Construction of a Third RF Acceleration Unit for the ESRF Storage Ring, C. DAVID, J. JACOB, A. PANZARELLA, J.P. PERRINE, J.-L. REVOL, ESRF - Presently, with four cavities powered by two 1.3 MW klystrons, the ESRF has successfully delivered synchrotron light to the users with 200 mA of stored multibunch beam, which is twice the initial ESRF target value. For this, the cavities and in particular the cavity input couplers have been pushed close to their upper power limits. In order to provide high intensity operation while still operating the klystrons and each cavity at a moderate power level, the ESRF has started the construction of a third 1.3 MW transmitter powering two additional five-cell cavities in the storage ring. This takes into account the steady increase of beam loading which results from the installation of more and more insertion devices. Furthermore, a total RF voltage increase from 8 MV to 12 MV will be obtained while still keeping the power constraints on the cavity couplers and the klystrons well below the present values. This will result in a higher lifetime especially for high currents per bunch in single and few bunch operation. Key issues of the improved design for the new RF unit as well as a scenario allowing to store beam with two cavities out of operation will be presented at the conference.