INDIA NUCLEAR FORUM (INF)

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Industry Feedback on
Draft SHANTI Rules 2026
Draft SHANTI Regulations 2026



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About India Nuclear Forum

India Nuclear Forum -INF (**https://indianuclearforum.in/index.php**) is a non-profit foundation, a nuclear industry body, striving to accelerate India's nuclear vision of 100 GWe by 2047. INF has been conducting various programs to create a holistic nuclear energy ecosystem.

INF conducted a series of consultation programs including a major event India Nuclear Energy Forum (INEF-2026) in May 2026 @ IIT Bombay. (https://indianuclearforum.in/india-nuclear-energy-forum-2026.php). About 350+ participants from 161 organisations from India, France, Japan, Nigeria, Russia, Singapore, Switzerland, UK, USA participated in the event.

Based on the deliberations before, during and after INEF-2026, a set of "**Policy Recommendations"** are made to government of India based on nuclear industry perceptions, concerns, and expectations. ***https://indianuclearforum.in/assets/pdf/INEF-industry-concerns-expectations-policy-recommendations.pdf***.

India Nuclear Forum publishes a monthly magazine **Nuclear.IN (www.magazine.indianuclearforum.in/)** to disseminate Indian nuclear energy news to nuclear energy professionals across the world.

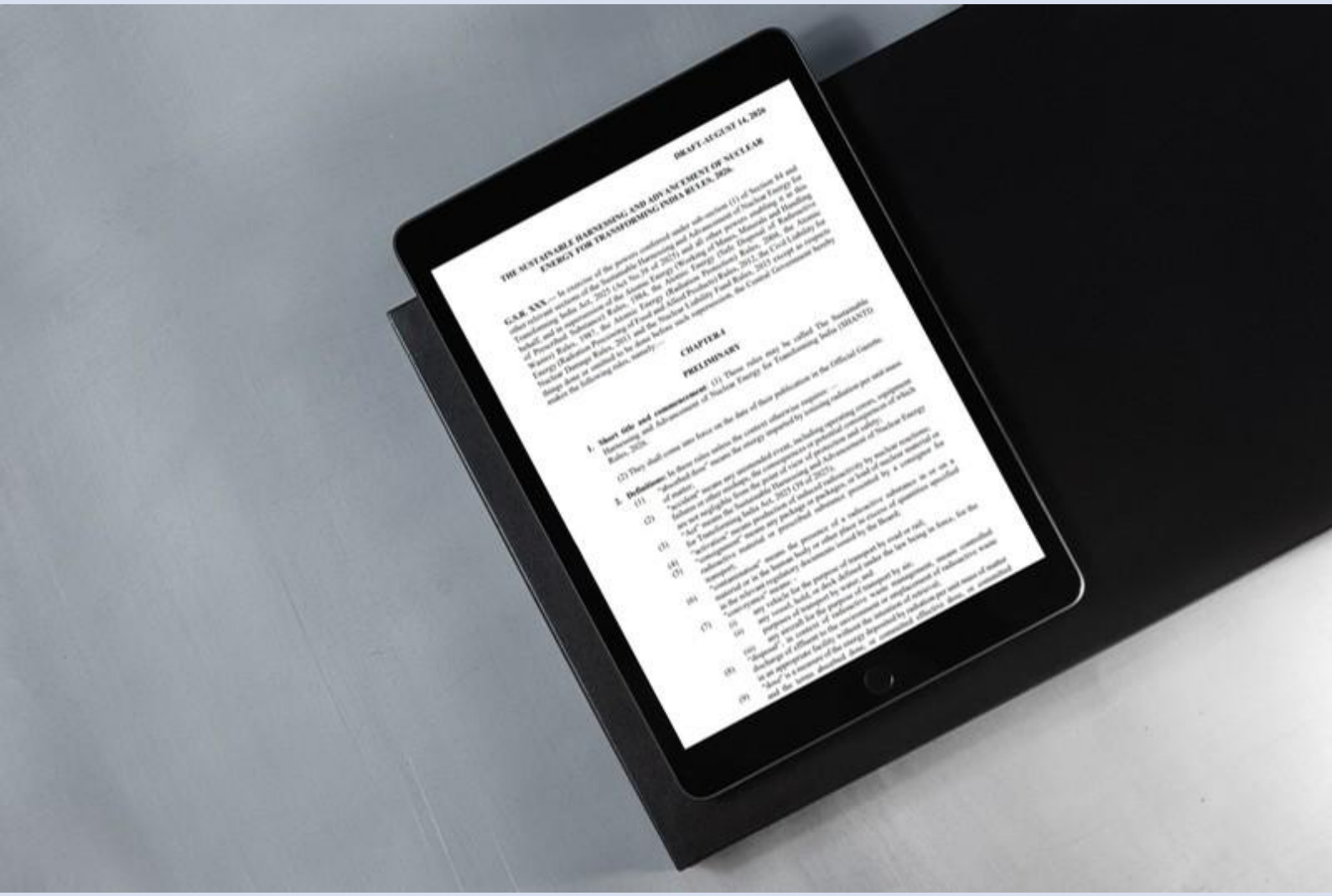
This document contains a 3- phase approach (short term, medium term, and long-term plans) to accelerate India's nuclear Mission. Executive Summary of policy recommendations are also covered under 10 different headings.

INF conducted consultation sessions from nuclear industry professionals, to **get industry feedback on draft SHANTI Rules and SHANTI regulations** announced by Department of Atomic Energy (DAE). Feedback received during the consultations has been summarized and presented to DAE.

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Feedback on Draft SHANTI Rules



India Nuclear Forum (INF) stakeholder consultation webinar feedback on Draft SHANTI Rules

Sl. No	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
1	Rule 2(15)	"Exclusion zone" means an area extending up to a specified distance around a nuclear facility where no public habitation is permitted and shall area shall be under the control of the licensee. [sic]	Correct to: "…and such area shall be under the control of the licensee."	Transcription error; Regulation 2(17) of the draft regulations contains the correct formulation and may be followed.
2	Rules 3, 10, 14 & 17 – Eligible Person / Licensing	Licensing linked to an "eligible person."	Clarify that licenses are issued to legal entities, with designated responsible individuals.	Prevents licence disruption due to personnel changes and provides certainty to investors and operators.
3	Rules 3, 10, 14 & 17 — Eligible Person / Licensing	The framework provides for an accountable licensee but does not fully clarify financing and project-SPV structures for private nuclear projects.	Retain one accountable licensee while expressly permitting sponsor support, parent guarantees, EPC/O&M contracting, lender security, lender step-in rights and expedited transfer/change-of-control approval, subject to safety review.	Provides bankability and lender protection while maintaining clear and non-delegable operator responsibility.
4	Rule 3(1) – Composite License	Composite license covering build, own, operate and decommission nuclear facilities.	Introduce phased licensing: design approval, prototype/test reactor approval, demonstration facility approval and commercial deployment license.	Enables technology developers, start-ups and OEMs to progress through development stages without requiring a full commercial licence at the outset.
5	Rule 3(1) Proviso – Composite License Provision	Single composite license framework for nuclear power plants/reactors.	Permit independent technology/OEM certification separate from site-specific operator licensing.	Different stakeholders (developers, EPC contractors and operators) have distinct responsibilities and risk profiles.

