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Swiss Federal Nuclear
Safety Inspectorate **ENSI.ch**

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COMPREHENSIVE.
INFORMED.



SAFETY

MADE IN SWITZERLAND

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ENSI

THE REGULATOR FOR NUCLEAR SAFETY AND SECURITY.

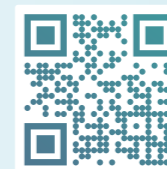
The Swiss Federal Nuclear Safety Inspectorate ENSI assesses and monitors nuclear installations in Switzerland. More than 150 employees work daily using their in-depth expert knowledge to promote nuclear safety, the security of nuclear installations and for the protection of people and the environment against ionising radiation.

ENSI's specialists maintain an active national and international exchange, are up to date with science and technology and participate in safety research projects. This enables ENSI to base its activities on world-wide experience in the nuclear energy sector and at the same time to make an active contribution to global nuclear safety.

ENSI's regulatory area extends from design, operation and decommissioning of installations through to the disposal of radioactive waste.

WHAT ARE NUCLEAR INSTALLATIONS?

Nuclear power plants, storage facilities for radioactive waste and the nuclear research facilities of the Paul Scherrer Institute in Villigen and the Swiss Federal Institute of Technology in Lausanne.



bit.ly/2ZrLB8o

DID YOU KNOW?

To increase the flood safety of the nuclear power plants, ENSI required specific improvements, for example, the flood protection of individual emergency buildings.

PERSPECTIVE.
ENSI OVERSEES THE OPERATION
OF NUCLEAR INSTALLATIONS.



ENSI OVERSEES THE OPERATION OF NUCLEAR INSTALLATIONS.

Nuclear safety and security take priority in the oversight of the operation of nuclear installations. ENSI's specialists are constantly monitoring the Swiss nuclear installations to ensure that their operation complies with legal requirements.

HOW DOES ENSI OVERSEE THE OPERATION OF NUCLEAR INSTALLATIONS?

INSPECTIONS: ENSI checks the reporting of the operators and checks the nuclear installations with around 450 inspections per year. In addition to weekly plant inspections, ENSI performs topic-specific inspections, for example in the areas of electrical engineering, civil engineering or radiation protection.

OVERHAULS: ENSI tracks and monitors the annual revisions of the nuclear power plants.

