 1,000 MW	BATAN; IAEA	Feasibility study completed 1996; “5 years further study required” (2012).
2	Muntok/ Teluk Inggris, West Bangka	Bangka-Belitung	LWR NPP	6 x 1,000 MW	BATAN; Bangka-Belitung provincial government	Feasibility study completed 2013.
3	Tanjung Barani, South Bangka	Bangka-Belitung	LWR NPP	4 x 1,000 MW	BATAN; Bangka-Belitung provincial government	Feasibility study completed 2013.
4	Unspecified	Bangka-Belitung	SMR		BATAN	Proposed August 2013.
5	Berau and East Kutai	East Kalimantan	LWR NPP	1,000 MW	BATAN; East Kalimantan provincial government; Ministry of Research and Technology	Min. of Research and Technology support 2012; provincial government support 2015; feasibility study reported in preparation 2015.
6	Dekan Putih, Kubu Raya, and Ketapang	West Kalimantan	LWR NPP	30 MW	BATAN; West Kalimantan provincial government	Feasibility study reported in preparation 2015.

<sup>2</sup> For full documentation of status and sources, see Richard Tanter, “Table: Indonesian nuclear power reactors, under governmental consideration, 2010 – 2015”, at <http://nautilus.org/network/associates/richard-tanter/publications/>.

7	Unspecified	Central Kalimantan			Pertamina; Central Kalimantan provincial government	Feasibility study proposed by provincial government 2015.
8	Gorontalo	Gorontalo	FNPP	90 MW	Gorontalo provincial government; RAO UES (Unified Energy System of Russia); Rosatom	Enthusiastically pursued by RAO UES/Rosatom and the provincial government in mid-2000s; subsequently dormant but re-emerged in 2010.
9	Pulau Panjang, Banten	West Java	LWR NPP		BATAN	Announcements 2010-2015.
10	Kramatwaru-Bojonegara, Banten	West Java	LWR NPP		BATAN	Announcements 2010-2015.
11	Serpong	West Java		10 MWe	BATAN	Announced 2013.
12	Serpong	West Java	NCPR	30 MWe	BATAN	Announced 2013.  Note this proposal may refer to 11 above.
13	Subang	West Java		600 Mw	BATAN Teknologi; Rosatom; PT Pertamina; PT Waskita Karya; PT Dahana.	Announced 2014.  Note separate 2014 Batan Tekno proposal for a Subang Babcox and Brown reactor to produce radioisotopes (capacity 3,000 curies).

14	Unspecified		HGTR	10-30 MWe	BATAN/ Japan Atomic Energy Agency	Demonstration plant to start operations “by 2020”; operation “by 2031”.
15	Unspecified		Pebble bed HTGR		BATAN; RENUKO: “a consortium of Russian and Indonesian companies led by NUKEM Technologies” (Rosatom subsidiary)	Announced June 2015.
15	Unspecified		TWR	500 MW	BATAN Teknologi; Terra Power (Bill Gates)	BATAN Teknologi proposal 2014.
16	Batam	Riau	LWR NPP	2 x 1,200 MW	Riau provincial government; Rosatom; BATAN	Proposed 2014.

Abbreviations

FNPP: Floating Nuclear Power Plant  
HTGR: High Temperature Gas Reactor  
LWR: Light Water Reactor  
NCPR: non-commercial power reactor  
NPP: nuclear power plant  
SMR: Small Modular Reactor  
TWR: Travelling Wave Reactor



Some of these announcements were occasioned by the signing of a nuclear cooperation agreement with another country, said to be leading to construction of an NPP. Between 2010 and mid-2015 BATAN or its partner organizations announced a number of such agreements with Russia and Japan. In the Russian case, these included claimed planned construction of a 600 MW NPP by Rosatom in Subang in West Java; two 1.2 GW NPPs on the island of Batam near Singapore; a high-temperature gas reactor at an unspecified location; and a floating nuclear power plant in Gorontalo.<sup>3</sup> The long history of Japanese interest in the Muria NPP project was followed by BATAN's announcement that it was cooperating with the Japan Atomic Energy Agency to build a high-temperature gas reactor, again at an unspecified location, to begin operation by 2031.

Another common practice in recent years has been an announcement of collaboration between BATAN and one of Indonesia's provincial governments, newly empowered in the era of post-Suharto decentralization of authority, such as the Bangka NPP proposal (Hadiz 2010). The plan for Batam involves collaboration with the Riau provincial government. Other announcements of cooperation between BATAN and provincial governments and other partners include a 1,000 MW reactor in East Kalimantan, a 30 MW reactor in West Kalimantan, and an NPP of unspecified size in Central Kalimantan.

