



Review Article

The Fresh Nuclear Fuel Storage Facility at the Rooppur Nuclear Power Plant, Bangladesh

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Abstract

Fresh nuclear fuel storage is a safety-critical function at every nuclear power plant, governed primarily by the need to prevent inadvertent criticality rather than to manage heat or radiation. This review examines the fresh fuel storage facility (FFS) at Bangladesh's Rooppur Nuclear Power Plant (RNPP), a twin-unit 2x1,200 MWe VVER-1200 facility supplied by Rosatom, as the country transitions from nuclear newcomer to operating nuclear state following first fuel loading in April 2026, situating Bangladesh's regulatory arrangements under the Bangladesh Atomic Energy Regulatory Authority (BAERA) within IAEA Safety Standards SSG-63, SSG-73, and SSR-2/1, and comparing them with the more mature regulatory systems of India (AERB) and Pakistan (PNRA). Key findings include: RNPP's storage racks maintain subcriticality ($k_{eff} < 0.95$) even under complete flooding with unborated water; facility design integrates seismic, fire, and physical-security provisions consistent with SSG-63; and multi-stage receipt and acceptance procedures link factory inspection at Russia's Novosibirsk Chemical Concentrates Plant to on-site verification at Rooppur. The review also identifies structural gaps, notably limited institutional independence between BAERA and Rooppur's operating organisations, an incomplete operational regulatory suite, constrained domestic inspection capacity, and dependence on a single foreign fuel supplier, and offers prioritised recommendations informed by regional and international best practice.

Keywords— Fresh fuel storage; criticality safety; Rooppur Nuclear Power Plant; nuclear regulatory framework; BAERA

Introduction

Nuclear power is increasingly regarded across South and Southeast Asia as a strategic pillar of energy security and climate mitigation. Bangladesh's entry into this domain is anchored by the Rooppur Nuclear Power Plant (RNPP), a two-unit VVER-1200 facility in Pabna district that became, with the arrival of its first fresh fuel shipment in October 2023, the country's first possession of nuclear fuel, making Bangladesh the 33rd nuclear-fuel-holding state in the world. Commissioning of Unit-1 progressed with a BAERA-issued commissioning license on 16 April 2026 and the commencement of fresh fuel loading on 28 April 2026 [1]

Every stage of a nuclear power programme depends on the safe receipt, inspection, and pre-loading storage of fresh fuel. Although fresh fuel is unirradiated and therefore does not present the intense radiation and decay-heat hazards associated with spent fuel, it does contain fissile material and, if improperly configured or accidentally flooded, can approach or

achieve an unintended, self-sustaining chain reaction, a criticality event. This singular safety concern, together with secondary considerations of mechanical integrity, fire protection, physical security, and material accountancy, defines the entire design philosophy of fresh fuel storage facilities [2], [3]

This review focuses specifically on the fresh fuel storage facility at RNPP, examining its physical design, regulatory basis, and operational procedures, while using the more established frameworks of India and Pakistan, and the overarching IAEA Safety Standards, as comparative and evaluative benchmarks. The purpose is to consolidate what is publicly documented about Bangladesh's arrangements, assess their alignment with international good practice, and identify the priority areas where Bangladesh's regulatory capacity must mature as RNPP moves from commissioning into decades of operation.

Objectives of this study

1. Describe the physical and regulatory characteristics of the RNPP fresh fuel storage facility
2. Benchmark Bangladesh's arrangements against IAEA Safety Standards (SSG-63, SSG-73, SSR-2/1) and related guidance
3. Draw comparative lessons from India's AERB and Pakistan's PNRA regulatory frameworks
4. Identify regulatory and institutional gaps specific to Bangladesh as a newcomer nuclear state
5. Offer prioritised, time-phased recommendations for strengthening Bangladesh's regulatory capacity

