Recent Status of Public Response to RDE Development & Utilization

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Abstract. Preliminary study on social aspect of Experimental Power Reactor (RDE) development and utilization has been conducted, focusing on the qualitative aspects of public response and developing social issues related to the planning of RDE development at South Tangerang region. The study involves assessment on focused-group discussions results, public inputs given via distributed questionnaires and interviews with relevant stakeholders at focus areas. The study is aimed to identify specific issues and opinions growing in the public prior to the launching of Government plan in building RDE at Puspiptek Complex and to identify important stakeholder groups which need to engaged during the continuation of RDE program, as part of sustainable social engineering program to increase public acceptance on RDE project and nuclear energy. Desk study, interviews and qualitative analysis were utilized as methodology of this study. The study reveals several important issues growing among the public, they are, public fear on environmental impact if accident occurs, public stigma on radiation danger, low understanding on environmental monitoring activities which leads to less confidence on environmental protection and economic benefits provided by the new reactor occurrence. The study also reveals three major important stakeholder groups which need to be engaged during the social engineering program implementation, they are general public living at 3 regions around Puspiptek Complex, workers at Puspiptek Complex and academic community. These results will be beneficial to the development of social engineering program and implementation of public engagement for RDE project.

Keywords: public response, social aspect, public engagement, social engineering, RDE, nuclear

1. Introduction
Experimental Power Reactor or Reaktor Daya Eksperimental (RDE) is one of energy development program which has been implemented by BATAN (National Nuclear Power Agency) on 2015-2019 strategic planning period. RDE program becomes integral part of the milestone of the Nuclear Power Plant (NPP) program road map in the National Energy Policy (NEP) framework. The EPR which is planned to be built at Puspiptek (Research Center of Science and Technology) area currently is entering the detailed design completion phase. Similar with other nuclear power development and
utilization program (for example Muria-Jepara NPP and Bangka NPP studies), RDE program is also important to be equipped with social studies related to its economical, public acceptance and other social impacts aspects. Based on technical document provided by International Atomic Energy Agency (IAEA) for nuclear energy program infrastructure development, stakeholder involvement becomes one major infrastructure which needs to be addressed and developed during all phase of the program. This includes the effort to develop public engagement and involvement in all phase of nuclear energy program, as the public acceptance plays important role in the success of the program itself.

Experiences over the last two decades shows how public resistance on nuclear energy program at Indonesia strongly affected the continuation of technical studies for nuclear power plant introduction at several potential sites. Past experiences also shows the importance of understanding public opinion and perception on nuclear energy and the specific program (Amir, 2009). Given these contexts it is strongly important that the views and perceptions of nuclear power within the public are explored, understood and properly theorized, not only because of their academic significance but also to allow for meaningful engagement between all parties involved in the debate over new nuclear energy program. Not only identifying public perception and opinion, mapping the society structure as clustered stakeholder groups is also crucial for the engagement program, as different socialization and engagement approaches may be needed to engage different groups with different social responses (Wijayanti, 2016). Thus, it is important to start the social engineering and public engagement program with comprehensive studies on public response towards nuclear energy and RDE program specifically to ensure during technical studies and preparation stages, public understanding and acceptance on the program will be developed properly.

Two main observations are conveyed in this paper. One relates to a set of social issues developing within communities living or working in the nearby area as response to the RDE program and early stage of government socialization activities. Other observation highlights the important stakeholder groups related to RDE project which was identified during interaction with the public which might be socially affected by the occurrence of RDE. The review on these two observations findings is addressed as feedback to government program related to RDE, especially to give inputs on the required social engineering and public engagement program to ensure the RDE program will be socially accepted by the public. Reflecting to previous experiences on public behavior towards nuclear energy program, it is important to construct social and public engagement program which addresses public main concerns to ensure proper public understanding and acceptance will be reached for RDE program.

2. Theoretical Framework

2.1. Public Engagement & Stakeholder Identification on Nuclear Energy Program

Public engagement as part of increasing awareness and acceptance effort in nuclear energy project is widely known as important aspect which needs to be addressed together with technical aspects since the early beginning of the project itself. This aspect is also included by International Atomic Energy Agency (IAEA) as part of Stakeholder Involvement infrastructure, one of the key aspects to be prepared by countries who is developing its nuclear energy program. In developing public engagement plan and during its implementation, the need to identify and address public views and opinion on the nuclear energy project is very crucial. Identifying correct social issues in each specific stakeholder groups will be beneficial in constructing the proper communication strategy and engagement activities which will be able to address the issues itself, thus increasing public trust & and understanding in general and increasing public acceptance towards the project implementation.

