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## An independent Nuclear Regulatory Authority (NRA) is the need of the hour

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December 26, 2018

*Why is the Department of Atomic Energy (DAE) dragging its feet?*

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The havoc caused by a 13-metre high tsunami off the coast of Japan on March 11, 2011 and the disaster that immediately struck Fukushima Daiichi nuclear facility, leading to the meltdown of three units of the power plant, constantly remind the humanity of the inherent, hitherto not fully understood perils of nuclear technology. There was a worldwide concern about the need to strengthen the safety features of the design and the operation of nuclear reactors and the need to strengthen the independent regulation of nuclear technology. The International Atomic Energy Agency (IAEA) and the national regulatory authorities in many countries have revisited the efficacy of governance in the field of nuclear power development and accepted the need to bring in greater transparency in the functioning of the nuclear industry.

Though more than seven years have elapsed since Fukushima, India has been hesitant in responding to the potential dangers of nuclear technology. From the point of view of public interest, this is unacceptable.

### **Transparency in governance – India's Atomic Energy Act (AE Act):**

The Indian Atomic Energy Act (AE Act), 1962 governs all activities associated with nuclear technology. In particular, Section 18 of the Act empowers the government to restrict, through executive orders, disclosure of information to the public, on any facility that involves the use of nuclear technology. This

provision remained untouched even after the Supreme Court's landmark order on the interpretation of the Constitution that Article 19 confers on the citizen the "right to information" on the functioning of all public authorities. It is ironic that AEAct fails to incorporate the letter and the spirit of the Right to Information Act (RTIAct) of 2005.

### **Atomic Energy Regulatory Board (AERB):**

Under Section 27 of the AEAct, DAE issued an executive order in 1983, setting up the Atomic Energy Regulatory Board (AERB) as an authority subordinate to the Central Government. The order required AERB to carry out regulatory and safety functions envisaged in the Act. Being subordinate to DAE, AERB often found it difficult to enforce the globally accepted safety norms on the activities of DAE and those of Nuclear Power Corporation of India Ltd (NPCIL).

### **DAE's post-Fukushima responses:**

Post-Fukushima, one would have expected DAE to review this anomalous situation and amend the AEAct to harmonise it with the provisions of RTIAct. Section 4 of RTIAct requires all public authorities to disclose information suo motu on their activities, whereas DAE has taken shelter under Section 18 of AE Act to exempt itself from such disclosures.

DEA ought to have introduced separate legislation to replace AERB with an independent authority to regulate the activities of DAE/ NPCIL from the safety point of view.

Learning from the lessons of Fukushima, DAE should also have reviewed the basis for the existing emergency planning zones around the nuclear power plants (NPPs) and put in place a more meaningful zoning system to ensure greater disaster preparedness.

Simultaneously, DAE should have reviewed the safety firewalls in the case of each NPP and taken measures to strengthen the same.

As far as AERB is concerned, DAE did move quickly in 2011, immediately after the Fukushima accident, to introduce the Nuclear Safety Regulatory Authority (NSRA) Bill in the Parliament to set up an independent regulatory authority. The concerned Parliamentary Standing Committee on Science & Technology, Environment & Forests considered the Bill in detail and, in March, 2012, recommended substantive changes in the Bill in order to make sure that the proposed NSRA becomes truly independent to be able to enforce the globally accepted safety norms. More than seven years have elapsed since then but DAE, for reasons best known to it, has failed to process the Bill in its amended form for the approval of the Parliament. Nor has DAE cared to review the emergency planning zones till date, as it ought to have.

DAE is meanwhile proceeding at a breakneck speed to expand the nuclear power generation capacity in leaps and bounds by ramping up domestic reactor manufacture and resorting to large-scale import of reactors from the US, French and Russian sources. What should cause public concern is that many existing and new nuclear power projects will not only have larger capacity reactors but also each project will have five to six units located in close proximity with one another. Though the probability of occurrence of a nuclear accident may be low, if it ever happens, its consequences can be formidable. The global experience with nuclear reactors till date has been limited and it is possible that, despite continuing improvements in technology, the probability of occurrence of a Fukushima-like disaster will be much higher than what the nuclear industry claims to be. Such a disaster can be triggered by a manual lapse, a cyber attack, an act of sabotage or a natural calamity which in itself is difficult to predict. Unlike the other technologies, a disaster at a nuclear power plant can have inter-generational impacts and it will take decades to decommission an accident-stricken plant. It is surprising that the DEA, headed by no less than

the Prime Minister himself, should treat these possibilities in a somewhat casual manner and carry on nuclear development in a business-as-usual mode.