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6	Rule 3(1), Explanation (a)	Explanation.— (a) Reactor includes nuclear fission as well as Deuterium-Tritium reaction based fusion reactors.	Explanation.— (a) Reactor includes nuclear fission reactors. (aa) Fusion devices and fusion energy facilities, irrespective of the fusion fuel employed or the confinement scheme adopted, are regulated under Part A-1 of this Chapter, and clause (a) shall not apply to any facility falling within that Part.	Deeming a Deuterium-Tritium device a "reactor" attaches all of rules 3-9 (foreign operating precedent, design approval against a non-existent fusion code, assured fuel contracts, exclusion zone, liability insurance, Spent Fuel Fund levy) disproportionately to fusion. No jurisdiction surveyed classifies a fusion device by its fuel; UK, US and Japan each regulate fusion outside the reactor regime on a radiation-protection/dose basis. The tiers proposed are India's own, offered as an improvement rather than as conformity with comparators.
7	Rule 3(1), read with section 3(1) of the Act	A licence may be granted to any eligible person as specified in or expressly permitted by notification under section 3(1) of the Act.	Add: a fusion energy facility shall be a facility in respect of which a licence may be granted under this rule, with the corresponding section 3(1) notification issued concurrently with commencement of these rules.	Eligibility flows entirely from the section 3(1) notification; unless fusion facilities/developers are expressly included, a private Indian fusion company arguably has no eligible-person status at all, unlike Regulation 27(1)'s open radiation-facility eligibility.
8	Rule 3(1)(e) r/w Rule 28(1)-(2)	Rule 3(1)(e) covers education, training and research applications; Rule 28(2) exempts laboratory/bench-scale research facilities handling small quantities of material as notified.	Clarify that education/training/research activities under rule 3(1)(e) may be undertaken independently by private or academic institutions without DAE affiliation, subject only to AERB licensing where applicable; specify quantitative thresholds for "small quantities" in rule 28(2) within the rule or an accompanying schedule.	It is unclear whether education/training/research activity is licensable on par with commercial licensees or must route through DAE; "small quantities" and "as notified" are undefined, so an institution cannot determine in advance whether it needs a license.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
9	Rule 3(1) Explanation — Fusion Classification	Fusion facilities are potentially treated under the existing reactor framework.	Establish a dedicated fusion regulatory framework with graded licensing.	Fusion technologies present different risks and should not automatically be regulated like fission reactors.
10	Rule 3(2)	The eligible person may source technology of a specific plant/reactor model, whether indigenous or of foreign origin, from the original technology developer or a licensed intermediary.	Reserve a specified number/proportion of SMR licences (or a dedicated licensing track) for indigenously designed and developed reactors, consistent with the Nuclear Energy Mission's target of five indigenous SMRs; define "indigenous design."	Rule 3(2) treats indigenous and foreign-origin technology identically, with no indigenisation preference, even though the Nuclear Energy Mission targets five indigenously designed SMRs by 2033; without an indigeneity criterion, licensing has no mechanism tying it to that target.
11	Rule 3(2), second proviso, and Rule 10(2), second proviso	Rule 3(2): the person sourcing technology shall ensure no infringement of IPR. Rule 10(2): the person sourcing technology shall ensure all related IPR vests with the technology developer.	Introduce a rule requiring a phased indigenisation/technology-transfer plan (including joint IP ownership or licence-back arrangements) as a condition of licence for imported reactor or fuel-fabrication technology.	These provisos protect the original (often foreign) developer's IP but impose no reciprocal indigenisation/technology-transfer requirement, risking entrenched long-term dependence, particularly under Rule 10 where IPR by default vests with the technology developer.
12	Rule 3(3)(a)	If a nuclear power plant or reactor is of a foreign design, its design should have been certified/approved in the country of origin and should be operational either there or in any other foreign country.	Add proviso: where the design is first-of-a-kind, including a fusion energy facility, and no plant of that design is operational anywhere, the operational requirement shall not apply; the applicant may instead furnish a demonstrated safety case, evidence of regulatory engagement in the country of origin, and satisfy such further conditions as the Central Government may impose.	No fusion power plant is operational anywhere. As drafted, this provision permanently and absolutely bars import/acquisition of fusion technology, regardless of safety demonstration. Corresponding change needed at Regulation 7(1)(h) and (i).

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
13	Rule 3(3)(b)-(c) and Rule 10(3)(c)-(d)	Imported/domestically acquired technology must not adversely affect India's interest, must not pose unreasonable risk, and must conform to national policy; "such other conditions as may be specified" by the Central Government.	Publish indicative criteria defining "adverse effect on the interest of India" (national security, supply-chain dependency, technology-transfer restrictions) before finalising the Rules, and require advance notification of any "other conditions" with a defined stakeholder-consultation period.	These are open-textured, undefined standards with no published criteria, so developers and investors cannot assess in advance whether a reactor design, fuel technology or import will qualify — creating approval uncertainty for capital-committing stakeholders.
14	Rule 3(3)(a)	Requires an imported reactor design to be operational in the country of origin.	Permit alternative qualification based on credible regulatory certification, advanced design approval, prototype demonstration, safety assessment and demonstrated technology maturity.	Avoids excluding advanced Gen-IV and other first-of-a-kind technologies that may not yet be commercially operational in their country of origin.
15	Rule 4(3)	Where the applicant is unfamiliar with licensing aspects, the licensing authority may conduct pre-licensing consultation and facilitate visits to an operating facility (waste management, spent fuel storage, decontamination, simulator, etc.) on payment of specified charges.	Establish a dedicated rule creating a Research and Technology Demonstration Programme enabling private/startup technology developers to access DAE facilities (e.g., BARC, IGCAR) for testing, prototyping and demonstration on a cost-sharing/fee basis, on the pattern of US DOE demonstration programmes and Idaho National Laboratory's GAIN initiative.	Rule 4(3) only provides for awareness-oriented facility "visits" during pre-licensing consultation; it does not establish a structured technology-demonstration platform for testing, validating or demonstrating new reactor/fuel technologies.
16	No corresponding provision (cf. Rule 4(3))	No rule other than Rule 4(3) addresses access to DAE infrastructure, and Rule 4(3) is limited to awareness-oriented visits during pre-licensing consultation.	Insert a rule under Chapter IV mandating that DAE research facilities be made available to licensed applicants for testing/validation of materials, fuel and components, on a paid-access basis, with defined application and prioritisation criteria.	There is presently no mechanism for a private licensee/applicant to access DAE research and testing infrastructure (irradiation loops, hot cells, test reactors) for materials qualification or component validation — particularly limiting for startups and smaller developers.

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17	Rule 6(b), read with rule 2(15)	Land sufficient for maintaining an exclusion zone from safety considerations as specified by Board.	Proviso: for a fusion energy facility the exclusion zone shall be determined on a dose basis under rule 9E; where assessed dose at the site boundary under bounding accident conditions does not exceed [D] as notified under rule 9A(5), no exclusion zone beyond the plant boundary shall be required.	Exclusion-zone criteria are calibrated to a fission source term/large early release. A fusion facility has no fissile inventory, no decay-heat melt sequence and no criticality potential; its off-site consequence is bounded by mobilisable tritium — a dose-based criterion enables the captive/data-centre applications already contemplated by rule 3(1)(b).
18	Rule 6 — Explanation (c); Rule 6(b); rule 2(15)	For SMRs, advanced reactors, barge-mounted/floating reactors, siting-suitability criteria shall be notified by the Central Government and the Board.	Notify specific siting criteria for SMRs and advanced reactors at the earliest, preferably concurrently with the Rules; criteria should be technology-neutral, risk-informed and performance-based, including exclusion-zone determination based on demonstrated radiological consequence rather than a uniform distance.	No exclusion-zone value appears anywhere in the Act, Rules or Regulations, yet it most determines whether an SMR can be sited near industrial load, and hence whether captive power/process-heat applications under rule 3(1)(b)-(c) are viable; a project cannot be sized, priced or financed until it is known.
19	Rule 7(b)(i)	If the selected design is operational in a foreign country, the applicant shall provide a copy of the operating licence and design certification/approval from the country of origin.	Add proviso: where no operating licence for the design exists anywhere, the applicant may furnish a design safety report assessed against recognised international standards and guidance for fusion safety as the Board may accept.	The same defect as Sl. No. 21 repeats at the design-acceptance stage — a document that does not exist anywhere cannot be furnished.
20	Rule 7(b)(ii) and the proviso thereto	Applicant shall submit a declaration that design complies with the Board's latest regulatory requirements; licensee shall obtain valid design approval before construction.	Add further proviso: pending issue of a fusion safety code, compliance may be demonstrated against recognised international fusion-safety standards/ guidance (IAEA, ITER safety framework, IEC/ISO); the Board shall publish a fusion safety code within 24 months of commencement of these rules.	The Board has issued no fusion safety code/standard, and Regulation 7's design-document set is wholly fission-specific — the requirement is presently circular and incapable of satisfaction.