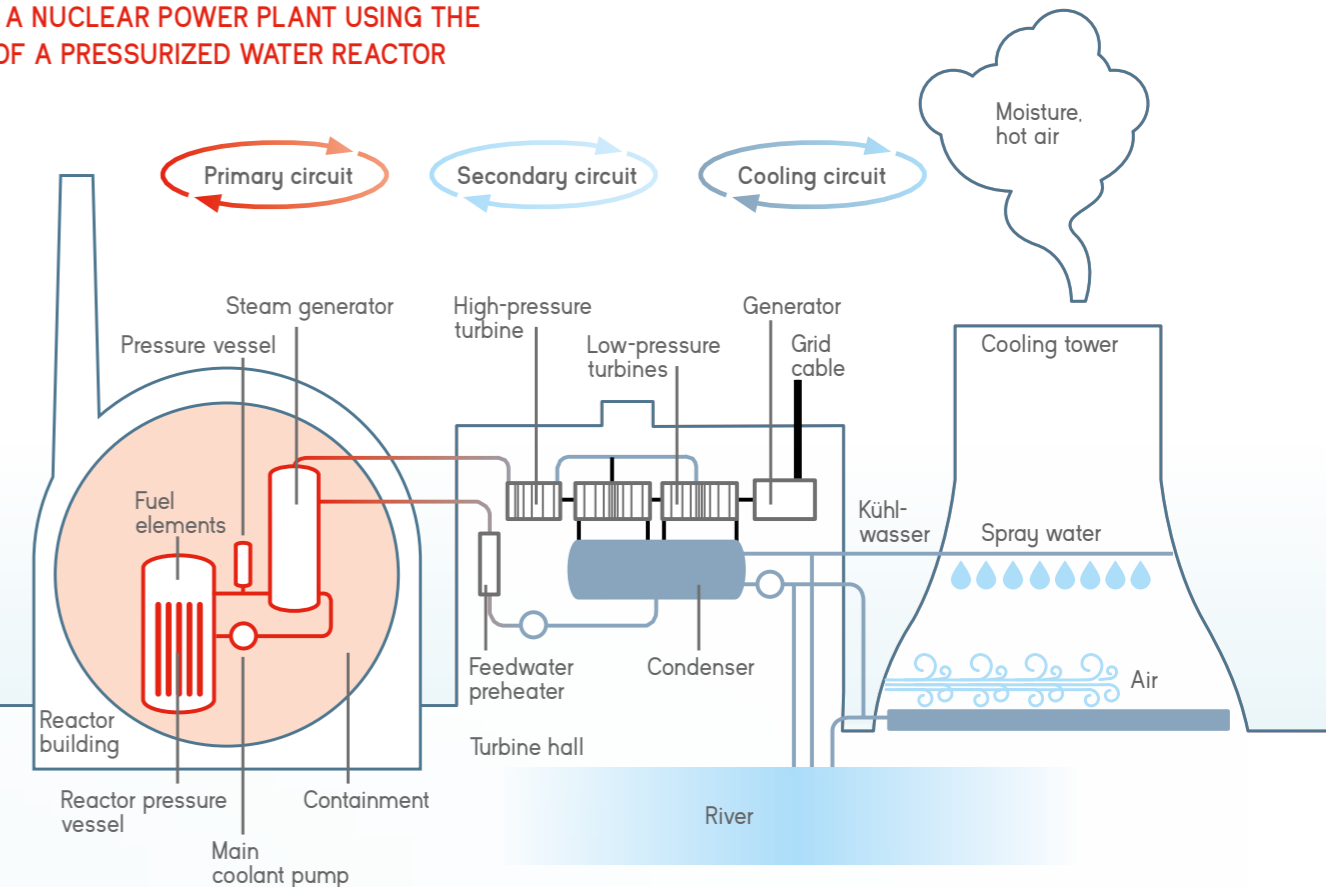
INCIDENTS: ENSI assesses events and initiates necessary improvements.

SAFETY ASSESSMENT: ENSI brings together all the data arising from the nuclear power plants over the course of a year to create a comprehensive safety assessment. From this, it derives optimisation actions and its future oversight planning.



HUMAN AND ORGANISATIONAL FACTORS: ENSI maintains a dialogue with those responsible for the nuclear installations and focuses in the oversight on the interaction between human, technology and organisation (HTO).

DESIGN OF A NUCLEAR POWER PLANT USING THE EXAMPLE OF A PRESSURIZED WATER REACTOR



DID YOU KNOW?

ENSI's specialists review the earthquake safety analyses of the nuclear power plants. If an optimisation potential is identified, the plants must carry out backfitting accordingly.

INSIGHT.

