

Surrogate Modeling of SMR cycle using gPC to determine the effect of uncertainty on energy intensive equipment

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A code was developed to connect Aspen Hysys and Matlab. Then a The generalized polynomial chaos (gPC) based approach was coded and applied to develop a surrogate model of the single mixed refrigerant (SMR) cycle for the natural gas liquefaction to determine the effect of the uncertain flow of the mixed refrigerant on the compressor and cooler. Uncertainty quantification (UQ) and sensitivity analysis (SA) were carried out by calculating the all statistical information of the uncertain objectives. SMR process is a highly energy intensive and study potentially help in suggesting the guidelines to make efficient use of the energy by measuring the reliability. This research was supported by a grant from the Gas Plant R&D Center funded by the Ministry of Land, Transportation and Maritime Affairs (MLTM) of the Korean government. This study was also supported by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189).