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ANALYSING "SUPPLIER LIABILITY" UNDER SHANTI BILL 2025: A CASE STUDY ON SMALL MODULAR REACTORS

Pragati Kumar[1]

ABSTRACT

Nuclear energy sits at the heart of India's long-term decarbonisation bet, and the country's 2047 target of 100 GW of installed nuclear capacity has given Small Modular Reactors (SMRs) grave importance.

What makes this transition legally interesting is the SHANTI Bill, 2025, the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India Bill, which combines the Atomic Energy Act, 1962 and the Civil Liability for Nuclear Damage Act (CLNDA), 2010 into one consolidated statute and, in doing so, fundamentally rewrites how financial responsibility is shared between nuclear operators and their equipment vendors. In its place sits a graduated, capped system of operator liability, calibrated to attract the private investors and foreign original-equipment manufacturers who had long regarded Indian nuclear projects as commercially treacherous ground.

This paper takes up three problems the Bill creates. The first is whether a capped-liability model can be reconciled with the absolute-liability doctrine the Supreme Court established in *M.C. Mehta v. Union of India*, A.I.R. 1987 S.C. 1086. The second is what the graded financial architecture actually means for the people most at risk, the potential victims of a nuclear accident.

The third is the troubling constitutional reach of Section 87's "notwithstanding" clause, which purports to override all other statutes. Throughout, the paper also examines how international partnerships with Russia, the United States, France, and South Korea shape both the opportunity and the constitutional obligation that the SMR programme carries.

Objectives of the Study

1. To examine the SHANTI Bill 2025 as a legal instrument governing SMR deployment.

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2. To critically assess the procurement model India has chosen for SMR rollout.

3. To evaluate how international technology-transfer partnerships shape India's nuclear liability exposure.

Keywords: SHANTI Bill 2025; Small Modular Reactors (SMRs); Supplier Liability; Environmental Jurisprudence; Privatisation of Nuclear Risk

Introduction

Two scientists gave India's nuclear programme its foundational logic. Dr. Homi J. Bhabha convinced Jawaharlal Nehru, shortly before independence, that mastery of atomic energy was non-negotiable for a country with India's resource base and strategic ambitions. Dr. Vikram Sarabhai went further, sketching out the famous three-stage thorium cycle, a plan that, if fully executed, would make India energy-independent for generations. The first legislative step came quickly, when the Atomic Energy Act, 1948 was passed within three years of independence, creating the Atomic Energy Commission (AEC). By 1956, the research reactor Apsara was operating at BARC in Trombay and, by 1969, the Tarapur station was feeding electricity to the grid commercially. Then came the rupture. India's 1974 test, Smiling Buddha, a so-called "Peaceful Nuclear Explosion" run on plutonium from the CIRUS reactor shattered its agreements with Canada overnight, producing sanctions, a technology embargo, and years of enforced isolation. India's response was to turn inward, concentrating on domestically produced Pressurized Heavy Water Reactors that could run on natural uranium without imported fuel. That isolation hardened after the 1998 Pokhran-II tests, when Prime Minister Atal Bihari Vajpayee declared India a nuclear-armed state.[2]

It is worth pausing here to appreciate the analytical lens that scholars have applied to what came next, the 2008 India-US civil-nuclear deal. The Poliheuristic framework,[3] which models foreign-policy decisions as a two-stage filter, fits remarkably well. In the first stage, Prime Minister Manmohan Singh's government simply ruled out anything that would tear apart the ruling coalition. Only then, among the politically survivable options, did they choose the US arrangement for what it offered strategically, i.e., access to advanced fuel and technology, an end to India's diplomatic quarantine, and a long-range energy security dividend that no domestic alternative could match. The US Congress had already smoothed the path through the Hyde Act, 2006, which carved out legal space for Washington to share civilian nuclear material and expertise with New Delhi without triggering its standard non-proliferation trip-wires. The Nuclear Suppliers Group (NSG)[4] followed with a historic exemption in 2008, opening India to the full global nuclear trade

[2]Rajesh Rajagopalan, *India's Nuclear Policy* (2009), https://www.nids.mod.go.jp/english/event/symposium/pdf/2009/e_06.pdf (last visited Feb. 7, 2026).

[3]K.P. Vijayalakshmi, *Poliheuristic Theory and Indian Foreign Policy Decision Making: Applicability and Limits*, 31 Glob. Soc'y 199, 201 (2017).