Not one of these sixteen NPP proposals or plans has come to fruition on the time scales announced, and, with the possible exception of the BATAN Serpong noncommercial power reactor (NCPR), none have a realistic prospect of being undertaken in the near future. The global nuclear industry itself, including its industry media outlets, is used to this situation worldwide, and longtime industry observers have come to be profoundly skeptical of such announcements, knowing full well how long and crooked the path to completion of construction actually is.

Yet for the Indonesian public and even other parts of the Indonesian state, these repeated unsubstantiated but also unquestioned media announcements may act as a kind of ideological conditioning, generating a sense of quasi-inevitability that one day, one of these announcements *will surely* be true. In the event that these reports are not actively and authoritatively contradicted in the same media outlets, these repeated governmental claims of ever imminent but never actualized NPP construction may function as a kind

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<sup>3</sup> Russian interest in selling a floating nuclear power plant to Indonesia is long-standing, with approaches made as early as 1997, long before Russia's first such plant was built (Muraviev and Brown 2008).

of ideological fog, acquiring a level of political currency among the Indonesian public and parts of government that are either less attentive or have their own interest in not gainsaying these claims.

### **The Bangka NPP Proposal**

In June 2009 BATAN signed a memorandum of understanding with the Bangka-Belitung government for the “Utilization of Nuclear Science and Technology for the Welfare of the Community of Bangka-Belitung” (BATAN 2009). Two sites were identified: in West Bangka at Teluk Inggris, and another in South Bangka at Tanjung Berani/Tanjung Krasak. By 2014 a feasibility study had confirmed their suitability, recommending construction of up to ten large reactors, six on the Teluk Inggris site and four on the South Bangka site (PPEN-BATAN 2011; Susilo, Budi, and Anzhar 2013).

The BATAN proposal, enthusiastically greeted by the then provincial governor, was presented as both a seismically safe option and an answer to the prayers of residents and workers of an island impoverished and environmentally ravaged by centuries of rapacious tin mining. Yet by early 2014, following the emergence of local opposition, the head of the provincial Disaster Management Agency wrote to BATAN and the increasingly professional Nuclear Regulatory Agency, BAPETEN, asking for a formal review of the possible effects of BATAN’s Bangka NPP plan on the “fragile condition of Bangka.” He described the condition as “already very alarming due to rampant mining for about a century,” reflecting the region’s history of severe environmental degradation (*Tempo* 2014). Serious concerns were also raised about local corruption and the emergence of what a government researcher has described as a criminal-business “local shadow state” (Erman 2007, 189).

### **The Slovakian Inspiration for a Permanently Failing Organization**

#### *Fantasy Visions*

In an enthusiastic and long article titled with the provincial government’s “Go Bangka Go Nuclear” promotional slogan, the Jakarta business magazine *Trust* published an image labeled “Slovakian Nuclear Power Plant, the inspiration for a Bangka Nuclear Power Plant” (see Figures 1 and 2) (*Majalah Trust* 2011, 52). The softly colored artist’s rendering of the Bohunice NPP located benignly in a bucolic rural landscape in western Slovakia, about fifty kilometers northwest of the capital Bratislava, was originally the product of Slovakian nuclear authorities, then borrowed by their Indonesian counterpart

for local nuclear campaigning. In fact, the reality of the Bohunice NPP turns out to be very different, and distinctly less appealing.

In December 2010, an Indonesian delegation visited the Slovak Republic. The delegation was headed by the governor of Babel, accompanied by officials from the region and from West and South Bangka districts, BATAN, and the National Energy Council. In addition to Bratislava, the delegation visited the Bohunice NPP, the site of five nuclear reactors, three of which are shut down or in the process of being completely decommissioned for safety reasons (*Antara* 2010).

Reports published in Bangka and Jakarta quoted the Indonesian ambassador to Slovakia as saying that “the Slovakian government intends to build three nuclear power plant projects with 3 x 100 [sic] megawatt capacity in Indonesia, one of which will be in Bangka Belitung,” with a credit line of \$100 million, and that “Slovakia will be the official consulting country Indonesia will use for its experience” (*Rakyat Pos* 2011). His Slovakian counterpart confirmed his belief that in his country nuclear power is “safe and good technology” (Hasugian and Amaruiddin 2011; Reuters 2011). Agreements were to be formally signed during a visit to Indonesia by the Slovak president planned for June 2011, but when the visit took place in October, no such agreements were signed (m.Webnoviny.sk 2011).

At the provincial level, however, hopes for a Bangka-Slovakia nuclear alliance remained alive. In late June 2011, the governor made a major speech to a national energy seminar where he outlined his energy vision for the province. By this time Slovakia’s putative role was both rather more grand and more vague. The governor said that “some countries such as Slovakia, Japan, and South Korea have expressed interest in helping to support the preparation of facilities and infrastructure equipment to build a nuclear power plant in Bangka Belitung” (NPP INDO BABEL 2011). This equation of Slovakia with Japan or South Korea on nuclear industrial capacity is quite literally fantastic, but is representative of much discussion in Indonesian official circles of the potential contribution Slovakia was to make to Indonesia’s electricity industry. Moreover, Ambassador Rozkopal’s assurance that his country could provide a “safe and good technology” as a “partner for Indonesia in developing its [nuclear] potential” bore no relationship to the actual state of affairs in Slovakia at any time.

