BLACKOUT - Preparing for the Unexpected

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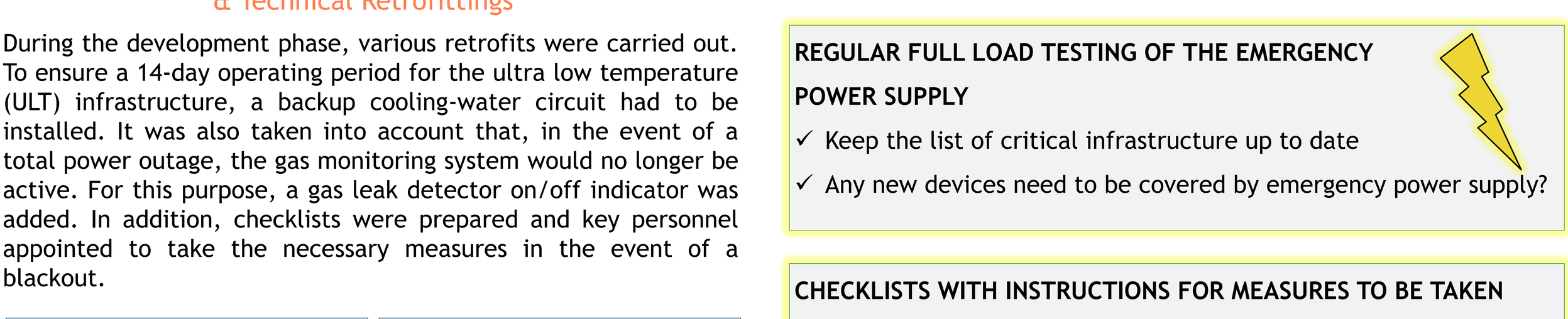
INTRODUCTION

After several years of development Biobank Graz (partner of BBMRI.at) implemented a blackout concept in 2025, which shall guarantee the maintenance of specified storage conditions for up to 14 days of power outage.



METHODS

Evaluation of the Critical Infrastructure & Technical Retrofittings

During the development phase, various retrofits were carried out. To ensure a 14-day operating period for the ultra low temperature (ULT) infrastructure, a backup cooling-water circuit had to be installed. It was also taken into account that, in the event of a total power outage, the gas monitoring system would no longer be active. For this purpose, a gas leak detector on/off indicator was added. In addition, checklists were prepared and key personnel appointed to take the necessary measures in the event of a blackout.

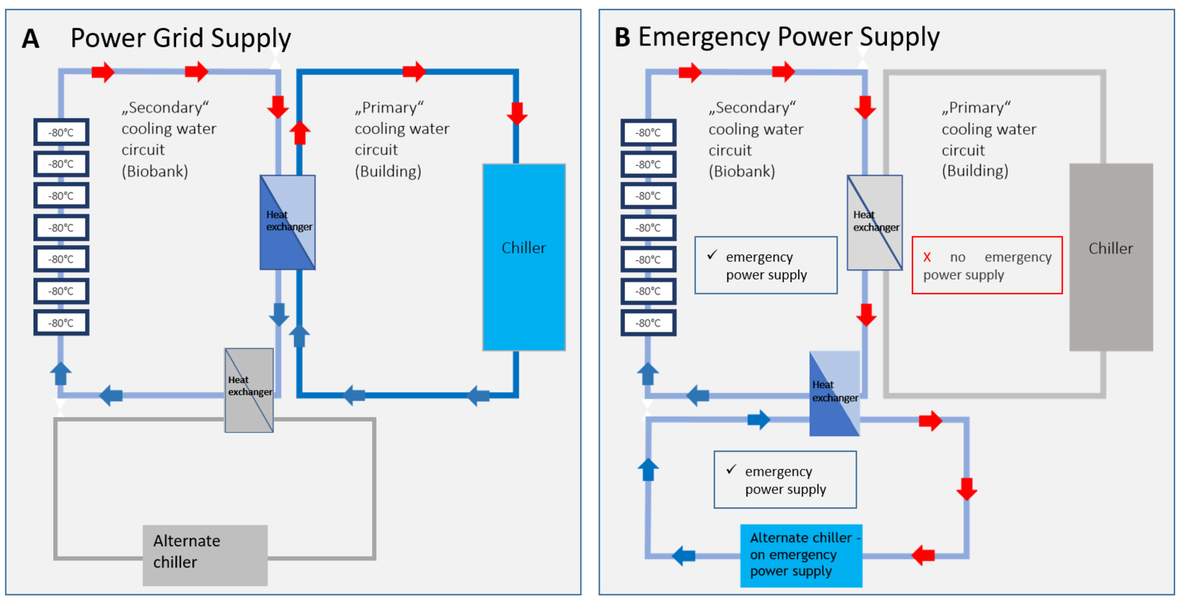


Figure: Implementation of a backup cooling water circuit.
A. Under normal conditions, the heat produced by the ULT freezers is transferred from the secondary cooling-water circuit to the primary building cooling-water circuit.
B. In the event of a power failure, the primary circuit is out of service. Therefore, a smaller primary cooling-water circuit, including an alternate chiller unit, was retrofitted; this system can now be kept running for up to 14 days during a blackout using an emergency generator.

RESULTS

The Blackout Contingency Plan

REGULAR FULL LOAD TESTING OF THE EMERGENCY POWER SUPPLY

- ✓ Keep the list of critical infrastructure up to date
- ✓ Any new devices need to be covered by emergency power supply?

CHECKLISTS WITH INSTRUCTIONS FOR MEASURES TO BE TAKEN

- ✓ Annual review of the checklists
- ✓ Any adaptions required?

ANNUAL TRAININGS

- ✓ Keep the list of key personnel up-to-date
- ✓ Key personnel still available/lives close by?

BLACKOUT BOX

- ✓ Regular check of the blackout box items

(expiration date, useless items, further items needed?)

CONCLUSION

Blackouts strike without warning. The Biobank Graz team conducted a comprehensive risk assessment and organizational planning to protect staff and sample quality. We identified critical gaps and executed time- and cost-intensive retrofits, greatly supported by the facility management team of the Medical University of Graz. The set technical measures shall enable the Biobank Graz ULT storage to operate through a 14-day power outage, and also strengthen resilience during short-term power cuts.

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