[4]The Nuclear Suppliers Group (NSG), formed in 1978, operates as an informal multilateral coalition of nuclear-exporting nations whose shared purpose is curbing weapons proliferation through coordinated export controls.

market.[5] By October 2013, the practical result was visible, wherein the first 1,000 MWe Russian VVER unit at Kudankulam was supplying power to the national grid.

What drives the renewed urgency around nuclear today is a collision of two pressures. India's greenhouse-gas footprint is growing fast, the energy sector alone accounted for nearly 68.7 per cent of national emissions in 2014, and the share has increased since.[6] Meanwhile, coal's dominance of the generation mix is both a climate liability and, increasingly, an economic one. Nuclear power, dense, low-emission, and dispatchable, offers a credible answer,[7] though one that brings its own formidable technical, political, and financial complications.[8] There is also growing interest in pairing nuclear baseload with variable renewables in hybrid configurations[9] that could address grid stability concerns and energy security simultaneously.[10]

Under the ambit of a specific target i.e. 100 GW of nuclear capacity by 2047, the Department of Atomic Energy's budget has grown 170 per cent since 2014, and the 2025-26 Union Budget earmarked ₹20,000 crore specifically for the indigenous development of at least five Bharat-SMRs by 2033.[11] Parliament's vehicle for enabling all of this is the SHANTI Bill,[12] which received presidential assent in December 2025. Its SMR scope runs from 16 MW to 300 MW, with thorium deployment. India holds roughly 21 percent of world reserves[13][14][15] as the eventual horizon. The Bill additionally aligns domestic law with the Convention on Supplementary Compensation for

[5]Vitaly Fedchenko, *Nuclear Energy, Peaceful Uses*, in *Max Planck Encyclopaedia of Public International Law* (July 2021).

[6]India's energy sector contributed 68.7% of domestic greenhouse-gas output in 2014; by 2016 that share of global GHG emissions had climbed to 73%, and the trajectory remains upward.

[7]Centre for Land Warfare Studies (CLAWS), *A Case for Expanding Nuclear Energy in India*, https://claws.co.in/a-case-for-expanding-nuclear-energy-in-india/ (last visited Feb. 7, 2026).

[8]Id.

[9]S. Suman, *Hybrid Nuclear-Renewable Energy Systems: A Review*, 181 J. Cleaner Prod. 166, 168 (2018).

[10]A. Garg et al., *Synchronizing Energy Transitions Toward Possible Net Zero for India: Affordable and Clean Energy for All* (Power Sys. Analysis Grp. 2024).

[11]Dep't of Atomic Energy, *Nuclear Power in Union Budget 2025–26*, Press Information Bureau (Feb. 3, 2025), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2099244 (last visited Jan. 29, 2026).

[12]Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India Bill, Bill No. 196 of 2025, Lok Sabha (India) (2025).

[13]OECD Nuclear Energy Agency, *Small Modular Reactors: Challenges and Opportunities* 12 (2021), https://www.oecd-nea.org/upload/docs/application/pdf/2021-03/7560_smr_report.pdf (last visited Jan. 28, 2026).

[14]Press Information Bureau, *India Targets 100 GW Nuclear Energy by 2047, Opens Sector to Private Players* (Mar. 27, 2025), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2115857&reg=3&lang=2 (last visited Jan. 29, 2026).

[15]OECD Nuclear Energy Agency, *SMRs: Challenges & Opportunities*, supra note 12, at 38.

Nuclear Damage (CSC),[16] complementing the Draft National Electricity Policy 2026[17] which champions precisely these advanced nuclear technologies. NTPC's recent membership of the World Nuclear Association[1819] signals that the drive is spreading beyond the specialist agencies. According to the National Electricity Plan,[20] 6,600 MW is already under construction targeting commissioning in 2029–30,[21] with another 7,000 MW in the pipeline. The flagship near-term project, the 4×700 MW Mahi Banswara Rajasthan Atomic Power Project (MBRAPP) is targeting its first unit for testing by FY 2032–33.[22]