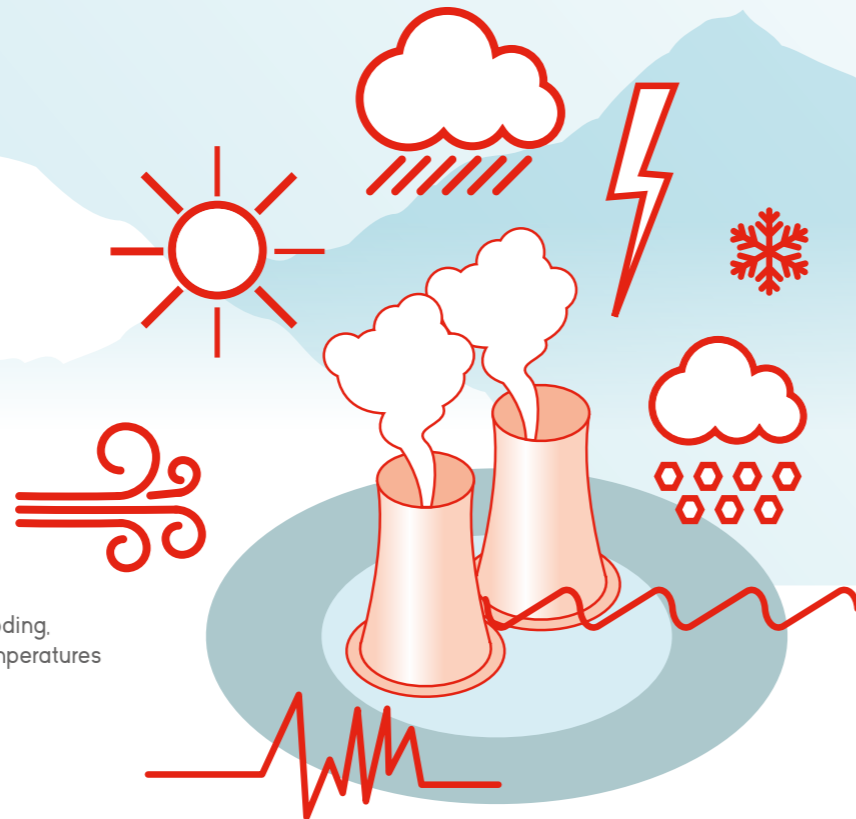
ENSI ANALYSES THE SAFETY OF NUCLEAR INSTALLATIONS.

ENSI ANALYSES THE SAFETY OF NUCLEAR INSTALLATIONS.

ENSI's specialists ensure that operators continually scrutinise the safety of their nuclear installations, update the safety proofs and backfit the installations in a targeted manner. They use analyses to check the correct layout and safe operation of the installations.

NATURAL HAZARDS FOR A NUCLEAR POWER PLANT

Earthquake, extreme wind, tornados, heavy rain, flooding, lightning and hail on the plant facilities, extreme temperatures in winter and summer and extreme snowfall.



HOW DOES ENSI ENSURE THAT THE SAFETY OF NUCLEAR INSTALLATIONS IS BEING IMPROVED?

GUIDELINES: ENSI implements the legal requirements in guidelines and monitors compliance with these. For example, guidelines define the specific requirements for the ageing management of nuclear installations or for deep geological disposal.

PERMITS: ENSI reviews requests for changes to nuclear installations. If the assessment is positive, it awards the necessary permits.

PERIODIC SAFETY REVIEW: Every ten years, ENSI comprehensively reviews the safety of the Swiss nuclear power plants and draws up requirements to further heighten safety.

ANALYSIS OF CHANGES: If operators want to make changes to their nuclear installations, ENSI checks the documentation. To some extent, ENSI's internal simulation models are used, which investigate components of the installations such as pumps or pipelines as well as the handling sequences performed by installation staff.

MODELLING OF ACCIDENTS: ENSI models accidents and identifies potential areas for improvement in the nuclear installations. ENSI submits this knowledge for the further development of internationally recognised safety standards.



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VISION.

ENSI OVERSEES RADIOACTIVE
WASTE DISPOSAL.

DID YOU KNOW?

ENSI inspects the boreholes for investigating the local geological background and monitors the corresponding scientific investigations.

ENSI OVERSEES RADIOACTIVE WASTE DISPOSAL.

Radioactive waste disposal is a legal duty of nuclear installation licensees. ENSI monitors the entire disposal path: from decommissioning to interim storage through to deep geological disposal.

ENSI's specialists prepare safety-related expert reports on disposal topics, in particular on the location proposals for deep geological repositories and the Nagra disposal programme.

WHAT DOES RADIOACTIVE WASTE DISPOSAL INVOLVE?

