Site Selection Process in Japan

Advanced Summer School of Radioactive Waste Disposal with Socio-Scientific Literacy
University of California, Berkeley
August 3 – 7, 2009

Nuclear Waste Management Organization of Japan (NUMO)
Tomio Kawata

Evolution of the Japanese HLW Disposal Programme

R&D
Second Progress Report (H12) (Technical Reliability)
First Progress Report (H 3) (Technical Feasibility)
Start of R&D Program
1976
“Specified Radioactive Waste Final Disposal Act” (June 2000)
1992
2000
2002
2005
2010
2020
2030
2040
Repository Operation
Selection of Disposal Site
R&D Program of supporting organizations
Amendment of “Final Disposal Act”, and Regulation Laws (June 2007)
Commencement of Open Solicitation (Dec. 2002)
NSC: “Requirements of Geological Environment to Select PIAs of HLW Disposal” (Sep. 2002)
NSC: “Requirements of Geological Environment to Select PIAs of HLW Disposal”
Establishment of NUMO (Oct. 2000)
Implementation
Multi-barrier Disposal System

Engineered Barriers

- Vitrified waste
  - Immobilize radionuclides in glass matrix
  - Assure extremely low dissolution rate

- Overpack (steel container)
  - Prevent vitrified waste from contacting with groundwater at least for 1,000 years

- Buffer (compacted clay)
  - Assure extremely low permeability to retard penetration of groundwater and migration of dissolved radionuclides
  - Provide mechanical buffer

Natural Barrier
- Host rock located deep underground

Typical repository layout

Disposal panel for HLW

Access tunnel

Emplacement of waste package

Disposal panel for TRU waste

Pit disposal

Tunnel disposal

HLW

TRU waste

Hard rock

Soft rock
Organizations and Roles in the HLW Disposal Program

Owner of power plants

Utilities, JAEA

Waste fund

Definition of funding condition

Submission and approval of implementation plan

METI
Ministry of Economy, Trade and Industry
• Basic policy
• Final disposal plan

Supervision

RWMC
Radioactive Waste Management, Funding and Research Center
• Fund management

Commitment of fund management

NUMO
Nuclear Waste Management Organization of Japan
• Collection of fund
• Site selection and characterization
• Design, licensing, construction, operation and closure of repository
• Public relations

Extraction of fund

R&D and technical support

JAEA
Japan Atomic Energy Agency
• R&D and URL Projects

Three Stages of Site Selection Process

1st stage

Selection of PIAs

Selection criteria

Selection of DIAs

Selection criteria

Selection of RS

Selection criteria

Preliminary Investigation Areas (PIAs)

Preliminary Investigation
- Geophysical survey
- Borehole drilling etc.

Detailed Investigation Areas (DIAs)

Detailed Investigation
- Excavation of test tunnel
- Investigation in the test tunnel

Repository Site (RS)

Municipalities invited by the Government (*)

Volunteer municipalities

Literature survey

(*) This route was added after Toyo town case
Siting procedure (1st stage)

1. NUMO's open solicitation
   - Government's invitation
     - Application by municipality
       - Acceptance by municipality

2. Literature survey by NUMO
   - NUMO's report on selection of PIAs
     - Conformity with selection criteria
       - Yes:
         - Government's hearings from mayor and governor
           - Opinions from mayor and governor
             - Negative:
               - Preliminary investigation by NUMO
             - Affirmative:
               - Government's approval for selection of PIAs

3. Similar process is repeated in the 2nd and 3rd stages

Why Open Solicitation?

1. Project to involve complex socio-political concerns
2. Public support is crucial for the success of the project
3. Autonomous application by the volunteer municipalities in support by residents forms the basis of politically stable conduct of the project
4. Long-term project lasting for almost a century provides communities a chance for sustainable development
Start of Open Solicitation

- On 19 December 2002, NUMO officially announced the start of open solicitation to invite volunteer municipalities for Literature Survey
- Information Package distributed to all municipalities in Japan

NUMO Information Package

Outreach Scheme

NUMO’s Project
Building a long-term working relationship
Municipalities

Outreach Policy

NUMO’s Position
As a community partner, NUMO will think and walk together towards the betterment of future community life

Approach for Outreach Scheme Planning

- Building an outreach relationship with local communities through formulation and implementation of a long-term vision
- Implementation of the project to ensure sustainable regional development
- Implementation of activities aimed at promoting mutual understanding with local communities
- Enhancement of outreach plans concurrent with the full start of operations
**Proposed Regional Development Plan**

