Independence of Nuclear Regulators in the Aftermath of the Fukushima Daiichi Nuclear Accident: A Comparative Approach

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Abstract: The purpose of this paper is to address the issue of regulatory independence in the nuclear industry. The principal focus will be on the application of this concept since the Fukushima Daiichi nuclear accident. Furthermore, by using a comparative approach, this paper will address the measures taken by various countries to ensure the independence of their respective nuclear regulator, especially in light of the recent nuclear accident. The first part of the paper will discuss the importance of regulatory independence; this section will address the ways in which regulatory independence can be achieved, as well as the meaning of effective independence. The purpose of the second part will be to compare the concept of regulatory independence in the aftermath of the Fukushima Daiichi nuclear accident, as applied and implemented in different countries.

Introduction

In March 2011, the world was astonished to hear that the Japan coastline had been hit by a powerful tsunami that affected the Fukushima Daiichi nuclear power plant and led to radiological releases. Following this accident, various jurisdictions decided to amend their legal framework, to ensure the independence of their nuclear regulator and to avoid future nuclear catastrophes. The purpose of this paper is to address the issue of regulatory independence in the nuclear industry, along with the legislative changes that took place following the Fukushima Daiichi nuclear accident.

The first half of the paper will discuss the importance of regulatory independence. This section will address the meaning of effective independence, as well as the ways in which regulatory independence can be achieved. The purpose of the second half will be to compare the concept of regulatory independence in the aftermath of the Fukushima Daiichi nuclear accident, as applied and implemented in different countries. The laws enacted in Japan, the United Kingdom and India will be briefly addressed, to illustrate the developments that were meant to ensure regulatory independence following the accident.

Part 1 – The Principles of Regulatory Independence for Nuclear Regulators

The *Convention on Nuclear Safety* commits participating States operating nuclear power plants to maintain a high level of safety, by setting international benchmarks to which these States must subscribe.[1] This part of the paper will describe the international obligations of Member States pursuant to the *Convention on Nuclear Safety* with regards to the independence of nuclear regulators. The United States Nuclear Regulatory Commission (U.S. NRC) will also be studied, to illustrate the principle of regulatory independence in the nuclear sector.

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[1] The Convention was adopted in Vienna on June 17, 1994, and came into force on October 24, 1996. As of July 2012, there were 75 contracting parties; 10 signatory countries had not yet ratified the Convention. The Convention is an incentive instrument; it is not designed to ensure fulfillment of obligations by parties through control and sanction, but is based on their common interest to achieve higher levels of safety, which will be developed and promoted through regular meetings of the parties. In this regard, see International Atomic Energy Agency, "Convention on Nuclear Safety".

A – Regulatory independence at the international level

Section 8.1 of the *Convention on Nuclear Safety* provides for the establishment of a regulatory body, while section 8.2 states that appropriate steps must be taken to ensure regulatory independence.[2] The independent legal status and decision making powers of the regulatory body have to be clearly defined in national legal instruments, enacted at the highest political level.[3]

This obligation was studied by the IAEA in its *Fundamental Safety Principles*, where Principle 2 states that "[a]n effective legal and governmental framework for safety, including an independent regulatory body, must be established and sustained." It reiterates that the government of the Member State is responsible for the adoption of a legal framework to fulfill its national and international obligations with regards to nuclear safety and to establish an independent regulatory body.[4]

The principle of "effective independence" was introduced by the IAEA, which states in its Requirement 4 of the *Governmental, Legal and Regulatory Framework for Safety* that "[t]he government shall ensure that the regulatory body is effectively independent in its safety related decision making and that it has functional separation from entities having responsibilities or interests that could unduly influence its decision making. [Emphasis added]"[5] The principle of "effective independence" does not mean that the regulatory body must be entirely separate from other governmental bodies; it means that this body must be able to make decisions for the regulatory control of facilities and activities, and be able to perform its duties without undue pressure or constraints.[6] Furthermore, under this principle, the regulator must establish and maintain suitable procedures for carrying out such interactions with other government departments, and for providing them with unbiased, independent and technically expert advice about the safety of licensed nuclear installations.[7] The regulatory body must also be independent from any organization promoting the nuclear industry, those who are opposed to the use of nuclear energy, or those it regulates.[8]

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[2] International Atomic Energy Agency, *Convention on Nuclear Safety*, 5 July 1994, INFCIRC/449. Section 8, entitled "Regulatory Body", reads as follows: "1. Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 7, and provided with adequate authority, competence, and financial and human resources to fulfill its assigned responsibilities; 2. Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy."

