The Policy Making and NPP Construction Processes in Korea
- The reality of civil participation and a suggestion to improve the public acceptance -

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1. Introduction

After the Fukushima accident in 2011 and the nuclear power plant (NPP) scandals revealed in Korea in 2013, the public acceptance (PA) on NPP has fallen rapidly and the anti-nuclear atmosphere has been spread to the political groups, the nuclear industry is facing an unprecedented crisis.

Many papers criticizing nuclear energy argue that there is a problem in ensuring the safety of citizens since the processes of energy policy establishment and construction of nuclear facilities do not provide enough opportunity for civil participation [1,2].

This paper examines whether this criticism is reasonable by examining relevant aspects of nuclear related policy making and licensing processes and draws a suggestion to enhance the PA.

2. Methods and Results

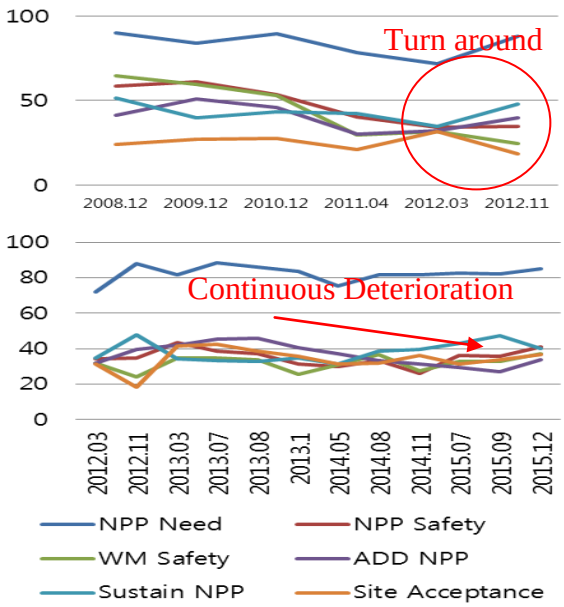
This section reviews 1) the research results related to changes in public acceptance (PA) on NPP to determine the causes of PA fall, 2) how to get public opinion in the processes of nuclear policy making and licensing the nuclear facilities, 3) the governance issue of nuclear power promotion and regulation whether the above critiques of NPP construction is reasonable. From the results of this review, and after discussing the reality of civil participation, a solution to promote nuclear PA is proposed.

2.1 Reviews on the PA

Ref.[3], an extensive study on PA, points out that the confidence index for nuclear safety is 52% in Korea in 2012, far below than expected considering domestic nuclear technology level [4]. It also indicates that, in 1991, 81% supported increasing nuclear power but it fell to 66% in 1996, and that the civil-government conflict over radioactive waste disposal site selection and the policy drift caused PA drop. It further asserts that trust in the government is crucial to establish policies and secure the driving force. Also driven out is that the DAD (Decide-Announce-Defend) of the elitism unilateral approach is likely to cause social conflicts and therefore it is better for the stakeholders to recognize, accept and understand the opponents. And concludes, 8 aspects, stakeholders' participation, responsibility, ethic, sincerity, independence, deliberation, non-linearness and transparency are important in enhancing PA on NPP.

Figure 1, constructed based on ref.[5], shows that anxiety about the NPP after the Fukushima accident in 2011 deteriorates PA, but in 2012 turn into rise. But after concealment of the Kori-1 NPP Blackout in 2012, and NPP scandals were revealed in 2013, the overall perception is falling continuously until Sept. 2015. This indicates that ethical problem is far more damaging than safety issues.

Fig. 1. Public Opinion on Nuclear Facilities (2008~2015)



2.2 The Nuclear Policy Making

The Master Plan of National Energy (MPNE), the top level national energy plan, is established in accordance with the Framework Act on Energy (FAE) made in 2006.