IAEA defines stakeholder as anyone (or any group of individuals) who feels impacted by an activity, whether physically or emotionally. It should be recognized that this definition makes it difficult to identify all relevant stakeholders in particular circumstances, as some stakeholders may be self-selecting and situational. For specific nuclear energy program proponent’s perspective,
stakeholders may include: the regulated industry or professionals; scientific bodies; governmental agencies (local, regional and national); the media; the public (individuals, community groups and interest groups); and other States (especially neighboring States that have entered into agreements providing for an exchange of information concerning possible trans-boundary impacts, or States involved in the export or import of certain technologies or material) (IAEA, 2011). The varying definitions of stakeholders shows that it is important to correctly and carefully identify stakeholders who are directly related to specific nuclear energy program, and the identification should also carefully consider specific social and cultural characteristics of public related to the nuclear energy program.

2.2. Public Response to Indonesia Nuclear Power Program

Annual Public Opinion on Nuclear Power Program conducted by BATAN during the last 7 years shows interesting findings on public views and perception on nuclear energy, which strongly related to their stance on accepting or resisting the program. Despite the increasing number of public acceptance percentage during the last 5 years at Indonesia, there are several resistance reasons which need to be identified and response based on these studies findings. Three major reasons which were identified on these studies are: public fear on accident possibility, public fear on radioactive contamination and nuclear proliferation issue.

Based on similar annual studies conducted by BATAN, these three issues have always become the major public concerns, although most of them were strongly affected by the lack of public understanding on specific issues and the low frequency of socialization activities which addressed these specific concerns. Despite these causes, these findings gave excellent feedback to BATAN and Indonesian government who have the authority in implementing nuclear energy program, to construct the proper communication and public engagement activities which will address these public concerns. More detailed review on the quantitative data of these study results also suggest public attitude on nuclear energy program is also strongly influenced by geographical factor. Public living in the area closer to potential NPP site tends to show higher concern on safety aspects of NPP operation compared to public at national level. For example, on 2014 survey, more than 81% of Bangka Belitung Province respondents who choose to against the nuclear program expressed the fear of accident possibility as their main reason of resistance, this number was almost twice higher than the number at national level which reached 41% (BATAN, 2011). This result becomes an excellent example on the importance of social and cultural aspects consideration during the planning and implementation stages of public engagement program. Thus, this result also suggests the importance of social and cultural consideration for RDE program since the beginning of the program implementation, to ensure public understanding and acceptance.

2.3. Geography and Demography of RDE Surrounding Area

RDE is planned to be built at Puspiptek Serpong Area, which is located in the South Tangerang municipality administration, however this research area is also directly adjacent with Tangerang and Bogor municipalities. This geographical condition suggests the social engineering and public engagement program related to RDE program should engage the public living in all three municipalities, as all of them share the same concern for living in the nearby areas. The RDE site which is located inside the Puspiptek research area also reveals the occurrence of workers and staffs working at different agencies and offices within Puspiptek area as important stakeholder as well, as they conduct daily activities at the same research complex which may be affected by the occurrence of RDE.
Based on geographical and demography data provided by BPS, within 5 km radius there are 20 districts in 3 municipalities which its public needs to be engaged during the RDE program development and implementation, they are South Tangerang City, Tangerang municipality and Bogor municipality.

3. Research Methodology
This study utilized desk study on secondary data collected from several references and qualitative analysis on primary data collected through public meetings, interviews and FGDs. These study activities were conducted between 2015 to 2017 period, involving active participation of public and local figures and government employees working and/or living at Puspiptek Complex surrounding areas.

Specific groups on FGDs were defined to carefully differ public representation from three municipalities (South Tangerang, Tangerang and Bogor) which has its own specific social characteristics. Questionnaires were also distributed to the participating stakeholders to provide quantitative data for further analysis in the future.

4. Results and Discussion

4.1. Stakeholder Groups Identification
Preliminary stakeholder groups identification was conducted based on geographical and population data obtained from BPS website and also Puspiptek Management Office. Three main stakeholder groups were defined based on geographical aspect, they are South Tangerang city public, Tangerang public and Bogor public. Each of these stakeholder groups represents specific population who shares similar geographical and demographical characteristics. Specific social characteristics within each stakeholder group like economical condition and cultural characteristics may influence public attitude and opinion on introduction of new technology or infrastructure in the nearby areas, including RDE. All of these three stakeholder groups may be further classified as smaller groups in further study, as
they may also have more detailed social characteristics in smaller groups. Based on interview findings, some of group members also expressed the importance of BATAN and Puspiptek employees as their neighbors within their communities. Their regular interaction with these employees as society members, give strong positive relationship and trust, which may be beneficial as an effective channel in distributing information related to nuclear research activities to other public members. Similar confidence trend also given to academic community (teachers) who are working and living in their areas. Their social attributes as society member with high education background has led to public trust build up, and they may also play important role as communication channel for RDE public engagement program. This finding suggests putting employees and academic community as important stakeholder groups to be engaged as well in the future, especially considering their potential role in delivering information effectively to the public. Their active participation in delivering information as part of the general public will be beneficial in building public confidence.

