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## Safeguards Approach for Establishing Remote Monitoring System at On-Load Reactors

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### Abstract

The international safeguards has been strengthened so as to detect the undeclared nuclear activities rather than verifications on the amount of nuclear materials since the nuclear issues associated with Iraq and DPRK

(Democratic People's Republic of Korea). With a view to accomplishing the end, an integration of safeguards is now embarked in order to achieve optimization through appropriate combinations of all the safeguards measures now available. The spent fuel discharged from On-Load Reactor is categorized as nuclear material having high possibility in terms of diversion due to the size of fuel bundles, composition, and fuelling method. The IAEA has installed various types of safeguards equipment at strategic points so as to detect the diversion of spent fuel. On the other hand, national safeguards inspection criteria taking into account diversion scenarios of nuclear material to get independent inspection results is not yet successfully established. This paper is designed to propose an approach both to detect undeclared nuclear activities and to establish remote monitoring system in the implementation of national safeguards. It is expected that the approach would contribute to the accomplishment of safeguards objectives in an effective manner as well as satisfy the requirements of international safeguards criteria.

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(physical model)

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3000 - 9000 MWD/t

30,000 - 40,000 MWD/t

600 MWe

7,500 MWD/t

Pu

0.4-0.5%

80 MTU

Pu

320-400 kg

1,000 MWe

3.3%

33,000 MWD/t

Pu

0.8-0.9%

24 MTU

Pu

200 kg

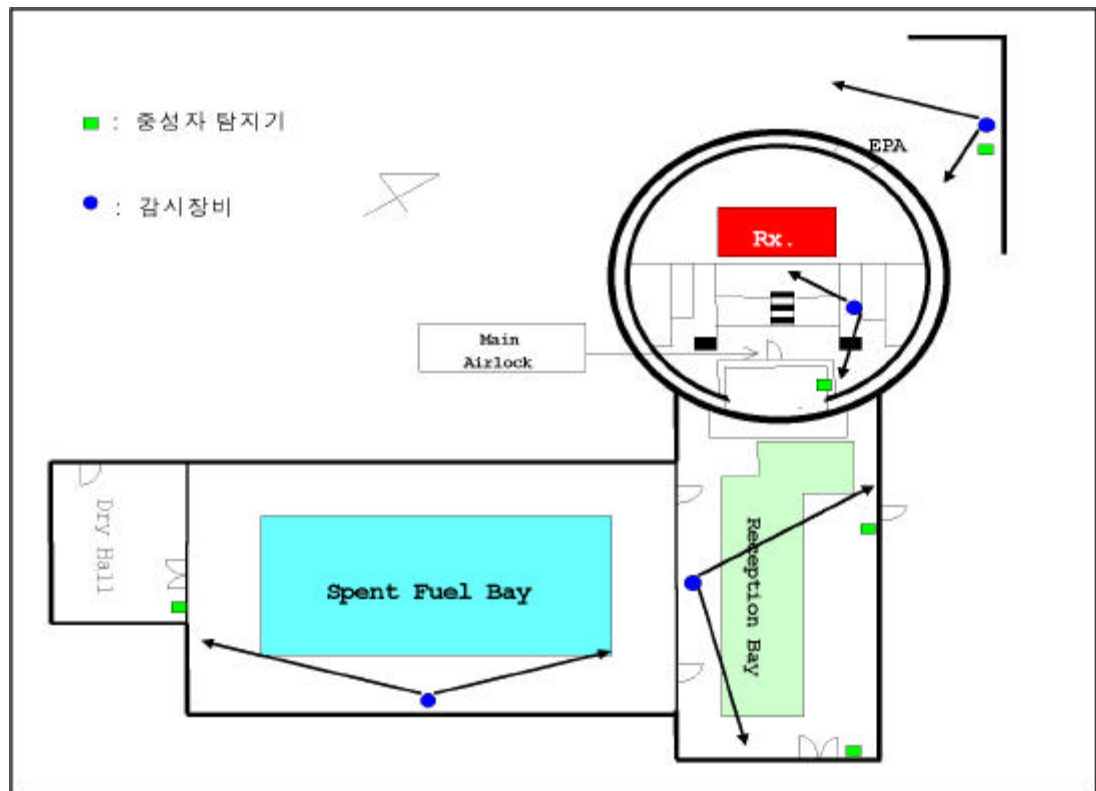
1,000

MWe 200 kg,  
 600 kg Pu  
 3  
 Pu Pu-239  
 Pu-239  
 Pu 1,000 MWD/t  
 , Pu 0.08-0.09% , 600 MTU  
 Pu 800-900 kg  
 100 가

