

## Suggestions for the next public acceptance activities in a NPP siting plan

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### 1. Introduction

Siting is the term used to describe the process to select where a nuclear installation is built and whether the decided location is suitable for it. Siting is one of the important decisions in the early stage of a planned nuclear energy project. The selection and evaluation of a site suitable for a nuclear installation are crucial processes. They can significantly affect the costs, public acceptance and safety of the installation. Poor planning and lack of knowledge can lead to faulty decision-making and can cause major delays of the project. Siting is a multifaceted process, involving many types of site characteristics. Those characteristics can affect the safety of a nuclear installation over the whole period during which it is planned, situated and operated.

Generally the project to select the site for a NPP needs to begin early, be well managed and deploy good communications with all stakeholders. It is widely recognized that when a state decides to begin or expand its nuclear power programme, the choice of the sites that will host the power plants is likely to be politically contentious. Evidence suggests that even in countries that rely on nuclear power for a large proportion of their electricity needs, there is a significant opposition to the nuclear industry and issues related to the site are often a source of conflict. It is therefore an important topic, not just for those States introducing nuclear power for the first time, but for any State looking to build a new nuclear power plant. Done well, it will ensure the right choice of site(s) taking into account safety, environmental, technical, economic and social factors and will allow the project to be completed within its programme. If not properly planned and executed, it is likely to result in major delays to a programme or even failure to complete the intended project.

### 2. Background

Nuclear power generation in South Korea started in the 1970s for the smooth supply of demand of electric energy. Since Kori unit 1 started commercial operation in 1978, Nuclear power station was added to Gori, Yeonggwang, Wolsong and Uljin continuously. As of May 2019, 24 nuclear power plants located in the above four regions are supplying more than 30% of total electric energy. The already canceled Samcheok nuclear power plant had many problems in the decision making process. It is almost impossible to select a new plant site.

Installing nuclear power plants has become difficult over time. As explained below, a case of the nuclear waste repository, it has changed from a government-led approach to consultation with the private sector. It is now difficult to persuade the public no matter what method is used.

#### 2.1 Poor Compensation and Typical DAD (Decide Announce Defend) approach (1986-1993)

At that time, the business model followed a typical DAD approach. In other words, the group of technical experts including Nuclear Research Institute strived to find the best geological location in principle. Through these efforts, we made a public announcement of the selected adaptation sites, and afterwards, we actively promoted the opposition of residents through public relations activities. However, the opposition of the residents has always surpassed the government's expectations. In particular, there was a damage consciousness of 'why' our region was selected, and compensation that was not enough or specific was the cause of the most direct repulsion. It was also a problem that it did not cover the consultation process with stakeholders in a downward way based on the expert's scientific judgment.

#### 2.2 Strong Compensation Policies and Allow Partial Participation (1994-2003)

On the basis of failure, the government can be interpreted as focusing on solving the problem of spatial equity experienced by the region as a law that establishes and clarifies the basis for support for the area where the waste repository site is located. As strong resistance from residents continues, the government begins to consider waste mines and islands, areas where residents' resistance may be least likely, as alternative sites. However, as the external environmental movement groups joined together with the residents of the neighboring areas, the opposition movement was expanded to the issue of environmental movement emphasizing the problem of temporal equity rather than the existing 'spatial equality problem'.

In 1998, the site selection of a nuclear waste repository was changed from a government-led method to the public bid contest method to prevent continuous residents' opposition.. Since then, the Government has been competing to attract local governments across the country. At that time, a total of seven regions, including Yeonggwang, had public offerings, but all failed due to

opposition from local government heads. The impatience of the government due to continued failures once again makes the mistake of turning the waste repository project into a business-led one. In 2003, the government announced the candidates for Yeongdeok, Uljin, Yeonggwang, and Gochang, but it was also systematically opposed by residents and civil society organizations, mainly the head of the organization.