Materials and Methods

This is a structured narrative review. Sources were drawn from four tiers, prioritised in the order applied below: (i) primary national regulatory instruments – the Bangladesh Atomic Energy Act 2012, the Nuclear Power Plant Act 2015, and published BAERA licensing conditions, together with AERB and PNRA safety guides; (ii) IAEA primary publications – the SSG-63, SSG-73, and SSR-2/1 safety standards, IAEA Country Nuclear Power Profiles, and the 2022 IRRS mission reports for Bangladesh and Pakistan; (iii) English-language secondary reporting on RNPP construction, licensing, and fuel-loading milestones from Rosatom, NPCBL, and Bangladeshi and international press; and (iv) peer-reviewed and industry literature on VVER-1200 fuel and safety systems. Sources were retrieved from the issuing bodies' own repositories (IAEA, AERB, PNRA, BAERA) and general web search using combinations of the terms "Rooppur", "fresh fuel storage", "BAERA", "VVER-1200 fuel", and the standard numbers SSG-63/SSG-73/SSR-2/1, restricted to English-language material published between February 2013 (BAERA's establishment) and mid-2026 [4], [5], [6]

Compliance with a given IAEA requirement was scored, for each of the three countries, on a three-point basis, applied consistently in the comparative assessment in Section 7 (Table 3):

Documented (a country- or facility-specific published source explicitly confirms the practice), Inferred (design or licensing information published for the facility is consistent with the requirement but no source explicitly certifies compliance against the cited IAEA text), or Not established (no publicly available source addresses the requirement). This scoring is intended to make explicit, and reproducible from the sources cited, the evidentiary strength behind each claim in this review, rather than treating a stated design feature as, by itself, proof of regulatory compliance. Tier (iii) sources are structurally more limited for Bangladesh than for India or Pakistan, given RNPP's recent commissioning and BAERA's restricted publication of primary licensing and design-basis documents; the implications of this limitation for the review's findings are set out in Section 1.3.

Understanding Fresh Nuclear Fuel

Physical and Chemical Properties

Fresh nuclear fuel for RNPP's VVER-1200 units is manufactured as sintered uranium dioxide (UO₂) ceramic pellets (density approximately 10.4-10.9 g/cm³), encased in zirconium-niobium alloy cladding, and enriched to between 2.4% and 4.95% U-235 (see Section 5.2 for full specifications). This places RNPP's fuel in the low-enriched uranium (LEU) category used across light water reactors, the same broad category as Pakistan's Chinese-supplied CHASNUPP fuel. This is a material distinction from the natural-uranium (~0.72% U-235) fuel used in India's and Pakistan's pressurised heavy water reactors (PHWRs, including KANUPP-1); natural uranium fuel cannot achieve criticality under dry storage conditions, which meaningfully simplifies criticality management for PHWR-type facilities but does not apply to RNPP's enriched fuel. This distinction matters because it is why RNPP's storage racks require active geometric controls that PHWR fresh-fuel stores do not (Section 2.2), and it is revisited in the country comparison in Section 7 [7], [8]

Criticality: The Primary Safety Concern

Criticality occurs when the rate of neutron production in fissile material equals or exceeds the rate of neutron absorption and leakage, sustaining an uncontrolled chain reaction. For fresh LEU fuel assemblies such as those used at RNPP, criticality is a credible risk if assemblies are improperly arranged or accidentally flooded with a moderating fluid. The universal regulatory objective, reflected in Bangladeshi, Indian, Pakistani, and IAEA requirements alike, is to maintain the effective neutron multiplication factor (*k_{eff}*) below 0.95 under all credible operational and accident conditions, including flooding with unborated water [2]

Other Safety Concerns

1. Mechanical damage: cladding scratches or deformation during handling can impair fuel performance
2. Moisture ingress: can promote hydrogen evolution in zirconium-clad fuel under certain conditions
3. Fire risk: combustible materials near storage areas can compromise fuel integrity

4. Physical security: fresh enriched fuel is a safeguarded nuclear material requiring access control and surveillance
5. Material accountancy: precise inventory control is mandated under IAEA safeguards, including the NPT Additional Protocol [6]

The International Framework: IAEA Safety Standards

The IAEA Safety Standards constitute a hierarchical, internationally recognised framework, Safety Fundamentals, Safety Requirements (GSR/SSR), and Safety Guides (GSG/SSG), that, while not legally binding, functions as the global benchmark for demonstrating regulatory adequacy. For fresh fuel storage, the most directly relevant instruments are summarised in Table 1 [2], [3], [5]

