Abstract/Description

- The new fourth-generation ESRF-Extremely Brilliant Source (EBS) storage ring features 50 times more magnet power converter units than before supplying almost 1,000 eletromagnets.
- This means ultra high-reliability power supply is required as well as “hot swapping” of power units without losing the beam and disturbing operations.

Technology Transfer proposal BSBF 2022

Original/Potential Field of Application

- The technology was developed for the original field of application in the new generation of “MBA” fourth generation synchrotron sources.
- These have many more magnets in the storage ring lattice to be powered and have a target of a high MTBF
- The ESRF “hot swap” power supply system provides for ease of swapping out failing units and a high reliability without compromising operation of the facility

- The technology could have the following fields of application:
  - High reliability accelerator devices (ion beam, medical physics, etc)
  - Continual manufacturing or process manufacturing where high reliability power supplies of many items of equipment are required (mills, cement, steel, sugar, fertiliser industries etc)

Proposal SWOT Analysis

Strengths

- Full solution for high reliability accelerator magnet power supplies
- Rerouting of power “on-the-fly” allowing repair of faulty unit whilst systems are running
- Installed on the new ESRF-EBS ring
- Ease of maintenance

Weaknesses

- Requires integration at system conception and homogeneity of the power capacity is required

Opportunities

- Application in MBA synchrotron storage ring designs where lattices enforce compact instrument designs and very high number of parameters adjustment.
- Potential in accelerators or systems where high reliability power supplies are required (e.g. ion beam medical treatment, 24 hour operating factories, etc)

Threats

- As far as known, this is a unique solution for current hot swap (a solution exists for voltage hot swap)

IPR Status & Contact Information

- The technology is patented.
  EP 16193203.3

- For further information, the contact point is Ed Mitchell (**mitchell@esrf.eu**)
- The European Synchrotron is an intergovernmental research organisation based in Grenoble, France.
- It develops and operates the world's **first high-energy fourth generation synchrotron light source**.
- Serving over 7,000 visitors from academia and industry every year, it provides state-of-the-art synchrotron X-rays for the study of materials and living matter.