BNL- 112464-2016-CP

Transparency in Civilian Nuclear Endeavors

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Presented at the 57th Institute of Nuclear Materials Management (INMM) Annual Meeting Atlanta, Georgia

July 2016

Department/Division/Office

Brookhaven National Laboratory

U.S. Department of Energy
NA-24, NA-241

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Transparency in Civilian Nuclear Endeavors

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Abstract:

It is no surprise that transparency is a critical consideration in nuclear activities. Unlike most commercial endeavors, the inherently crosscutting nature of civilian nuclear programs, combined with the far-reaching effects of their existence, attracts scrutiny from a broader set of stakeholders. Whether the nuclear endeavor is a power plant, research reactor, or waste storage plan, people are interested not only in outright successes and failures, but also more incremental choices on the road to realization. This paper examines the impact of nuclear transparency in the implementation of civilian nuclear endeavors, focusing specifically on diverse and country-specific, high-level factors impacting civilian nuclear endeavors in France, the United Arab Emirates, and Japan.

Introduction

This paper seeks to better understand the impact of involving the public in the discussion and decision-making that surrounds nuclear installation planning and implementation. The central question being posed is, does transparency surrounding civilian nuclear initiatives lead to greater societal acceptance of the development of these initiatives? In order to answer this question, three differing country case studies were chosen. The countries selected for the paper are diverse in their geographical locations, their populaces, their nuclear histories and futures, and their public's involvement.

France

France represents a case in which a public generally accepting of large-scale technological infrastructure projects experienced a backlash against nuclear waste siting. In the French case, the controversy surrounding the waste citing was ameliorated by assessing and accurately comprehending the concerns of the local citizens, and by better explaining the civilian nuclear waste siting plans to the citizenry.

France has a tradition of a public supportive of civilian nuclear power projects, and currently derives approximately 75% of its electricity from nuclear energy.[1] The origins of France's civilian nuclear energy program lie in the 1970's OPEC decision to quadruple the price of oil, referred to by the French, as by much of the world, as the oil shock. That event, and the sudden, unpleasant realization that energy security meant (for France) energy independence, reinvigorated in 1973 the civilian nuclear program that had already been underway. French policymakers saw nuclear energy as the only answer to the energy independence conundrum, and, between 1977 and 1999, oversaw the installation of 59 NPPs, beginning with Fessehiem in 1977 and ending with Civaux 2 in 1999.[2] This allowed France to not only satisfy its own domestic electricity needs, but also

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[1] *Nuclear Power in France,* accessed 28 December 2015. www.world-nuclear.org/info/country-profiles/countries-a-f/France

[2] *Spotlight on France's Oldest Nuclear Power Plant.* www.euronews.com March 25 2011

to export electricity throughout Europe.[3] The acceptability of this campaign to introduce nuclear energy into France as a mainstay will be discussed in subsequent sections.

France's compliance with the three main legal instruments relevant to this topic can be summed up as follows: Kyiv: signed (2003) but not ratified.[4] Espoo: Signed and ratified (approved 2001).[5] Aarhus: signed and ratified (2002).[6,7,8]

The construction of the first nuclear power plant in France was completed in 1956 (Marcoule).[9] As France continued on the civilian nuclear journey in the 1970s, the country experienced a remarkably smooth transition into nuclear-generated electricity and the installation of tens of nuclear power reactors - with some notable exceptions, including violent protests[10]. Some of the factors that led to this smooth transition, and one important exception, can be summarized as follows:

One factor for France is acceptability, or pride, in large technical projects. France, according to various researchers, has a history of large, centrally managed technical projects, which the French populace likes and generally is proud of. According to Claude Mandil, the former[11] General Director for Energy and Raw Materials at the Ministry of Industry, "French people like large projects. They like nuclear for the same reasons they like high speed trains and supersonic jets."[12] Another, related reason is that France has a history of respect for science and engineering, which dates back to 1666.[13] Public opinion was most certainly influenced in a positive way toward nuclear power due to an ingrained cultural appreciation of scientific pursuits. Another factor influencing public opinion positively is a tendency on the part of average citizens, when compared with the United States, to trust technocrats. A PBS *Frontline* interview conducted in the 1990's found that in the Civaux region of southwestern France, attitudes towards technocrats and scientists