Table 1. Key IAEA Safety Standards relevant to fresh fuel storage

IAEA Standard	Title	Relevance to Fresh Fuel Storage
SSR-2/1 (Rev.1)	Safety of NPPs: Design	Overarching design safety requirements, including fuel systems
SSG-63	Design of Fuel Handling & Storage Systems	Primary guide for fresh and spent fuel storage facility design
SSG-73	Core Management and Fuel Handling	Operational fuel management and handling procedures
SSG-26	Safe Transport of Radioactive Material	Transport of fresh fuel to the plant site
TECDOC-1580	Criticality Safety in NPPs	Subcriticality requirements during storage
NSS No.13 (INFCIRC/225/Rev.5)	Physical Protection of Nuclear Material	Security requirements for fresh LEU fuel

SSG-63: Design of Fuel Handling and Storage Systems

SSG-63 (2020), superseding the earlier NS-G-1.4, is the most authoritative international guidance specifically addressing fresh and spent fuel storage design. Its core requirements, directly applicable to RNPP's fresh fuel storage facility, are that storage racks maintain subcriticality even when fully flooded with unborated water; that keff not exceed 0.95 under the most reactive credible configuration; that racks resist tipping or displacement under design-basis seismic loading (SL-2); that ventilation prevent hydrogen accumulation; that access control and surveillance comply with INFCIRC/225; that incoming fuel be inspected before storage; and that storage areas be segregated from combustible materials [2]

SSG-73: Core Management and Fuel Handling

SSG-73 (2022) governs operational aspects of fuel management, requiring documented receipt procedures, independent verification of fuel identity and enrichment, damage assessment on arrival, formal authorisation for removal from storage, qualified fuel-handling engineers, and strict control over loading sequences, all of which are reflected in RNPP's fuel acceptance protocol described in Section 5.3 [3]

IAEA Safeguards and Material Accountancy

Under the NPT full-scope safeguards regime (INFCIRC/153) and the Additional Protocol (INFCIRC/540), all nuclear material, including fresh enriched fuel, must be declared and made available for IAEA inspection. Bangladesh has held full-scope safeguards since 1982 and the Additional Protocol since 2001, placing it, unlike Pakistan (item-specific safeguards only), among the more comprehensively safeguarded of the three countries reviewed here. For fresh fuel arriving at RNPP, this requires an Inventory Change Report (ICR) upon receipt and submission to Physical Inventory Verification (PIV) at the IAEA's request [1]

Bangladesh: Institutional and Regulatory Framework**Legislative Basis**

Bangladesh's nuclear programme is governed by the Bangladesh Atomic Energy Act (BAEA) 2012, which established the Bangladesh Atomic Energy Regulatory Authority (BAERA) in February 2013 as the country's dedicated nuclear regulator, responsible for safety rulemaking, licensing, inspection, enforcement, material accountancy, and emergency response. BAERA reports to the Ministry of Science and Technology (MoST) [4]

The Rooppur plant is owned by the Bangladesh Atomic Energy Commission (BAEC), while the Nuclear Power Company of Bangladesh Ltd. (NPCBL), established under the Nuclear Power Plant Act 2015, serves as the operating organisation. Notably, BAERA, BAEC, and NPCBL all currently report to the same ministry, a structural overlap that the IAEA's 2022 IRRS mission explicitly flagged as inconsistent with the principle of regulatory independence (see Section 6.1) [1], [4]

The Rooppur Nuclear Power Plant

RNPP, located in Pabna district approximately 200 km west of Dhaka on the Padma River, comprises two VVER-1200 (Generation III+) units of 1,200 MWe each, supplied under a 2015 General Contract with Rosatom's engineering division (ASE). RNPP received its first fresh fuel shipment in October 2023; BAERA issued the Unit-1 commissioning license on 16 April 2026, and fuel loading began on 28 April 2026 [1]

BAERA's Licensing System for Nuclear Material

BAERA operates a class-based licensing structure for nuclear material handling directly relevant to fresh fuel, summarised in Table 2. Class B, D, and E licenses were issued progressively from 2023, ahead of the first fuel delivery. The Unit-1 commissioning license, issued 16 April 2026, followed assessment by national and international regulatory bodies, completion of the IAEA Pre-OSART mission, and a successful dummy fuel assembly rehearsal [1]

Evidence caveat

The following facility-specific descriptions have not been independently verified from publicly available design or licensing records. The IAEA references establish general standards only.