[3] International Atomic Energy Agency, *Independence in regulatory decision making*, INSAG-17, International Nuclear Safety Advisory Group, 2003, pp. 5-6 [IAEA, *Independence in regulatory decision making*]. The IAEA states that "[i]n particular, the regulatory body must have the authority to adopt or develop safety regulations so as to implement laws passed by the legislature. The regulatory body must also have the authority to take decisions, including decisions on enforcement actions."

[4] International Atomic Energy Agency, *Fundamental Safety Principles*, Safety Fundamentals SF-1, Vienna, 2006, Principle 2.

[5] See International Atomic Energy Agency, *Governmental, Legal and Regulatory Framework for Safety*, General Safety Requirements Part 1, No. GSR Part 1, Vienna, 2010, Requirement 4 [IAEA, *Framework for Safety*].

[6] *Ibid*., paras. 2.7 and 2.8. These undue influences that can compromise safety include pressures associated with changing political circumstances or economic conditions and pressures from government departments or from other organizations. See also George Frampton, "The Relationship Between Regulatory Infrastructure and Safety Culture in Nuclear Regulation", Session 4 of the *International Workshop on Nuclear Energy Safety: Improving Safety in the Aftermath of the Fukushima Crisis*, Workshop Summary, June 29–30, 2011, Beijing, China, pp. 11-12.

[7] IAEA, *Framework for Safety*, *supra* note 5, para. 2.8; and Organisation for Economic Co-operation and Development, Nuclear Energy Agency, *Improving Nuclear Regulatory Effectiveness*, 2001, p. 23.

[8] Alexandre Bredimas and William J. Nuttall, "An international comparison of regulatory organizations and licensing procedures for new nuclear power plants" (2008) 26 Energy Policy 1344, 1346 [*Bredimas*]; International Conference on Effective Nuclear Regulatory Systems, "Facing Safety and Security Challenges", Summary and Conclusions of the Conference by President Laurence Williams, p. 7-8; and IAEA, *Independence in regulatory decision making*, *supra* note 3, pp. 1-2.

To better understand the principle of effective independence, it is important to discuss the relationship of the regulatory body with two branches of power in modern democracies: the government and Parliament. As previously mentioned, it is recognized that a regulatory body cannot be absolutely independent in all respects from the rest of government. The necessary political guidance and oversight must be clearly defined and limited by appropriate legal instruments, in order to ensure a high degree of professional independence in the way the regulatory body operates its regulatory decision making.[9] To ensure an independent use of the government's power, the regulatory authorities need to have some measure of organizational autonomy, and be exempted from direct supervision. For instance, it is important for regulatory bodies to have sources of funding that are not entirely dependent upon a State's budget, in order to avoid being affected by budget cuts and be less vulnerable to politically motivated cuts. Furthermore, it is preferable for regulatory authorities to have financial autonomy, as well as the power to decide on matters of personnel policy.[10] These elements are crucial in determining if an "effective independence" of the nuclear regulator is achieved.

It is possible to wonder whether the principle of "effective independence" is truly democratic. Firstly, the concept of independence of the nuclear regulator is broader than the government system adopted in a democracy, since the regulator issues norms, verifies their compliance, and enforces them by applying sanctions.[11] Secondly, issues arise with regards to the appeal process. In fact, a superior authority of the same institution is responsible for judging disagreements between the regulator and licensees, which may compromise the independence of the judgment. It is also worth mentioning that the IAEA defines independence as "effective separation" and "effective independence," which can be interpreted differently by parties. Since the definition of "effective" depends largely on a national concept, this may lead to different results than those considered by the IAEA.[12]

The principles of "effective independence" have been generally understood amongst the international community to mean that the regulatory body must be able to make decisions for the regulatory control of facilities and activities without undue pressure or constraints from the government, from any organization promoting the nuclear industry or opposed to the use of nuclear energy, or from those it regulates. I now suggest studying the case of the U.S. NRC, to better understand how these principles are applied.