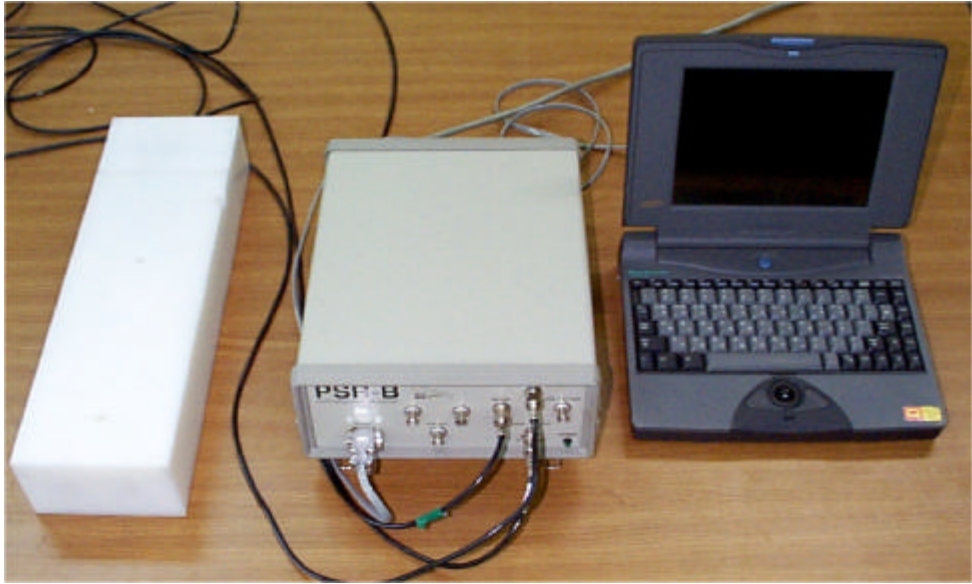
가 (MBA) ,

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 EPA (Emergency Personnel Airlock), reception bay 2  
 , main airlock, 가  
 . 1 reception bay main airlock

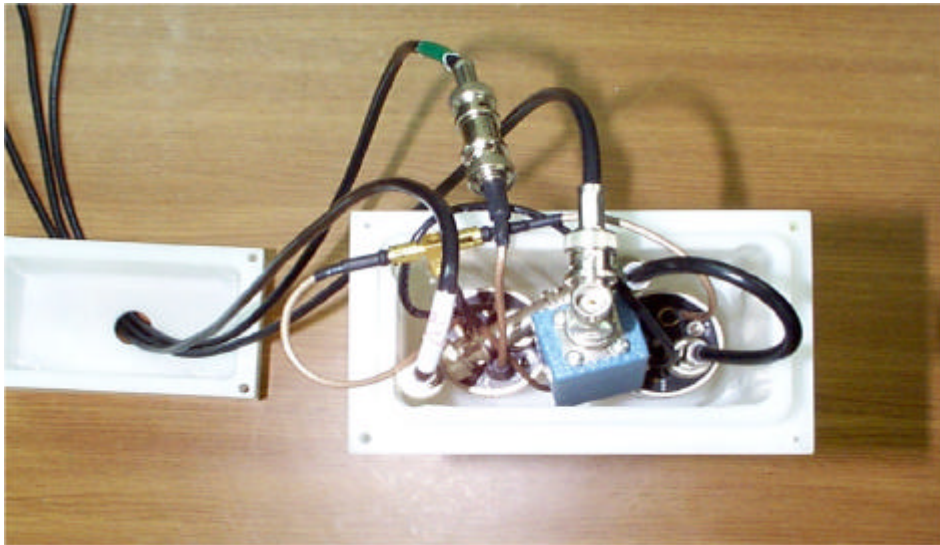
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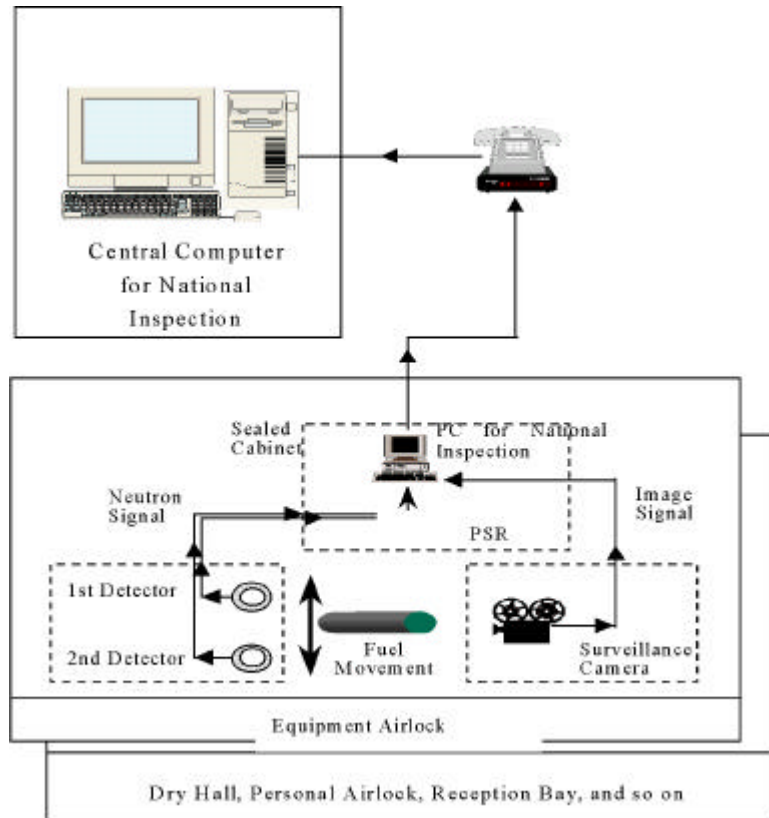
2.



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가 , (strengthened safeguards system) (integrated safeguards system)

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- [1] IAEA Safeguards Criteria, IAEA, 1998. 2. 11
- [2] Jae-Sung Lee, Wan-Sou Park, B-K Kim, K-S Rheem, OLR Safeguards Criteria for National Inspection in Korea, IAEA Symposium on International Safeguards, IAEA-SM-351/150, 1997. 10.
- [3] Jae-Sung Lee, Hong-Ryul Cha, Young-Soo Ham, Yeo-Chang Yoon, Application of Neutron Monitor for National Safeguards in Korean OLRs, 39th INMM Annual Meeting, INMM, 1998. 7.
- [4] Jae-Sung Lee, Consideration of Verification Methodologies for the Initial Core and An Experience of National Verification for Transfer Campaign in OLR, 40th INMM Annual Meeting, INMM, 1999. 7.