

## **NE-18-16170, Integrated Nuclear Hybrid Energy System**

Eastman is seeking assistance in the conceptual design and analysis of an integrated nuclear hybrid energy system to replace the existing energy production infrastructure at their Kingsport, TN site. Converting the Eastman power production portfolio to nuclear power for combined thermal and electrical production represents a potential path to simultaneously update and upgrade the internal process systems while decreasing exposure to natural gas market volatility and environmental emission requirements.

Eastman is requesting expertise and knowledge from Oak Ridge National Laboratory (ORNL) in advanced reactor technology and dynamic system modeling. ORNL will analyze and evaluate the operational and economic performance of a deployed set of nuclear power plants. The primary figures of merit include the system reliability; the operational cost; and the system stability, as compared to the existing power production portfolio. Additionally, the conceptual nuclear power system may include light water or advanced reactors, including high temperature reactors such as gas-cooled or molten salt reactors.

This project will define a set of potential deployment scenarios for Eastman to improve product energy efficiency and market competitiveness in a global economy. As the global market for specialty chemicals continues to grow, industry must increase productivity and energy efficiency at the same time. If the results of the analysis show that nuclear power is not a good fit for the Eastman site, the reasons why will be examined and will form the basis for future consideration and potential investment. This could also pave the way for other similar companies and/or industries to consider the option of a nuclear hybrid energy system.