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[9] IAEA, *Independence in regulatory decision making*, *supra* note 3, p. 2.

[10] Katja Sander Johannsen, *Regulatory Independence in Theory and Practice – a Survey of Independent Energy Regulators in Eight European Countries*, AKF Forlaget, February 2003, pp. 48-49, 57-60. See also Mark A. Jamison, "Leadership and the Independent Regulator," World Bank Policy Research Working Paper 3620, June 2005, pp. 3-4.

[11] Usually, in a democracy, the system is composed of three independent powers: the Congress or Parliament, which proposes and votes on the laws; the government, which is responsible for the enforcement of the laws; and the judiciary, which judges cases of misconduct with respect to the laws. However, the concept of independence is broader, as the regulator develops and issues the norms and standards (which frequently have the power of law, guaranteed by the national legislation), verifies compliance to these rules, and enforces them by applying sanctions to the offenders. In this regard, see O.D. Gonçalves, "Openness and Transparency, Stakeholder Involvement", in International Atomic Energy Agency, *Effective Nuclear Regulatory Systems – Further Enhancing the Global Nuclear Safety and Security Regime*, Proceedings of an International Conference, December 14–18, 2009, Cape Town, South Africa, pp. 94-95.

[12] *Ibid.* The author adds that "[t]he main reason for these comments is to show that the issue is not as clear as it may seem and that a proper evaluation of a nuclear regulatory body would need more than just a check list."

B – The United States Nuclear Regulatory Commission: an "effectively" independent nuclear regulator?

Regulators can either be an integral part of the government or totally independent and protected from political influence.[13] It has been demonstrated that "[c]ountries where the government has historically played an important role […] have relatively weak regulators integrated within the government. They lack licensing authority and report exclusively to the government. By contrast, countries with a more laissez-faire approach […] have independent and significantly empowered regulators."[14] I suggest analyzing the case of the United States as an example of an "effectively" independent regulator.

The U.S. NRC was created pursuant to the *Energy Reorganization Act of 1974,* to regulate commercial nuclear activities.[15] According to the U.S. government, the U.S. NRC is an independent regulatory agency within the executive branch of the federal government, in that the President cannot ordinarily direct its regulatory decisions.[16] Furthermore, regulatory independence is achieved in that the President and Congress have limited influence over the U.S. NRC. The President appoints each commissioner and the Chairman, but the removal of a commissioner can only be for cause, and not political incompatibility. For its part, the Congress has a relatively greater influence, because it can make changes to the law applicable to the U.S. NRC, refuse to confirm a nomination, remove a commissioner from office, or appropriate funds for the organisation.[17]

It is also noteworthy to mention that the U.S. NRC has the right to defend its decisions whenever its safety findings are challenged in court. In fact, judicial influence is limited to the judicial review of U.S. NRC decisions in response to citizen petitions.[18] Finally, the U.S. NRC has an annual budget of which 90 percent comes from fees imposed on regulated entities.[19]

It is possible to see that the main elements of "effective independence" discussed above are present: the U.S. NRC is separate from the President, Congress and the judicial system; and the regulatory body has a budget that is somewhat independent from the federal budget. This example serves to illustrate elements that are essential to achieve regulatory independence in the nuclear sector.

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[13] *Bredimas*, *supra* note 8, p. 1347. For instance, France (before the 2006 reform), Germany (before the 1998 phase-out decision) and Switzerland have government-integrated regulators, while Canada and the United States have officially independent regulators. See also W. Renneberg, "Independence and Effectiveness in Licensing, Inspection and Enforcement", in International Atomic Energy Agency, *Effective Nuclear Regulatory Systems – Facing Safety and Security Challenges*, Proceedings of an International Conference, February 27–March 6, 2006, Moscow, Russia, p. 44.

[14] *Bredimas*, *supra* note 8, p. 1351. The author adds that "[i]n most countries possessing a domestic nuclear industry, it seems advisable to have an independent regulator. This ensures both the public and environmental groups that nuclear project regulatory decisions are not biased by inappropriate factors."

[15] *Energy Reorganization Act of 1974*, 42 U.S.C. § 5801 (1974). The previous regulatory body, the Atomic Energy Commission, was created pursuant to the *Atomic Energy Act of 1954*, 42 U.S.C. § 2011 (1954).