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21	No corresponding provision (cf. Rule 8(1)(a), Rule 11(1)(a), Rule 18(1)(a))	No rule prescribes a foreign shareholding limit; eligibility provisions require only disclosure of ownership structure (net worth, turnover, financial statements, shareholding pattern).	Insert a rule prescribing the maximum permissible foreign shareholding (e.g., 49%) applicable to licensees under Rules 3, 8, 10, 11 and 17, following the sectoral-cap model under the Insurance Act/FDI Policy framework.	A 49% FDI cap for the nuclear sector has been publicly announced but is not codified in the Act, Rules or Regulations, leaving foreign investors and JV partners without a clear statutory limit to plan around.
22	Rules 8(1)(a), 8(2), 9(2)(c)(ix) and 111	Require demonstration of financial capability.	Introduce defined financial-capability tests with periodic reassessment.	Lifetime financial capability cannot realistically be demonstrated at project inception.
23	Rule 8(2) (also mirrored at Rule 11(1) and Rule 18(2))	For newly formed entities, requires disclosure of shareholding pattern, shareholders' agreement, statements of assets/ liabilities/ capital structure, financial-assistance arrangements, and parent/promoter control information.	Introduce a differentiated licensing track for startups and indigenous technology developers — phased capability demonstration, calibrated financial thresholds — combined with earmarked funding support and access to DAE incubation/testing facilities.	The only provision addressing newly formed entities (startups) imposes additional financial-disclosure requirements, with no differentiated, lighter-touch licensing track, dedicated funding window, or incubation/facility-access support.
24	Rule 9 — new sub-rule (5)	(No provision for fusion currently.)	New sub-rule (5): the requirements of assured nuclear fuel/heavy-water supply contracts and transmission-licensee arrangements shall not apply to a fusion energy facility; instead require evidence of assured deuterium/lithium supply, tritium inventory control, and detritiation/waste-management arrangements.	A fusion facility has no nuclear fuel assemblies and produces no spent fuel; a research/isotope facility may supply no electricity at all, making the transmission condition equally inapplicable.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
25	Rule 9(1); Rule 7 — first proviso (with a new rule 7A)	Rule 9(1): licensee shall obtain design approval from the Board upon grant of license. Rule 7, proviso: licensee shall obtain valid design approval and no construction shall commence without it.	Introduce a separate provision enabling the Board to grant design approval for a specified reactor design independent of a specific project licence or site, assessed against defined bounding site parameters and site-interface requirements; a subsequent licensee deploying the approved design may reference it, with further review limited to site-specific conformance, design modifications and regulatory changes.	Linking design approval to a licensed, site-specific project creates a sequencing constraint for technology developers. A site-independent design assessment (building on the Generic Design Document, bounding site parameters and site-interface requirements already in the draft Regulations) mirrors US NRC design certification and the UK's Generic Design Assessment.
26	Rule 9(2)(a)(iv) and 9(2)(c)(iii) — no amendment sought	(Provisions as drafted.)	Provisions supported as drafted; corresponding action to lie with the Board: notify fusion positions under Regulation 62(2) (plasma operations, tritium handling, superconducting magnet engineering, fusion radiation protection) and confirm the self-authorisation route under Regulation 62(3) is available pending a mature certification scheme.	No AERB certification scheme exists for fusion operators/engineers, so the licensing hold point cannot presently be cleared; a notification closes the gap without amending either instrument.
27	Rule 9(3)	Notwithstanding anything contained in clause (viii) of sub-rule (2) …	Correct to: "Notwithstanding anything contained in sub-clause (viii) of clause (c) of sub-rule (2) …"	Sub-rule (2) is divided into clauses (a)-(d); the insurance provision is sub-clause (viii) of clause (c). The cross-reference as drafted does not resolve.
28	Rule 10 – Fuel Security & Fuel Access	Fuel access provisions for licensed operators.	Establish a transparent fuel-access mechanism for eligible private operators under India's international agreements.	Ensures predictable access to uranium, yellowcake and fabricated fuel, improving project bankability.
29	Rules 10, 13, 14 & 17	Thorium supply chain remains largely government controlled.	Enable controlled private-sector participation in thorium fuel R&D through approved frameworks.	Supports India's long-term thorium strategy and technology development.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
30	Rules 10, 17 & 28 — Fuel, Fuel-Cycle R&D and Spent-Fuel/Associated Technologies	Unclear participation of private entities in fuel fabrication/ testing.	Clearly define permissible fuel-cycle activities and licensing pathways.	Provides certainty for industry investment while maintaining strategic controls.
31	Rules 10, 24 & 28 — Nuclear Fuel Fabrication, Fuel-Cycle Activities and R&D	Limited clarity on start-up participation.	Create controlled innovation pathways for fuel-cycle and spent-fuel technologies.	Encourages innovation without compromising activities reserved for the Government.
32	Rule 10(1)	Licence for fuel fabrication facilities (conversion, refining, associated activity) may be granted to any eligible person under a single undifferentiated pathway.	Specify categories of nuclear fuel fabrication activity open to private licensees (e.g., natural uranium fuel, Pu-U MOX, Th-U^{235} MOX, Th-U^{233} MOX) with category-specific safeguards and licensing conditions.	Rule 10 does not distinguish between fuel categories, each with distinct proliferation-sensitivity, safeguards and processing considerations, leaving it unclear which fuel-cycle activities a private licensee may pursue and under what conditions.
33	Rule 10(2), third proviso	The person sourcing the technology shall ensure that all related Intellectual Property Rights vest with the technology developer.	Amend to require only that there be no infringement of IPR, and that improvements generated by the Indian licensee may vest in the licensee subject to contract.	Rule 3(2) and rule 10(2) state inconsistent tests in parallel contexts; the rule 10(2) wording, read literally, would prevent an Indian licensee owning its own improvements, discouraging domestic co-development.
34	Rule 10(3)	Clauses presently lettered (a), (b), (d), (c).	Re-letter sequentially as (a), (b), (c), (d).	Transcription error affecting citation.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
35	Rule 15(d)	"…legally binding undertaking as an assurance towards safe decommission-ing or closure of the mine. as specified in rule …" [sic]	Correct punctuation/spacing: "…closure of the mine as specified in rule 112."	Typographical.
36	Rule 17, Explanation (c)	Isotopic separation of prescribed substances remains under exclusive Central Government control unless otherwise notified.	Proviso: the Central Government may, by notification, permit separation of lithium isotopes for fusion fuel-cycle purposes under licence, subject to accountancy, security and safeguards conditions.	If lithium is a prescribed substance, no entity other than Government may enrich Li-6, foreclosing an indigenous breeding-blanket supply chain and any credible tritium breeding ratio pathway — the largest technical dependency in a D-T programme.
37	Rule 17(a)-(b)	Covers extraction of uranium/thorium from primary and secondary sources, milling and processing of ores.	Specify indicative capacity thresholds, or a capacity-based licensing tier, for thorium/uranium extraction and processing plants, so private operators can determine plant scale and investment before applying.	No threshold or scale (permissible throughput/processing capacity) is specified, making it difficult to plan the size of a processing/fabrication plant before a licence is granted.
38	Rule 17, Explanation (c)	"Other prescribed substances" (other than uranium and thorium) remain under exclusive Central Government control unless otherwise notified.	Expressly permit a licensed private operator to recover and supply specified medically/industrially valuable radioisotopes (e.g., Ra-228) generated as a by-product of authorised thorium/uranium processing, subject to Board authorisation and safeguards.	A private operator licensed to process thorium from monazite may recover radioisotopes like Ra-228 (used in cancer treatment); as isotopic separation of "other prescribed substances" is reserved exclusively to Government, it is unclear whether the operator may process and supply such isotopes.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
39	Rule 20, Explanation	Explanation.— "high energy radiation generating equipment" includes particle accelerators and fusion devices, and the like.	Add proviso: a fusion device at or above the Tier-1 threshold in rule 9A shall be regulated as a fusion energy facility under Part A-1, and rule 20 shall apply to it only in respect of manufacture.	The same object is presently treated under two regimes — radiation-generating equipment (rule 20) and reactor (rule 3) — with no rule of priority; Schedule-I reproduces the same duality.
40	Rule 22(1)	Upon the grant of licence under sub-rule (1) of rule 20 …	Correct to: "Upon the grant of licence under rule 20 …"	Rule 20 is not divided into sub-rules, so the cross-reference does not resolve.
41	Rule 24(1) (c) and (d)	Import, export or acquisition of prescribed equipment/technology or software for prescribed substance/equipment.	Proviso: the lists of prescribed equipment and technology shall include a fusion annex (tritium handling/detritiation systems, lithium isotope separation equipment, high-power gyrotrons, neutral beam injection systems, tritium-compatible pumps/permeation barriers), calibrated so commercial HTS/REBCO tape, cryogenic plant and standard vacuum equipment are not captured.	The existing lists were framed for the fission fuel cycle and neither capture genuinely sensitive fusion items nor guard against over-control of commercial ones, which would damage the domestic supply chain.
42	Rule 24(1), first proviso	Provided for import of technology of any specific model of nuclear power plant/ reactor/ fuel fabrication facility, the conditions in sub-rule (3) of rule 3 or sub-rule (2) of rule 10 shall apply.	Correct to: "Provided that … the conditions specified in sub-rule (3) of rule 3 or sub-rule (3) of rule 10 shall apply."	The conditions governing import of fuel-fabrication technology are in sub-rule (3) of rule 10, not sub-rule (2); three separate errors in one proviso.
43	No corresponding provision (cf. Rule 24(1), Explanation)	Licence for acquisition of prescribed equipment is intended only for imported equipment, excluding domestically manufactured equipment unless otherwise specified; Government/Board have inspection powers over domestic manufacturing premises.	Introduce a rule mandating minimum indigenous content for equipment/systems/components used in licensed facilities, linked to a Production Linked Incentive scheme for domestic nuclear-component manufacturers, administered alongside the Rule 71 quality-assurance framework.	The Draft Rules contain no Make-in-India/local-content mandate or PLI framework for procurement, risking excessive import dependence for the 100 GW target.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
44	Rule 28 – R&D Activities	R&D activities exempted from licensing requirements.	Create a clear pathway from R&D to design certification, prototype testing and regulatory approval.	Supports innovation and collaborative development involving domestic and foreign technology partners.
45	Rule 28 – Prototype & Demonstration Facilities	Provisions relating to R&D and technology testing.	Introduce a dedicated regulatory pathway for experimental, prototype and demonstration reactors.	Encourages innovation while applying graded safety requirements proportionate to risk.
46	Rule 28 – Educational & Training Activities	Educational, academic and training activities.	Explicitly exempt non-commercial educational and training activities from project licensing requirements.	Prevents unnecessary regulatory burden on universities, training institutions and research organisations.
47	Rule 28(1)-(2)	Exempts certain R&D, design and innovation work, and laboratory/bench-scale research facilities (including fusion devices handling small quantities of material), from licensing.	Insert rules establishing a governance and disbursement framework for the Nuclear Energy Mission's R&D outlay — eligible applicants, application process, milestone-based release of funds, reporting/audit requirements — administered under Rule 28 or a dedicated new Part.	Rule 28 only exempts certain R&D activity from licensing; it contains no framework for disbursement, eligibility or governance of the ₹20,000 crore R&D outlay announced under the Nuclear Energy Mission, leaving private/academic entities without a defined route to access funding.
48	Rule 28(2), and the first proviso to rule 28(1)	For setting up laboratory/bench-scale research facilities including nuclear fusion devices handling small quantities of source/fissile/radioactive material as notified, no licence required.	Recast as Tier-1 research facilities; add proviso that the section 44 notification issue concurrently with commencement of these rules, expressing thresholds for fusion devices in terms of tritium inventory and activation source term, issued together with the corresponding notification under section 24(3)(n).	"Small quantities"/"laboratory or bench scale" are undefined and the notification has not issued; an Indian fusion research group wishing to handle tritium presently has no clear route.