4.2. Stakeholder Knowledge on Nuclear Research Program
The study reveals three stakeholder groups from three different municipalities showed different knowledge on research activities conducted by BATAN inside the Serpong Nuclear Complex. South Tangerang public has relatively adequate knowledge on BATAN activities conducted inside Serpong Nuclear Complex and future infrastructure development planning, including RDE development. This adequate knowledge can be assumed affected by much frequent interaction between BATAN and South Tangerang public, both in formal interaction (socialization) and informal interaction. Some of public figures also expressed their confidence on BATAN’s program as they are regularly exposed to information and updates disseminated by their own neighbors who worked at BATAN.

The results for Tangerang region and Bogor region public groups showed slightly different trend, which less public members expressed having adequate knowledge on BATAN research activities and future program. This trend can be assumed affected by less frequent interaction and socialization activities conducted by BATAN for public in these areas.

The findings related to public knowledge on nuclear research program is very important for future RDE public engagement program, as the knowledge level gained by the public may affects public confidence on BATAN as nuclear complex operator and activities conducted inside the area, especially linked to public confidence on safety aspects of nuclear facilities operation. Thus it is strongly recommended for BATAN to conduct regular communication program to Tangerang and Bogor regions public, to ensure their proper understanding on research activities conducted inside Serpong Nuclear Complex will lead to the build up of their confidence on RDE program.

4.3. Public Attitude on RDE Program
The study reveals all three stakeholder groups share similar attitude to RDE development plan. Although majority of stakeholder members expressed their acceptance on the RDE plan, but most of them also expressed their concerns on environmental impacts if accident occurs, fear on radiation effects and less understanding on environmental monitoring activities conducted by BATAN to ensure public and environmental safety protection.

Despite the fact that BATAN has already conducted socialization and communication activities, especially in South Tangerang city, it is strongly recommended that these activities should addressed main public concerns stated above and also facilitating two-way communication process to reach optimal and equal understanding and also encouraging people to increase their confidence on RDE program. Addressing these concerns directly will receive much better response from the public compared with only delivering information on the benefits of nuclear research activities.

5. Conclusion
Based on several findings on this study, it is important to highlight main major concerns expressed by the stakeholder groups, which mostly are related to public fear on negative impact of radiation to
environment and public if accident occurs. The communication and engagement activities should address these concerns directly to answer public anxiety and increasing their confidence to radiation protection program.

The study suggests further analysis on stakeholder groups living in three municipalities in the RDE site surrounding areas. Understanding social characteristics of specific stakeholder groups will give important information on the most effective engagement strategies to increase public confidence and acceptance. This study reinforces the needs of the use of effective communication channel by involving important stakeholders like employees and academic community members as communicators, considering their attributes as public members with strong relationship with other society members. The communication and engagement program also must directly address the stakeholder main concerns, especially related to the environmental and public safety protection.

6. References
[1]. Amir, S. (2009). Challenging Nuclear: Antinuclear Movements in Postauthoritarian Indonesia. Taiwan: East Asian Science, Technology and Society: an International Journal. National Science Council
[2]. Wijayanti, T.E. (2016). Risk Communication Of Nuclear Technology Utilization (Study on Communicating the Risks of Experimental Power Reactor (EPR) Construction Program in South Tangerang, Banten). Yogyakarta: Universitas Gadjah Mada
[3]. Badan Tenaga Nuklir Nasional. (2011). Jajak Pendapat Iptek Nuklir Tahun 2011: Nasional, Bangka Belitung, Jamali
[4]. __________. (2012). Jajak Pendapat Iptek Nuklir Tahun 2012: Nasional, Bangka Belitung, Jamali
[5]. __________. (2012). Executive Summary: Stakeholder Mapping
[6]. __________. (2013). Jajak Pendapat Iptek Nuklir Tahun 20123: Nasional, Bangka Belitung, Jamali
[7]. __________. (2014). Jajak Pendapat Iptek Nuklir Tahun 2014: Nasional, Bangka Belitung, Jamali
[8]. __________. (2014). Cetak Biru Rencana Pembangunan Reaktor Daya Eksperimental (RDE) 2014-2020
[9]. Internasional Atomic Energy Agency. (2011). Nuclear Energy Series: Stakeholder Involvement Throughout The Life Cycle of Nuclear Facilities
[10]. Act No 10 Year 1997 on Nuclear Energy
[11]. Presidential Regulation No 5 Year 2006 on National Energy Policy (NEP)