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[3] Palfreman, Jon. "Why the French Like Nuclear Energy," *PBS Frontline.* http://www.pbs.org/wgbh/pages/frontline/shows/reaction/readings/french.html

[4] *United Nations Treaty Collection,* accessed 28 December 2015. https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4-b&chapter=27&lang=en

[5] *United Nations Treaty Collection,* accessed 28 December 2015. https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&lang=en

[6] *United Nations Treaty Collection,* accessed 28 December 2015. https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=xxvii-13&chapter=27&lang=en

[7] All ratification citations for the remainder of the paper will be based on the above three URLs.

[8] The three instruments are: The Kyiv Protocol, the Aarhus Convention, and the Espoo Convention.

[9] "Marcoule Nuclear Site", www.wikipedia.com, accessed May 2016.

[10] Nelkin, Dorothy and Michael Pollak. *The Atom Besieged: Antinuclear Movements in France and Germany.* MIT Press; 1982

[11] His tenure at that post was from 1990-1998

[12] Palfreman, Jon.

[13] *Acádémie des Sciences, established by Louis XIV to encourage the spirit of scientific research.*

in charge of nuclear power installations included such sentiments as "…the [Russians] were not up to the task. But the French scientists and engineers are."[14] Polls indicate that the French remain largely supportive of nuclear power, and some of that may also be attributable to a highly effective advertising campaign undertaken in the 1970's and 1980's. Advertisements on television linked nuclear power with the electricity needed to make modern life possible.[15] A related element, that reflects some level of commitment to nuclear transparency, is the solicitation in the 1990's by nuclear plants to take citizens on tours, something that many inhabitants of France did indeed partake of.

The description above indicates that much of the acceptability of nuclear power in France was derived from a cultural preponderance of acceptability involving technology, technocrats, and a pragmatic understanding of the link between modern inventions and a modern standard of living. The important exception that was mentioned above, the break in the successful public acceptance campaign undertaken by the French authorities, came with the advent of a need for nuclear waste storage (an essential consideration for any civilian nuclear program).

According to researchers, French authorities in the early years of the civilian program had not given much thought about any potential public acceptability issues surrounding the waste problem. The extremely small quantity of waste per family of four (approximately the size of a cigarette lighter after 20 years) may have contributed to the fact that the technocrats did not really consider waste as a potential public relations nightmare, and in the 1980's, exploratory holes were dug in some rural regions of France.[16]

The exploratory digs resulted in extreme unhappiness in the general populace. There were riots and protests. The very regions that had proudly sought to have nuclear power plants located within their boundaries fought becoming France's nuclear waste depositories. In this case, the public sentiment was arguably not a result of a lack of transparency, but rather, a lack of any perceived benefit for those communities[17]. Another important distinction that likely led to the anti-nuclear waste depositing fervor in the rural regions was the perception that this waste disposal would be permanent, in other words, that the authorities were dumping garbage under the homes of the people in the rural region, and then abandoning them.[18] While the cheapest solution to the problem was to bury the waste materials under the earth, National Party of France member and politician Christian Bataille noted that "the idea of burying the waste awoke the most profound human myths. In France we bury the dead, we don't bury nuclear waste, there was an idea of profanation of the soil, desecration of the earth." The concept of despoiling the

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[14] Palfreman, Jon. Quote from Jacques Rambault.

[15] Chaussade, Jean-Pierre, "Impact of French Advertising Campaign," *Pime 93,* January 1993. www.iaea.org/inis/collection/NCLCollectionStore/_public/36/018/36018041.pdf

[16] "The history of the French waste policy," *Nuclear Monitor*, issue #550, 15 June 2001. Wiseinternational.org/nuclear-monitor/550/history-french-waste-policy

[17] Palfreman, Jon.