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49	Rule 29(1)	An application for licence shall be made by the employer of the facility, occupier of the factory, owner of the mine, or any person with ultimate control over the activity.	Add a further category: "or, in respect of an application relating to the design of a plant or reactor, by a technology developer or technology provider," with consequential provision in rules 4(1) and 5(1).	A technology developer that neither owns nor operates a facility falls within none of the listed categories and cannot apply for anything under Chapter II, including pre-licensing consultation and in-principle approval; section 3(1)(c) already makes "any other company" eligible.
50	Rule 29(3), read with rules 31(2)(b), 73(7) and 74(1)(d)	Applicant shall declare and delineate strategic, sensitive, proprietary or commercially confidential information.	Add sub-rule (4): the independence/confidentiality obligations of rule 139 shall apply, with necessary modifications, to committee members under rule 31 and to experts/consultants/institutions engaged under rules 73(7) and 74(1)(d), each furnishing a conflict-of-interest declaration and recusing where a conflict arises.	No confidentiality or recusal obligation presently binds those who examine flagged proprietary information, though rule 139/Regulation 76 accept the principle elsewhere; in a small field like fusion, reviewers are likely drawn from competing institutions.
51	Rule 32(3) — no amendment sought	(Provision as drafted.)	Supported as drafted; a corresponding outer limit or published service standards should be provided in the regulations for the Board's decisions.	Rule 32(3) creates valuable licensing-side certainty, but the regulations contain no corresponding outer limit (Regulation 45(4) provides only an "indicative timeframe"), and the Board stage is ordinarily the longer of the two.
52	Rule 32(3)	Unless otherwise specified by notification, a licence for a facility/plant/mine shall be issued within 180 days and related permission within 60 days, subject to requirements being fulfilled.	Extend defined, outer-limit timelines to other categories of regulatory decisions affecting licensees and technology developers, including patent-application and secrecy-direction decisions concerning nuclear-related inventions, and cap the "unless otherwise specified by notification" exception at a maximum additional period.	Rule 32(3) prescribes timelines only for licence/permission decisions; the Draft Rules are silent on timelines for other regulatory/IP-related decisions (historically slow where an invention relates to nuclear energy), and the notification-based carve-out has no defined outer limit.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
53	Rule 33, Explanation ; and rule 35	Licence period ordinarily determined based on the design life of the plant/reactor as provided by the technology provider.	Proviso: for a first-of-a-kind facility, including a fusion energy facility, with no established design life, the licensing authority may fix the licence period on the basis of the safety case. In rule 35, insert: reconfiguration of a fusion energy facility within an approved design/safety envelope requires the Board's prior permission but not a fresh license.	First-of-a-kind fusion devices have no established design life; experimental/pilot devices are also reconfigured frequently. Regulation 50(1) ties the authorisation period to the licence period, compounding this.
54	Rule 38(2) (m) and (n)	Clause (m) and clause (n) both require compliance with conditions/directions issued by the Central Government based on national policies under section 32 of the Act.	Delete the duplicate clause; re-letter the remaining clauses.	The two clauses are identical in terms — duplication.
55	Rule 48(3)	No new practice shall be carried out unless found justified by the Standing Committee per Schedule-I and accepted by the Board.	Proviso: fusion energy generation, fusion-based isotope production and fusion neutron applications shall be treated as justified practices for this sub-rule, subject to optimisation in the individual case.	Every fusion facility would otherwise require its own justification determination; an ex-ante determination unlocks both instruments without diluting the justification principle.
56	Rule 52 – In-Principle Approval	In-principle approval mechanism.	Define validity, conditions and transition process from in-principle approval to composite license.	Avoids duplication of regulatory reviews and improves investor confidence.
57	Rule 52 – Site & Technology Approval	Site and technology assessment following in-principle approval.	Grandfather approved elements into subsequent licensing stages unless material changes occur.	Provides regulatory certainty and reduces repetitive assessments.