[16] Government of the United States of America, *The United States of America Fifth National Report for the Convention on Nuclear Safety*, U.S. Nuclear Regulatory Commission, September 2010, pp. 61-62 [U.S., *IAEA Report*].

[17] *Ibid*., pp. 61-62. See also Martin G. Malsch, "Nuclear Regulatory Independence in the United States", Session 3 of the *International Workshop on Nuclear Energy Safety: Improving Safety in the Aftermath of the Fukushima Crisis*, June 29–30, 2011, Workshop Summary, Beijing, China, p. 8 [Malsch, *Independence in U.S.*].

[18] U.S., *IAEA Report*, *supra* note 16, pp. 61-62; and Malsch, *Independence in U.S.*, *supra* note 17, p. 8.

[19] Malsch, *Independence in U.S.*, *supra* note 17, p. 8. See also R.W. Borchardt, "Balanced Integrated Regulatory Oversight", in International Atomic Energy Agency, *Effective Nuclear Regulatory Systems – Further Enhancing the Global Nuclear Safety and Security Regime*, Proceedings of an International Conference, December 14–18, 2009, Cape Town, South Africa, p. 91.

For the second part of this article, I suggest analyzing the legal changes adopted by various countries in the aftermath of the Fukushima Daiichi nuclear accident, to ensure "effective independence" of their nuclear regulators.

Part 2 – Changes Brought to Regulatory Agencies since the Fukushima Daiichi Nuclear Accident

Whenever a major nuclear accident occurs, the role of the regulatory body often comes under scrutiny. Following the nuclear accident at Fukushima Daiichi in March 2011, many States have reviewed the structure of their nuclear regulator and emphasized the importance of having independent regulators, in order to ensure that such events will not occur again in the future. In this section, I propose to analyze the changes adopted by Japan, the United Kingdom and India.

A – Japan

The Fukushima Daiichi nuclear accident put Japan at the centre of an international controversy on nuclear safety and regulation. Following this event, the Japanese government adopted a new regulatory regime to oversee nuclear safety in the country.

The *Atomic Energy Basic Act* and other laws regulate nuclear energy in the country.[20] Prior to 2012, the Minister of Economy, Trade and Industry (METI) had jurisdiction over nuclear installations in Japan; METI was in charge of the safety regulation of the nuclear installations, and had the authority to issue licenses for the installment of nuclear installations, after examining sitting, structure, and equipment to ensure that the nuclear installation would not cause any radiological hazard.[21]

For its part, the Nuclear Industry and Safety Agency (NISA) – which was established as a special organization under the METI Agency of Natural Resources and Energy – administered the safety regulations for nuclear power reactor installations. The Nuclear Safety Commission (NSC) of the Cabinet Office audited and supervised the adequacy of the safety regulations implemented by these regulatory bodies from a third-party perspective, to ensure independency and transparency of the safety regulation. The NSC was also responsible for planning, deliberation and decisions on matters that were related to ensuring safety of the research, development, and utilization of nuclear energy.[22]

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[20] *Atomic Energy Basic Act*, Law No. 186, 19 December 1955. Other legislation includes the *Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors*, Law No. 166, 10 June 1957, the *Act concerning Prevention from Radiation Hazards due to Radioisotopes*, Law No. 167, 10 June 1957, the *Electricity Business Act*, Law No. 170, 11 July 1964, and the *Act on Special Measures Concerning Nuclear Emergency Preparedness*, Law No. 156, 17 December 1999.

[21] Government of Japan, *Convention on Nuclear Safety National Report of Japan for the Fifth Review Meeting (Draft)*, September 2010, pp. 41-42. The Minister also has the "authority to 1) to establish Ordinances specifying the details of the safety regulations including measures for the safe operation and physical protection of specific nuclear fuel materials, the Operational Safety Program, measures to be taken in emergency, etc.; 2) to approve and inspect the design and construction of the facilities, approve the Operational Safety Program and the decommissioning plan, etc. of the nuclear installations, collect reports from the licensees of reactor operation and execute on-site inspection, if necessary; and 3) evocate or discontinue utilization of a license for installment of a nuclear installation, order measures for operational safety, dismiss a Chief Engineer of Reactor, implementation order concerning decommissioning, implementing order for an emergency preparedness, etc."