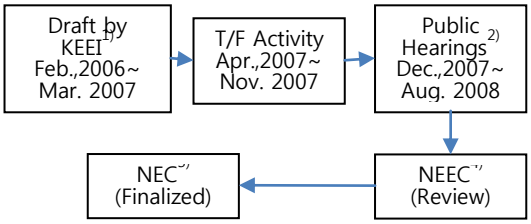
Since, this plan governs the nuclear energy supply and hence it shall be considered as the most authoritative decision making process for the nuclear energy in Korea.

The article 9 of the FAE specifies that the National Energy Committee (NEC) shall be organized by 25 members as shown in Table 1. As such, the opportunity of the civil participation is provided by the law.

The Figs. 2&3 below depict the actual processes taken in the 1st and 2nd MPNE made in Aug. 2008 and Dec. 2013, respectively..

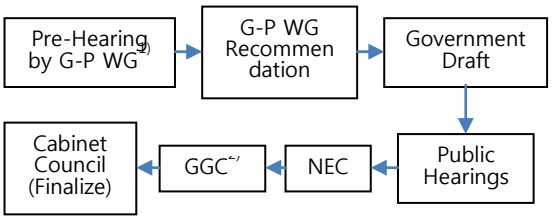
Table 1. Organization of NEC Members

Position		#	Eligibility
Chair		1	President
Vice-Chair		1	Prime Minister
Member	Official	6	Related Ministers
	Appointed	17	Energy experts appointed by the president (including 5 recommended by energy related NGOs)
Total		25	



Notes:
1) Korea Energy Economics Inst.
2) Include 2 Public hearings, 2 Public Discussions & 4 Workshops
3) National Energy Committee
4) National Energy Expert Committee
Data: the 1st MPNE, 2008~2030, Aug. 27, 2008

Fig. 2. The 1st MPNE establishment Processes



Notes:
1) Government-Public Working Group
2) Green Growth Committee
Data: the 2nd MPNE, G-P WG, Energy Strategy Forum. Dec. 11, 2013

Fig. 3. The 2nd MPNE establishment Processes

For the 1st MPNE, the NEC operated 4 expert committees, NEECs, each consists of 3 working groups with 2~3 civil experts to join per group and the public discussions & hearings and workshops were used to collect diverse civil opinions including energy NGOs.

However, there were complaints that the civil role was limited only to confirm the draft plan established by the KEEI based on governmental opinion.

In the 2nd MPNE, government formed G-P WGs in which government/civil experts working together from pre-hearing stage to recommend appropriate energy mix to draft the plan to enhance publicness of the plan.

As such, civil participation in energy planning is continuously increasing.

2.4 Nuclear Promotion and Regulation

Table 2 compares the current organization of the Atomic Energy Commission (AEC) and the Nuclear Safety & Security Commission (NSC). By the NSC law took effect in October, 2011, the NSC became an executive office of the President. This law was implementing the IAEA recommendation to have the independency of regulation to assure the nuclear safety. However, in March, 2013, the NSC changed to be an affiliation under the Prime Minister during the governmental restructuring.

Table 2. Organization of the AEC and NSC

	AEC	NSC
Affiliation	Prime Minister (PM)	Prime Minister
Members	9~ 11members including the Chair	9 members including the Chair
Chair	Prime Minister	Recommended by PM, Appointed by President,
Member Appointment	Official: 4 Ministers Appointed: 6, by President, Chair's recommendation	Appointed by President, recommended by Chair (4), National Assembly (4)

Many criticizes this being fairly tilted for nuclear promotion than for safety.[6,7,8] As AEC promotes nuclear and NSC regulates it, if both are under the same organization, and the PM recommends the chair of the NSC, the doubt that the NSC's decision on nuclear safety could be influenced by the AEC may arise.

If, however, the NSC Chair holds strong ethics such doubt can be overcome.

Table 3 shows the regulatory bodies of the USA, France, Japan and Canada are under the head of state (HOS) whereas 6 countries, including Korea, are not.