AERB has highly competent personnel capable of exercising strict professional oversight on the safety of the nuclear industry, provided they are allowed to do so. In practice, to what extent has AERB been able to discharge the obligations cast on it by AEAAct?

### **AERB's performance:**

In their report (No 9/2012-13) to the Parliament, Comptroller & Auditor General of India (CAG), while auditing the performance of AERB, pointed out several lapses on AERB's part, including failure to carry out periodic regulatory inspections. Against that background, CAG had expressed concern about the lack of sufficient autonomy for AERB in the following words.

“the Government may ensure that the nuclear regulator is empowered and independent. For this purpose, it should be created in law and should be able to exercise necessary authority in the setting of regulations, verification of compliance with the regulations and enforcement of the same in the cases of non compliance.....Although international commitments, good practices and internal expert committees' recommendations were available, the legal status of AERB continued to be that of an authority subordinate to the Central Government, with powers delegated to it by the latter. AERB did not have the authority for framing or revising the rules relating to nuclear and radiation safety”

With specific reference to the “international commitments” referred by CAG, it should be noted that India is a member of the International Atomic Energy Agency (IAEA) and, therefore, stands committed to the guidelines issued by that Agency. With a view to review the safety aspects of nuclear installations across the countries, IAEA constituted the International Nuclear Safety Advisory Group (INSAG) in 2017 to recommend measures to enhance the safety standards of the nuclear industry. India was a member of INSAG. With specific reference to the need for independent regulation, INSAG-17 stated as follows.

“a regulatory body should more resemble the judicial branch (the courts of law) than the executive branch of government. Thus, it is important for its credibility and effectiveness that the regulatory body has effective independence in order to make the necessary decisions with respect to the safety of workers and the public and the protection of the environment.”

Though a party to this commitment, it is ironic that India should drag its feet in complying with IAEA's advice.

The fact that AERB stands constrained in its ability to regulate the activities of the nuclear establishment and the Board's reluctance to communicate freely with the public is corroborated by several aspects of its performance.

Many anomalies/ events that occur at NPPs ought to be notified to the public in a meaningful manner but often one comes to know of such events more from media investigations and applications filed under RTIAAct than from suo motu disclosures made by AERB. While AERB may be monitoring the radiation levels and their impact on the health of the people in and around the nuclear installations, the findings are not adequately shared with the local communities. The statutory public consultation process that precedes environment clearance for NPPs under the provisions of the Environment (Protection) Act, as in the case of the other industrial projects, is treated more as a ritual than an opportunity to explain to the people the costs and the benefits of a given nuclear project and elicit their views in an objective manner.

The National Disaster Management Authority (NDMA) has prescribed that NPCIL should conduct periodical mock drills within 30 km of every nuclear power station. Such mock drills are meant to test the

disaster preparedness of the Central and the State agencies in a coordinated manner. In practice, however, such mock drills are either done away with or restricted to a couple villages by way of a token gesture.

For example, in a case pertaining to Kudankulam nuclear power project (WP No.24770/2011), Madras High Court pointed out in August, 2012 that NPCIL was yet to undertake such a mock drill and directed NPCIL as follows.

“Even though it is stated that the said exercise was done in only one village, namely Nakkneri village, which is stated to be nearer to the KKNPP, as we are informed that nearly 30 to 40 villages are within 30 Kms radius of KKNPP, such event must take place in all villages and more importantly, apart from the officials, as stated above, the people in the area must be made to participate and an awareness programme must be made to infuse confidence in the minds of the local people that the project is for the benefit of the country and there is no need to alarm”(Para 89 of the court order)

NPCIL is yet to comply with this direction. On its part, AERB too has not acted on what the court had pointed out, as a responsible regulatory authority ought to, nor has AERB disclosed at its website the reasons for non-compliance with the court direction. AERB should have suo motu directed NPCIL to conduct mock drills periodically, in line with the guidelines issued by IAEA. Should a major accident take place at any nuclear power project, in the absence of adequate preparedness, one wonders whether the concerned agencies would be able to act in a concerted manner and deal with the accident effectively.

How transparent is AERB's functioning?

One would have expected AERB to disclose to the public IAEA's norms on safety and safety practices and indicate the extent to which those norms find compliance by NPCIL. AERB ought to have made public the periodicity of its regulatory inspections of the nuclear power plants, the details of the findings and the action taken by NPCIL. Similarly, AERB ought to have put in place systems to monitor the radiation levels periodically in and around each nuclear power plant, especially w.r.t ground water quality and made a public disclosure of the relevant information. More important, AERB should have taken the public into confidence in the case of each and every anomaly/ event occurring at each NPP. In view of the public apprehension that even low-dose radiation can lead to carcinogenic diseases, AERB should have commissioned periodic independent health surveys and informed the public of the results of such surveys.

