Superconducting RF System for the CESR Luminosity Upgrade: Design, Status, and Plans, P. BARNES, S. BELOMESTNYKH, E. CHOJNACKI, D. COFFMAN, R. ERLICH, J. GRABER, W. HARTUNG, T. HAYS, R. KAPLAN, J. KIRCHGESSNER, E. NORDBERG, H. PADAMSEE, D. RUBIN, J. SEARS, Laboratory of Nuclear Studies, Cornell University - The Phase III of the luminosity upgrade program for CESR utilizes four superconducting single cell cavities with required accelerating gradient of 6 MV/m. Prototypes of the cavity module was subjected to a beam test in CESR in August 1994. Obtained experience allowed us to finish the design of the superconducting RF system. In order to fit in the accelerator tunnel a new cryostat has a more compact design than the previous one. A new refrigeration and distribution system was developed and is under manufacturing and installation at this time. A new, second, cavity was tested in a vertical cryostat. No signs of the "Q virus" were encountered. By the late summer of 1996, the first of the final superconducting cavity modules will be installed into CESR in place of one of the NRF cavities for a long term test. The design of the new system is presented in this paper. The results of recent tests as well as the system status and future plans are discussed.