[18] van den Berg, Robert Jan et al. "A Survey on Public Participation, Decision-making, and Discussions in Eight Countries," *CORA*, January 2000.

earth for future generations played a large role in the public conception of the digging and burying of nuclear waste as a general endeavor.[19,20]

France's involvement of its public has been manifold, not merely relying on EIA/SEA processes, but also through taking into account public perception such as in the nuclear waste mishap noted above. In order to respond to that significant experience in the program, French officials took into account the cultural response of the French to a 'permanent' waste disposal situation, and introduced the highly more palatable notion of reversibility and 'stocking'. The difference between permanent storage and stocking may seem a fine line to some, but to the indignant populace of the affected regions, temporary stocking of nuclear waste in such a way that it would be accessible to future scientists and engineers, made all the difference. Although the technical experts grumbled about the added expense of a nuclear stocking room (vis-à-vis a nuclear "graveyard")[21], in the end it proved to be much more than a semantic difference, and, it could be argued, allowed France to continue its highly profitable, useful, and accepted civilian nuclear program despite the hurdle of the nuclear waste Achilles heel. While the first French response to nuclear waste was rioting and protests, following the change from permanent disposition to reversible stocking, regions actually applied to host underground laboratories that could deal with nuclear waste in the future. This will not spell out certain success for the continuation of the program, but it certainly bodes well for countries with public acceptance campaigns that tap into the cultural notions in peoples' mind - not only the technical realities known to scientists, technocrats, and engineers.

While France's nuclear model is slowing in momentum, prior to recent years, the public acceptance level of nuclear was relatively high. Its involvement in the legal instruments pertaining to environmental law, as noted above, is good compared to its peers in other powerful sovereign states. A combination of cultural predisposition toward civilian (and military) nuclear endeavors, combined with canny politicians and technocrats whose fingers seem to have been sufficiently on the French cultural pulse regarding the waste issue helped avert what could have been disastrous, insurmountable challenges to the French civilian nuclear program.

United Arab Emirates

The second country included in this overview is the United Arab Emirates (UAE). The UAE first announced its interest in nuclear power in 2008,[22] and is currently on track to have one of its four power reactors on line by 2017. The program that the UAE is developing is well funded, well organized, and ambitious. UAE's electricity demands are growing by 9% a year, and the requirements of the country are expected to reach 40GWe

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[19] Palfreman, Jon.

[20] Comments of Fabienne Pehuet, Brussels EU Consortium on Nonproliferation and Disarmament, November 2015.

[21] Van den Berg, Robert Jan.

[22] "Nuclear Power in the United Arab Emirates," *Country Briefings*, World Nuclear Association, January 2011.

by 2020. Claims vary, but some sources note that natural gas supplies would suffice for only half of this demand.[23]

Despite a regional history of environmental exploitation with serious negative results, the UAE has, according to several experts, undergone an environmental protection renaissance in recent years. Whereas in the past, threats to the natural world in the Gulf region have been overlooked, there is now a governmental and non-governmental framework in place to facilitate better environmental protection measures.[24] What is the role of public opinion in this pursuit, and how does it impact the burgeoning civilian nuclear program of the UAE?

General environmentally relevant regulation in the UAE is a noteworthy topic, in particular due to the unique position in the world that the Emirates occupy based on their high quantity of natural reserves and environmental richness. As with any state, in order to understand the UAE's legal status regarding the environment, one must closely examine the cultural norms, history, and behavior underlying political decision-making that affects the environment. Such a framework can begin to be obtained through the following presidential quote, providing an explanation for UAE's successes in the environmental protection realm: "We cherish our environment because it is an integral part of our country, our history and our heritage. On land and in the sea, our forefathers lived and survived in this environment. They were able to do so only because they recognized the need to conserve it, to take from it only what they needed to live, and to preserve it for succeeding generations.."[25] UAE's Federal Environmental Law addresses several important points inherent to environmental protection, many of which have relevancy to civilian nuclear operations and plans. These points include: environmental impact assessment; protection of the marine environment, pollution from land sources, soil protection, protection of the air from air pollution, and the handling of hazardous substances and wastes.[26] There appears to be a general acceptance on behalf of civil society and academicians that the UAE scores highly on the scale of environmental protection. Based on the Environmental Performance Index (EPI), which is heavily used by the UAE, the Emirates were in the 25th highest spot in the world on the EPI in 2014.[27] Pride in high achievement in protection of the environment bodes well for the UAE regarding environmental protection from nuclear installations.