A cursory look at AERB's website shows how sketchy the disclosed information on any of these items is. The website does not provide information on disaster preparedness exercises, if any, conducted by NPCIL. The information made available on the radiation levels in the areas adjacent to the nuclear power plants is far too inadequate to inspire public confidence. Public health surveys are rarely conducted. There is some information provided on radioactive effluent disposals for the years 2016 and 2017 (not updated for 2018) but it is far too inadequate to address the public concerns.

AERB's website mentions the occurrence of anomalies/ events that occurred at NPPs in terms of the INES scale but, once again, the disclosure is more ritualistic than being meaningful from the point of view of providing detailed information to the public. INES User's Manual (2008) requires a public disclosure of the date and the time of the event, its actual confirmed consequences on the health of the workers and the members of the public, protective action taken etc. AERB's website is blissfully silent on the details, showing how insensitive it is to the need to be accountable to the public!

Disaster preparedness planning:

In view of the widespread radiation emissions that a major nuclear accident can cause, the area around each NPP is divided into different zones for the purpose of emergency planning including evacuation of people. NPCIL has adopted a zoning system in line with the globally accepted norms pre-Fukushima,

according to which, around the plant site, the area upto 1.5 km is designated as “Exclusion Zone” where no one can reside. In the “Sterilised Zone” upto 5km, no development activity is to be permitted, the intention being to discourage addition to the existing population in that zone. In the “Emergency Planning Zone” extending upto 16km, in the event of a major accident, the resident population may have to be evacuated within a short time.

Drawing lessons from Fukushima, in 2013, IAEA issued guidelines on revising the zoning system. According to this, “precautionary action zone” (PAZ) upto 3-5 km, “urgent protective action planning zone” (UPZ) upto 15-30 km, “extended planning distance” (EPD) upto 100 km and “ingestion and commodities planning distance” (ICPD) upto 300 km.

AERB is yet to adopt a system of zoning in line with this guideline of IAEA.

### **Regulatory authorities in other countries:**

It is of interest to compare AERB with its counterparts in USA, France, UK and Finland, in terms of the information made available to the public. The latter seem to be far more willing than AERB to take the public into confidence on the safety aspects of the nuclear installations in their respective areas.

#### **USA- Nuclear Regulatory Commission (NRC):**

NRC’s website (<http://www.nrc.gov>) provides a wealth of information to the public on the shortcomings in the working of a large number of NPPs in USA.

For example, NRC closely monitors the quality of groundwater near NPPs with special reference to the presence of radioactive Tritium. NRC issues periodical Press Reports on Tritium contamination of groundwater in the case of each NPP. The NRC website provides free access to the Press Reports on the subject. In addition, it provides open access to a 76-page report of the Task Force of 2006 constituted on the subject, the recommendations made by a Task Force of 2009, the Charter of Groundwater Task Force of 2010, the Memo issued by the Executive Director (Operations) on the subject and the Task Force Report of 2010, “Initiative for improved communication of groundwater incidents” of 2011 and so on.

NRC’s disclosures on anomalies/ events at NPPs are equally detailed as required by IAEA.

#### **France- Autorite de Surete Nucleaire (ASN):**

The State-owned French nuclear company, Areva (since taken over by another State-owned French company, EDF) will be supplying reactors for the proposed Jaitapur Nuclear Power Project in Maharashtra. There is a public agitation going on against the project in India. AERB’s website fails to make any disclosure of the track record of Areva and the disclosures made on that company by ASN in France!

There have been complaints on the quality of steel used by Areva and the quality of the nuclear components supplied by it. While AERB has been tactfully silent on it, the French nuclear regulator has been more forthright in highlighting the shortcomings of Areva, as evident from the following excerpts from its website (<http://www.french-nuclear-safety.frits>)

“Falsification, changes required in monitoring and oversight practices:

The review of the quality of production by the Creusot Forge plant highlighted a number of irregularities: concealment of technical anomalies from the customer and the regulatory authority and potential falsification of measurement or examination results. These irregularities were detected neither by the Creusot Forge plant’s internal checks, nor by the monitoring carried out by Areva and EDF. Nor were the

inspections carried out by ASN able to identify them. ASN has examined ways of improving the oversight and monitoring arrangements in order to improve the prevention and detection of this type of irregularity. The resulting action plan will be finalised in the first half of 2018”

“New nuclear facilities are currently under construction: whether the Flamanville EPR reactor, the Jules Horowitz reactor or the ITER project in Cadarache are concerned, there have been numerous difficulties and significant delays, mainly owing to the lack of design and construction experience. There is another major issue: the lessons learned from the Fukushima Daiichi accident. This led to a large number of safety reinforcements on all French nuclear facilities; nonetheless major works will still be needed in the coming years”

The above statements not only demonstrate the independence of ASN but also its eagerness to review the safety standards at each NPP and reinforce the same, keeping in view the aftermath of Fukushima. One would wish that AERB had displayed the same degree of autonomy and a similar concern for strengthening the safety of the existing NPPs in India!