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58	Rule 53(3)	For off-site emergency, emergency response plans shall be reviewed by the Board and approved by district authorities.	Proviso: where the safety case demonstrates generic intervention levels are not exceeded beyond the site boundary, a plant-level emergency response plan approved by the Board, with notification arrangements agreed with district authorities, shall suffice, and no off-site emergency planning zone shall be required.	For a facility whose bounding release cannot produce doses warranting off-site protective action, an off-site plan imposes cost/delay without safety benefit and diverts emergency-planning resources from facilities that need them.
59	Rule 55, and rule 57(2)	Determination of design basis threat (rule 55) and appointment of nuclear security officer (rule 57(2)).	Proviso: for a fusion energy facility, the design basis threat and physical protection requirements shall be graded by site tritium inventory and assessed sabotage consequence; the computer-security obligations under rule 57(1)(g) continue to apply in full.	Fissile-material-calibrated design basis threat/physical protection requirements impose substantial cost against a threat that does not arise for fusion, which has no fissile inventory; the cyber concern, which does arise, is common to both.
60	Rule 62	Central Government shall maintain a national registry of radioactive substance; licensees maintain local registers and furnish annual returns.	Provide for fusion neutron sources and generators above notified thresholds, consistent with the registration tier marked by asterisk in Schedule-I to the regulations.	Fusion neutron sources/generators will proliferate as fusion-adjacent commercial applications develop; Schedule-I to the regulations lists neutron generators for registration only, and the rules should be aligned to avoid inconsistent obligations on the same device.
61	Rule 64(1) — new clause	List of items subject to safeguards.	Add clause: tritium, and tritium production/handling systems, in quantities exceeding a Central-Government-notified threshold.	Given the boosted-weapon relevance of tritium, silence is likely to be read internationally as a gap rather than deliberate liberalisation; bringing tritium within national accounting/control strengthens India's position for fusion collaboration.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
62	Rule 64(1) (b)	Heavy water including its upgradation for maintaining isotopic purity.	Add "in quantities exceeding the threshold notified under section 44 of the Act."	A fusion developer procuring deuterium gas/heavy water as fuel or reagent is otherwise drawn into full accountancy/inspection obligations disproportionate to any conceivable sensitivity at those quantities.
63	Rules 66 to 72	Cover environmental surveillance, emergency preparedness, stakeholder awareness, centralised radioactive waste management, quality assurance and recognition of training courses. No provision for applicant/ developer access to research, testing or irradiation facilities.	Add access to materials-testing facilities, hot cells and full-scope simulators under the Department of Atomic Energy, for qualifying materials, fuel, components and systems ahead of committing a prototype or demonstration reactor.	Irradiation, hot-cell and materials-qualification capability needed to complete indigenous design work exists almost entirely within DAE; section 32(3) and 24(2) already contemplate such facilities being made available, and rule 4(3) already contemplates chargeable access — full cost recovery would avoid exchequer burden.
64	Rule 71	Framework for facilitating quality assurance/control of systems, structures and components manufactured in India or imported to globally recognised standards.	Extend to include development of codes and standards for fusion components (HTS magnets, plasma-facing components, tritium systems, large cryogenic plant, vacuum vessels) and accreditation under Regulation 61 of agencies competent to certify them.	There is presently no Indian code coverage for these fusion components; without codes, neither manufacturer nor regulator has a certification basis and the domestic supply chain cannot develop.
65	Rule 72	Central Government may facilitate training and qualification of individuals in nuclear energy for capacity building and skill development.	Include fusion-specific qualification pathways (plasma engineering, tritium handling, superconducting magnet engineering, fusion radiation protection), aligned with positions notified by the Board under Regulation 62(2).	Capacity building is presently provided in general terms only, without reference to fusion-specific disciplines; qualification pathways and certified positions need to be developed together to clear licensing hold points.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
66	Rule 72 (r/w Rule 71)	Central Government "may facilitate" training and qualification of individuals in nuclear energy for capacity building and skill development; may establish wings/directorates as needed.	Convert Rule 72 into a mandatory framework requiring the Central Government to establish and fund nuclear-education and training institutions spanning ITI, diploma, degree and doctoral levels, define a process for recognising international certifications, and set periodic manpower-planning targets aligned to capacity-addition and regulatory-staffing needs.	Rule 72 is enabling ("may facilitate") rather than mandatory and establishes no structured, centrally-funded workforce pipeline, certification-recognition process, or manpower targets — risking a personnel shortfall for a 100 GW capacity target.
67	Rule 73(6)	"The any authorized representative of Central Government may verify compliance …" [sic]	Correct to: "Any authorised representative of Central Government may verify compliance …"	Typographical; "authorised" and "authorized" are used interchangeably throughout both instruments — a single spelling should be adopted.
68	Rule 76, and rules 77 and 108	The operator of a nuclear installation shall be liable …	Proviso: this Part, and rules 77 and 108, shall not apply to a fusion energy facility unless otherwise notified; liability for radiation damage caused by a fusion energy facility shall be governed by Part-B of this Chapter and rule 101.	Deeming a D-T device a "reactor" makes it a nuclear installation attracting compulsory nuclear liability insurance for which no product exists in India; comparable international regimes do not bring fusion within the nuclear liability convention framework.
69	Rule 77 – Insurance & Financial Protection	Insurance and financial protection against nuclear damage.	Enable comprehensive insurance arrangements covering liability and operational risks.	Private and PPP projects require adequate insurance coverage beyond statutory liability provisions.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
70	Rules 77-78 — PPP/Private Sector Insurance	Insurance provisions for PPP/private projects.	Explicitly recognise private and PPP installations within insurance and liability arrangements.	Existing structures are primarily designed around government-owned facilities.
71	Rules 77-78 — Insurance / Financial Protection	Insurance and financial-security provisions need to accommodate private-sector and PPP nuclear projects.	Establish clear and standardised insurance/reinsurance arrangements and avoid uncapped, non-transparent levies or duplicate financial-security requirements.	Improves financial predictability and prevents overlapping or excessive risk-transfer requirements.
72	Rule 78 – Review of Liability Limits	Five-year review of operator liability limits.	Establish a risk-based insurance pool covering public, private and PPP operators.	Creates a sustainable mechanism for liability coverage while reflecting technological and market realities.
73	Rule 78 – Nuclear Liability Fund / Insurance Pool	Liability protection framework.	Consider an industry-wide nuclear liability insurance pool.	Improves access to affordable liability coverage and spreads risk across the sector.
74	Rule 93(2)(e)	Claims of any other economic loss other than one caused by impairment of the environment referred to in (a) and (b) …	Correct to: "… referred to in (b) and (c) …"	Impairment of the environment is dealt with in clauses (b) and (c) of that sub-rule, not (a) and (b).
75	Schedule-II (see rule 101(3))	Financial security for radiation damage: from one lakh to fifty lakh rupees, the highest band applying where there is potential for severe deterministic health effects off-site.	Add a fusion-energy-facility band graded by site tritium inventory, in amounts the Central Government may specify by notification under rule 151; existing bands to be reviewed for quantum.	If fusion is placed under Part-B (Sl. No. 21), fifty lakh rupees is not a credible measure for a facility with significant tritium inventory; lowest bands may also be over-calibrated for small research devices.