Table 2. BAERA licensing classes for nuclear material relevant to fresh fuel

License Class	Authorization	Holder
Class B	Purchase, ownership, handling, and storage of nuclear materials	BAEC
Class D	Transport of nuclear materials by designated carrier	Russian transport entity (Rosatom logistics)
Class E	Import of nuclear materials into Bangladesh	BAEC
Commissioning License	Fuel loading and pilot power generation	BAEC / NPCBL

The Fresh Fuel Storage Facility at Rooppur

Physical Design

RNPP's fresh fuel storage facility (FFS) is integrated into the reactor building complex and was designed by Rosatom's engineering division in accordance with Russian federal nuclear safety regulations (the NP series) and IAEA standards, subject to BAERA review and approval. Its key design features, as publicly described by Rosatom, NPCBL, and BAERA, are set out below; the strength of the public evidence behind each is assessed against IAEA, Indian, and Pakistani practice in Table 3 (Section 7), and the basis for treating these as design commitments rather than independently verified compliance is discussed in Section 1.3: [2], [5]

Table 3. Benchmark comparison of fresh fuel storage requirements: Bangladesh (RNPP) vs. India (AERB) vs. Pakistan (PNRA), against the IAEA baseline. Compliance evidence is scored Documented / Inferred / Not established (see Section 1.2 for scoring method).

Parameter	IAEA Requirement	Bangladesh (RNPP / BAERA)	India (AERB)	Pakistan (PNRA)
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Criticality control ($k_{eff} < 0.95$)	Mandatory under SSG-63; racks subcritical under most reactive credible configuration	Inferred – geometry-controlled racks stated in Rosatom/NPCBL design summaries; no independently published criticality safety analysis	Documented for PHWR fresh fuel (AERB/SG/D-24); Inferred for MOX/LWR fuel	Inferred – CHASNUPP LEU storage design not independently published
Flooding with unborated water	Subcriticality maintained under complete flooding (SSG-63)	Inferred – design basis stated by Rosatom/NPCBL, not independently verified	Documented for PHWR fuel (AERB/SG/D-24)	Inferred – not independently published
Seismic qualification	Racks resist tipping/displacement under design-basis earthquake (SSR-2/1, SSG-63)	Inferred – site-specific SL-2 basis stated by NPCBL/Rosatom; independent qualification report not public	Documented – AERB seismic re-evaluation programme publicly reported	Inferred – CHASNUPP seismic basis not independently published
Fuel receipt and inspection procedures	Documented receipt/verification procedures (SSG-73)	Documented – multi-stage receipt sequence published in BAERA licensing conditions and IGA terms (Section 5.3)	Documented (AERB/SG/O-10A)	Not established in the open sources reviewed
Regulator independence from operator/owner	Regulator must not report to the same authority as the licensee (SSR-2/1; GSR Part 1)	Not established – 2022 IRRS mission found BAERA, BAEC and NPCBL all report to MoST	Inferred – AERB reports to the Atomic Energy Commission, which also oversees NPCIL; independence	Documented – PNRA established by ordinance as structurally separate from PAEC

			debated in Indian policy literature	
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Note: "Documented" indicates an explicit, country- or facility-specific published source confirming the practice; "Inferred" indicates published design or licensing information consistent with the requirement but without an explicit compliance certification; "Not established" indicates no publicly available source addressing the requirement was located in the review described in Section 1.2.

1. Geometry-controlled storage racks maintaining subcriticality ($k_{eff} < 0.95$) even under fully flooded conditions with unborated water
2. Seismic qualification to the Rooppur site-specific SL-2 design basis earthquake
3. Ventilation systems controlling temperature and humidity within the storage vault
4. Fire suppression systems using materials compatible with fuel integrity
5. Physical security measures: access control, CCTV surveillance, and radiation monitoring
6. Storage capacity sized to support continuous reactor operation per the inter-governmental fuel supply agreement with Russia

Fresh Fuel Specifications

Fresh fuel for the RNPP VVER-1200 consists of uranium dioxide pellets enriched to between 2.4% and 4.95% U-235, clad in zirconium-niobium alloy. Each core loading requires 163 fuel assemblies. Fuel is manufactured at the Novosibirsk Chemical Concentrates Plant (NCCP) in Russia and undergoes acceptance inspection at the factory prior to dispatch [1]

Fuel Delivery and Acceptance Process

Delivery of fresh fuel to RNPP is governed by the Bangladesh-Russia Inter-Governmental Agreement (IGA) and BAERA licensing conditions, following a multi-stage sequence: [3]

