Examination of Proliferation Resistance Assessment for Nuclear Fuel Cycles

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There are many factors to evaluate nuclear fuel cycle such as safety, public acceptance, economics, etc.. Transparency, proliferation, environment issues, public acceptance and safety are essential to expansion of nuclear industry and proliferation resistance is one of key constraints in the deployment of advanced nuclear energy systems. Proliferation resistance is being considered as one of the most important factors in assessing advanced and innovative nuclear systems. IAEA defines proliferation resistance as characteristics of nuclear energy system that impedes the diversion or undeclared production of nuclear material [1].

Barriers to proliferation is consist of intrinsic and extrinsic barriers(institutional measures). Intrinsic barriers are characterized in material barriers and technical barriers in general. Material barriers is intrinsic, or inherent, qualities of materials that reduce the inherent desirability or attractiveness of the material as an explosive. Isotopic, chemical, radiological, mass and bulk, detectability barriers are considered as material barriers attributes [2].

Proliferation resistance is examined for several nuclear fuel cycles based on previous study which is focused on the intrinsic barriers [3-4]. Pyroprocessing and DUPIC are considered as reprocessing technologies in Korea and the PWR direct disposal is considered. Comparative assessments of the proliferation attributes and merits of different fuel cycle systems will be performed and the optimal back-end fuel cycle and strategy will be proposed.

REFERENCES

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