The newly launched participatory government changed its business method back to a bid public offering method in April 2003, and issued strong compensation policies, including support of about 300 billion won, relocation of KHNP headquarters, and promotion of linking proton accelerator projects.

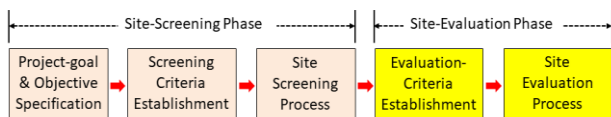
### 2.3 Strong Compensation, Granting Veto and Solving Problems (2004-2013)

The participatory government eventually grants residents veto power through a policy of "introducing a referendum in the process of selecting sites."

The problem of spatial equity was solved by strengthening compensation that had been maintained since the second phase, and almost all requirements of open location selection procedures were included in the form of hosting public offerings and the granting of resident veto rights. Of course, problems such as overheated competition among local governments during the referendum process, fair management of the referendum, and conflicts in small areas in Gyeongju after the location was selected can be pointed out as problems. Nevertheless, the success of the site of the nuclear waste dump in Gyeongju has great significance as the success of the 20-year-old state project and the end of the biggest conflict in South Korea.

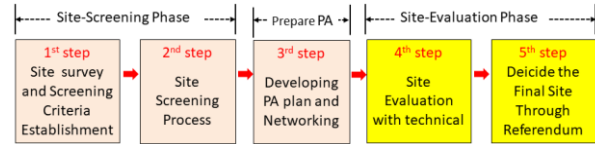
### 3. Methods

In general, the siting selection procedure is described in two phases as shown below. The procedure below is suitable for planning large projects where Public Acceptance is not important.



The general procedure needs to be modified considering the specificity of South Korea. Therefore, PA analysis should be preceded, and technical analysis after that is an efficient way to minimize social waves and save time and money. Based on this, considering the way in which PA and technical reviews cooperate harmoniously, this report suggests the following gradual process. Following figure shows the modified process. It is clear that the project goal & objective specification will be decided by the power authority, so this report is

discussed except for that. The basic layout plan is divided into five steps in time. PA activities should be treated as more important and weighted individual stages as shown below.



In developing a detailed plan, the procedures according to the related laws should be thoroughly reviewed and reflected.

### 4. Results and Discussion

According to the procedure involving pa, plan a is prepared as shown in the table below. Actually each activities require much time and unexpected situations always happen. So it is closer to an expected schedule than an estimated schedule.

| Step   | Main activities   | 1 Yr |    |    |    | 2 Yr |    |    |    | 3 Yr |    |    |    | 4 Yr |    |    |    |   |
|--------|---|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|---|
|        |   | Q1   | Q2 | Q3 | Q4 | Q1   | Q2 | Q3 | Q4 | Q1   | Q2 | Q3 | Q4 | Q1   | Q2 | Q3 | Q4 |   |
| 1 Step | Survey & Screening Criteria Establishment   | █    | █  | █  | █  |      |    |    |    |      |    |    |    |      |    |    |    |   |
|        | identify requirements from past and stakeholders  | █    | █  | █  | █  |      |    |    |    |      |    |    |    |      |    |    |    |   |
|        | Site survey with literal data<br>establish screening 3 criteria                             | █    | █  | █  | █  |      |    |    |    |      |    |    |    |      |    |    |    |   |
| 2 Step | Site screening and selecting  |      |    |    |    | █    | █  | █  | █  |      |    |    |    |      |    |    |    |   |
|        | Further screening and ranking with criteria   |      |    |    |    | █    | █  | █  | █  |      |    |    |    |      |    |    |    |   |
|        | Conduct detailed study for by siting team<br>select 8(or over) candidate sites              |      |    |    |    | █    | █  | █  | █  |      |    |    |    |      |    |    |    |   |
| 3 Step | Stakeholder engagement  |      |    |    |    |      |    |    |    | █    | █  | █  | █  |      |    |    |    |   |
|        | Conduct pre-communication opinion survey  |      |    |    |    |      |    |    |    | █    | █  | █  | █  |      |    |    |    |   |
|        | Conduct public communication activities<br>Conduct post-communication public opinion survey |      |    |    |    |      |    |    |    | █    | █  | █  | █  |      |    |    |    |   |
| 4 Step | Site evaluation   |      |    |    |    |      |    |    |    |      |    |    |    | █    | █  | █  | █  |   |
|        | Conduct detailed onsite investigations  |      |    |    |    |      |    |    |    |      |    |    |    | █    | █  | █  | █  |   |
|        | Ranking analysis for select 4 sites   |      |    |    |    |      |    |    |    |      |    |    |    | █    | █  | █  | █  |   |
| 5 Step | Decide the final site through referendum  |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    | █ |
|        | Set up the communication center   |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    | █ |
|        | Campaign activity for referendum<br>Referendum and notification of selected site            |      |    |    |    |      |    |    |    |      |    |    |    |      |    |    |    | █ |

