

FBNR Letter

FIXED BED NUCLEAR REACTOR – FBNR

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Dear coworkers and potential coworkers around the world,

As the number of coworkers is increasing, we are issuing a circular letter to communicate about the matters of general interest to the FBNR project. Please consider this as a personal letter to yourself. Those who are not involved in the project as yet may participate at any appropriate moment. The project has manifold aspects including scientific, technological, economical, political, and sociological.

A new era of nuclear energy is emerging. The International Atomic Energy Agency has committed itself to “Help to ensure that nuclear energy is available to contribute in fulfilling energy needs in the 21st century in a sustainable manner; and to bring together both technology holders and technology users to consider jointly the international and national actions required to achieve desired innovations in nuclear reactors and fuel cycles.”- IAEA-TECDOC-1362.

The objective is to develop an innovative nuclear reactor to be inherently safe, passively cooled, small, modular, and simple in design with integrated primary circuit. Safety is achieved by design, and has reduced adverse impact on environment. It is to meet the requirements of GEN IV and IAEA-INPRO as being economic, safe, proliferation resistant and sustainable.

The FBNR may be called People’s Reactor. It is intended to be developed by the peoples for the peoples of the world in the spirit of cooperation and service to humanity. It is intended to be a near term deployment project. Let us form an international consortium to develop this reactor where all members are stakeholders.

An IAEA Coordinated Research Project (CRP) includes FBNR in its program.

Participate in the project and make a proposal on a particular activity of your interest.

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FBNR is a non-proliferation nuclear reactor.

In the first debate between the candidates for the US Presidency, both declared that their highest priority will be the prevention of nuclear proliferation. This will reinforce the FBNR project.

The IAEA-INPRO recommends that “proliferation resistant features and measures should be provided in innovative nuclear energy systems to minimize the possibilities of misuse of nuclear materials for nuclear weapons. Both intrinsic features and extrinsic measures are essential, and neither should be considered sufficient by itself. Extrinsic proliferation resistance measures, such as control and verification measures will remain essential, whatever the level of effectiveness of intrinsic features. From a proliferation resistance point of view, the development and implementation of intrinsic features should be encouraged. Communication between stakeholders will be facilitated by clear, documented and transparent methodologies for comparison or evaluation/assessment of proliferation resistance”-(IAEA-TECDOC-1362).

Small Reactors without On-Site Refueling are defined as reactors which have a capability to operate without refueling and reshuffling of fuel for a reasonably long period consistent with the plant economics and energy security, with no fresh and spent fuel being stored at the site outside the reactor during its service life. They also should ensure difficult unauthorized access to fuel during the whole period of its presence at the site and during transportation, and design provisions to facilitate the implementation of safeguards. FBNR being a Small Reactor without On-Site Refueling will be factory produced and fuelled and brought back to the factory for refueling after its fuel lifetime expires.

The establishment of Multilateral Fuel Cycles (perhaps on a regional basis) will be of benefit to the deployment of many advanced reactors independent of their particular type. Specifically, an option for fuel or nuclear power plant leasing coupled with an option of Multilateral Fuel Cycles may be of essential benefit for the deployment of such reactors in many developing countries that are embarking on a nuclear program without having a sufficient nuclear infrastructure.

Adopting a thorium cycle as an intrinsic measure will hinder the possibility of misuse of nuclear materials for nuclear weapons. The mixing of thorium with low enriched uranium or plutonium results in the production of U-233 which is diluted along with U-235 in U-238. The access to uranium will only be possible through isotope separation techniques. The high Pu-238 to Pu-239 ratio and the production of gamma emitting Tl-208 in the thorium cycle are hindrances to nuclear proliferation.

The proposed World Nuclear Energy Company (WONEC), an international consortium responsible for the development and deployment of FBNR will operate closely and faithfully under the auspices of the IAEA to eliminate the problem of nuclear proliferation.- (FBNR Letter No.04)

FBNR modules are fabricated, fueled, and sealed in the factory under the supervision of the IAEA safeguard program. They are taken to the site and installed in the reactor and will

return to the factory as sealed for refueling. This will assure the safeguard of the nuclear fuel.

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