This indicates the regulatory body doesn't have to be under the HOS and interviews with U.K, France and US experts confirmed that expert ethics is the key to assure nuclear safety rather than the affiliation where the licensing body belongs to.[9]

2.3 Nuclear Facility Licensing

The nuclear facility related laws specify requirements to collect residents' opinion at various stages.

For the NPP site selection, the approval of the implementation plan shall be carried out in accordance with the Electric Source Development Promotion Act

and in article 5(2) of this act the requirements of 'Listening to Opinions of Residents' is specified.

Table 3. The Status of Nuclear Regulatory Bodies

Country	Name	Affiliation Status
Korea	NSC	Prime minister, independent
USA*[1)]	NRC	President, independent
France*	ASN	Prime minister, independent
Japan*	NSC	Prime minister, independent
Canada*	CNSC	Prime minister, independent
U.K	ONR	Dept. for Work & Pension
Sweden	SSM	Ministry of Environment
Spain	NSC	National Assembly, independent
Russia	RTN	Ministry of Natural Resources & Environment
China	NNSA	CAEA[2), 3)]

Note: 1) Regulatory body of * countries are under the HOS.
2) China Atomic Energy Authority.
3) NNSA reports directly to the State Council

The pre-site license and construction permit application shall include Radiation Environmental Impact Assessment Report (REIAR) prepared in accordance with the NSC Notice No. 2014-11, 'Regulations on Preparation of REIAR'. The article 5(8) of the Notice specifies that residents' opinions shall be collected, evaluated and reflected in the REIAR.

The High-Level Radioactive Waste Management Basic Plan announced on July 25, 2016, is evaluated as a step ahead of the processes of the existing nuclear facilities. The site selection procedures for the plan are depicted in Fig. 4.

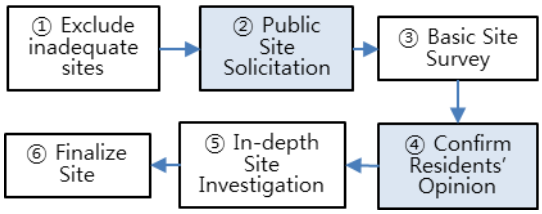


Figure 4. High-Level Waste Repository Site Selection Procedure

The government emphasizes that for ② and ④ above, a sufficient and continuous communication with local residents, such as regular disclosure of operation information, and supporting resident surveillance organizations, will be conducted to increase the PA.

So, the opportunity of civil participation is open and increasing in nuclear facility licensing.

2.4 The NSC Information Disclosure

Transparent information disclosure (ID) in nuclear safety regulation is important for securing public trust.

To promote ID and transparency in decision-making process, NSC discloses its minutes, stenographic records and agenda on its homepage, nuclear safety regulation information using the Nuclear Safety Information Disclosure Center (NSIC) and allows the participation of general public in the meeting. In addition, the Internet (IERNet) and the smartphone application (dRAD @ NOW) provide environmental radiation dose in real time.

In Korea recently, the revised Nuclear Safety Act (2015.1.20), which discloses the main data of the NPP to the general public, has passed and ID has become mandatory.

As such, the level of ID is at very near proximity of other advanced countries with strong nuclear program.

2.5 Methods of Civil Participation

In order to secure the public trust, diverse efforts are made to communicate and strengthen the participation in the safety regulation process.

Nuclear Safety Council was established in May, 2013, as the direct communication channels between the residents of the NPP sites and the NSC and is expanding its operations.

Civilian Environmental Monitoring Center (CEMC) was established in the area with NPPs as the MOCIE confirmed the operation guidelines in 1997, as a civil participation mechanism for monitoring the environment and radiation safety related to the NPP. The NPP Civilian Monitoring Agency Council (CMAC) was formed as the consulting body for local CEMCs.