*“A Safe and Good Technology”: The Slovakian Nuclear Experience*

As of 2015, Slovakia has four operating nuclear power reactors at the Bohunice NPP and the Mochovce NPP 100 kilometers west of Bratislava, producing more than half the country’s electricity. Three other reactors at Bohunice were shut down in 1987 and 2006–2008 for safety reasons. (See Tables 2, 3 and 4.) Decommissioning of two of them barely commenced amid scandals about the misuse and diversion of EU funds, and decommissioning of the third, the grossly damaged Bohunice A-1 reactor, is not expected to be completed before 2070, by which time the reactor will be over 100 years old.

Two of four Russian-designed VVER V-213-type pressurized water reactors at Mochovce, construction of which started in 1987, remain incomplete. They are for sale, but are unlikely to find a buyer. In 2008 the IAEA Delayed Nuclear Power Plants Project assessed the state of the suspended Mochovce-3 and -4 units, and estimated that “construction of MO 3 and 4 reached approximately 30% completion in terms of mechanical equipment, approximately 70% completion in terms of civil works, minimal electrical work completion, and virtually zero completion on instrumentation and control” (IAEA 2008, 116).

*The Suppression of the Bohunice A-1 Nuclear Disasters*

One legacy of the secrecy that accompanied communist rule in Eastern Europe is widespread ignorance even today, three decades later, of the worst nuclear power accident sequence in Europe—a sequence that very nearly became worse even than Chernobyl. The radiation effects remain today, and the contaminated reactor is still not properly decommissioned.

According to BATAN, the first nuclear reactor built in then Czechoslovakia, the 110 MWe Bohunice A-1 gas-cooled reactor, “was closed following a non-radiation accident during re-fueling” in 1977 (Aziz 2010).<sup>4</sup> This explanation is grossly incorrect and misled the Indonesian public over a critical issue.

In 1955, the Soviet Union agreed to supply Czechoslovakia with a nuclear power reactor, and provided an experimental design KS-150-type 150 MWe reactor fueled by natural (nonenriched) uranium, cooled by carbon dioxide gas, and moderated by heavy water (Air Information Division 1960, 45). Fraternal socialist cooperation to build the

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<sup>4</sup> “Reaktor 110 MWe ini ditutup pada tahun 1977 sebagai buntut dari kecelakaan non-radiasi saat pengisian bahan bakar” (The 110 MWe reactor was shut down in 1977 in the aftermath of a nonradiation accident during refueling) (Aziz 2010).

Bohunice A-1 nuclear power plant soon ran afoul of the global politics of burgeoning socialist state hostility. Soviet authorities quickly realized that the nuclear power facilities they had provided to China were allowing China to make nuclear weapons at far greater speed than they had anticipated. Cooperation with Czechoslovakia stopped almost as soon as the first ground was broken at the Bohunice site, and according to a RAND study “the Czechs were essentially forced to finish it on their own” (Duffy 1979, 5–6). After many delays and much difficulty, including many unplanned shutdowns following accidents, the reactor, which began construction in 1956, reached full power inline on Christmas Day, 1972 (Tomčík 2007).

After four years of operation, three catastrophic accidents took place at the A-1 NPP between January 1976 and June 1978, leading to the closure of the plant in 1979, the deaths of two workers, extremely high irradiation of the primary and secondary plant circuits, and dispersal of high levels of radiation downstream of the plant. The radiation created an unquantified increased risk of cancer in the surrounding population. Here was Europe’s worst nuclear accident sequence apart from the Chernobyl disaster a decade later, but it was kept secret by the communist government then and is rarely mentioned outside the country today.

**Table 2. Slovakia, reactors in operation, April 2015**

Reactor		Type	Model	Capacity (net MWe)	Operator	NSSS Supplier	Construction start	Grid connection
Code	Name							
SK13	Bohunice-3	PWR	VVER V-213	442	SE.plc	SKODA	1976	1984
SK-14	Bohunice-4	PWR	VVER V-213	448	SE.plc	SKODA	1976	1985
SK-6	Mochovce-1	PWR	VVER V-213	436	SE.plc	SKODA	1983	1998
SK-7	Mochovce-2	PWR	VVER V-213	436	SE.plc	SKODA	1983	1999

**Table 3. Slovakia, reactors permanently shutdown, April 2015**

Reactor		Type	Capacity (net MWe)	Operator	NSSS Supplier	Construction start	Grid connection	Shut down
Code	Name							
<b>SK-1</b>	Bohunice A1	HWGCR	93	JAVYS	SKODA	1958	1972	1977
<b>SK-2</b>	Bohunice-1	PWR	408	JAVYS	AEE	1972	1978	2006
<b>SK-3</b>	Bohunice-2	PWR	408	JAVYS	AEE	1972	1981	2008

