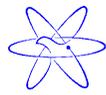


Public Participation in Taiwan's Radioactive Waste Management

Chang, Min-Tsang
Fuel Cycle & Materials Administration (FCMA)
Atomic Energy Council (AEC)
Taiwan, R.O.C.
March 10, 2015

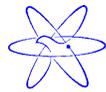


Outline

- ❖ Overview of Radioactive Waste Management in Taiwan
- ❖ Public Participation in Environmental Radiation Monitoring at Lanyu (Orchid Island)
- ❖ Public Observation for Spent Nuclear Fuel (SNF) Dry Storage Facility
- ❖ Public Hearings for SNF Dry Storage
- ❖ Conclusions



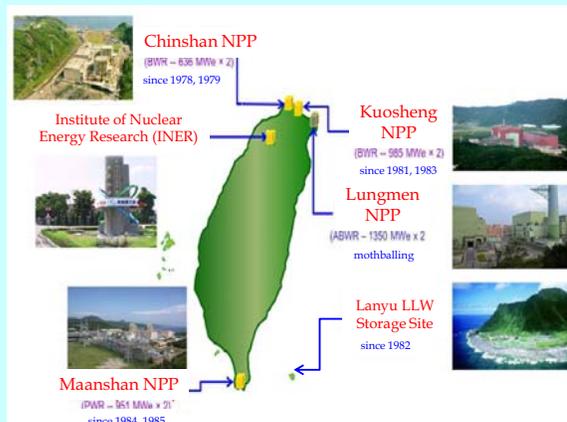
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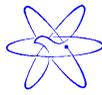
Overview of Radioactive Waste Management

Waste Generation and Management

- ❖ 4 NPPs: 3 in operation, 1 in mothballing
- ❖ Institute of Nuclear Energy Research (INER): receive & treat civil LLW
- ❖ Lanyu Island: LLW storage site
- ❖ SNF dry storage facilities at Chinshan and Kuosheng NPPs: public hearings by law
- ❖ LLW final disposal siting: local referendum by law (Duble 50% - 50% Voting, 50% Yes)



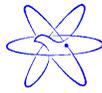
3



Public Participation in Environmental Monitoring

4 Development Stages at Lanyu

- ❖ 1st stage (2008 ~ 2010):
 - nuclear safety, radiation protection, and industrial safety scholars and experts visited Lanyu LLW storage site
 - scholars and experts reported visiting results to Lanyu residents
- ❖ 2nd stage (2011 ~ 2012):
 - environmental NGO delegates visited Lanyu LLW storage site
 - delegates shared the visiting results to Lanyu residents
- ❖ 3rd stage (2013 ~ Currently):
 - Lanyu residents participate in environmental monitoring and sampling
 - Parliaments visited Lanyu storage site, opened a random trench, inspected radwaste condition and measured radiation, then supervised environmental monitoring around Lanyu
- ❖ 4th stage: voluntary & well-trained Lanyu residents undertake sampling and radiation measuring
- ❖ From 2008 till now: no abnormality was found
 - a health and safety assessment project for LLW impact at Lanyu under processing
 - including health investigation & whole body counting for Lanyu residents



Public Participation in Environmental Monitoring

Environmental Sampling & Radiation Monitoring at Lanyu



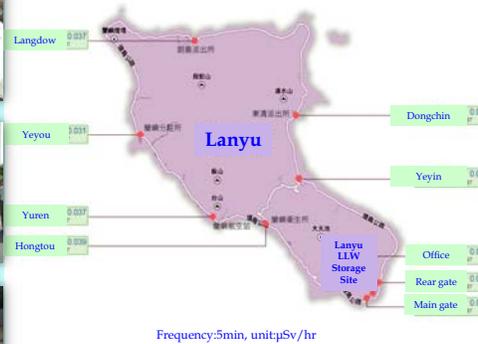
Introduction before sampling



Environmental radiation detection



Detection record



Results far lower than Alarm level, and below Taiwan's environmental radiation background



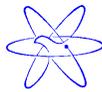
Water sampling



Soil & grass sampling



Yam sampling



Public Participation in Environmental Monitoring

Lanyu Island-surrounding Route - Radiation Detection



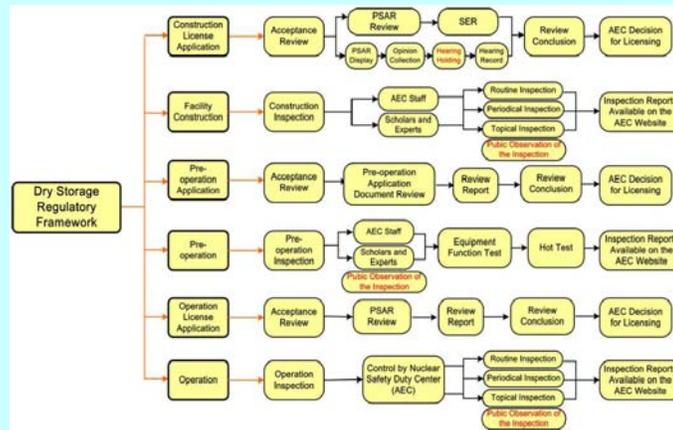
- ❖ One detection points - every 500 meter
- ❖ Detection results lower than the average of Taiwan's environmental radiation background



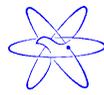


Public Observation to SNF Dry Storage Facility

Regulatory Framework for Dry Storage



10



Public Observation on SNF Dry Storage Facility

Current Status of Dry Storage Facility at Chinshan NPP



Concrete Storage Casks

SNF Quantity

Reactor unit	Storage capacity of SNF pool	SNF quantity	estimated date for full storage
No. 1	3,083 bundles	2,982 bundles	January 2015
No. 2	3,083 bundles	2,972 bundles	March 2017