Critical Analysis of the SHANTI Bill 2025

To understand what the SHANTI Bill changes, one has to appreciate just how badly the previous regime had broken down. India's nuclear liability law found its statutory home in the Atomic Energy Act, 1962,[23] but the regime was substantially rebuilt by the CLNDA in 2010.[24] Section 17(b) of that statute[25] handed NPCIL, as the usual operator, a right to pursue suppliers in court whenever a nuclear incident could be traced to defective or substandard equipment. That single provision transformed India's nuclear market. Leading foreign OEMs, including Rosatom and Westinghouse, publicly labelled Indian contracts unbankable. Moreover, the Absolute Liability doctrine from *M.C. Mehta v. Union of India* (1987),[26] holding that an enterprise engaged in a

[16]Gurmanpreet Kaur, *Nuclear Energy Law in India: An Analysis of Environmental Perspective* 45 (2021), https://docs.manupatra.in/newsline/articles/Upload/A4A3C2EC-3ADC-4524-BCB5-EE0F6350C5A3.pdf (last visited Feb. 3, 2026).

[17]Ministry of Power, Gov't of India, *Draft National Electricity Policy 2026*, https://powermin.gov.in/sites/default/files/webform/notices/Seeking_comments_on_Draft_National_Electricity_Policy_2026.pdf (last visited Jan. 29, 2026).

[18]Indian Government Releases Draft Energy Policy, *World Nuclear News* (Jan. 27, 2026), https://world-nuclear-news.org/articles/indian-government-releases-draft-energy-policy (last visited Jan. 28, 2026).

[19]World Nuclear Association, *NTPC Joins World Nuclear Association as India Energy Week Features First Nuclear Zone* (Jan. 27, 2026), https://world-nuclear.org/news-and-media/press-statements/ntpc-joins-world-nuclear-association-as-india-energy-week-features-first-nuclear-zone (last visited Jan. 31, 2026).

[20]Ministry of Power, Gov't of India, *From Power Deficit to Power Sufficient* (Jan. 29, 2026), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2220087&reg=3&lang=1 (last visited Jan. 29, 2026).

[21]Id.

[22]Press Information Bureau, *NTPC Plans Setting Up of Nuclear Power Projects* (Feb. 5, 2026), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2223660&reg=3&lang=1 (last visited Feb. 7, 2026).

[23]Atomic Energy Act, No. 33 of 1962, Acts of Parliament (India).

[24]Civil Liability for Nuclear Damage Act, No. 28 of 2010, Acts of Parliament (India).

[25]Id. § 17(b).

[26]M.C. Mehta v. Union of India, A.I.R. 1987 S.C. 1086 (India).

hazardous activity owes unlimited compensation with no defences, made the exposure theoretically infinite.

Under the SHANTI Bill's operator liability is now capped at ₹100 crore for SMRs rated up to 150 MW, rising to ₹300 crore for units between 150 MW and 750 MW.[27] The penalty framework runs from ₹50,000 for "minor" breaches up to ₹1 crore for those classified "severe".[28] These numbers restore the bankability that the CLNDA destroyed, hereinafter, private OEMs can price their risk, and insurers can guarantee assurance. Concomitantly, what these caps actually do is socialise the catastrophic tail. Once damages breach the statutory ceiling, the Central Government absorbs everything above it. Profit is privatised, disaster is nationalised. The Supreme Court's insistence in *Charan Lal Sahu v. Union of India* (1990)[29] that industrial compensation must be "just and sufficient" sits uncomfortably with liability thresholds calibrated to attract investment rather than to make victims whole. A nuclear accident is not modular, whatever the size of the reactor that caused it.[30]

Section 87's "notwithstanding" clause sharpens the constitutional tension. By giving the SHANTI Bill overriding force against all other statutes, it directly displaces the polluter-pays principle,[31] a norm the Supreme Court elevated to constitutional status in *Vellore Citizens Welfare Forum v. Union of India* (1996).[32] That case held the entity responsible for generating an environmental hazard must bear the remediation cost.[33] In the SMR context, where the vendor designs and is accountable for the sealed reactor core, the Bill's removal of supplier recourse means the most likely cause of any latent design failure is legally insulated, therefore, all liability channels instead to the operator.[34]

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[27]Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Bill, Bill No. 196 of 2025, Sch. 2 (India, Dec. 19, 2025), https://prsindia.org/files/bills_acts/bills_parliament/2025/Sustainable_Harnessing_and_Advancement%20of_Nuclear_Energy_Bill,2025.pdf (last visited Jan. 29, 2026).

