Industry Alliance

Clean, Sustainable Energy for the 21st Century

Press Release
NGNP Industry Alliance Limited
Ridgeland Mississippi
April 26, 2011

The most recent evaluation by the Idaho National Laboratory (INL) for a typical High Temperature Gas-cooled Reactor (HTGR) multi-module plant shows that high temperature process heat and electric power for use by energy intensive industries can be produced at an energy price that is equivalent to natural gas in the $6 to $9 per MMBTU range.

The NGNP Industry Alliance (Alliance) believes that the key economic drivers that have made HTGR technology of interest to industry will continue to be viable. The price of HTGR produced energy is expected to be competitive with alternative sources of energy such as natural gas, new clean coal technologies and renewables at the anticipated time of initial commercial operation of the first of many HTGRs one to two decades in the future. This is independent of any cost for carbon that may be applied for fossil fuels. Further, this competitive energy pricing will remain stable over the HTGR plant lifetime of several decades.

At the present time, the Alliance views the HTGR as one of the only energy technologies that America can pursue that can address stability of energy pricing (reduce volatility), add to energy security and contribute to a substantial reduction of carbon footprint for the high temperature process heat industries (accounting for up to 20% of the energy use in the US).

With the importance of economic security and our impact on climate changes as a result of our energy decisions today that affect our future, the Department of Energy's Idaho National Laboratory recently prepared the attached one-page summary of the inherent safety characteristics of the HTGR technology.

Contact: Fred Moore, Executive Director

executivedirector@ngnpalliance.org

THE HIGH TEMPERATURE GAS-COOLED REACTOR NEXT GENERATION NUCLEAR ENERGY

SAFE, CLEAN, & SUSTAINABLE ENERGY FOR THE FUTURE

Essential to Our Global Energy Future

- ***Improving substantially the safety of nuclear energy*** through the inherent design characteristics of a modular helium reactor – a High Temperature Gas-cooled Reactor. This is achieved by ensuring no internal or external event can lead to release of radioactive material from the plant that endangers the safety of the public.
- ***Providing a clean energy supply option*** in the form of steam and/or high temperature fluid that can be used in highly efficient generation of electricity and a wide range of industrial processes.

Safety at the Highest Levels

No need to evacuate or shelter the public and no threat to food or water supplies under any conditions. No harmful release of radioactive material under any conditions is assured by design.

Multiple assured barriers to the release of radioactive material are provided. These barriers include multiple layers of ceramic coatings on the nuclear fuel, the carbon encasement, and the graphite core structure. Additional barriers include the reactor vessel and the reactor building. The high temperature and robust structural capabilities eliminate concerns of fuel damage that could lead to significant release of radioactive materials from the nuclear fuel. The ceramic coated nuclear fuel provides the primary containment for radioactive materials rather than depending on a containment building.

Reactor power levels are limited and the nuclear reactor shuts down if reactor temperatures exceed intended operating conditions. Inherent to the nuclear reactor design is suppression of the nuclear reaction if the operating temperature increases. Complete shutdown is achieved through automatic insertion of control rods into the reactor core by gravity.

No actions by plant personnel or backup systems are required to either ensure shutdown of the reactor or ensure cooling. Conversely, actions of plant personnel cannot achieve conditions that cause the reactor fuel to lose its ability to contain radioactive material.

No power and no water or other cooling fluid is required. Heat removal from the reactor occurs naturally and directly to the earth if normal heat transport systems are not available. The low energy density of the reactor core combined with the large heat capacity of the graphite structure results in the reactor taking days to reach maximum temperatures (still well below temperatures that could cause fuel degradation), even if normal cooling systems are not functional.

Reactor materials including the reactor fuel are chemically compatible and in combination will not react or burn to produce heat or explosive gases. Helium is inert and the fuel and materials of construction of the reactor core and the nuclear heat supply system preclude such reactions.

Achievable levels of air or water intrusion do not result in substantive degradation of the capability to contain radioactive materials. The reactor is maintained shutdown under these conditions.

Spent or used fuel is stored in casks or tanks in underground dry vaults that can be cooled by natural circulation of air and shielded by steel plugs and concrete structure. No water is required for either cooling or radiation shielding and no active cooling system is required.