[22] *Ibid.*, pp. 41-42, 57-58. The NSC was composed of five commissioners appointed by the Prime Minister with the consent of the Diet, and these commissioners elected a chairman among them. The general affairs of the NSC were entrusted to the NSC Secretariat of the Cabinet Office. The NSC Secretariat was composed of the Secretary-General, the Management and Coordination Division, the Regulatory Guides and Review Division, the Radiation Protection and Accident Management Division, and the Subsequent Regulation Review Division, and had about 100 staff members.

The structure, responsibilities and role of the Japanese regulatory body were reviewed in 2007 by the IAEA, with several recommendations and suggestions for improvement being made at that time. However, the IAEA report did not specifically mention the hierarchy lines drawn within the government between NISA and the promotional ministry METI, or the movement of senior personnel between regulatory authorities, METI and the largest nuclear organization (TEPCO), which could have resulted in a potential conflict of interest.[23] It had been argued that the Japanese government had not responded sufficiently to the recommendations and suggestions of the IAEA.[24]

In May 2011, following the Fukushima Daiichi nuclear accident, the IAEA fact-finding mission made further observations on the Japanese regulatory system. The preliminary report found that the tsunami risk for several sites had been underestimated, and that the nuclear regulatory systems should have adequately addressed extreme events. These initial findings were confirmed in the final IAEA report.[25] Furthermore, in July 2011, the Prime Minister of Japan commented that NISA being part of METI (which also promotes nuclear power) potentially conflicted with independent enforcement of nuclear safety requirements. He confirmed that NISA would be separated from the direct influence of the ministry sponsoring nuclear power.[26]

On June 27, 2012, Japan adopted the *Nuclear Regulatory Commission Establishment Act*. The Nuclear Regulatory Commission will be an external branch of the Environment Ministry, while the Nuclear Regulatory Agency (NRA) will be placed under the jurisdiction of the Cabinet Office and will serve as the secretariat of the Nuclear Regulatory Commission.[27] The NRA is established as an independent commission body, in order to separate the nuclear regulation and promotion functions. The NRA will independently provide guidance and standards for nuclear regulation, and will be entitled to make recommendations to relevant ministers for ensuring nuclear safety.[28] Furthermore, the NRA will be able to establish legal binding rules on affairs under its jurisdiction.[29] With regards to the composition of the NRA, the commissioners will be appointed by the Prime Minister, with the consent of the Diet, and their appointment will take into consideration disqualifying conditions, to ensure NRA's independence from nuclear operators.[30] Therefore, a reformed regulatory body, which is independent from other government organizations promoting nuclear energy and operators, will soon be created in Japan.

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[23] Government of the United Kingdom, *Japanese earthquake and tsunami: Implications for the UK nuclear industry – Final Report*, Office for Nuclear Regulation, September 2011, p. 10-13 [U.K., *Japanese earthquake and tsunami*].

[24] Jun Fukusawa and Momoko Okusaki, "Reform of the Nuclear Safety Regulatory Bodies in Japan", International Nuclear Law Association, 2012 Congress, Manchester, England [Fukusawa and Okusaki].

[25] International Atomic Energy Agency, *IAEA International Fact Finding Expert Mission of the Fukushima Dai-ichi NPP Accident Following the Great East Japan Earthquake and Tsunami*, IAEA Mission Report, May–June 2011, pp. 42-54. See also U.K., *Japanese earthquake and tsunami*, *supra* note 23, pp. (v), 10-13.

[26] National Diet of Japan, *The official report of the Fukushima Nuclear Accident Independent Investigation Commission*, 2012. See also U.K., *Japanese earthquake and tsunami*, *supra* note 23, pp. 10-13.

[27] *Nuclear Regulatory Commission Establishment Act*, Law No. 47, 27 June 2012. See also Library of Congress, "Japan: Law to Establish Nuclear Regulatory Commission", 13 August 2012.

[28] Takashi Kume, "Reform of Nuclear Regulation Organisation and System in Japan", Task Force for the Reform of Nuclear Safety Regulations and Organisations, Presentation at the *Technical Workshop on the Accident of TEPCO's Fukushima Dai-ichi NPS*, July 23–24, 2012, Tokyo.

[29] Fukusawa and Okusaki, *supra* note 24, p. 5.

