Towards ‘better’ engineering practice with STS: Reflexive feedbacks on HLW disposal program in Japan

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Background and Context

- High-level radioactive waste (HLW) disposal is a key issue in STS field
  - Beyond the pro-con dichotomic disputes
  - Its essential difficulty as a STS issue
- One of the challenging trials for STS studies
  - Can we make meaningful inputs to the management of HLW disposal in reality?
  - How should we do those inputs?
  - Are those inputs reasonable, feasible and acceptable for experts engaging this issue?
- A key theme in UC Berkeley – U Tokyo partnership project in nuclear field
  - “Global Center of Excellence” funding by Japanese government
  - Development of advanced educational program for graduate student including the understanding of social aspect
  - Social scientists join the project and collaborate with engineering people

Establishment of HLW disposal program in Japan

<table>
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<tr>
<th>Year</th>
<th>Events</th>
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<tbody>
<tr>
<td>1976</td>
<td>Basic R&amp;D was started in governmental organizations</td>
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<tr>
<td>1992</td>
<td>The 1st official technical report on HLW disposal was published</td>
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<td>1995</td>
<td>Atomic Energy Commission of Japan (AECJ) set an advisory board up for the establishment of the HLW disposal program in Japan</td>
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<td>1997</td>
<td>AECJ conduct the “round table conference” on nuclear policy (- 2000)</td>
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<td>1998</td>
<td>Advisory board submitted their report which suggest the establish of HLW disposal program</td>
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<td>2000</td>
<td>The 2nd official technical report on HLW disposal was published</td>
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<td>2000.6</td>
<td>&quot;Specified Radioactive Waste Final Disposal Act” was approved by Diet</td>
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<td>2000.10</td>
<td>Nuclear Waste Management Organization (NUMOI), the implemementer of HLW disposal program, was established</td>
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<td>2002.12</td>
<td>NUMO introduce the “Open Solicitation” program for the application for preliminary survey of HLW disposal plant siting</td>
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Design of HLW repository siting process: Criticism for conventional nuclear siting

- Conventional scheme and method of nuclear siting
  - Informal negotiation among stakeholders and important actors BEFORE the project publicized
  - No “participatory” decision-making event was implemented in the formal (legal) siting process
  - Not presupposed the possibility of cancel of the project after the formal siting process started (Local consensus is the prior condition of siting)
- This style had been criticized so much
  - Critic: Local residents, citizen activists, politicians, journalists, scholars...
  - “Ceremonial process”, “Backroom deal”, and so on.
  - Negative stigma: dirty and incredible image, trigger the distrust for whole nuclear industry

Design of HLW repository siting process: A ‘reflection’ to past situation

- “It is required to establish a transparent process which could make the social consensus. Especially, on the selection process of the disposal site, ..., the process and procedures should be clarified in public, with the legal basis” (“On the Basic Policy toward the HLW Disposal Program” by governmental advisory board in 1998)
- Consciousness of importance of public support
- NUMO (implementer) use the word “transparency” in their publications, in fact
- In response to this concept, NUMO introduced the “stepwise” process and “open solicitation” scheme
“Stepwise” process and “open solicitation” scheme

- “Open solicitation”
  - Process is triggered by voluntary application from mayors
  - Every municipality in Japan can apply (no specific condition)
- “Stepwise process” after the application (3 stages)
  - "Selection of Preliminary Investigation Areas (PIAs)"
  - "Selection of Detailed Investigation Areas (DIAs)"
  - "Selection of Repository Site (RS)"
- Candidate area (prefecture and/or municipality) can declare withdrawal in every step, without any condition and sanction

A symbolic case under this scheme: Toyo-cho town case and its tragic consequence

- The Mayor of Toyo-cho town, Kochi Prefecture, apply for the “Open Solicitation” by NUMO in 2006
  - But he didn’t consult formally neither of the town council, stakeholders in the town and town residents.
  - “Open Solicitation” scheme require no specific condition for application (Mayors can apply by his discretion)
  - He made no violation against the conditions of “Open Solicitation” scheme
- He was criticized by Prefectural Governor, journalism, citizen activist and town residents very strongly
  - He had to resign by the recall
  - He couldn’t win in the recall election
- The application was withdrawn by the new Mayor
  - The new Mayor was a citizen activist lived in neighborhood town
  - (Professor Pickett will explain on this case more in detail...)
Current “dead-locked” situation and problematic points

- It has been reported that about 15 municipalities have considered the application for “Open Solicitation” from 2003 to now
- However, none of those submitted their application for NUMO, in fact
  - Mayors gave up to submit their application by oppositions inside the municipalities
- No prospect for the selection of candidate site

‘Hindsight’ criticism for NUMO’s scheme

- No reference model of process to make a consensus BEFORE municipalities enter to NUMO’s process
  - No model case for the decision-making in the community was proposed by NUMO’s scheme
- It is possible that the application itself may be considered as a clear commitment for HLW disposal siting
  - Financial support scheme for applicants seems to be one of the source of people’s distrust
  - Government provide subsidy money only by application itself
  - Citizens’ instincts: “Easy money is filthy money”
- They still misunderstand and/or overlooked those important factors
  - They seem not to understand well the peoples’ views
    - Critical importance of the deliberation and decision-making process IN the local community: Process will not start from the Mayor’s application
    - Subsidy scheme in too early stage may spoil the public trust
    - Also, the fascinating subsidy scheme may affect as an emphasis of potential risks of the facility
- These critical comments seem to be easily led by past studies, such as those on NPP siting...
But, some points should be considered...

- When NUMO’s scheme was discussed and adopted, the STS field in Japan was not established well
  - Japan Society for Science and Technologies (JSSTS), the major academic society in this field in Japan, was established October, 2001, about 1 year after the establishment of NUMO
  - Only few literature involving to the critical and insightful analysis on the decision-making process about STS issues
- NUMO do tried to respond to the criticisms for past NPP siting
  - But they had to do it on their own way
  - Of course, many constraint by political, economic and the other pressures had limited the options for their design of siting process
- STS field in Japan has never committed on this issue until now: no suggestion, no criticism, no interest...
- Should we contribute to this issue in critical, but collaborative way?

Reflective learning from STS research:
Towards the ‘better’ decision-making on the HLW issue

- STS research, such as the sociological study on decision-making process, could provide insightful feedbacks for the issue
  - STS literatures have dealt with many siting controversies and/or participatory decision-making cases up to now
  - They provide the insights on the conditions of convincing decision-making process
    - Cf. Case study on the cancel of NPP by local decision-making process (Juraku, et al. (2007))
    - Also, they could show the critical analysis on the possible side effect and/or unintended result when the ‘new’ design of decision-making methods are conducted
- The missing link: feedback channels from STS to engineering practice, such as HLW disposal program
- Not only inside the STS community, but also with engineering community!