**Table 4. Slovakia, reactors under construction, April 2015**

Reactor		Type	Model	Capacity (net MWe)	Operator	NSSS Supplier	Construction start	First criticality	Grid connection
Code	Name								
SK-10	Mochovce-3	PWR	VVER V-213	391	EMO	SKODA	1987	-	-
SK-11	Mochovce-4	PWR	VVER V-213	391	EMO	SKODA	1987	-	-

**Abbreviations:**

AEE: Atomenergoexport

EMO: Electrostation Mochovce

HWGCR: Heavy water graphit-cooled reactor

JAVYS: Jadrová a vyrábacia spoločnosť [Nuclear and Decommissioning Company]

NSSS: Nuclear steam supply system

SE.plc: Slovenské Elektrárne [ENEL Group]

SKODA: Skoda Concern Nuclear Power Plant Works

VVER: Водо-водяной энергетический реактор [water-cooled, water-moderated energy reactor]

The first accident took place on January 5, 1976, ironically from a malfunction associated with what was intended by designers to be one of the Bohunice A-1 plant's great virtues—the ability to be refueled while the reactor was in operation.<sup>5</sup> Workers

<sup>5</sup> This account of the 1976 accident draws on Kuruc and Mátel (2007) and Cameron (2008).

were replacing one of the fuel assembly rods weighing four and a half tons. When the fresh fuel element was in place, an electronic indicator showed that a crucial seal was tightly secured, and power was gradually brought back up. In fact, the indicator was malfunctioning, and the new fuel element was not tightly in place. The twelve-meter-long fuel assembly shot upwards, smashed into a crane and the ceiling of the reactor hall, and shattered. Radioactive and asphyxiating carbon dioxide coolant began spilling out of the reactor vessel into the reactor hall, and “steel cubes were flying out from the cover of the reactor” (Kuruc and Mátel 2007, 270). Milan Antolík, one of the two dazed technicians present, recalled that “the noise was incredible. It was so loud—a ship’s siren was nothing compared to this. The whole building started shaking and there was just this incredible cacophony of sound” (Cameron 2008).

Antolík’s colleague, Viliam Paces, obtained a gas mask, radiation suit, and dosimeter from the control room, and returned to the reactor hall to try to stem the strong flow of gas coolant. After ten to fifteen minutes Paces was finally able to push the shattered fuel assembly away from the refueling machine and close the reactor shaft. Antolík recalled that the radiation in the reactor hall was so high that their equipment was incapable of measuring it. Two maintenance workers who were resting in a room off the reactor hall and did not respond to the alarm died of asphyxiation.

The Czechoslovak government and nuclear authorities suppressed all information about the accident, and it is only recently that full and accurate information has emerged about an accident that would have rivaled Chernobyl. Kuruc and Mátel noted that in the three decades up to their review of the accident sequence “no accessible special publication” had admitted “that the melting of the active zone of the reactor threatened during this first accident” [*sic*] (Kuruc and Mátel 2007, 270). According to Antolík, all of the coolant gas would have escaped within half an hour, with nothing to prevent the fuel rods from melting. A meltdown “would have been far worse than Chernobyl” (Cameron 2008).

Repairs and testing kept the Bohunice A-1 reactor closed until the end of 1976. After two months of operation, another accident occurred during a refueling operation, this time even more serious in its effects.<sup>6</sup> On February 22, 1977, workers loading a fresh fuel element into the reactor failed to remove silica gel covering the fuel element as a humidity absorber during transport and storage. When the fuel element was placed into

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<sup>6</sup> This account of the February 1977 accident draws on Kuruc and Mátel (2007), Burclová and Konecny (2001), and Tomčík (2007).

the reactor, the gel prevented the carbon dioxide gas from cooling the fuel rods. This resulted in overheating of the fuel assembly, heating of the coolant gas, and damage to the heavy water tank. The cladding of the fuel elements was badly damaged by heavy water saturated by carbon dioxide. The radioactive mixture of moderator and coolant leaking via corroded steam generator pipes meant that both the primary and secondary circuits, as well as the reactor hall, were highly contaminated (Burclová and Konecny 2001). Although no radiation leaked into the environment, the 1977 accident was subsequently classified as INES level 4.