[28]Id. Sch. 1.

[29]Charan Lal Sahu v. Union of India, A.I.R. 1990 S.C. 1480 (India).

[30]Maitra Varun Chotia, *The SHANTI Bill, 2025: Privatising Nuclear Risk—Liability Caps, Regulatory Bypass, and the Erosion of Environmental Safeguards in India*, 6 Int'l J. Rsch. Publication & Revs. 7309, 7315 (2025), https://ijrpr.com/uploads/V6ISSUE12/IJRPR58118.pdf (last visited Jan. 31, 2026).

[31]Nicolas de Sadeleer, *The Polluter-Pays Principle* 23 (Oxford Univ. Press 2020).

[32]Anika Ballal & Lekhana Wesley, *Case Analysis: Vellore Citizens Welfare Forum v. Union of India*, 5 Ind. J. Integrated Rsch. L. 1700, 1703 (2025).

[33]Vellore Citizens Welfare Forum v. Union of India, A.I.R. 1996 S.C. 2715 (India).

[34]Id.

What is troubling about this is not the policy choice alone but its constitutional durability. In the case of, *G. Sundarrajan v. Union of India* (2013)[35] it is made clear that any liability cap must yield to the Article 21 right to life. Whether Parliament has struck the right balance here, between the investment imperative and constitutional duty of care, is a question the courts will ultimately have to answer.[36]

India's Approach to SMR Procurement

The procurement model India has chosen for SMR rollout reflects a deliberate hybrid logic. The Nuclear Energy Mission[37] structures the programme as a public-private partnership where private entities bring three things to the table, land, cooling-water access, and capital. NPCIL, by contrast, retains everything that touches the reactor itself, design authority, quality assurance, operational control, and long-term maintenance responsibility. This division of roles is not incidental, it is designed to let private investors carry construction-phase financial risk while the state retains the technical liability that still attaches to nuclear operation.

On the reactor-design side, BARC leads the indigenous effort, concentrating its engineering resources on Pressurized Water Reactor-based SMR architectures.[38][39] Two programmes define the near-term pipeline. The 200 MWe Bharat Small Modular Reactor (BSMR-200) is the larger of the two, intended for applications that include repowering retiring coal stations. The 55 MWe SMR-55 targets remote and off-grid locations that transmission economics make impractical to serve by other means.[40] BSMRs are not new reactor types, they are cost-optimised adaptations of proven PHWR technology, upgraded for modular deployment. The globally promoted category, are new-generation miniaturised reactors engineered for factory fabrication and standardised assembly at site. The "Atma-nirbhar" drive applies to both tracks, directing BARC and its public-sector

[35]G. Sundarrajan v. Union of India & Ors., 2013 A.I.R. S.C.W. 4019 (India).

[36]Nupur Chowdhury, *Environmental Risk Regulation and the Indian Supreme Court: An Exercise in de-Formalisation of the Law?*, 17 J. Risk Rsch. 71, 79 (2013).

[37]Dep't of Atomic Energy, *Parliament Question: Nuclear Energy Mission* (Dec. 4, 2025), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2198953&reg=3&lang=2 (last visited Mar. 3, 2026).

[38]SMRs carry higher installation costs but substantially lower operating expenses relative to coal-fired plants, as refuelling needs are minimal. India's net-zero-by-2070 ambition depends in part on installing forty to fifty such reactors within the decade.

[39]Dep't of Atomic Energy, *Nuclear Power in Union Budget 2025–26*, supra note 10.

[40]BSMRs adapt existing Pressurized Heavy Water Reactor designs for modular cost-efficiency, whereas true SMRs are purpose-built miniaturised reactors assembled from factory-standardised components for flexible siting and output.

partners to produce coolant pumps, heat exchangers, control electronics, and other critical components domestically. The ambition is real, but of roughly eighty SMR designs active globally, credible analysts project fewer than ten will reach commercial scale,[41] which means technology selection is not merely an engineering question but a strategic one.[42]

The commercial mechanics work through EPC (Engineering, Procurement, and Construction) contracts that give private firms an equity interest in construction while NPCIL retains the operating licence, a structure that aligns incentives without surrendering regulatory control. Hard-to-abate industries are additionally incentivised to take ownership of SMR-generated electricity, helping them manage the carbon costs that an eventual national pricing scheme will impose. Fiscal policy reinforces this through, the Union Budget 2026-27[43] by extending the zero-customs-duty concession on nuclear imports through 2035,[44] reducing the upfront cost of technology transfer. The AERB's integrated management framework keeps all this within a regulatory perimeter, this entails that SMRs must satisfy the same technical standards as their large-reactor counterparts, regardless of their power output.[45] Commercial contracts with firms like EIL and BHEL, along with NPCIL and NTPC MoUs with state governments for pilot projects,[46] suggest that the supply-chain ecosystem, though nascent, is already taking shape.

