

Potential of MgB₂ for Electric Power Applications. P. M. GRANT, *Electric Power Research Institute, Palo Alto, CA 94304.*

Notwithstanding the fact that the now-known existence of superconductivity below 40 K in the intermetallic compound MgB₂ is barely a few months old, sufficient data has already emerged to allow a preliminary assessment of its potential for electric power equipment and infrastructure application. Even at this early stage of investigation, present values of technical parameters such as critical current density, intergrain coupling and irreversibility field in a projected operation range of 25 – 30 K are already of encouraging magnitude and will only increase as vortex pinning mechanisms are understood and enhanced in what is now a relatively “clean” material. Moreover, there are signs that practical wire development is a distinct possibility at reasonable cost given the huge natural abundance of its constituent elements and widespread experience in commercial metallurgical manufacturing of similar materials. Thus superconductivity in MgB₂ opens a technical window to a range of electric power applications previously thought accessible only with copper oxide perovskites. These include superconducting rotating machinery, transformers, magnetic energy storage, and cables. In this talk, we will address the extent of this opportunity, and establish preliminary targets of performance and cost prospective MgB₂ wire would have to meet to fully capture its promise.