[30] *Ibid.*, p. 6. The disqualifying conditions are as follows: 1) a person who has been a nuclear operator, or an employee of the organization of a nuclear operator in the most recent three year period; and 2) a person who has received, in the role of a private party, monetary rewards over a specific amount of money from the same nuclear operator in the most recent three year period.

B – The United Kingdom

Even though the United Kingdom had commenced the modification of its regulatory authority prior to the Fukushima Daiichi nuclear accident, the event confirmed the need for a modern, independent and flexible nuclear regulator.[31] Prior to the changes, the Health and Safety Executive (HSE) regulated the nuclear industry through its Nuclear Directorate.[32] The HSE was set apart from government and industry, and was therefore independent in its role as nuclear regulator. There were, however, inherent concerns about the HSE's accountability and transparency in its regulation of the nuclear sector, especially since the HSE carried out certain statutory functions on behalf of the Secretary of State, rather than in its own right as regulator.[33]

In February 2011, the Government of the United Kingdom announced the establishment of the Office for Nuclear Regulation (ONR) to regulate the nuclear power industry; pending legislation, the ONR was set up as a non-statutory agency of the HSE, in April 2011.[34] As such, the ONR is without legal personality, and does not have the right to perform regulatory functions in its own right. Its establishment is a temporary solution, pending the introduction of legislation to establish the ONR more formally as a statutory body.[35] On May 22, 2012, the Department of Energy and Climate Change published its draft *Energy Bill 2012*, which seeks to establish the ONR. It is anticipated that the *Energy Bill* will receive Royal Assent in mid-2013.[36]

The provisions set out in the *Energy Bill* reflect existing legislation, and do not present a significant departure from the status quo. The transition to a statutory ONR is intended to create a transparent regulatory arrangement, and will provide the statutory ONR with an increased flexibility in financial and employment arrangements.[37]

C – India

Several issues arose following the Fukushima Daiichi accident with regards to the Atomic Energy Regulatory Board (AERB) of India. Under the previous regime, the AERB reported to the Secretary of the Department of Atomic Energy (DAE). The DAE Secretary was also responsible for the Nuclear Power Corporation of India Limited, which constructs and operates all power reactors in India. Some have argued that the lack of separation between the nuclear regulatory and promotional agencies was a violation of the *Convention on Nuclear Safety*. One result of this structure was that the Indian government did not make

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[31] Government of the United Kingdom, "Energy Bill 2012–13: Office for Nuclear Regulation", p. 4 [U.K., *Energy Bill*]. To the question "Is this a response to Fukushima?", the Government responds that "[t]he origins of the plans to create a new independent nuclear regulator go back to the Stone review conducted in 2008, predating the events in Fukushima. The events at Fukushima last year however, have further confirmed the need for a modern, independent and flexible nuclear regulator."

[32] *Health and Safety at Work and etc. Act 1974* (U.K.), 1974, c. 37, s. 10-15; see also Government of the United Kingdom, *The United Kingdom's Fifth National Report on Compliance with the Convention on Nuclear Safety Obligations*, Health and Safety Executive, Sept. 2010, pp. 40-41.

[33] Burges Salmon LLP, "Office for Nuclear Regulation, Electricity Market Reform and Contracts for Difference", Nuclear Law - Draft Energy Bill 2012, Summer 2012 [Burges Salmon LLP].

[34] See U.K., *Energy Bill*, *supra* note 31, p. 1. The ONR is responsible for licensing and regulating a broad range of facilities and activities. The main safety functions of the ONR are to grant and administer the nuclear site licence, inspect, and review and assess the safety of plant, people and processes on licensed nuclear sites. See U.K., *Japanese earthquake and tsunami*, *supra* note 23, p. 26.

[35] Burges Salmon LLP, *supra* note 33.

[36] *Ibid*. The Bill was debated at second reading on December 19, 2012. The House of Commons voted for the Bill to be sent to a Public Bill Committee that will scrutinize it line by line. The Committee met in January 2013. Part 2 of the Bill (s. 47-96) refers to nuclear regulation. For the draft document, see Bill 100, *Energy Bill*, 2012–2013 Sess., 2012.