The results that should be achieved at each step can be briefly described as follows.

*1st step. Site survey and establish screening 3 criteria (expected duration 12 months)*

The stage where surveys are conducted for identifying several potential sites or appropriate areas and simple screening of potential sites is carried out resulting in finding appropriate candidate sites. After Basic analysis for PA preferences from step1, the person in charge can specify the criteria for screening like exclusionary, avoidance, suitability criteria.

*2nd step. Site screening (expected duration 6 months)*

The stages where preferred candidate sites are identified through ranking analysis and particular sites are selected for detailed study by the siting team. This involves a duration of about 6 months for site selection. This period is obviously dependent on the available resources. The final result of this step is the selection of more than 8 candidates.

*3rd step. Stakeholder engagement (expected duration 6 months)*

At this stage, explanatory data on why nuclear power plants are needed should be disclosed, and voluntary participation of all citizens should result in the consent to voluntarily establish nuclear power plants. Depending on the situation of public opinion, the period may be longer, but it is assumed to be 6 months at the planning stage

*4th step. Site evaluation - before referendum (expected duration 18 months)*

The stages where candidate sites are surveyed through field test and lab test. This involves a duration of 18 months for assessing. This period is obviously dependent on the available resources, including human and financial, but is mainly based on the fact that 12 months are required to measure relevant data. Especially certain parameters for environmental impact assessments require measurements for 12 months. The final result of this step is elimination of worst 2 or 3 candidate sites from group of candidate sites.

*5th step. Selection of the final site through referendum (expected duration 6 months)*

The duration of this phase is expected to be the most variable. Additional information will be added to the known contents of released in first step 1 to be publicly disclosed, and a period for the residents to be informed and a period for the referendum of the local government should be added. The final result of this step is the selection of final 1 candidate.

Generally, it is not possible to give precise guidance on the time or resources required for a siting project. It depends on the siting criteria, the availability of data, the nature of stakeholder interaction required, the regulatory process and many more factors. The following can only be considered as an approximate indication.

## 5. Conclusion

The ultimate issue of NPP siting is the safety. If only the most local public get to know that some NPP is highly safe technically, can the local public allow the NPP in their back yards? This cannot be always yes. This matter is not related to only the safety itself but also many other factors. These determining factors should be considered and managed systematically using such as communication, compensation and so on. This can be called PA activities to be engaged timely and properly in the siting process.

We all recognize that the old ways like DAD approach are no longer valid. The procedure proposed in this report should be reflected in the planning of the installation of all nuclear-related facilities to ensure the

success of successful projects. It should also be reflected in the construction of next power plants and radioactive waste repository under discussion.

## ACKNOWLEDGEMENTS

The authors thank the other members of the NPP construction project management group at KINGS (KPECO International Nuclear Graduate School); in particular Mrs. Hyojung Kim, Mr. David Kassel the professor who gave special lectures.

This paper was supported by the 2019 Research Fund of KINGS, Republic of Korea

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