1. Factory acceptance: BAERA-authorized inspectors witness acceptance testing at NCCP Novosibirsk
2. Transport: fuel is shipped under Class D (transport) and Class E (import) licenses, with IAEA notification
3. Border inspection: customs clearance under BAERA oversight with radiation monitoring at point of entry
4. Site acceptance: on arrival at RNPP, assemblies are inspected for transport damage, identity, and documentation
5. Pre-storage inspection: helium leak tests, visual cladding inspection, and dimensional verification
6. IAEA safeguards: an Inventory Change Report (ICR) is filed with the IAEA upon receipt

7. Storage: fuel accepted after inspection is transferred to the FFS under strict access control

Regulatory Challenges and Gaps

Regulatory Independence

The IAEA's 2022 IRRS mission found that BAERA, BAEC, and NPCBL all report to MoST, undermining the fundamental IAEA safety principle that a regulator must not report to the same ministry as the operator it oversees. The mission recommended that BAERA be made structurally independent, reporting directly to the Prime Minister or Parliament, a recommendation that, as of this review, remains to be fully implemented [4], [6]

Incomplete Operational Regulations

As of the commencement of fuel loading in 2026, the full suite of binding operational regulations, including detailed technical specifications for fresh fuel storage, criticality safety procedures, and fuel-handling emergency response, remained under development. Bangladesh must complete this framework, informed by IAEA standards, Russian NP-series regulations, and the more mature Indian and Pakistani precedents [4]

Human Resource Capacity

Qualified fuel-handling engineers, nuclear safety inspectors, and material accountants with hands-on operational experience remain in short supply. Training conducted in Russia and through IAEA technical cooperation is essential but must be complemented by sustained domestic capacity-building [4]

Fuel Supply Dependency

Unlike India, which has a domestic fuel cycle, and Pakistan, which retains some domestic fuel fabrication capability, Bangladesh is entirely dependent on Russia for fresh fuel supply under the IGA. The 2022 IRRS mission noted that reliance on a single supplier for the lifetime of a reactor programme carries strategic risk, and recommended diversification as a medium-term policy objective [1], [7], [8]

Evidence caveat: Cross-country claims of documented facility-level compliance require primary inspection or licensing records; the country profiles cited here substantiate general nuclear-programme context, not individual storage-facility compliance.

Comparative Perspectives: India and Pakistan

Benchmarking Bangladesh's arrangements against those of its regional neighbours highlights both the direction of travel and the distance still to cover.

India (AERB)

India's Atomic Energy Regulatory Board, established in 1983 under the Atomic Energy Act 1962, oversees a mature, multi-decade regulatory architecture spanning PHWRs, BWRs, and new VVER units at Kudankulam. Its fresh fuel storage requirements are set out chiefly in AERB/SG/D-24 (design) and AERB/SG/O-10A (operations), supported by a domestic fuel fabrication and inspection ecosystem (Nuclear Fuel Complex, Hyderabad) that Bangladesh currently lacks entirely [7]

Pakistan (PNRA)

Pakistan's Nuclear Regulatory Authority, created by ordinance in 2001, operates independently of the plant-owning Pakistan Atomic Energy Commission, a structural separation Bangladesh has not yet achieved. PNRA's oversight of Chinese-supplied PWR fuel at CHASNUPP closely parallels RNPP's reliance on a single foreign supplier, though Pakistan additionally operates a partial domestic fuel fabrication facility (PNPFC) [8]

Common Ground

All three countries converge on the same core requirements: criticality-safe storage geometry ($k_{eff} < 0.95$ under flooded conditions), rigorous receipt inspection, physical security aligned with INFCIRC/225, and IAEA material accountancy. Table 3 benchmarks each country against these parameters and against the strength of the published evidence for compliance (see Section 1.2 for the scoring method). Bangladesh is not uniformly the least mature of the three: its receipt-inspection documentation is as complete as India's, and its safeguards posture exceeds Pakistan's. Its clearest divergences are regulatory independence, where it lags both comparators, and the public evidentiary record for facility-specific compliance, which is thinner than either, reflecting its status as the newest entrant [2], [7], [8]