[37] Pinsent Masons LLP, "Energy Bill Update - November 2012 - Nuclear Regulation".

available any information about the nuclear industry or any operations that "would be of interest to the public," despite their presence close to urban centers.[38]

In September 2011, the Indian Parliament introduced the *Nuclear Safety Regulatory Authority Bill, 2011*, to establish the Nuclear Safety Regulatory Authority (NSRA). According to section 20 of the Bill, the Authority shall "take measures […] to ensure that the use of radiation and atomic energy is safe for the health of the radiation workers, members of the public and the environment."[39] The NSRA will regulate nuclear safety and activities related to nuclear material and facilities.[40]

Some key issues have been noted with regards to this bill that could affect the independence of the NSRA. For instance, the Council includes the Chairman of the Atomic Energy Commission, who also heads the department that controls nuclear power plants; this could lead to a conflict of interest. Furthermore, the Chairperson of the NSRA will be on the search committee for other members, which may affect these other members' independence. The Bill allows the central government to regulate certain nuclear facilities; such facilities would not be under regulatory control.[41]

Conclusion

The purpose of this paper was to explain the independence of regulatory bodies in the nuclear sector and to examine the changes that have taken place since the Fukushima Daiichi nuclear accident. Effective independence generally means that the regulatory body must be able to make decisions for the regulatory control of facilities and activities without undue pressure or constraints from the government, from any organization promoting the nuclear industry, those who are opposed to the use of nuclear energy, or those it regulates. As illustrated by the example of the U.S. NRC, it is possible for states to put in place a legislative framework that ensures regulatory independence in the nuclear sector.

Following the Fukushima Daiichi nuclear accident, many States have reconsidered their legislative framework to ensure better regulatory independence. For instance, Japan has adopted new law to create a nuclear regulatory agency independent from the ministry responsible for the promotion of nuclear energy. The accident also precipitated the adoption of the *Energy Bill 2012* by the United Kingdom, which aims to reform their nuclear regulatory body. Finally, following a negative perception of its nuclear regulator, India also introduced a bill to modify its regulatory body.

It has been argued that, in order to ensure that a nominally independent nuclear safety regulator stays independent and is not "captured" by the commercial nuclear industry it regulates, while also remaining publicly accountable, an independent Nuclear Safety Advisory Committee with investigatory powers could be established at the international level. The Committee would report annually on the nuclear safety agency

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[38] Dr. A. Gopalakrishnan, "India: Post-Fukushima Improvements in Safety Regulation", Session 3 of the *International Workshop on Nuclear Energy Safety: Improving Safety in the Aftermath of the Fukushima Crisis*, Workshop Summary, June 29–30, 2011, Beijing, China, p. 10. The author is the former Chairman of India's AERB.

[39] *Nuclear Safety Regulatory Authority Bill, 2011*, Bill No. 76 of 2011, 5 September 2011, ss. 8, 20. According to the Parliament of India, the status of this bill is still pending. The Committee Report was issued on March 6, 2012, but no further steps have been taken to send the bill to the Rajya Sabha (equivalent of the Senate); see also Parliament of India, PRS Legislative Research, "The *Nuclear Safety Regulatory Authority Bill, 2011*", online: <www.prsindia.org/billtrack/the-nuclear-safety-regulatory-authority-bill-2011-1980/> [Parliament of India].

[40] Parliament of India, *supra* note 39. For a detailed analysis of the current situation in India and the changes brought forth by this Bill, please refer to Yash Thomas Mannully, "Indian Nuclear Regulatory Authority Bill, 2011 in the light of Fukushima Incident", International Nuclear Law Association, 2012 Congress, Manchester, England.

[41] *Ibid.*

and nuclear industry to legislative oversight committees and the public.[42] It remains to be seen if effective regulatory independence will be achieved with the changes occurring within many jurisdictions, and whether such international oversight is necessary to ensure that the principles of the *Convention on Nuclear Safety* with respect to the independence of the regulator are followed by all Member States.

[42] Christopher E. Paine, "Who Assures that a Nuclear Safety Agency is Actually Carrying Out its Mission to Protect the Public", Session 5 of the *International Workshop on Nuclear Energy Safety: Improving Safety in the Aftermath of the Fukushima Crisis*, Workshop Summary, June 29–30, 2011, Beijing, China, p. 13. He suggests that the Committee be comprised of independent nuclear experts from academia, government laboratories, NGOs, labor and business.

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