The third major accident at the now disabled A-1 reactor was to have the most serious long-term consequences. The Bohunice NPP is connected to the Dudváh and Váh Rivers by the Manivier Canal. Flood control measures had been undertaken on the Dudváh below the NPP, but unsatisfactorily. In June 1978 “abnormal rainfall” fell on the NPP site, resulting in extensive flooding of parts of the plant:

A huge amount of contaminated water originated [from the plant]. The contaminated water was released subsequently into the recipient of Dudváh River and then into Vah River [sic]. In spite of increased radioactivity of the effluents no immediate countermeasures for the mitigation of consequences had to be done. Water from these rivers is used for irrigation of fields. (Kuruc and Mátel 2007, 271)

#### *Decommissioning Bohunice A-1 NPP: A 100-Year Project*

In 1979 the Czechoslovakian government decided that the Bohunice A-1 NPP was too badly damaged to consider repairing, so it closed the plant. In practice no serious decommissioning was attempted until the end of the communist period, apart from shipping undamaged fuel assemblies back to the Soviet Union. Badly damaged fuel assemblies did not return to Russia until 1999.

For financial reasons, decommissioning proper did not begin until 1995. Such limited and preliminary decommissioning as has been undertaken has resulted in even more serious contamination. The amount of radioactive waste from the Bohunice A-1 NPP, even before serious decommissioning, was of too great a volume to be stored in the designated Mochovce RAW (Radioactive Waste) National Deposit site, and was consequently stored at the Bohunice A-1 NPP. However, the on-site storage facilities for liquid radioactive waste were poorly designed and operated, with resulting “strong contamination” of soil and groundwater in the vicinity of the plant (Wuppertal Institute et al. 2006, 15).

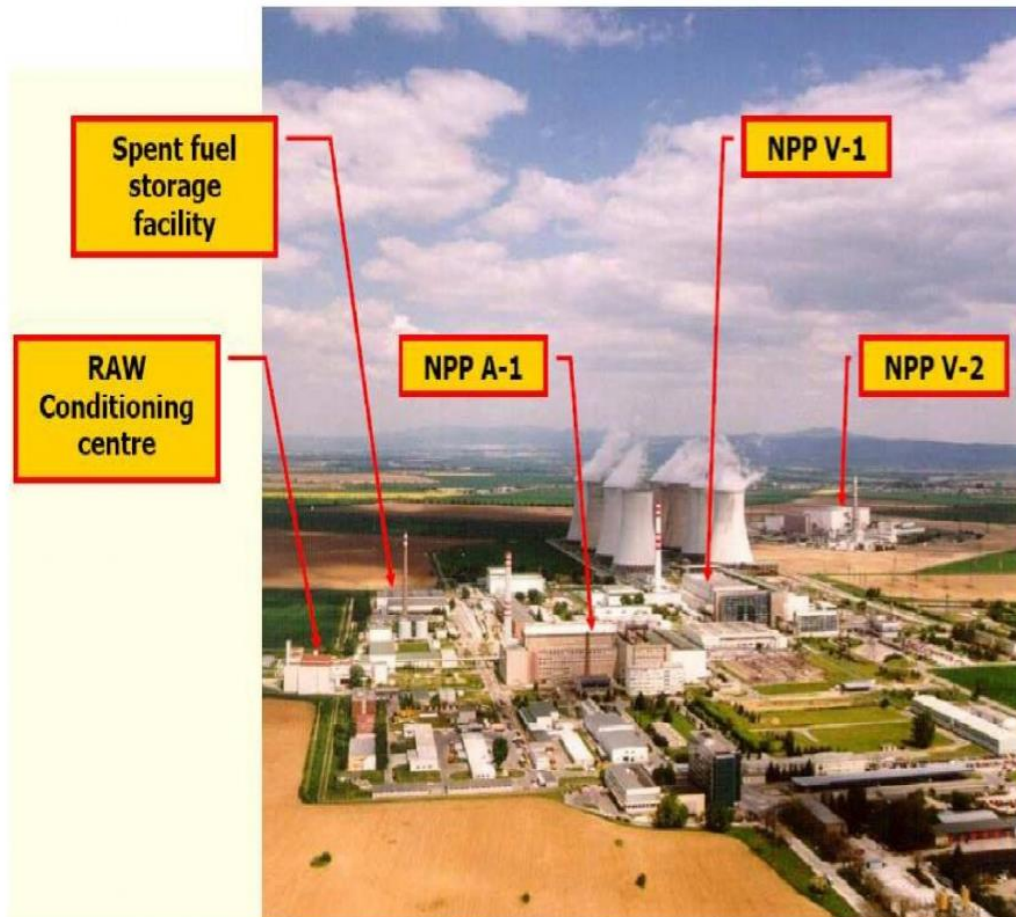


Despite almost twenty-five years of work, no firm date has been set for the completion of the A-1 NPP decommissioning. Official estimates vary, depending on the method to be chosen, between 2032 and 2067. According to Kuruc and Mátel (2007, 272–273), it will not be possible “to isolate definitively the pressure vessel and steam-generators” before 2070. By that time, the core elements of the nuclear power plant will be over a hundred years old, more than ninety years after the nuclear accident that caused their terminal irradiation. (See Figure 2.)