### **UK- Office of Nuclear Regulation (ONR) [<http://www.onr.org.uk/>]**

The French company, Areva, referred above, is involved in the construction of NPPs in UK. UK’s ONR was equally concerned about Areva using Creusot Forge’s steel and expressed similar concerns as in France. Some excerpts of the Chief Nuclear Inspector’s Inspection of NNB GenCo Ltd.’s Supply Chain Management Arrangements for the Hinkley Point C Project (2018) are reproduced below.

“ONRTheme 2: Learning associated with shortfalls at ACF Areva’s Creusot Forge (ACF)  
The effective deployment of lessons learnt to other key contractors was a key element of the CNI Inspection. Evidence was not provided during the inspection to demonstrate how NNB GenCo had captured all key learning from the issues associated with the failings at Areva Creusot Forge and ensured effective dissemination to key contractors interviewed as part of this inspection”

ONR makes periodical disclosures of “civil incidents” and copies of the same are made available to the public free of cost.

### **Finland- STUK (<https://www.stuk.fi/web/en>):**

STUK’s website, like the NRC and ASN websites, provides valuable information to the public on the safety of Finland’s nuclear installations. For example, the website provides access to a 112-page safety assessment of Units 1 and 2 of Olkiluoto NPP. STUK displays no hesitation in pointing out the shortcomings in the operation of the two units. One significant point made in that report is the post-Fukushima reinforcement action taken at Olkiluoto 1 and 2 units . It is not clear whether AERB has similarly ordered NPCIL to reinforce the existing NPPs in India, in view of the lessons drawn from Fukushima.

### **Conclusion:**

Nuclear technology has several inherent risks. The available information on the performance of the existing nuclear reactors in the world is far too inadequate to enable the experts to assess the risks accurately. Three Mile Island (1979), Chernobyl(1986) and Fukushima (2011) are major nuclear accidents that have demonstrated to the world the uncertainty in anticipating the risks of nuclear technology and the magnitude of the consequences of an accident. The Precautionary Principle places the burden of taking preventive measures in such cases on the government in order to protect the public from exposure to potential harm.

Principle 15 of Rio Declaration from the United Nations Conference on Environment and Development (1992) reads as follows.

“In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

It is ironic that DAE, headed by no other than the Prime Minister, should hesitate to learn lessons from the havoc that was caused by Fukushima and comply with the guidelines issued by IAEA on reinforcing the safety of the nuclear installations in order to ensure the safety of the public and safeguard their health.

The government should take immediate steps to get the amended version of the Nuclear Regulatory Authority Bill enacted by the Parliament, get the Atomic Energy Act suitably amended to incorporate the concept of the “right to information”, adopt IAEA’s guidelines on emergency planning approach and ensure that the globally accepted safety norms are fully complied with at every nuclear installation in the country. To proceed ahead in the business-as-usual mode would expose the people to unimaginable harm. No additions should be permitted to nuclear power generation capacity, pending these measures being implemented.

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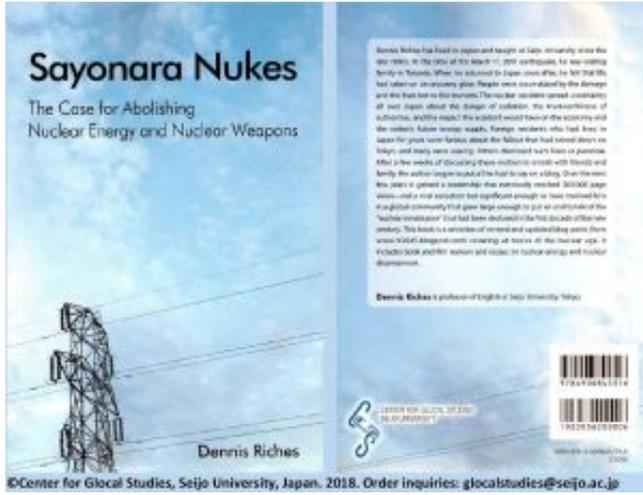
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