SNF Dry Storage Facility

- ❖ Storage capacity- 30 casks, 1680 bundles
- ❖ Construction & cold test- completion
- ❖ Hot test- application approved in September 2013.
- ❖ On-site hot test suspended due to the local government's hindering (lack of completion certificate of soil and water conservation)

11



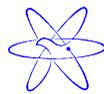
Public Observation on SNF Dry Storage Facility

Measures Highlights

- ❖ 11 community delegates (village chiefs, directors of community associations, stakeholder representatives), 3 local government officials, 2 scholars and experts, 4 environmental NGO delegates, 20 members in total visited and observed the installation quality of SNF dry storage facility at Chinshan NPP to ensure the public's right to know
- ❖ Scope of public observation - all installation processes of SNF dry storage facility



12



Public Observation on SNF Dry Storage Facility

Observation Team

- ❖ To facilitate the observation, director of FCMA visited Parliaments, local government officials, village chiefs, and directors of community associations, to invite them to participate and support the public observation of SNF dry storage facility
- ❖ Conduct 10 times of Public Observation in total for the period of May 2011 to December 2014



Visit Parliaments



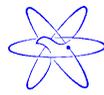
Visit local officials



Visit local representatives



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Public Observation on SNF Dry Storage Facility

Public Observation Process



Training workshop



AEC introduction



Radiation monitoring



Detector practice



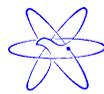
TPC briefing



Monitoring result



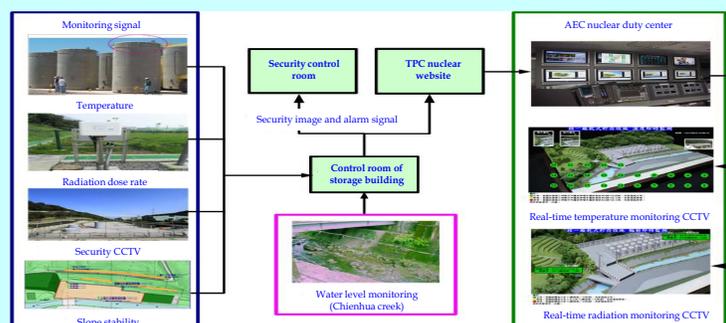
14



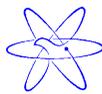
Public Observation on SNF Dry Storage Facility

Information Disclosure of Public Observation

- ❖ AEC accepts observers' suggestions and requested TPC to disclose temperature and radiation monitoring data on the Internet after the hot test of SNF dry storage facility thereafter
- ❖ The monitoring information network is available now, and waiting for the completion of hot test
- ❖ Communication platform - between stakeholders and the facility installer



15



Public Hearings for Dry Storage

Compiling Referenced Statues and New Regulations

Nuclear Materials and Radioactive Waste Management Act and its enforcement rules

- Holding hearings (sponsored agency, procedure, schedule)
- Authorities must hold hearings
- Announcement and display (for the purpose of collecting written opinions)
- Hearing records

Administrative Procedure Act

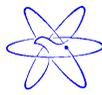
- The national applicable operating provisions of public hearings
- Preliminary hearing to facilitate formal hearings

Procedure Highlights for Applying for Hearings for the Installation of a Radioactive Waste Facility

- Rules for sponsor agency and attendee to follow
- Applying for attending hearings, authority granting procedures
- Hearing procedures (agenda, order of statements, speaking time)
- Public review for hearing records
- Add, delete, or edit hearing records



16



Public Hearings for Dry Storage

Information Disclosure and Public Participation



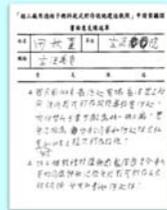
Information Disclosure

- ◆ Installation Announcement shown on official news, and official websites of Executive Yuan and AEC
- ◆ Hearing records released on the website of AEC Bulletin Board
- ◆ Press release

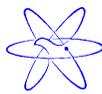


Public Participation

- ◆ Written opinions by postage-paid reply postcard & official website
- ◆ Preliminary hearings : held at a local place near the facility
- ◆ Hearings: held at a downtown conference center, and free shuttles for the transportation of local residents around the facility



17



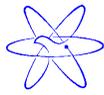
Public Hearings for Dry Storage

Hearing Summary

- ❖ The pre-operation plan of SNF dry storage facility must involve the retrieval operation of SNFs so as to carry out a mock-up simulation.
- ❖ The operator must install a facility for retrieving SNFs in dry storage before decommissioning the SNF pool.
- ❖ The operator must propose a maintenance and surveillance plan of SNF dry storage facility, including the monitoring of stress corrosion cracking (SCC) of the storage facility.
- ❖ When finding any new survey evidence of fault around the facility, the operator must re-evaluate the seismic design of the SNF dry storage facility.



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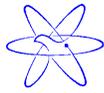


Conclusions

- ❖ Taiwan AEC introduces two measures, Public Observation and Parallel Environmental Monitoring, to clarify people's doubts on radwaste management.
- ❖ Upgrade mutual understanding and reconcile differences by information disclosure, transparent decision-making, public participation, and continuous communication on the issue of radwaste management.
- ❖ On-site visiting by key stakeholders helps clarify their queries, and enhance mutual understanding and effective interaction.
- ❖ Hope to build up a win-win and coexistent progress by public participation in Taiwan's radioactive waste management.



19



Thank you for Your Attention



20