Ministry of Foreign Affairs and Trade

Nuclear Security and Nuclear Safety

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1.Coneptual Frame

❖ Nuclear Security

- Cause : Malicious acts by non-state actors
- It is series of preemptive measures introduced to prevent internal/external threats directly or indirectly related to nuclear materials and relevant facilities.

❖ Nuclear Safety

- Cause : Natural disaster/technical errors
- It covers the actions taken to prevent nuclear and radiation accidents or to limit their consequences.

❖ Safeguard

- Check possible diversion of nuclear material to military purpose by state → non - proliferatioin issue

2. Nuclear Security(1)

❖ Back Ground

▸ Increased concern over nuclear terrorism after 9/11

▸ President Obama's call to secure all vulnerable nuclear material in four years(Prague Speech, April 2009)

▸ Multilateral response is needed to address threats arising from malicious acts from non-state actors

❖ Major Achievements of Washington Summit(2010)

▸ Adopting Washington Communique and annexed Work Plan(50 measures in 11 areas)

▸ National Commitments by 30 countries : HEU return or elimination, ratification of CPPNM/ICSANT, Center of Excellence for training, and Nuclear Security Fund, etc.

2. Nuclear Security(2)

❖ Direction of Seoul Nuclear Security Summit(March 26-27, 2012)

▸ Renew and reaffirm the principles and spirit of Washington Summit

▸ Move from political declaration to practical vision and implementation ; Highlight prioritized key objectives for Seoul Summit Communique

❖ Possible Agenda and Issues of Seoul Summit

▸ HEU(High Enriched Uranium)/Pu management and minimization

▸ IAEA's central role in implementing nuclear security objectives

▸ Illicit trafficking detection and border control : smuggling control, nuclear forensics, INTERPOL, information exchanges

▸ Securing sensitive Information : Information Security

3.The Scope of Nuclear Safety

Incident and emergency preparedness and response	Fuel cycle facility safety	Safety of radioactive waste management and disposal
Civil liability for nuclear damage	Occupational radiation exposure	Radioactive source safety and security
Nuclear power plant safety	Radiation protection of the public and the environment	Radioactive source safety and security
Research reactor safety	Remediation of contaminated sites	Safety of transport of radioactive material