Limitations of the study

A structural limitation of this review, and of any current open-source assessment of RNPP, is that Bangladesh does not publish facility-specific design-basis documentation, safety analysis reports, or criticality safety calculations for the FFS in the way that, for example, licensing dockets are available for AERB-regulated facilities. Consequently, statements in this review that RNPP's storage racks maintain $k_{eff} < 0.95$ under complete flooding, that the facility is seismically qualified to the SL-2 design basis, or that ventilation provisions prevent hydrogen accumulation (Section 5.1) reflect design requirements that Rosatom and BAERA have publicly stated the facility was designed to meet, rather than independently verified, facility-specific calculations or inspection records. Where this review states that a design feature is "consistent with" or "reflects" an IAEA requirement, this denotes the Inferred category defined in Section 1.2, not confirmed regulatory compliance; compliance is treated as Documented only where an explicit, facility- or country-specific primary source is cited.

This distinction, and the resulting gap between stated design intent and independently verified, publicly documented compliance, is itself among this review's principal findings (Section 7, Table 3) and is carried through into the recommendations in Section 8.

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Conclusion

This review set out to assess how the fresh fuel storage facility at Rooppur measures up against IAEA Safety Standards and regional practice, and to be explicit about the strength of the evidence behind that assessment. Three findings follow from the benchmarking in Table 3. First, the principal gap this review identifies is evidentiary rather than one of stated design intent: on criticality control, flooding response, and seismic qualification, RNPP's published design commitments are consistent with SSG-63, but are classified here as Inferred rather than documented, because no independently published, facility-specific safety analysis or seismic qualification report is available to confirm them (Section 1.3). This absence of public documentation is itself a regulatory transparency gap, not merely a limitation of this review's method [2], [5] Second, on the parameters assessable from published licensing and institutional records rather than engineering specifications, RNPP fares unevenly: fuel receipt and inspection procedures are Documented in detail (Section 5.3), reflecting BAERA's active licensing role, but regulatory independence is Not established – the 2022 IAEA IRRS mission explicitly found BAERA, BAEC, and NPCBL all reporting to the same ministry, a structural weakness neither India nor Pakistan shares in the same form [4] Third, Bangladesh is not uniformly the least mature of the three countries compared: its safeguards posture exceeds Pakistan's, and its receipt-inspection documentation matches India's. Its principal deficits are institutional (regulatory independence, domestic inspection and criticality-assessment capacity) and evidentiary (the absence of published, facility-specific compliance documentation for RNPP), rather than deficits in the underlying design specification. These findings point to a narrower set of priorities than a general call for regulatory maturation: legislating BAERA's structural independence (Section 8.1); building an in-house BAERA criticality safety assessment capability so RNPP's compliance can move from Inferred to Documented (Section 8.2); and directing future IRRS follow-up missions specifically at closing the public-documentation gap this review identifies (Section 8.3) [1], [7], [8]

Recommendations

Immediate Priorities (0-2 Years)

1. Expedite publication of binding operational regulations for fresh fuel storage, handling, criticality safety, and fuel-handling emergency response, aligned with SSG-63 and SSG-73 and adapted for VVER-1200 technology [2], [3]
2. Legislate BAERA's structural independence from MoST, following Pakistan's PNRA-PAEC separation as a regional model [4], [6], [8]
3. Establish a dedicated BAERA fuel inspection team trained in VVER assembly inspection, leveraging the 2017 BAERA-AERB bilateral agreement and IAEA technical cooperation

Medium-Term Priorities (2-5 Years)

1. Develop an in-house BAERA criticality safety assessment capability, initially in partnership with Russian technical support and the IAEA
2. Pursue diversification of the fuel supply chain beyond sole reliance on Russia
3. Fully implement Additional Protocol obligations, including timely ICR filing and scheduled PIVs [1]

Long-Term Priorities (5-15 Years)

1. Request a follow-up IAEA IRRS mission within 3-5 years of commercial operation to assess progress against the 2022 recommendations [4]
2. Deepen regional regulatory cooperation, including a possible trilateral South Asian nuclear safety forum with India and Pakistan, facilitated by the IAEA

Authors Contributions

S. M. Nazmus Shakib Pias: Conceptualization, methodology, literature review, data collection, regulatory and technical analysis, interpretation of findings, manuscript drafting, and review and editing.

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Conflict of interest

The author declare that they do not have any conflict of interest.

AI Declaration

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