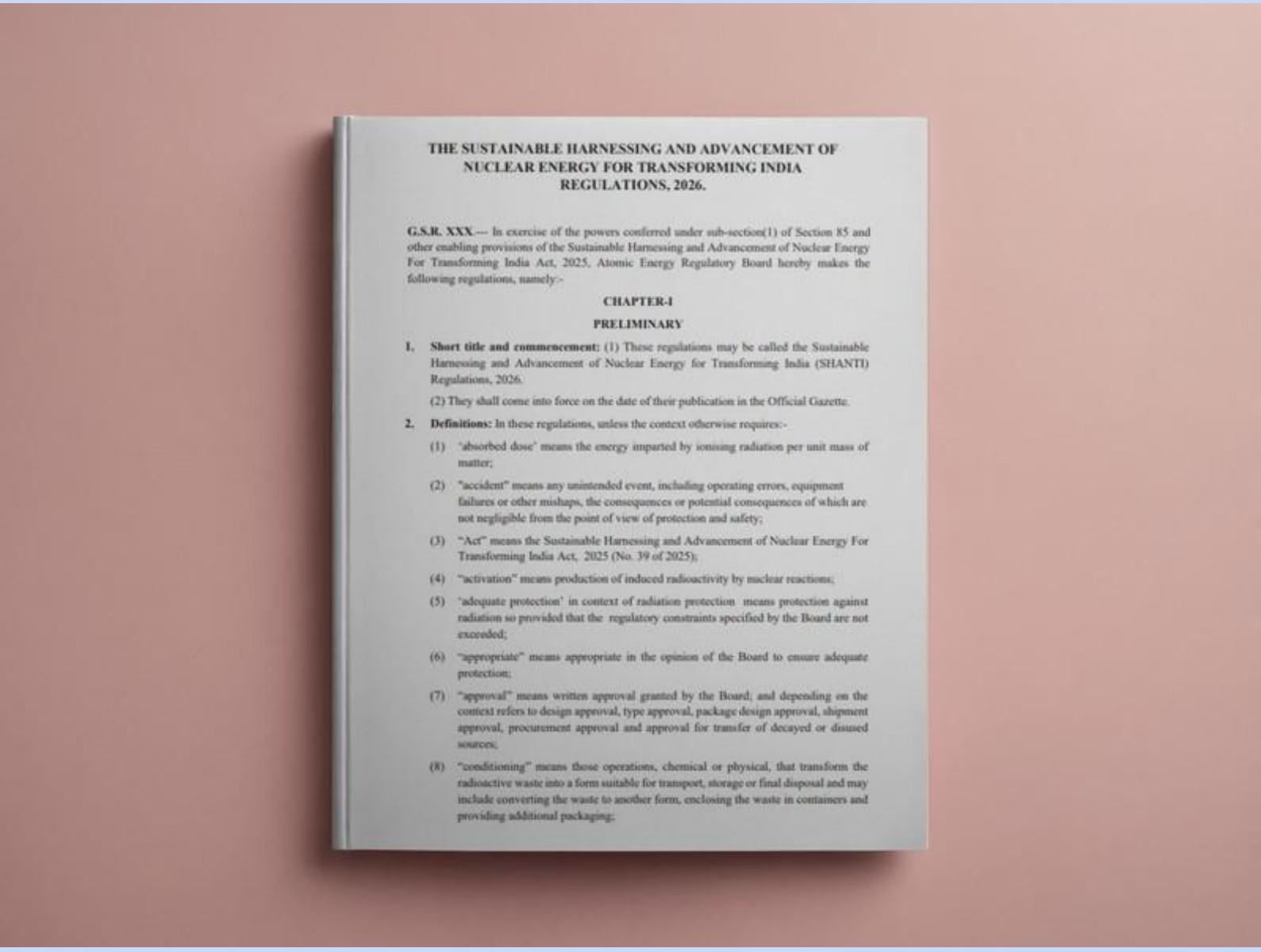
Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
76	Rule 105(3)	"3) No account shall be taken of any benefits, reimbursement or insurance received by the applicant."	Renumber as "(3)" and add a new sub-rule (3A): compensation shall be reduced by any … [text incomplete in draft].	As drafted, the sub-rule contains two propositions pulling in opposite directions within a single sentence, whose relationship is not ascertainable.
77	Rule 106 – Tariff Determination	Tariff determination through future notification.	Prescribe a time-bound tariff framework with clear methodology and review mechanism.	Investors and lenders require tariff visibility for project financing.
78	Rule 106 – Power Purchase Agreement (PPA)	Power Purchase Agreements (PPA).	Introduce a Model Nuclear Power Purchase Agreement or mandate its notification.	Standardised PPAs improve bankability and reduce transaction complexity.
79	Rule 106 – Two-Part Tariff	Tariff structure for nuclear projects.	Consider a two-part tariff comprising fixed and variable components.	Reflects the high capital cost and relatively stable operating costs of nuclear generation.
80	Rule 106 & Related Policy Provisions	Procurement mechanism for nuclear power.	Establish a SECI-like procurement framework with standard bidding and PPA documents.	Creates demand certainty and facilitates participation by DISCOMs, captive users and C&I consumers.
81	Rule 106 & Related Policy Provisions – Nuclear	Demand creation mechanism.	Consider a Nuclear Purchase Obligation (NPO).	Creates long-term demand certainty similar to Renewable Purchase Obligations.
82	Rule 106, read with rules 110(3) and 111(4)	A notional amount of electricity using a normative thermal efficiency shall be applied to reactors not supplying the grid.	Proviso: the normative thermal-efficiency method shall not apply to a facility generating no electricity; the rule-106 Committee's terms of reference shall extend expressly to first-of-a-kind cost structures and outputs other than electricity (neutrons, isotopes, process heat).	Early fusion facilities will supply neutrons, isotopes and process heat before electricity; a notional-electricity method applied to a facility generating none produces an arbitrary figure.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
83	Rule 106 — Tariff Determination	Rule 106 does not by itself provide sufficient detail on long-term tariff principles required for project financing.	Incorporate transparent tariff principles covering prudent lifecycle-cost recovery, return on capital, indexation, foreign-exchange treatment, fuel/waste/decommissioning pass-through, change-in-law relief and time-bound determination.	Long-term tariff visibility is essential for project bankability and lender/investor confidence.
84	Rules 109 and 110	The Spent Fuel Management Fund shall be constituted from a levy on licensees of nuclear power plants or reactors.	Exclude a fusion energy facility from the levy: rules 109 and 110 shall not apply to it.	A fusion facility produces no spent fuel; as drafted a fusion licensee would appear liable to contribute to a fund from which it derives no benefit.
85	Rule 111(2)	Decommissioning cost estimate shall have regard to technology/plant performance and cover activities including defueling, safe storage, decontamination.	Proviso: for a fusion energy facility the estimate shall reflect management of activated components and detritiation in place of defueling, with credit given for an approved decay-storage/clearance strategy.	There is no defueling in a fusion facility; its decommissioning cost is dominated by activated in-vessel components and detritiation, substantially reduced by a decay-storage strategy — a fission-based cost basis would over-state security required.
86	Rule 111(4)	"The annual contribution to for maintaining the financial security for decommissioning shall be based on …" [sic]	Correct to: "The annual contribution for maintaining the financial security for decommissioning shall be based on …"	Typographical.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
87	Rule 114(3), proviso	No application shall be accepted from a company whose licence has been cancelled, or its joint venture, and the company, joint venture and directors shall be deemed blacklisted.	Limit disqualification to cancellation on grounds of wilful default or safety-significant misconduct, for a specified period; exclude joint-venture partners, investors or directors not responsible for the default; preserve lawfully-held IP rights; require an opportunity to remedy and consideration of graded intermediate measures before cancellation.	Applied to a venture-funded developer, automatic blacklisting of the company, joint ventures and all directors regardless of fault is a materially disproportionate deterrent to private investment.
88	Form-D (see rule 126)	Declaration by the Chairperson/Member of the Appellate Tribunal for Electricity.	Correct to: "Declaration by the Chairperson/Member of the Atomic Energy Regulatory Board …"	Rule 126 concerns declaration of financial/other interest by the Chairperson and Members of the Board, not the Appellate Tribunal; the Form appears adapted from another instrument without amendment. A separate declaration may be prescribed for the Technical Member (Atomic Energy) under rule 143.
89	Rule 130(3)	(No independent operative content — provision as drafted reproduces rule 129(3).)	Review and, if duplicative, delete or recast: the sub-rule reproduces rule 129(3) verbatim and refers to budget estimates in a rule concerned with maintenance of accounts.	The sub-rule reproduces rule 129(3) verbatim and refers to budget estimates in a rule concerned with the maintenance of accounts.
90	Rule 143(7)	Subject to the provisions of sub-rules (4) to (7), the Search-Cum-Selection Committee shall regulate its own procedure.	Correct to: "Subject to the provisions of sub-rules (1) to (6) …"	The sub-rule refers to itself; rule 116(7), the parallel provision for the Board, is correctly drafted and may be followed.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
91	Chapter III — regulation of tritium	Tritium is not mentioned anywhere in the draft rules.	Give effect to tritium regulation via proposed new rule 9D.	Tritium is the principal radiological hazard, waste-management challenge and proliferation sensitivity of the D-T fuel cycle; its absence leaves no accountancy obligation or control mechanism.
92	Schedule-I, citation line	"(see rule 19(7), 46(2), 48(3), 50(2) and 54 (4)"	Correct to: "(see rule 19(7), 46(2), 48(3), 50(2) and 54(4))"	Typographical — the closing parenthesis is missing and the spacing in "54 (4)" should be closed up.
93	Chapter IV — Services by Central Governme nt	Chapter IV sets out chargeable services — calibration and dosimetry, the National Dose Registry, etc.	Add a service enabling licensees, applicants and technology developers to obtain chargeable access to research centres, test loops, irradiation and related facilities.	Rule 28 already permits design, modelling, simulation and manufacture/type-testing without a licence, but the irradiation/hot-cell/materials-qualification capability needed to complete that work sits almost entirely within DAE.
94	Schedule-I, paragraph 1 (Standing Committee)	Standing Committee comprises a Chairperson expert in radiation protection and ex officio members from DAE, Health, Environment, Commerce, Home Affairs, AERB, BARC, Tata Memorial Hospital and AMD.	Add the Director of the Institute for Plasma Research and a representative of DST or the Anusandhan National Research Foundation; in paragraph 2, add fusion energy generation, fusion-based isotope production and fusion neutron applications to the Committee's remit.	The Standing Committee determines under rule 48(3) whether fusion is a justified practice, yet presently has no fusion/plasma research representation; if not accepted, co-option under paragraph 1(d) should at least be made explicit.
95	Chapter II — fusion-fission hybrid systems	No provision exists in the draft.	(No modification text provided — gap identified.)	A fusion device driving a sub-critical fissile/fertile assembly presently defaults into the full fission regime, ungraded by effective multiplication factor. Given India's thorium interest, this forecloses a pathway of national significance by default rather than decision.

Feedback on Draft SHANTI Regulations 2026



THE SUSTAINABLE HARNESSING AND ADVANCEMENT OF NUCLEAR ENERGY FOR TRANSFORMING INDIA REGULATIONS, 2026.

G.S.R. XXX.— In exercise of the powers conferred under sub-section(1) of Section 85 and other enabling provisions of the Sustainable Harnessing and Advancement of Nuclear Energy For Transforming India Act, 2025, Atomic Energy Regulatory Board hereby makes the following regulations, namely:-

CHAPTER-I

PRELIMINARY

1. **Short title and commencement:** (1) These regulations may be called the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Regulations, 2026.

   (2) They shall come into force on the date of their publication in the Official Gazette.

