Legacy codes remain a crucial element of today's simulation-based engineering ecosystem due to the extensive validation process and investment in such software. The rapid evolution of high-performance computing architectures necessitates the modernization of these codes. One approach to modernization is a complete overhaul of the code. However, this could require extensive investments, such as rewriting in modern languages, new data constructs, etc., which will necessitate systematic verification and validation to re-establish the credibility of the computational models. The current study advocates using a more incremental approach and is a culmination of several modernization efforts of the legacy code MFIX, which is an open-source computational fluid dynamics code that has evolved over several decades, widely used in multiphase flows and still being developed by the National Energy Technology Laboratory. Two different modernization approaches,'bottom-up' and 'top-down', are illustrated. Preliminary results show up to 8.5x improvement at the selected kernel level with the first approach, and up to 50% improvement in total simulated time with the latter were achieved for the demonstration cases and target HPC systems employed.