Earth and Space

Current findings and proposed demonstrations

ZENIT’s Earth Program studies cleaner power, transport and emergency shelter. Its Space Program designs research vessels and a lunar outpost. A winter shelter and a lunar refuge share a practical question. Which services can keep running when power or communications fail?



Earth / Coastal research facility concept



Space / Orbital vessel concept

What has been tested

Seven Developments software release / 9 November 2026

7	69	969	0
software prototypes	software checks	reference or synthetic cases	hardware tests in release

One prototype declined a science load that the electrical supply could carry because there was too little cooling. The NEXUS checker found all nine deliberately inserted inconsistencies and kept 22 unknown installation values open.

Who controls a restart?

SERAT and GENI-10	SERAT routes power and manages heat. GENI-10 requests field actions within local operating limits.
NEXUS and LSI	NEXUS compares telemetry with its digital model. On Earth, Living Systems Intelligence (LSI) shows operators a reading’s age and uncertainty.
AXIOM and ZSA	AXIOM can block a restart locally during a communications outage. The independent ZENIT Safety Authority (ZSA) authorizes tests and closes hazards.

Project records

Seven Developments Telemetry integrity System roles

Earth program

Power, heat and transport

The Earth Program pairs an immediate need, keeping a community shelter operating in winter, with longer-term work on power plants and hydrogen transport. A Norwegian building with grid access could host the first field trial.



SafeSpot interior. ZENIT concept artwork.

SafeSpot winter outage model

36.9 hours

24 kWh usable reserve ÷ 0.65 kW

Runtime for three constant essential loads

A SafeSpot in winter

The model allocates 0.10 kW to lighting, 0.15 kW to local communications and monitoring, and 0.40 kW to refuge ventilation controls. After 24 hours it has 8.4 kWh left. It excludes space heating, cold-battery effects, start-up peaks and recharging. A field pilot would meter each load and the reserve while the ZENIT Academy rehearses the shift handover.

Fusion power and useful heat

The plant design separates a single stellarator-derived fusion core from the SERAT Energy Island. Its targets are 5.30 GW of fusion heat and 2.00 GW of net electricity to the grid. Magnet protection and tritium inventory control still need physical qualification. In parallel, a grid-fed SERAT pilot could meter electricity bought, heat delivered to a customer and losses.

Hydrogen on a real route

The ZC-1 car and ZA-1 passenger aircraft use hydrogen combustion in their designs. The ZP-1 passenger boat offers a route trial. Match the route, speed and passenger load with the ferry in service and, where feasible, a battery-electric vessel. Measure fuel-chain greenhouse gases per passenger-nautical mile, refuelling time and availability. For combustion, also measure nitrogen oxides.

That comparison could substantiate a climate claim for one transport service. Estimating a wider impact would also require evidence of deployment and which journeys it replaced.

Qualification record Fusion Power Plant Qualification Work Packages, WP3 R1 / 30 September 2026

Project records

SafeSpot outage model · Fusion facility · ZP-1 passenger boat · Route trial design

Space program

Fleet missions and a lunar refuge

The Qi Vanguard Fleet assigns distinct jobs to orbital and surface vehicles. The CORAC Lunar Research Outpost gives those designs a concrete mission. Six people would conduct polar research over a proposed 30-day surface campaign.



CORAC lunar site. ZENIT concept artwork.

CORAC refuge sizing model

72 hours

864 kWh deliverable ÷ 12 kW

One refuge load, starting with a full bank

From orbit to the sample archive

In the fleet design, Zorak provides command and reserve capacity, Centri coordinates recovery, Anorak maps ahead and Fronak studies anomalies. Norak carries roadsters for surface surveys. Qi shuttles handle orbital transfers. At CORAC, scouts would survey the terrain and rovers would deliver sealed samples to a cold lab.

What the refuge calculation covers

The calculation starts with a 1.2 MWh nominal bank, assumes 80% usable depth and 90% delivery efficiency, and budgets one 12 kW refuge load. A ground trial would run representative ventilation, carbon dioxide removal, cooling and communications together through a supply interruption.

What the latest shield run found

The fleet’s Outverse shield design divides five layers across five hull sectors into 25 control regions. In the CORAC simulation published with revision 202, 0.24% more protons reached one 25 cm diameter detector with the steady field on than with it off. In one second the coils drew 36.71 J and returned 0 J to the modeled buffer. A crew-protection claim would require a calibrated exposure map and dose measurements.

Frequency travel and IT-Jump remain research hypotheses. An interstellar travel time would require a verified mechanism and independent measurements that account for energy and momentum.

Project records

Fleet roles Norak CORAC outpost Steady-field result

Recommended sequence

From a building to orbit

Start with one question that a building operator and a spacecraft operator can both answer. When power, cooling or remote data is lost, do the essential loads stay within limits, and does the local controller wait for valid readings before restart?

1	**Earth field pilot** One Norwegian building	Record a normal operating day. During a planned loss of grid power and the data link, meter each essential load and the reserve, log temperatures and observe the shift handover.
2	**Spacecraft bench test** Real controller, simulated loads	Replay the faults with a real controller connected to simulated spacecraft equipment. Independently log voltage, temperature, trips and recovery against limits agreed before the test.
3	**Uncrewed orbital test** Proposed 50–150 kg spacecraft	Once the bench results justify flight, use a purchased spacecraft platform in low Earth orbit. Compare time-stamped flight readings with the ground record during defined faults and communications gaps.



Orbital demonstrator concept.

What would carry forward

Each step would produce a fault log with original readings, declared limits and observed recovery. That record would give the next team a way to reproduce the result and the ZENIT Safety Authority a basis for deciding whether the next test can proceed.

Reference points beyond ZENIT

ITER distinguishes fusion power in the plasma from electricity delivered to the grid. ESA’s Moonlight program offers a reference for lunar communications and navigation planning, including where a mission would need relay coverage.

ITER • fusion power and electricity ESA • Moonlight services

Project records

Scientific potential and proposed tests Orbital demonstrator scope Published research records