2. **Definitions:** In these regulations, unless the context otherwise requires:-

   (1) 'absorbed dose' means the energy imparted by ionising radiation per unit mass of matter;

   (2) "accident" means any unintended event, including operating errors, equipment failures or other mishaps, the consequences or potential consequences of which are not negligible from the point of view of protection and safety;

   (3) "Act" means the Sustainable Harnessing and Advancement of Nuclear Energy For Transforming India Act, 2025 (No. 39 of 2025);

   (4) "activation" means production of induced radioactivity by nuclear reactions;

   (5) 'adequate protection' in context of radiation protection means protection against radiation so provided that the regulatory constraints specified by the Board are not exceeded;

   (6) "appropriate" means appropriate in the opinion of the Board to ensure adequate protection;

   (7) "approval" means written approval granted by the Board; and depending on the context refers to design approval, type approval, package design approval, shipment approval, procurement approval and approval for transfer of decayed or disused sources;

   (8) "conditioning" means those operations, chemical or physical, that transform the radioactive waste into a form suitable for transport, storage or final disposal and may include converting the waste to another form, enclosing the waste in containers and providing additional packaging;

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
1	**Regulation 3 + Schedule-I**	No specific provision for fusion-fission hybrid systems.	Introduce a dedicated regulatory provision for hybrid facilities.	Hybrid systems require a tailored regulatory approach reflecting combined hazards.
2	**Regulation 9(2) (o)**	Exclusion zone prescribed by Government/Boa rd.	Define technology- and consequence-based exclusion zones, including differentiated criteria for SMRs/MMRs.	A risk-informed approach is more appropriate than a one-size-fits-all requirement.
3	**Regulation 7(1) (h) & 7(1)(i)**	Foreign reactor design may require prior operation in country of origin.	Allow alternative qualification based on regulatory certification, safety assessment and technology maturity.	Prevents exclusion of advanced SMR technologies that are certified but not yet commercially deployed.
4	**Regulation 7; also Regulation 42(2)**	Design approval linked to project licence applications.	Create an OEM/design-authorisation certificate that can be referenced by future projects.	Avoids repeated design assessments and accelerates deployment.
5	**Regulations 6, 8, 42, 45, 47 & 48**	The draft establishes licensing and stage-wise safety authorisations, but the overall project approval	Establish a time-bound single-window project pathway with a designated case officer, consolidated documentation checklist, 30-day completeness	Provides regulatory certainty and reduces avoidable administrative delays without compromising safety review.
6	**Regulations 6, 8, 42, 45, 47 & 48**	The framework should distinguish between proven technologies and emerging technologies in	Apply a common high standard of safety while grading the evidence requirements, review depth and regulatory hold points according to novelty and hazard.	Provides a technology-neutral approach that avoids both under-regulation and unnecessary regulatory burden.
7	**Regulations 7, 9, 45, 47, 48, 50**	Site and design approval processes may create uncertainty regarding early	Permit appropriate conditional/early site actions; establish generic design approval reusable across sites; define "material change";	Provides site and design certainty, reduces duplication and improves investment confidence.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
8	**Regulations 7, 9, 12, 15, 35, 59**	Private developers require greater clarity on lifecycle responsibilities and financial arrangements.	Publish standard arrangements covering fuel/spent fuel, waste transport, decommissioning trust funding, insurance/ reinsurance and State-provided technical and emergency services.	Provides predictable lifecycle risk allocation and allows developers and lenders to assess total project costs.
9	**Regulation 9(2)(o) + Regulation 45(4), 45(7)**	No defined exclusion-zone distance for SMRs/MMRs.	Provide indicative distances or a transparent calculation methodology.	Reduces uncertainty regarding land requirements, site selection and project
10	**Regulations 10(j), 11(k), 12(i), 15(f)**	Managerial and technical capability requirements.	Publish standard qualification and competency criteria for key personnel.	Ensures consistency and transparency across the industry.
11	**Regulation 46 + Schedule-I**	Absence of dedicated fusion safety codes.	Develop technology-neutral fusion safety codes and guidance.	Provides regulatory clarity for emerging fusion technologies.
12	**Regulations 10(j), 11(k), 12(i), 15(f); Regulation 59**	Workforce competency requirements not fully defined.	Establish a national competency framework for construction, QA, operations and safety personnel.	Supports workforce development and standardisation as the sector expands.
13	**Regulations 45–47**	Regulations 45–47 provide for graded review, expert involvement, safety-case presentation, inspections, use of international standards and creation of new regulatory requirements where necessary.	Explicitly incorporate Technology-Neutral Safety Assessment Principles within the regulatory framework.	Provides a consistent basis for assessing PHWRs, imported LWRs, SMRs, Gen-IV reactors, fusion and other emerging technologies.
14	**Regulations 45–47**	The regulatory review provisions provide significant discretionary and procedural powers but do not explicitly establish a structured framework for assessing regulatory readiness of novel technologies.	Introduce a formal Regulatory Readiness Assessment Framework for novel and first-of-a-kind technologies.	Provides transparency where Indian codes, standards, operating experience or regulatory precedents are limited.

Sl. No.	Reference	Existing Provision in the Draft	Proposed Modification	Rationale / Justification
15	**Regulations 45–47**	International standards and external expertise may be considered during regulatory review.	Establish explicit provisions for International Regulatory Cooperation and Leveraging, while retaining AERB's independent regulatory authority.	Enables India to benefit from international regulatory experience, safety assessments and operating experience.
16	**45–47 and related safety-review provisions**	The framework establishes review and inspection processes but provides limited articulation of how regulatory judgement should be exercised for novel technologies.	Provide clear principles for regulatory judgement, including treatment of uncertainty, evidence, safety margins, defence-in-depth and relevant international experience.	Improves transparency, consistency and predictability of regulatory decision-making.
17	**Regulations 45(3), 45(4), 45(7), 46**	The draft framework does not clearly establish a specific regulatory approach for safety-significant AI applications.	Introduce provisions for verification, validation, qualification, reliability, cybersecurity and regulatory oversight of AI-enabled safety-significant systems.	Creates regulatory readiness for future use of AI in monitoring, diagnostics, control and safety-support functions.
18	**Regulations 45(3), 45(4), 45(7), 46**	A comprehensive technology-neutral framework for first-of-a-kind technologies is not explicitly articulated.	Establish technology-neutral assessment criteria applicable to PHWRs, imported LWRs, SMRs, microreactors, Gen-IV systems, fusion and other emerging technologies.	Creates a future-ready framework without prescribing a particular reactor technology or national regulatory model.
19	**Regulations 45(4), 45(7), 47(4)**	The framework requires a clear pathway for advanced technologies at different stages of development, testing and deployment.	Introduce a graded pathway covering pre-application familiarisation, Indian regulatory gap analysis, generic design review, independent peer review, technology qualification, site-specific assessment, non-nuclear testing, fuel loading/initial criticality, limited-power operation and commercial-operation authorisation after defined evidence gates.	Enables deployment of advanced and first-of-a-kind technologies while maintaining safety requirements proportionate to technology maturity and hazard.
20	**Regulation 50(3)**	Design approval validity not clearly defined.	Specify validity period and review triggers.	Provides regulatory certainty while maintaining safety oversight.

Additional Policy Recommendations from INF

Sl. No.	Reference	Document Type	Existing Position / Issue	Proposed Action	Rationale / Justification
M1	Long-term Power Offtake	**Miscellaneous – Government Policy Action**	Private nuclear projects require long-term revenue visibility and predictable demand for firm clean power.	DAE should work with the Ministry of Power, CERC and States to develop long-term procurement mechanisms for firm clean nuclear power.	Provides predictable offtake and improves project bankability.
M2	Nuclear Power Purchase Obligation	**Miscellaneous – Government Policy Action**	No nuclear-specific purchase obligation is created solely through the SHANTI framework.	Consider a Nuclear Power Purchase Obligation (NPPO) or clean-firm-power procurement target through the appropriate electricity-law/policy instrument.	Creates predictable demand while ensuring that the mechanism is established under the appropriate legal framework.
M3	Clean-Nuclear / Clean-Firm-Power Benefits	**Miscellaneous – Government Policy Action**	Nuclear power may not automatically qualify for all renewable-energy, green-finance or certificate mechanisms.	Create a distinct clean-nuclear / clean-firm-power eligibility category for applicable green-finance, certificates or other benefits based on lifecycle emissions and system value.	Recognises nuclear as low-carbon and firm power without automatically classifying it as renewable.
M4	Depreciation / Capital Allowance	**Miscellaneous – Fiscal Policy Action**	The SHANTI Rules do not establish a nuclear-specific depreciation or capital-allowance framework.	Request the Department of Revenue to evaluate a nuclear-specific depreciation/capital-allowance approach reflecting long construction periods and operating lives.	Appropriate tax treatment could improve project economics and investment viability.