Bohunice’s decommissioning problems did not stop there. In the European Union accession negotiations for Slovakia, the European Commission effectively made the early closure of the outmoded and dangerous Soviet-built Bohunice-1 and -2 VVER reactors a condition of Slovakia’s entry, with Austria threatening to block Slovakia’s accession otherwise. While the EU committed €603 million (\$860 million) over the 1999–2013 period for the reactors’ decommissioning, a major portion of these funds was siphoned off to pay for the construction of Mochovce-3 and -4, leaving the Slovakian government seeking a further €425 million for the Bohunice-1 and -2 decommissioning project (*Slovenska Tlacova Agentura* 2011; Committee on Budgetary Control 2011, 10; European Bank for Reconstruction and Development n.d.).

## Figure 2. Bohunice Nuclear Power Plant – the reality

*Annotations by Kuruc and Mátel of the official publicity graphic show the A-1 NPP (shut down in 1979 following meltdown), the Bohunice-1 and -2 reactors (NPP V-1, shut down in 2006-8 as unsafe), the Bohunice-3 and -4 reactors (NPP V-2, currently operating), the spent fuel storage facility and the radioactive waste (RAW) facility (highly polluted following the A-1 accident sequence).*



Source: Jozef Kuruc and Lubomír Mátel, *Thirtieth Anniversary of Reactor Accident in A-1 Nuclear Power Plant Jaslovské Bohunice*, *Minulosť a súčasné trendy jadrovej chémie*, 2007, p. 272

### *Currently Operating Slovakian Nuclear Power Stations*

In 2013 Slovakia generated 51.7 percent of its electricity from four nuclear reactors, making it the third most nuclear-reliant country in the world after Lithuania and France. All four currently operational reactors were built by the former Czechoslovakian state-owned Skoda JS organization in cooperation with the Soviet Union's Atomenergoexport. Today they are operated by Slovenske elektrárne, which is 66 percent owned since 2004 by the Italian power giant Enel S.p.A., in which the Italian

government is the largest single shareholder (Thomas 2009a, 2009b; Schneider and Froggatt 2014).

At the time of the creation of the Slovak Republic following the breakup of Czechoslovakia, four reactors that had been under construction at the Mochovce NPP since 1983 and 1987 lay unfinished, with construction suspended for financial reasons. Slovak government hopes to resume construction on the Soviet “nuclear ghosts” faced wider concerns from the EU about the forty-three Soviet-style nuclear reactors in operation throughout Central and Eastern Europe, most of which were characterized by “design flaws, poor maintenance, and demoralized staff” (Wesolowsky 1998, 19).

For Austrians, the Slovakian reactors’ lack of an adequate modern containment structure was of particular concern. Both civil society and government responses to the plan to restart Mochovce-1 and -2 were intense and protracted—1.3 million Austrians signed a petition opposing the project. The Austrian government lobbied the European Bank for Reconstruction and Development (EBRD) to withhold financing of the project, and the bank drew up stringent conditions for the required loan. However, the Slovakian government preferred an alternative and cheaper offer from the Czech and Russian governments, including Russian finance, and signed contracts with Skoda JS, Russian Atomenergoexport, and other Czech and Russian firms to complete the two older Mochovce-1 and -2 plants. To assuage Western concerns, Framatome and Siemens were contracted to address seismic, containment, and other safety issues at a cost of more than \$2 billion (Lofstedt 2008, 2228; Van Oudenaren 2001).

Despite strong continuing protests from Austria and other Western governments about inadequacies in these redesigns, the Mochovce-1 and -2 reactors were connected to the Slovak grid in 1998 and 1999 (Wesolowsky 1998; Van Oudenaren 2001). The Austrian government described the opening of the two reactors as an “irresponsible and unfriendly act” (Lofstedt 2008, 2228). However, Austria, together with Slovakian and other European civil society groups, remained deeply concerned about the plan to complete Mochovce-3 and -4 due to the fact that the only environmental impact assessment had been a sham affair undertaken more than two decades earlier by the communist bureaucracy. In August 2008 the Slovakian Nuclear Regulatory Authority approved a revised design and promised a new environmental impact assessment, but only at the distant point when an operating license was considered (*Nucleonics Week* 2011).

Restarting the Mochovce-3 and -4 project is proving to be even more controversial and difficult for Slovenské elektrárne than restarting the Mochovce-1 and -2 units in the late 1990s. By early 2014, Enel decided that its investment in Slovenske elektrárne faced overwhelming problems, especially in completing construction of Mochovce-3 and -4, where projected costs had jumped to more than \$5 billion. Facing limited prospects of recovering costs through electricity export, Enel announced its intention to sell its 66 percent interest in Slovenske elektrárne (Schneider and Froggatt 2014; Bauerova and Tomek 2015).