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1. Design Step

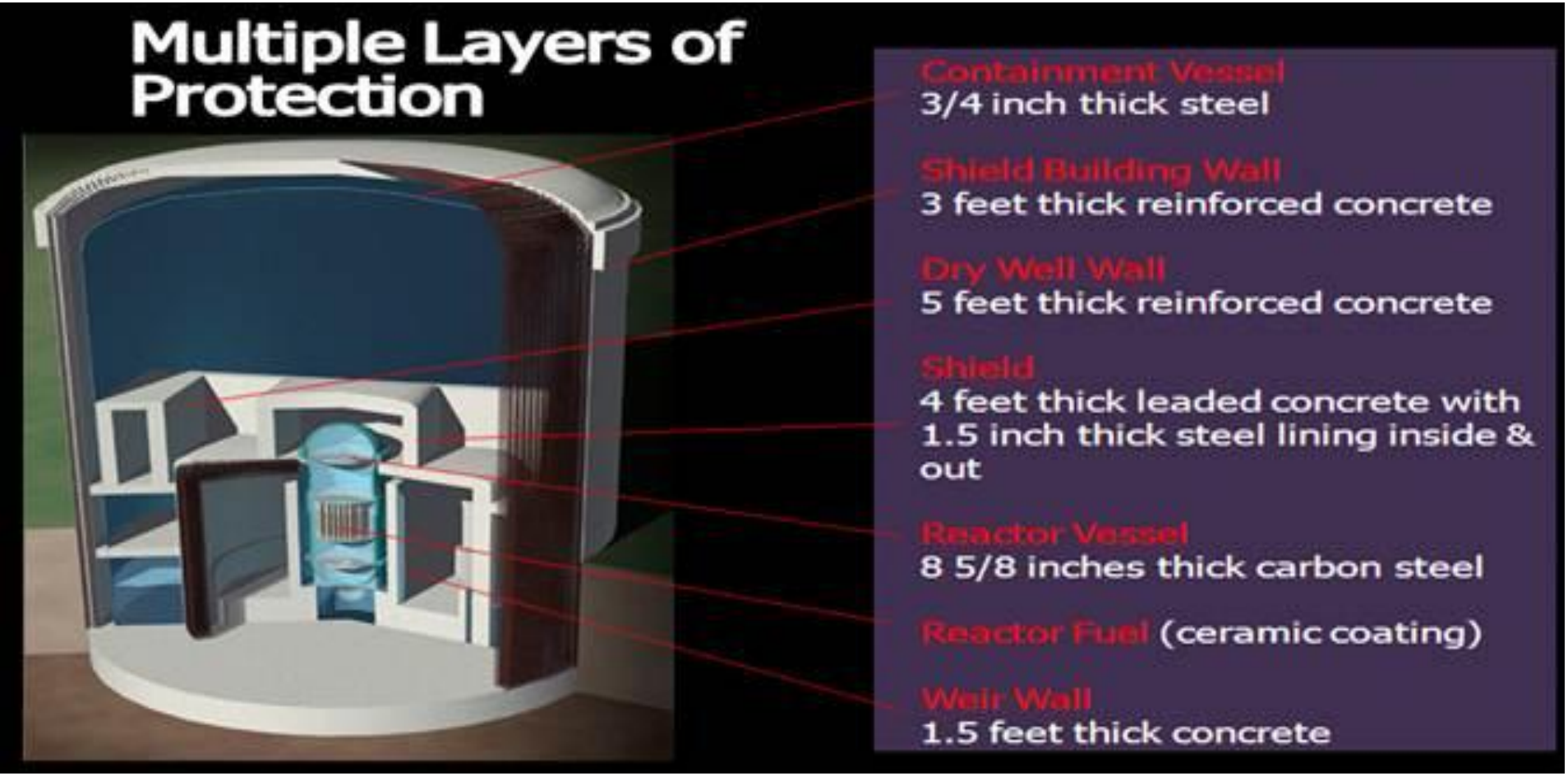
❖ Defense In Depth

- Prevent an abnormal state from happening as much as you can.
- Minimize the effect when an abnormal state would be expanded into an incident or emergency.
- Stop the emission of radioactive material out of the nuclear power plant.

❖ Multi Layered Defense

- All facilities should have safety margin to prevent abnormal state from happening.
- Important facilities for safety be installed in several piece.
- When an serious incident or emergency happens, the facilities like Emergency Core Cooling System, Reactor Containment, etc. stop an incident deepening and radioactive material emitting.

<REFERENCE 1>


Multiple Layers of Protection
Containment Vessel
3/4 inch thick steel
Shield Building Wall
3 feet thick reinforced concrete
Dry Well Wall
5 feet thick reinforced concrete
Shield
4 feet thick leaded concrete with 1.5 inch thick steel lining inside & out
Reactor Vessel
8 5/8 inches thick carbon steel
Reactor Fuel (ceramic coating)
Weir Wall
1.5 feet thick concrete

2.Construction Step(1)

❖ A test for site of nuclear power plant

- A wholesale generator should apply for approval of the site suitablity.
- NSSC(Nuclear Safety and Security Commission) evaluates whether the site is in place or not.
  *(KINS(Korea Institute of Nuclear Safety) is entrusted with reviewing papers, investigation on a site, etc.)

❖ A sanction for building nuclear power plant

- A wholesale generator apply for approval of building nuclear power plant
- NSSC(requests KINS to inspect safety of nuclear power plant
- KINS hands in inspection report to NSSC(Nuclear Safety and Security Commission)
- NSSC makes a judgment about after reviewing the report of KINS and the applications of a wholesale generator

2.Construction Step(2)

❖ The regulation of making facilities and installing them

- A test for quality guarantee : KINS judges whether important parts of facilities are being built by quality guarantee plan.
- A test of facilities before use : KINS judges whether important facilities(reactor containments and safety facilities) correspond with the standard stipulated in a sanction for building nuclear power plant.
- A test of performance before use : After all module and machinery parts are installed, KINS judges whether the performance of all systems is in the standard of laws and regulations.

3.Operation Step

Before a commercial operation

❖ A wholesale generator can't run a nuclear power plant in a commercial scale until it get an operation sanction

▸ NSSC judges to give a operation sanction to a wholesale generator with a trial test.

After a commercial operation

❖ A regular test(every 12 ~ 18 months)

▸ A wholesale generator should prove the ability to operate nuclear power plant by passing a regular test

❖ A periodic safety reviews(every 10 years)

▸ This review needed to check how much all structures and systems of nuclear power plants are damaged for 10 years

▸ NSSC should judge whether a nuclear power plant has no problem to keep operating

The End

Q & A

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