INFRASTRUCTURE FOR HPC RIVR

Due to restrictions in terms of space and content, the supply infrastructure was planned with the following restrictions:

- The total available power for powering HPC RIVR ICT clients is limited to 600 kW. This also corresponds with the total available cooling power for HPC RIVR ICT clients.
- Two system areas were built for the HPC RIVR ICT equipment:
  - RIVR1 system area – the main system area for HPC RIVR purposes. It is planned to house the main HPC processing part; the area measurements are: width 5.54 metres, length 9.63 metres, 3.25 metres gross height, 0.5 metres raised flooring height, 2.6 metres net height.
    - In the RIVR1 area, 500 kW of power supply and the corresponding technical cooling power are available for main processing systems; the power supply has an integrated UPS system for three (3) minutes of autonomy, the cooling system does not have a backup power supply.
    - For installing the main processing system, RIVR1 has 20 cabinets measuring 600x1000x2000 millimetres and four (4) cabinets measuring 600x1200x2000 millimetres. All cabinets have 42 HE of available installation height. The cabinets with a width of 1000 millimetres have an installed PDU unit with 20kW and up to 36 C13 plugs. The cabinets with a width of 1200 millimetres have two installed redundant PDU units with 20kW each and up to 36 C13 plugs.
    - The technical cooling system in RIVR1 is carried out based on air cooling in the cold zone. The air temperature in the cold zone is 19 °C, the separate warm zone has a temperature of up to 35 °C, the air flow rate is up to 124,000 m^3/h.
    - The central monitoring system has been upgraded with a power supply monitoring system that enables the remote switch-off of HPC RIVR1 clients in the case of an emergency, cooling system failure, etc.
  - RIVR2 system area – high availability area for installation of critical systems for HPC RIVR. Area dimensions are as follows: width 3.98 metres, length 8.77 metres, gross height 2.9 metres, raised floor height 0.28 metres, net height 2.3 metres.
    - In the RIVR2 area, 100 kW of redundant power supply with UPS support and the corresponding technical cooling power are available for high availability systems; both are backed up with a backup power source. For installing high availability systems, RIVR2 has 8 cabinets measuring 600x1200x2000 millimetres and 42 HE of available installation height. Each cabinet has two (2) redundant PDU units with 20 kW each and up to 36 C13 plugs.
    - The technical cooling system in RIVR2 is carried out based on air cooling in the cold zone. The air temperature in the cold zone is 20 °C, the separate warm zone has a temperature of up to 37 °C, the air flow rate is up to 26,000 m^3/h (data given for operation at full power with only one active cooling system).

CONDITIONS FOR ANY PROSPECTIVE UPGRADES

The contracting authority allows for the option of upgrading the existing infrastructure within the available capacities; the upgrades are building-dependant. The restrictions are as follows:

- The total output at the exit of the substation for all HPC purposes is 1100 kVA max; at the moment, 900 kVA are being used for the current infrastructure.
- In the RIVR1 system area, the cabinets can be replaced with taller ones. In the RIVR2 system area, there is no room for taller cabinets.
- The outside cooling system units are installed on the roof of the building; there is still some room for some additional units.

The operation is partly co-funded by the European Union through the European Regional Development Fund and by the Ministry for Science, Education and Sport of the Republic of Slovenia. The operation is carried out within main priority axis no. 1: »International competitiveness of research, innovation and technological development in line with smart specialisation for enhanced competitiveness and greening of the economy«, priority investment 1.1 »Enhancing research and innovation (R&I) infrastructure and capacities to develop R&I excellence, and promoting centres of competence, in particular those of European interest«, specific objective 1.1.1 »Efficient use of the research infrastructure and development of knowledge/ competences to improve national and international collaboration in the knowledge triangle« within the Operational Programme for the Implementation of the EU Cohesion Policy 2014-2020.

With any capacity upgrade, the following restrictions should be taken into account:

- The building's impact on the environment must remain unchanged (noise, connected load, etc.).
- The building's looks must remain unchanged.
- The operation of IZUM's existing systems and work processes must not be threatened at any time.
- The change of systems is permissible within the use of the existing capacities, intended for HPC RIVR. Additional space is not available.
- Minimum power surge protection must be provided for the equipment; among other things, this includes UPS systems with a minimum of 3-minute autonomy for the power rating.

The operation is partly co-funded by the European Union through the European Regional Development Fund and by the Ministry for Science, Education and Sport of the Republic of Slovenia. The operation is carried out within main priority axis no. 1: »International competitiveness of research, innovation and technological development in line with smart specialisation for enhanced competitiveness and greening of the economy«, priority investment 1.1 »Enhancing research and innovation (R&I) infrastructure and capacities to develop R&I excellence, and promoting centres of competence, in particular those of European interest«, specific objective 1.1.1 »Efficient use of the research infrastructure and development of knowledge/ competences to improve national and international collaboration in the knowledge triangle« within the Operational Programme for the Implementation of the EU Cohesion Policy 2014-2020.