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[23] "Nuclear Power in the United Arab Emirates," *Country Briefings,* World Nuclear Association, updated April 2016.

[24] Aspinall, Simon. "Environmental Development and Protection in the UAE," *United Arab Emirates: A New Perspective*, chapter 14, pp. 278.

[25] Quated from Sheikh Zayed bin Sultan Al Nahyan, the late President of the U.A.E., www.adcbuae.com/Dubai/Government_in_Dubai/Government_of_Abu_Dhabi/127233-12591.html.

[26] Singh, Kanishka, "Legislation: Environmental Law Regime in the United Arab Emirates," *EJIMEL (Electronic Journal of Islamic and Middle Eastern Law),* Vol. 2, 2014, pp. 85. www.zora.uzh.ch/97709/1/kanishka%20singh%20Final.pdf

[27] Bishtawi, Fatima, "Environmental Policymaking in the United Arab Emirates," *Environmental Performance Index,* 2 September 2015. Epi.yale.edu/the-metric/environmental-policymaking-united-arab-emirates

While the UAE scores rather poorly on compliance with the main international legal instruments relevant to nuclear law (the Kyiv Protocol, the Espoo Convention and the Aarhus Convention), the domestic regulation is worth a second look, as domestic regulation to some extent may make up for the lack of adherence at present to those instruments. For example, while the answers to the below queries regarding ratification are all "no", domestic liabilities and compensation requirements for environmental damages are quite severe when it comes to nuclear waste (including and up to imposition of the death penalty).

As of 2012, 82% of the UAE population surveyed was in favor of nuclear power in their country. Furthermore, 89% of the population at that time indicated they would be supportive of a nuclear power plant installation to be located in their emirate.[28] This is due not only to the growing need for electricity and demand upon the electrical grid, but also for a recognized need for desalination and other technologies that civilian nuclear efforts can support.

A significant portion of the high support for civilian nuclear energy in the UAE has been attributed to the high level of public engagement undertaken by Emirates Nuclear Energy Corporation regarding the progression of nuclear planning in that country. Additionally, the generally low level of concern among the public regarding nuclear safety in the UAE has been attributed to campaigns related to the provision of safety information about nuclear power plants, undertaken by ENEC. ENEC, headed by Mohamed Al Hammadi, puts effort into regular public outreach events in order to improve nuclear transparency and create confidence in the civilian nuclear program among the populace. Apparently these public outreach events are quite popular and well attended, regularly drawing audiences as large as 600 people.[29] According to Ambassador Alkaabi, these outreach events are key to the successful public relations state of affairs in the UAE.[30]

UAE has led an energetic campaign to gain public acceptance of its new and ambitious nuclear power program. This campaign has involved and informed the public from the beginning, and appears to have been highly effective. Additional factors influencing public opinion may be the geographic location of the UAE, the need for alternative resources for generating electricity and desalinating water, and a level of practicality regarding the role nuclear energy can play in that civilian equation.