**Applicant municipality**

**Surrounding municipalities**

**Economic effect:** 1.7 trillion yen (27.5 billion yen/year)
**Induced employment:** 2,200 man/year

**Annual Tax:** 2.7 billion yen
**Total tax:** 160 billion yen

**Fixed property tax**

**Annual grant limit:** 1 billion yen
**Total grant limit:** 2 billion yen

**NUMO’s outreach program**

**Annual grant limit:** 2 billion yen
**Total grant limit:** 7 billion yen

**Government’s subsidy to promote siting**

**Literature Survey**

**Preliminary Investigation**

**Detailed Investigation**

**Construction**

**Operation**

**Publicity activities (~FY2006)**

**Commercial Messages**

**TV**
- TV spot advertisements to introduce NUMO’s business on air since Oct. 2002

**Magazine**
- Advertisements in popular, special-interest and governmental magazines

**Newspaper**
- Serial advertisements in 5 regional and 42 local papers

**Poster campaign**

**NUMO’s Forum & Panel discussion**

Prior to the commencement of open solicitation
- 31 fora in different prefectures

After the commencement
- 48 panel discussions in different prefectures
Evolution since the commencement of open solicitation

- By the end of 2006, about ten local municipalities were reported to have expressed an interest in Literature Survey (LS) in four years since the start of NUMO's open solicitation, but none lead to the actual application.
- In January 2007, Toyo town became the first municipality to submit an application for LS.
- Escalation in opposition activities led to the resignation of the mayor and his loss in the following election.
- A newly elected mayor withdrew application and the literature survey for the town was abandoned in May 2007.
- Reflecting the lessons learnt, METI radioactive waste sub-committee recommended enhancement measures for HLW disposal program in November 2007.

Responses from municipalities since Dec, 2002

- Municipalities reported to have expressed an interest in Literature Survey.
## Case of Toyo town

### August 2006
NUMO held a study/briefing session for the town officials and councillors

### Sept. – Dec. 2006
A series of study sessions by the town, government, and NUMO were held for town citizens
Opponent activities emerged and escalated, holding a seminar lectured by a leader of anti-nuclear NPO

### Jan. 15, 2007
Opponent group collected signatures from more than two thirds of town citizens for anti-repository petition

### Jan. 25, 2007
Application for LS was submitted by the mayor

### Feb. 9, 2007
Petition against application and resolution to demand mayor’s resignation were adopted by the town council

### Feb. 28, 2007
Government granted NUMO’s literature survey (LS) plan

### Mar. 15, 2007
Movement to recall the town mayor started

### Apr. 5, 2007
Mayor resigned to seek the judgment of the people, leading to the election.

### Apr. 22, 2007
An opponent to the project was elected (vote: 1821 – 761)

### Apr. 23, 2007
Application was withdrawn by the newly elected mayor

### Apr. 26, 2007
Government granted the abortion of NUMO’s LS plan

---

## Enhancement measures recommended by METI Waste Subcommittee
*(Interim report of the subcommittee, Nov.1, 2007)*

### Enhancement measures
- Enhanced PA activities to improve public confidence and to encourage municipalities to participate in literature survey
- Publication of catalogue of model plans for community partnership
- Enhancement of R&D and international cooperation to promote public confidence
- Reinforcement of cooperative framework among government, NUMO and utility companies

### Minor modification of siting process
- Addition of the system where the government can invite candidate municipalities for literature survey as a supplemental measure to NUMO’s voluntary approach
**Enhancing Sitting Activities**

Promotion of understanding and trust

- interested people
- various inquiries
- study meeting

Community resident

Application for Literature Survey

Model plan for community development

- Public relations using mass media
- Round-table discussions
- Quick response to inquiries from interested people

*Promote further communication such as holding Study Meetings*

**Country-wide PA Activities**

*(Activities since December 2007)*

**METI**
- Energy Caravan for wide audiences: 35 locations
- Workshop with local NPO: 20 locations

**NUMO**
- Table discussion & mini-forum with editors of local newspapers: 29 locations
- Workshop with local NPO: 8 locations
Newspaper ads

Message from Minister of Economy, Trade and Industry

Report from Sweden and Finland

TV ads

Convey necessity of geological disposal project by voice of celebrities

“I think it’s necessary”
Models, visual display and virtual theater at various exhibition halls

Tokyo Science Museum

TEPCO’s exhibition pavilion, Tokyo

Osaka Science Museum

NUMO Website

Contents for children

Geological information for would-be applicants (volcanic region and active fault)
Engaging Communities

Safety and Trust

Stepwise Project Development

Focus on Transparency