Open Communication Forum (OCF) is a forum between the KINS and the regional CEMC, which provides nuclear safety regulatory information and discusses the issue to promote mutual understanding held twice a year from 2005.

Civil Verification Team (CVT) was formed and participated in the stress test on domestic NPPs. The Stress tests were conducted, as the anxiety on NPPs has increased after the Fukushima accident, to assess the response capability of NPPs and to derive safety enhancements, assuming natural disasters exceeding design bases and possible accidents therefrom.

2.6 The Reality of Civil Participation

As stated above, the processes of nuclear policy making and its implementation include various ways to collect opinions of residents and the ID level seems sufficient. Therefore, the argument that there is not enough opportunity for civil participation is not valid. Instead, it should be regarded as a complaint that the antinuclear opinion is not being fully reflected in the policy or enforcement although it is given opportunity.

Some argue that because the NSC is composed of 7 pro- and 2 anti- nuclear members, antis' opinion are structurally ignored. Such argument is not acceptable

because it will continue until the NSC is filled by equal pro- and anti- members so that no decision can be made.

In addition, CVT claims that expanding its activities as a regular organization is needed. CVT may play a complementary role in the verification by the KINS, to enhance PA of the results. However, its regularization is not preferable because it would be overlapped with the public regulation function of the KINS and weakening of public nuclear safety assurance structure will follow.

Further, as in refs.[1,2], the antis attempt to exclude nuclear experts from the category of citizen by using a cynical expression of 'politics of expertise' implying that experts cannot secure citizens' safety because they blindly comply with governmental policies. Even the criticism that formulation and implementation processes of nuclear policy are undemocratic is emerging.

All these attempts are on-going to achieve the antis' goal to shut down all the NPPs in Korea.

As the situation worsens, an opinion for expanding civil participation is emerging, even from pro-nuclear.

Expanding participation of residents may be necessary, but of the NGOs that ignore IAEA standards, lead absurd law suit linking NPPs with thyroid cancer, exaggerate risks of tritium and radiation of NPPs, is not.

Because, they are unethical, break down rational premise of democracy and their participation only hampers growth of healthy civil society.

For these irrational anti-behaviors, pro-nuclears' much more direct and decisive action is needed.

2.7 Proposed Solution to Improve PA

It should be noted that in Sweden, when determining the radioactive waste disposal site they strictly separated technology from societal matters and civil participation was made only in the societal matters. The US NRC, to protect intellectual property, does not disclose the detailed design data required for safety verification so third-party verification is rarely possible. Yet, NRC's technical judgment on safety is not being challenged. France and the UK are similar. This is because trust in public institutions is high in these countries.

Therefore, to improve the PA, government and expert trust should be improved first. To improve the trust, authentic communication is needed, but professional ethics must be strengthened and settled at an early stage.

The importance of ethics also appears in ref.[3]. Because among the 8 aspects conclusively suggested for PA enhancement, ethic is included and 4 of them, i.e. the responsibility, sincerity, independence, and transparency are related to ethics. In addition, experts' ethics, by itself, is one of the measures that can prevent corruption, and it can provide a ground for not blindly comply with governmental policies, it can be concluded that securing expert ethics is the most important for PA enhancement. Because, the code of ethics requires professionals, to be honest, impartial, fair and requires dedication to protect public health, safety and welfare.[10]

Above all, it is absolutely necessary to disclose and rectify any undue work in the nuclear organization. Because for those engaged in the nuclear industry, public safety is much more important than maintaining the organization. If this is ignored and associating with the organization is continued, the whole industry will collapse and the organizations to keep will also collapse.

3. Conclusions

This paper showed that the ethical failure is a root cause of nuclear PA fall, and that it's not desirable to expand the participation of anti-nuclear NGOs but it is urgent to raise the trust of the government and experts.

It is, therefore, concluded that it is necessary to establish and strengthen experts' ethics early to enhance the nuclear PA in Korea.

4. Acknowledgement

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