*“The Octopus”: Slovakian Corruption and the Nuclear Industry*

One particular aspect of postcommunist Slovakia has a special resonance and salience for Indonesia: widespread enduring corruption. The transition from communism in Slovakia, especially following the country’s separation from the Czech Republic, yielded quite mixed results (Klimovský 2009). Widely acknowledged systemic corruption was a central issue in the 2010 fall of the left coalition government led by Prime Minister Robert Fico (*press europ* 2010). After a period of limited improvement, Slovakia’s rating in Transparency International’s Corruption Perceptions Index worsened in the last years of Fico’s administration. The organization’s spokesperson attributed this decline to “non-transparent public procurement processes carried out by Robert Fico’s government, the lack of will to close loopholes in the law, and problems in the judiciary. He added that a poor political culture and a lack of systematic measures in the struggle against corruption didn’t help either” (*Slovak Spectator* 2010).

The subsequent center-right government of Prime Minister Iveta Radicova moved quickly to introduce radical measures to address the problem. A cabinet anticorruption strategy document reportedly stated that “corruption is a widespread form of criminality in Slovakia,” and referred to both endemic minor everyday forms and major abuses of public office (Terenzani-Stanková 2011, 15). Radicova was under few illusions about the degree of difficulty involved: “Corruption is an octopus, a spider’s web that tangles up not just Slovakia. . . . It would be naive to rely solely on individual change when [corruption] has slowly become a systemic element in this country” (Terenzani-Stanková 2011, 15).

Corruption is endemic in almost all of the former European communist states. Slovakia has long been seen by analysts of corruption as having “a high degree of state capture,” defined as “the capacity of vested interests to shape government policy

(including regulatory agencies and the judiciary) through illicit and non-transparent methods.” State capture is accompanied by “the grabbing hand,” “by which the state officials generate excessive regulations to increase their bribe income” (Hellman and Schankerman 2000, 548).

The Slovakian nuclear industry resisted the transition from the incompetent and wholly opaque communist regulatory regime to the era engendered by the conditionality requirements for access to the European Union. A study of postaccession compliance with these requirements showed that backtracking and “institutionalisation for reversibility” (pre-accession planning for subsequent postaccession reversal) was widespread in Slovakia (Pridham 2008). This postaccession regression left the Slovakian regulatory regime “technically weak and politically cowed.” More worrying still, Van Oudenaren argued, the return of the Russian nuclear industry to Slovakia via the takeover of Skoda JS “meant that domestic opponents of Western conditionality in Bulgaria and Slovakia (although to a far lesser extent in Lithuania) had external sources of psychological and material support in resisting conditionality” (Van Oudenaren 2001, 489).

There is as yet no direct evidence of corruption in the Slovakian nuclear industry, unlike in neighboring Bulgaria and in Lithuania and Russia itself, but it would be foolish to expect the nuclear power industry to be wholly exempt from the “octopus” strangling probity standards in all other parts of the Slovakian political and economic system (Tanter 2013). However, industry-government collusion in weakening nuclear safety standards or evading regulation is undoubtedly substantial in Slovakia.

The corruption and collusion facilitating this Slovakian backsliding from the nuclear regulatory standards of the accession conditionality process were starkly evident in the environment ministry’s faux environmental impact assessment process for the restarting of construction of Mochovce-3 and -4 NPPs—to the point where the EU’s Aarhus Compliance Committee condemned the assessment for lack of transparency (Zlatnanska 2010). The consequences of such nuclear industry-government collusion in the Japanese case were devastating in the accident cascade at Fukushima Daiichi NPP. Comparable results in Slovakia have yet to be seen, but the existing evidence points in that direction.

## **Slovakian “Inspirasi” and Indonesian Reality**

In contrast to the benign image of Slovakian nuclear power offered to Indonesian citizens by BATAN, the reality of nuclear power in Slovakia is thus one of disaster, early shutdowns, delay, cost escalation, financial scandal, and an uncertain future. That BATAN should promote Slovakian nuclear power as a model for Indonesian nuclear power can only be considered misleading or worse when the facts are considered. What is more surprising, and much more serious, is that the foreign ministry should have allowed itself to become involved in this attempt by BATAN, in alliance with the governor of Babel, to pressure Indonesian energy policy in a nuclear direction using such a flimsy fantasy as a vehicle.

How then is the Slovakian connection to be explained? Could Slovakian companies actually participate in the construction of an Indonesian nuclear power station, were one ever to be built? The leading Slovakian industrial partner in the Bangka discussions was the privatized former state Nuclear Power Plant Research Institute VUJE, based largely on its experience with Russia’s AtomStroyExport in the modernization of Mochovce-3 and -4. VUJE described its Mochovce-3 and -4 role in terms of development of “safety concepts, feasibility studies and other safety documentation related to the enhancement of nuclear safety and operational reliability of power installations” (VUJE n.d.) These are essentially minor ancillary functions in an NPP construction.