Strategic International Partnerships Driving India's SMR Procurement and Deployment

India's multi-partner acquisition strategy for SMR technology is not accidental. It reflects a considered judgment that no single vendor relationship can supply everything the country needs, including technology breadth, fuel security, training capacity, and geopolitical balance since the dependence on any one partner carries strategic risk. So the architecture is deliberately pluralist. Russia has been the longest-standing partner and remains the most deeply embedded. DAE and

[41]J.K. Nøland, M. Hjelmeland & C. Hartmann, *Overview of Small Modular and Advanced Nuclear Reactors and Their Role in the Energy Transition*, 40 IEEE Trans. Energy Conversion 1933, 1937 (2025).

[42]R.B. Grover, *Nurturing Nuclear Power in India*, 128 Current Sci. 3240, 3242 (2025).

[43]N. Sitharaman, *Union Budget 2026: Zero Customs Duty for Nuclear Power Imports till 2035*, Bus. Standard (Feb. 1, 2026), https://www.business-standard.com/budget/news/nuclear-push-in-union-budget-2026-why-customs-duty-has-been-scrapped-126020100545_1.html (last visited Feb. 1, 2026).

[44]Press Information Bureau, *Summary of Union Budget 2026–27* (Feb. 1, 2026), https://static.pib.gov.in/WriteReadData/specificdocs/documents/2026/feb/doc202621776101.pdf (last visited Feb. 1, 2026).

[45]Dep't of Atomic Energy, *Parliament Question: Nuclear Safety and Security* (Jan. 29, 2026), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2220195&reg=3&lang=1 (last visited Feb. 1, 2026).

[46]Dep't of Atomic Energy, *Parliament Question: Financial and Operational Structures for SMR Deployment* (Dec. 10, 2025), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2201523&reg=3&lang=2 (last visited Jan. 29, 2026).

Rosatom are working to localise Russian-designed VVER-SMR production within India, explore floating nuclear plant applications, and extend fuel-cycle collaboration into enrichment and reprocessing.[47] Perhaps the most striking recent development was the April 2025 MoU between MAHAGENCO and Rosatom for a thorium-based SMR under the "Make in Maharashtra" initiative, a deal that explicitly commits to domestic manufacturing and AERB compliance.[48] The United States brings a complementary, and in some ways more commercially advanced technologies. The COMPACT programme authorises the transfer of Holtec's SMR-300 design to India for a decade under 10 CFR 810 export controls,[49] with Holtec partnering alongside Larsen & Toubro and Tata Consulting Engineers to build reactors targeted at coal-plant retirement sites.[50] The US-India TRUST initiative (formerly iCET),[5152] operating at the level of heads-of-government agreement, institutionalises cooperation on next-generation energy and defence technology well beyond any individual reactor deal. France's EDF has broadened its India partnership to span joint SMR design work, technology-transfer commitments, and specialised engineering training, an arrangement that covers the full technical lifecycle from design through operations.[5354] South Korea's contribution, through Doosan Enerbility and Samsung C&T, is concentrated on the

[47]Dep't of Atomic Energy, *Parliament Question: Agreements with Russia's ROSATOM* (Dec. 3, 2025), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2198342&reg=3&lang=1 (last visited Jan. 29, 2026).

[48]Maharashtra Signs MoU with Russia's ROSATOM to Develop Thorium-Based Small Modular Reactor, *Econ. Times* (Apr. 11, 2025), https://economictimes.indiatimes.com/industry/energy/power/maharashtra-signs-mou-with-russias-rosatom-to-develop-thorium-based-small-modular-reactor/articleshow/120208725.cms?from=mdr (last visited Jan. 29, 2026).