Japan

The Japanese civilian nuclear power program began in 1954. While prior to the Fukushima accident, Japanese sentiment was not as anti-civilian nuclear projects as would later become the case, a strong history of anti-nuclear activism did exist. Some have speculated that Japanese nuclear power companies "have a history of conspiring with governments to manipulate public opinion in favor of nuclear energy," also stating

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[28] *Nuclear Power in the United Arab Emirates,* last accessed 28 December 2015. www.world-nuclear.org/info/country-profiles/countries-t-z/united-arab-emirates/

[29] "Transparency key for UAE," *World Nuclear News,* 11 September 2014. www.world-nuclear-news.org/nn-transparency-key-for-uae-1109147.html

[30] Remarks by Hamad Alkaabi, Permanent Representative of the UAE to the IAEA. EU Consortium on Nonproliferation and Disarmament, Brussels, November 2015.

that one nuclear company "stacked public meetings with its own employees who posed as ordinary citizens to speak in support of nuclear power plants."[31] It is within this purported context of manipulated or sub-standard transparency initiatives on the part of Japanese governmental authorities and energy organizations that the analysis of the role of Japan's public stakeholder engagement must occur. At the same time, it must be noted that Japan's lack of natural resources, and large population with high energy demands, have played a large role in Japan's decision to maintain a nuclear energy program for civilian purposes.[32]

Our third and final example is Japan. Any discussion of nuclear safety, environmental law, or nuclear transparency in Japan in recent years most likely orbits the subject of the Fukushima nuclear accident of 2011. The Fukushima Independent Accident Commission noted, in regard to the regulatory body and its failures in the aftermath of the Fukushima nuclear accident, that "[we] conclude that the safety of nuclear energy in Japan and the public cannot be assured unless the regulators go through and essential transformation process. The entire organization needs to be transformed, not as a formality but in a substantial way. Japan's regulators need to shed the insular attitude of ignoring international safety standards and transform themselves into a globally trusted entity… [in the aftermath of the Fukushima accident], the regulators did not monitor or supervise nuclear safety… Moreover, the organization lacked transparency…. After the accident, the Tokyo Electric Power Company (TEPCO) continued to avoid transparency in disclosing information." In fact, not only did the report highlight a lack of transparency in the aftermath of the accident, it also made several recommendations pertaining to improving nuclear transparency moving forward.[33]

Public opinion in Japan regarding its reliance on nuclear power has shifted drastically in the wake of Fukushima. Following the earthquake and tsunami in March 2011 that triggered the nuclear disaster, protests and anti-nuclear events took off around the country. Thousands of protestors took to the streets to call on the government to cut the nation's reliance on nuclear power. Signs carried by ordinary citizens could be seen at rallies across Japan, with slogans such as "No More Fukushima" and "No Nukes".[34]

It is worth noting that Japan has not signed on to any of the three main relevant legal instruments noted in previous examples.

As in the French example, in the case of Japan it is worthwhile to consider the space that nuclear and other large technical projects occupy in the public consciousness.[35]

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[31] Willacy, Mark. "Japan nuke companies stacked public meetings," *ABC News,* 3 October 2011.

[32] "Nuclear Power in Japan," last accessed 19 December, 2015. *World Nuclear Association,* www.world-nuclear.org/info/country-profiles/countries-g-n/japan/

[33]"The Fukushima Nuclear Accident Independent Investigation Commission," *The National Diet of Japan,* 2012. https://www.nirs.org/fukushima/naiic_report.pdf

[34] Slodkowski, Antoni. "Japan anti-nuclear protesters rally after quake," *Reuters,* 15 June, 2011. www.reuters.com/article/columns-us-japan-nuclear-protest-idUSTRE75A0QH20110615

[35] Fujigaki, Yuko (ed.), "Lessons from Fukushima: Chapter 2, The Processes Through Which Nuclear Power Plants Are Embedded in Political, Economic and Social Context in Japan," *Springer,* 2015.