The owner of Slovakian NPPs already operating and nearing completion is Slovenske elektrárne, now majority-owned by the Italian government through Enel. In the aftermath of the Fukushima accident series and the Italian referendum rejecting the return of nuclear power in that country, Enel’s plans for recovery of corporate capacity for nuclear construction rested largely on its collaboration with EDF Energy in joint construction of the beleaguered Flamanville-3 European Pressurized Reactor (EPR) NPP in France (Thomas 2009b). Due to severe construction delays and cost increases, Enel withdrew from the EPR project in 2012 (*Nuclear Engineering International* 2011; *Power* 2012). Enel would be an implausible contender for nuclear technology export to Indonesia.

In other words, the fundamental fact, never mentioned by BATAN at any stage in the whole three-year episode, was that at no stage was there ever a Slovakian nuclear manufacturer to fulfil the role of “inspiration” and “mentor.”

From an Indonesian perspective at the time, however, the public presentation of a Slovakian nuclear investment or mentoring role looked rather different. First, the Indonesian public was unlikely to know much about Slovakia, its nuclear industry, and its history in particular. Certainly no serious investigation of Slovakia's nuclear record has been published in the Indonesian media. Enthusiastic support of the Slovakian nuclear link from the head of BATAN, the Indonesian ambassador to Slovakia, and the governor of Babel was reported at face value, as were the claims by the Slovakian hosts of the Indonesian nuclear study delegation in December 2010. In other words, pro-nuclear groups in Jakarta and Babel were able to invoke a benign Slovakian "model" without fear of contradiction.

Second, Slovakian nuclear industrial interests may have been functioning as a stalking horse for Russian nuclear export ambitions in Indonesia. The long-running Czechoslovakian nuclear relationship with the former Soviet Union was a complex one, with negative aspects such as the Soviet abrogation of support for the A-1 NPP, leading to great design and manufacturing difficulty for the Czechoslovakian side, and ultimately disaster. But at the same time, Soviet provision of design and manufacturing assistance for the much larger fleet of VVER pressurized water reactors in the former Czechoslovakia was the foundation of the Slovak and Czech energy systems today, with enduring deeply layered institutional, financial, and personal connections with contemporary Russia.

The sale of Skoda JS to the OMZ group consolidated those Russian connections (Skoda JS 2004). Russia's Rosatom has been successful in obtaining a contract to build Vietnam's first nuclear power reactor (*World Nuclear News* 2014). It has also played a prominent part in promoting the renewed closeness between Indonesia and Russia that emerged during Vladimir Putin's presidency, culminating in an agreement between him and Indonesian president Yudhoyono "to develop two major bilateral strategic initiatives focused on space and nuclear projects" (Muraviev and Brown 2008, 19–20).

But all in all, the Slovakian connection was a chimera at best, and a deliberate deception at worst, amounting to little more than a tool for elites in Jakarta and Bangka-Belitung to use in their maneuvering to build a coalition between national and provincial political levels. The ultimate purpose of some parties in this coalition may have been to build a nuclear power plant, but that notional goal was in fact subordinate to more immediate objectives of securing funding—for BATAN's organizational survival, for "socialization" or top-down public education on nuclear power, and for a Bangka NPP

feasibility study or at least preliminary studies designed to keep the prospect of construction of a nuclear power plant alive in Indonesia.

The idea that Slovakia would provide a model for development of a nuclear project on Bangka was always absurd, but almost never questioned. Proponents of the Slovakian inspiration for a Bangka nuclear power project circulated a great deal of erroneous information about Slovakia's nuclear industry and its history. Mostly these were errors of omission—simply not telling an Indonesian audience about the ongoing troubles of the industry, the nuclear scandals associated with the conditions of entry into the European Union, and especially Slovakian nuclear accidents.

Misinformation may have shifted into official disinformation on the matter of the enduring consequences of the 1976–1978 Bohunice A-1 NPP accidents, for here was a clear official government agency attempt to mislead Indonesian citizens. The Slovakian connection, as presented by the two key Indonesian players, BATAN and the provincial government of Babel, worked as a kind of discursive camouflage or smokescreen in an attempt to legitimize the Bangka NPP proposal and deflect informed scrutiny. More importantly still, it deflected attention from the political and financial maneuverings of both the Bangka shadow state and the bureaucratic entrepreneurs in BATAN, eliminating the need for impartial and transparent assessment of proposals for nuclear power in Bangka or elsewhere in Indonesia.

BATAN is a permanently failing organization that survives, but in a manner that does not meet the interests of the Indonesian public and its legislators by providing reliable, accurate, and comprehensive information about its NPP proposals. In place of transparency and concern for institutional and regulatory integrity in its mandated pursuit of the construction of Indonesia's first nuclear power plant, BATAN indulges in murky deals with some of the global nuclear industry's bottomfeeders.

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