[49]U.S. Dep't of Energy, *Transfers of Civil Nuclear Technology* 8 (Apr. 30, 2020), https://www.energy.gov/sites/prod/files/2020/04/f74/Final%20-%20EXEC-2019-000810%20Transfers%20of%20Civil%20Nuclear%20Technology%20Report.pdf (last visited Jan. 29, 2026).

[50]Aditya Ramji, *A Blueprint to Advance the U.S.–India Energy Security Partnership* (Observer Rsch. Found., May 19, 2025), https://www.orfonline.org/research/a-blueprint-to-advance-the-u-s-india-energy-security-partnership/ (last visited Jan. 29, 2026).

[51]*India – U.S. Joint Statement* (Feb. 13, 2025), https://www.psa.gov.in/icet (last visited Jan. 29, 2026).

[52]*U.S.–India TRUST Initiative (Formerly iCET)* (Feb. 13, 2025), https://www.mea.gov.in/bilateral-documents.htm?dtl/39066 (last visited Jan. 29, 2026).

[53]Ministry of External Affairs, Gov't of India, *Frequently Asked Questions on the India–U.S. Agreement for Co-operation Concerning Peaceful Uses of Nuclear Energy* (2008), https://www.mea.gov.in/Uploads/PublicationDocs/19149_Frequently_Asked_Questions_01-11-2008.pdf (last visited Jan. 31, 2026).

[54]Ministry of External Affairs, Gov't of India, *Horizon 2047: 25th Anniversary of the India–France Strategic Partnership, Towards a Century of India–France Relations* (July 14, 2023), https://www.mea.gov.in/bilateral-documents.htm?dtl/36806 (last visited Jan. 31, 2026).

Korean SMART reactor design and involves both joint R&D and investment commitments with Indian developers.[55]

There are real vulnerabilities in this landscape, and they deserve candid acknowledgement. The most acute is China's rapid SMR development programme. American officials have flagged the prospect of Chinese floating reactors near Indian Ocean territories as a regional security risk.[56] Fuel security presents a different kind of exposure, for this reason, India signed a US$2.8 billion uranium supply contract with Canada's Cameco in late 2025,[57] a necessary hedge against the supply concentration risks that come with heavy dependence on Russian fuel. Domestically, the private supply chain is beginning to consolidate. Adani is developing a 1,600 MW project in Uttar Pradesh, additionally, engineering majors L&T,[58] Megha Engineering,[59] MTAR, and Walchandnagar[60] are positioned as Tier-1 component suppliers. BARC's continued design work on the BSMR-200 and SMR-55, combined with the engineering contracts awarded to EIL and BHEL, indicate a domestic manufacturing capability that is genuinely growing, even if it has not yet been tested at commercial scale.

prospective loss of US contributions following its announced UNFCCC withdrawal) with in-fighting between non-annex-I parties represent a failure to operationalize CBDR-RC in practice.

[55]CSDR, *India–South Korea Partnership on SMRs: Tapping into Strategic Potential for Clean Energy* (Aug. 1, 2025), https://csdronline.com/blind-spot/india-south-korea-partnership-on-smrs-tapping-into-strategic-potential-for-clean-energy/ (last visited Jan. 30, 2026).

[56]Basant S. Sanghera, *China Is Wasting No Time in the Small Reactor Great Game—India Must Act Fast, Work with US*, The Print (June 11, 2024), https://theprint.in/opinion/china-is-wasting-no-time-in-the-small-reactor-great-game-india-must-act-fast-work-with-us/2125908/ (last visited Jan. 29, 2026).

[57]*India, Canada Close to Seal $2.8 Billion Uranium Deal: Report*, Econ. Times (Nov. 25, 2025), https://economictimes.indiatimes.com/industry/indl-goods/svs/metals-mining/canada-close-to-uranium-deal-with-india-worth-2-8-billion-report/articleshow/125554409.cms?from=mdr (last visited Jan. 30, 2026).

[58]Subramanian Sarma, *L&T Gears up for Nuclear Entry, to Focus on Small Modular Reactors*, Bus. Standard (June 2, 2025), https://www.business-standard.com/companies/news/l-t-gears-up-for-nuclear-foray-to-focus-on-small-modular-reactors-125060100393_1.html (last visited Jan. 31, 2026).