Any discussion of the relation of the Japanese public to nuclear energy cannot be viewed without taking into account the cultural and historical association of the Japanese populace with the first (and only) wartime use of an atomic bomb, at the end of World War II in Hiroshima and Nagasaki. Due to this horrific experience, "a 'dark shadow' clouds the image of the atom for Japanese citizens… [and] cultural acceptance of nuclear energy in Japan is complex."[36]

The notion that openness could improve the acceptability of nuclear power installations in Japan is nothing new, and in fact, was employed by some early Japanese physicists, who were trying to improve public acceptance of nuclear power in the 1970's. One example is Koji Fushimi, who insisted on three principles in the promotional aspects of nuclear power, one of which was 'openness'.[37] This principle was put into the Basic Law of Nuclear Power of 1955, in addition to the inclusion of the principle of "democratic control".[38] The inclusion of the 'openness' and the 'democratic control' principles from the inception of the Japanese nuclear power program may have helped to persuade the public to accept nuclear power, but in hindsight and with the insights provided by the Fukushima investigation report, one rather jaded assessment can be that in the case of Japan, these principles were tools of manipulation rather than precedents for involving the public and maintaining sufficient transparency.

Another important consideration regarding the inclusion of the public in Japan's nuclear decision making, as noted in the Fukushima report, is culture. Kiyoshi Kurokawa, in the executive summary of that report, noted that the Fukushima accident was "made in Japan", and reflected a set of Japanese cultural tendencies that contributed to the magnitude of the disaster. Namely, the so-called 'ingrained conventions of Japanese culture' that the summary highlighted included: reflexive obedience, reluctance to question authority, devotion to 'sticking with the program', groupism, and insularity' were factors that were highlighted as cultural attributes that contributed to the nuclear safety accident and resulting environmental and human tragedy of the Fukushima event.[39] One potential implication of this cultural assessment is that public transparency may fall lower in terms of priority than ingrained notions of respect for authority and associated hierarchical tendencies. Transparency, it may be safe to generalize, is often a trait most valued in democratic societies with lower reliance on power distance and authority, and a greater propensity for egalitarianism, openness, and low context communication.[40]

Japan's public involvement in the nuclear question, both civilian and otherwise, is extremely complicated by the fact that not only did it experience the most recent nuclear accident on the earth, but it is also the only country to have been bombed with nuclear weapons as an act of war. Japan's utility companies and technocrats are not renowned for their stakeholder engagement, nor are they known for their transparency regarding

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[36] Fujigaki, Yuko. Pp. 9.

[37] *A challenge in this research has been locating Koshimi's paper translated into English; he apparently wrote what must be a fascinating article in the 1950's entitled "How to deal with the atomic power peace offensive."*

[38] Yoshioka, H, "Social History of atomic energy," cited by Fujigaki, Yuko.

[39] National Diet of Japan, *Executive Summary.*

[40] Bachner, Katherine. "Promoting Intercultural Competency in the Nuclear Workplace," *Brookhaven National Laboratory,* July 2015.

ancillary nuclear issues. The lesson from the Japan continues to unfold, but one obvious take away is that in the wake of the Fukushima accident, Japan needs to improve its stakeholder engagement, public dialog, and the opportunities that exist for citizen stakeholders to meaningfully, practically join the conversation and affect the results.

Conclusion

Not surprisingly, this paper finds that transparency and outreach yield results in the world of civilian nuclear power, and can improve the smoothness and success of a civilian nuclear undertaking. This finding is shared by various experts and interested parties the world over. One source ably summarized a good set of principles to guide a nuclear energy organization:

1. Transparency of an organization's plans and operations matters,
2. Successful community and stakeholder relations involves reaching out to critics,
3. Stakeholders should be kept apprised of as much information as possible,
4. Continuously building community and policymaker support is an effective strategy.[41]

A supplementary conclusion of this paper is that in addition to transparency, information sharing, and stakeholder engagement, the general cultural norms and attitudes of a populace should be respectfully analyzed, fully understood, and sufficiently taken into account as part of the stakeholder engagement and nuclear transparency process. If this crucial step is taken at the beginning of the process, the technical hurdles that may arise later will be much easier to focus on and solve, knowing that the community stands behind the project and that the engineers implementing it are taking the opinion of the community indigenous to the area seriously. Success hinges on knowing one's audience, knowing what matters to them, and appealing to that set of sensibilities with transparency and integrity.

[41] Lambach, Mimi. "Good nuclear energy communications," *ANS Nuclear Café,* 19 June 2013. Ansnuclearcafe.org/2013/06/19