Sl. No.	Reference	Document Type	Existing Position / Issue	Proposed Action	Rationale / Justification
M5	AERB Capacity & Transparency	**Miscellaneous – Institutional Measure**	Expansion into multiple reactor technologies will increase regulatory workload and technical requirements.	Publish recognised-agency criteria, review timelines, non-sensitive precedents, inspection/enforcement manuals and annual regulatory performance statistics.	Improves transparency, regulatory predictability and institutional capacity.
M6	Indian / Foreign Technical Support	**Miscellaneous – Institutional Measure**	Novel technologies may require specialised expertise beyond currently available domestic regulatory resources.	Allow qualified Indian and foreign technical support subject to recognition, confidentiality, independence and conflict-of-interest controls.	Provides access to specialised expertise while retaining AERB's independent regulatory authority.
M7	Three-Phase Implementation	**Miscellaneous – Implementation Measure**	Notification of the Rules and Regulations alone may not provide all operational mechanisms required by project developers.	Phase I: Before notification—publish forms, fees, guidance and insurance/financial-security framework. Phase II: Before financial close—issue project-specific regulatory plan, tariff pathway and spent-fuel/decommissioning arrangements. Phase III: During execution—use coordinated inspections, digital reporting and a single observation register.	Ensures that the framework becomes operational and usable from the beginning of project development.
M8	Inter-Ministerial Coordination	**Miscellaneous – Government Coordination Measure**	Several enabling measures fall outside the direct scope of SHANTI Rules and Regulations.	Establish an inter-ministerial mechanism involving DAE, AERB, Ministry of Power, CERC, Ministry of Finance/Department of Revenue and States.	Ensures coordinated action on tariff, offtake, clean-power benefits, taxation and implementation.

Three Phase Priority



Short Term

1. SHANTI Rules notification.
2. Nuclear Mission Directorate.
3. Model PPA and Concession Agreement.
4. Nuclear Infrastructure Status.
5. Green taxonomy inclusion.
6. Site Bank.
7. Strengthening AERB capacity.
8. SECI-type intermediary procurer.
9. Financing window through IIFCL/PFC/REC.
10. Human Resource Mission.

Medium Term

1. FDI reforms.
2. National manufacturing mission.
3. SMR mission.
4. Public outreach.
5. Digital clearance system.
6. Generic design assessment.

Long term

1. NSRA legislation.
2. Export strategy.
3. Global nuclear technology leadership.
4. Advanced reactors
5. Hydrogen and desalination integration

Industry Perceptions, Concerns, Expectations & Policy Recommendations - Executive Summary

Policy Recommendations based on Industry Perceptions, Concerns, Expectations to accelerate India's 100 GWe Nuclear Vision.

This document presents a set of recommendations derived from a series of consultative meetings, workshops, discussions in sub-committees before, during and after the India Nuclear Energy Forum (INEF-2026) held at IIT Bombay on 29-30 May, 2026.

Industry perceptions, concerns and expectations and policy recommendations, consolidated after several rounds of discussions with multiple stake holders to accelerate 100 GWe nuclear energy vision are presented in this report. A key issue is to make nuclear energy sector business friendly and investor friendly, while keeping the safety and security issues as mandated for nuclear power plants.

The recommendations are in the following categories and are detailed in following sections:

1. India Nuclear Mission:

a. Create Nuclear Energy Development Council (NUDEC) for Policy Level

i. Consisting of Cabinet Secretary, Principal Secretary, NITI Aayog, DAE and all ministries concerned, and industry representatives

b. Create a National Nuclear Energy Mission Directorate (NUMID) as an executive arm. Ensure industry and all stake holder participation.

i. Consisting of AERB, DAE, all concerned ministries, and industry stakeholders

c. Develop nter-ministerial coordination framework for all nuclear energy related activities (for example grid integration at scale with MoP, CEA, GRID India, etc.)

d. NUDEC and NUMID should come out with an integrated nuclear energy development roadmap for 100 GWe nuclear by 2047.

e. A set of standardized documents should be developed and issued to enable new entrants. Such documents can include

i. Model PPA, Model Concession Agreement, Model EPC Framework, standardized risk allocation principles,

ii. These will dramatically improve bankability of nuclear projects

2. Licensing Rules, Regulations, and Siting

a. Rules and Regulations to be finalized after consultations with industries and all stake holders including different ministries.

b. Create a timebound roadmap for announcement / deployment of clearly defined qualification criteria in rules and regulations.

c. Increasing capacity of AERB, and Independence of AERB

d. Establish a licensing engagement cell, a single window clearance system, with 3 stage- licensing approach **(i.)** Early Engagement, **(ii.)** Generic Design Assessment, **(iii.)** Site Specific licensing

e. Create a national nuclear portal for digital clearance and tracking

f. Developing a National Nuclear Site Bank

g. Government may examine creation of Nuclear Safety Regulatory Authority (NSRA) through separate legislation at an appropriate stage.

3. Policy Interventions to promote nuclear energy

a. Green Classification, Green Taxonomy
b. Nuclear as infrastructure
c. Power offtake, Demand Assurance, and payment security
d. India Nuclear Pool Expansion
e. Nuclear dispute resolution mechanism

4. Economics of nuclear power plants, financing and investments

a. Make policies, rules, regulations to make nuclear projects bankable.
b. Sovereign support mechanism through IIFCL / PFC / REC orOr any other Entity felt fit by the GoI
c. Long tenor debt (30+ years
d. Sovereign payment security mechanism through SECI type intermediary.
e. First-of-a-kind support for initial projects through Viability Gap Funding schemes.
f. Rupee bond market access
g. FDI in Nuclear Reactor technologies, fuel fabrication facilities, and Nuclear Power Plants to be made flexible. Mechanism to review to increase FDI percentage after 3 years. Use a 3 phase approach to increase FDI in nuclear
h. Customs duty exemption for nuclear energy imports
i. GST of nuclear power to be at 5% (on par with renewable energy)

5. A framework for licensing and managing Reactor Technologies (PHWR, BSMR, MMR, SMR)

a. Standardise over a limited number of reactor designs to enable fleet mode deployment which will aid in cost reduction and time compression.
b. Capacity targets for various technologies including PHWR Fleet, LWR Projects, SMRs to enable Fleet mode
c. Fuel cycle infrastructure
d. Manufacturing localization targets.

6. Nuclear Fuel supply security and Heavy Water Supply Security

a. Assurance of long term fuel, and heavy water supply
b. Publish policy on spent fuel & waste management including back-end fuel cycle, reprocessing rights, decommissioning. This clarity is needed to make projects bankable.
c. Define responsibilities of private operators in waste management

7. Nuclear Supply Chain

a. Establish a nuclear manufacturing mission.
b. Create a PLI scheme
c. Develop nuclear vendor qualification program
d. Work towards export promotion
e. Set up nuclear energy parks with PLI type incentives
f. MSME vendor development
g. FDI in special areas such as instrumentation and control, special steels and forgings, heavy equipment
h. QA & certification support. Develop TSO
i. Introduce phased manufacturing programs to increase the local content in each phase.

8. Human Capacity Development

Human Capacity Development, through cooperative and collaborative arrangement between DAE entities, academic institutions and industry bodies.

a. Identify human capacity development as a key infrastructure for nuclear energy expansion
b. Involve UGC, AICTE, HBNI, universities, BARC, IGCAR, NTPC and private players to create a task force.
c. Develop UG and PG academic programs, PhD programs for nuclear energy
d. Develop integrated Masters programs in reactors physics, reactor engineering
e. Develop PG training programs, operator licensing programs, simulation centers,
f. Encourage international collaborations in workforce development

9. Collaborative R&D

Collaborative R&D in nuclear energy to create global benchmarks in India.
a. Create a public-private nuclear research framework
b. Create a Small Business Innovation & Research (SBIR) for nuclear inline with SBIR of DoE, USA and DBT of GoI.
c. Create a focused attempt to develop indigenous designs of SMRs / MMRs by private players

10. Public Perception, Mass Awareness

Public Perception, Mass Awareness for acceptance of nuclear energy, to ensure smooth implementation and operation of nuclear power projects.

a. Local Area Development in Nuclear Project sites
b. Mass awareness campaigns in schools, colleges, political and administration, and general public on safety of nuclear energy
c. Create transparent nuclear information framework.
d. Create social media campaigns to promote nuclear

Building India's Nuclear Energy Ecosystem

Accelerating India's Nuclear Mission Through Stakeholder Collaboration

India Nuclear Forum (INF), is dedicated to fostering a vibrant and inclusive nuclear energy



ecosystem by facilitating continuous engagement, collaboration, and knowledge exchange among all stakeholders across the nuclear sector.