[59]*Megha Engineering Receives India's First Private-Sector Nuclear Power Order*, Econ. Times (Apr. 23, 2025), https://economictimes.indiatimes.com/industry/indl-goods/svs/engineering/megha-engineering-receives-indias-first-private-sector-nuclear-power-order/articleshow/120554471.cms?from=mdr (last visited Jan. 28, 2026).

[60]*Not Adani or Tata: The 2 'Underdog' Engineering Firms Building India's Nuclear Energy Core*, Fin. Express (Jan. 26, 2026), https://www.financialexpress.com/market/stock-insights/not-adani-or-tata-the-2-underdog-engineering-firms-building-indias-nuclear-energy-core/4118908/ (last visited Feb. 4, 2026).

Conclusion

International OEMs that previously walked away from India's nuclear market now have a liability framework they can model, and private investors have a statutory structure they can work within. However, a fixed liability ceiling that may prove wholly insufficient to compensate victims of a major accident, leaving the national government to absorb the residual, remains a constitutional question. The absolute-liability doctrine of *M.C. Mehta* and the polluter-pays logic of *Vellore Citizens Welfare Forum* are not merely common-law principles, they are expressions of Article 21, i.e., the right to life. Against that legal complexity, the operational picture is considerably more encouraging. India's domestic R&D programme, rooted in decades of PHWR engineering, gives the Bharat-SMR initiative genuine technical credibility. The 123 Agreement with the United States, the Rosatom thorium partnership, the Cameco uranium supply deal, EDF's training commitments, and the South Korean SMART collaboration collectively diversify India's technology base in ways that reduce dependence on any single partner. The Union Budget 2026-27 reinforced political commitment by raising nuclear research allocations by 113 per cent to ₹1,977.20 crore.[61] If the legislative, industrial, and diplomatic threads of this strategy are pulled together with equal care and honesty, India's Net-Zero 2070 objective moves from aspiration toward probability.

Recommendations

Six concrete policy recommendations follow from this analysis.

First, the ₹100 crore liability cap for 150 MW SMRs must be treated as a starting point, not a permanent ceiling. Parliamentary review at five-year intervals, with indexation to construction-cost inflation, is the minimum that fiscal prudence and constitutional obligation require.

Second, removing statutory supplier recourse without a replacement mechanism for quality accountability is legally and practically dangerous. A dedicated nuclear-insurance pool, backed by mandatory third-party manufacturing audits, should be established as a condition of any SMR operating licence.

Third, the contractual vacuum left by the removal of Section 17(b) recourse must be filled at the private-contract level. SBD ("Safeguard-by-Design") clauses, modelled on the Section 123

[61] *Budget Doubles Allocation for Nuclear Research to ₹2,410 Crore*, Hindu Bus. Line (Feb. 1, 2026), https://www.thehindubusinessline.com/economy/budget/budget-doubles-allocation-to-nuclear-research/article70578009.ece (last visited Feb. 1, 2026).

framework of the US Atomic Energy Act, 1954, can create a contractual right of recourse even where the statutory one has been extinguished.

Fourth, the remote-operation and factory-assembly model that makes SMRs attractive also makes them unusually vulnerable to cyber intrusion.[62] IAEA digital-security standards[63] need to be embedded in the pre-licensing regulatory process before any reactor is commissioned, not retrofitted afterward.

Fifth, India should build a sixty-year strategic reserve of nuclear fuel. The country's nuclear supply chain is young and fuel-cycle security gaps in a nascent system carry risks that are qualitatively different from those faced by established nuclear powers.[64]

Sixth, the human-capital challenge deserves far more attention than it currently receives. Many workers at retiring coal plants lack the formal technical education that nuclear maintenance roles require.[6566] A structured reskilling programme, developed with technical institutes and industry partners, is both a social-equity obligation and a practical precondition for safe SMR operation. Without it, supply-chain management ecosystem, IAEA standards adherence, and investment in human capital, the three pillars on which successful SMR deployment ultimately rests,[67] will remain aspirational rather than tangible.

[62]Cristina Siserman-Gray & Guy Landine, *Cybersecurity for Small Modular Reactors (SMRs): Regulatory Challenges and Opportunities* 3 (PNNL-SA-184813, Pac. Nw. Nat'l Lab. 2024), https://resources.inmm.org/sites/default/files/2023-07/finalpaper_378_0512115036.pdf (last visited Jan. 31, 2026).

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