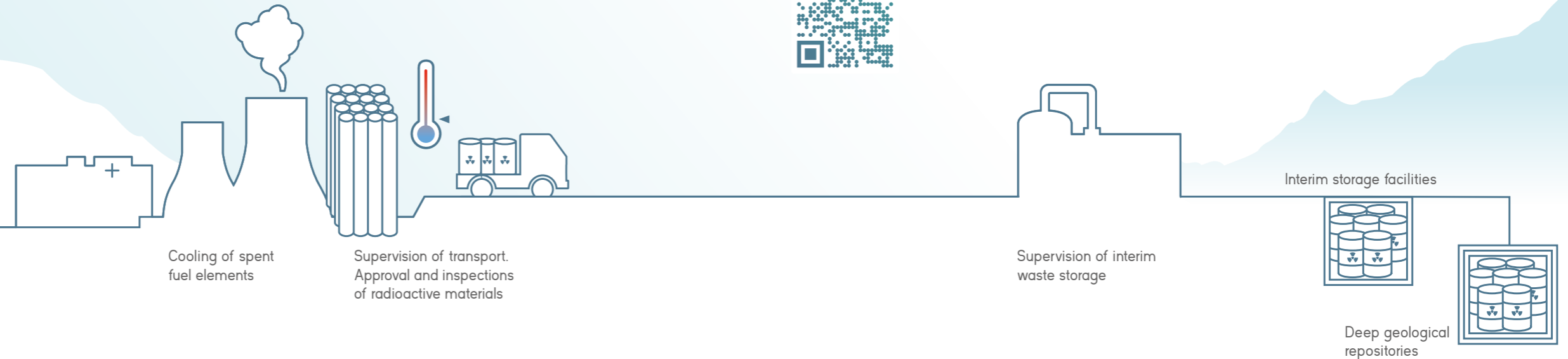
DECOMMISSIONING: After decommissioning of a nuclear power plant, the radioactivity of the fuel rods as well as the activated concrete and steel elements decreases. Thereafter, the system components and fuel elements can be safely disposed of. ENSI deals with the post-operation of nuclear installations and oversees their dismantling.

INTERIM STORAGE: Each nuclear power plant has facilities for the interim storage of waste that arises during operation. The Paul Scherrer Institute and the Centralised Interim Storage Facility in Würenlingen also operate waste treatment facilities for conditioning the waste ready for storage. ENSI oversees all these interim storage and radioactive waste treatment facilities used in treating the waste arising from the operation of the nuclear installations.

DEEP GEOLOGICAL DISPOSAL: ENSI assesses the proposals of the waste producers from a safety point of view for the implementation of the Sectoral Plan for Deep Geological Repositories.

TRANSPORT OF RADIOACTIVE WASTE: ENSI oversees the transport of radioactive materials. It checks applications for transport, grants licences for container approvals and carries out inspections.

DISPOSAL OF SPENT FUEL ELEMENTS



OVERVIEW.

ENSI PROTECTS PEOPLE AND THE ENVIRONMENT AGAINST IONISING RADIATION.

DID YOU KNOW?

A nuclear installation is required to renovate a sewage system that may contain contaminated pipework. ENSI's radiation protection specialists carry out site inspections to determine whether the containment of the radioactive substances and the protection of the personnel of the nuclear installation have been properly prepared.

ENSI PROTECTS PEOPLE AND THE ENVIRONMENT AGAINST IONISING RADIATION.

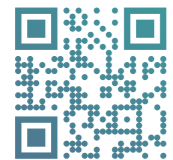
ENSI implements the legal mandate of protecting people and the environment from ionising radiation. Among other things, ENSI's specialists ensure this with measures in the field of radiation protection and with their own emergency response organisation.

EMERGENCY PREPAREDNESS: ENSI is incorporated in a national organisation for the combating of severe accidents. In the event of incidents in nuclear installations, ENSI's emergency response organisation assesses the situation, makes forecasts and recommends actions to protect the population.

HOW DOES ENSI PROTECT THE POPULATION FROM IONISING RADIATION?

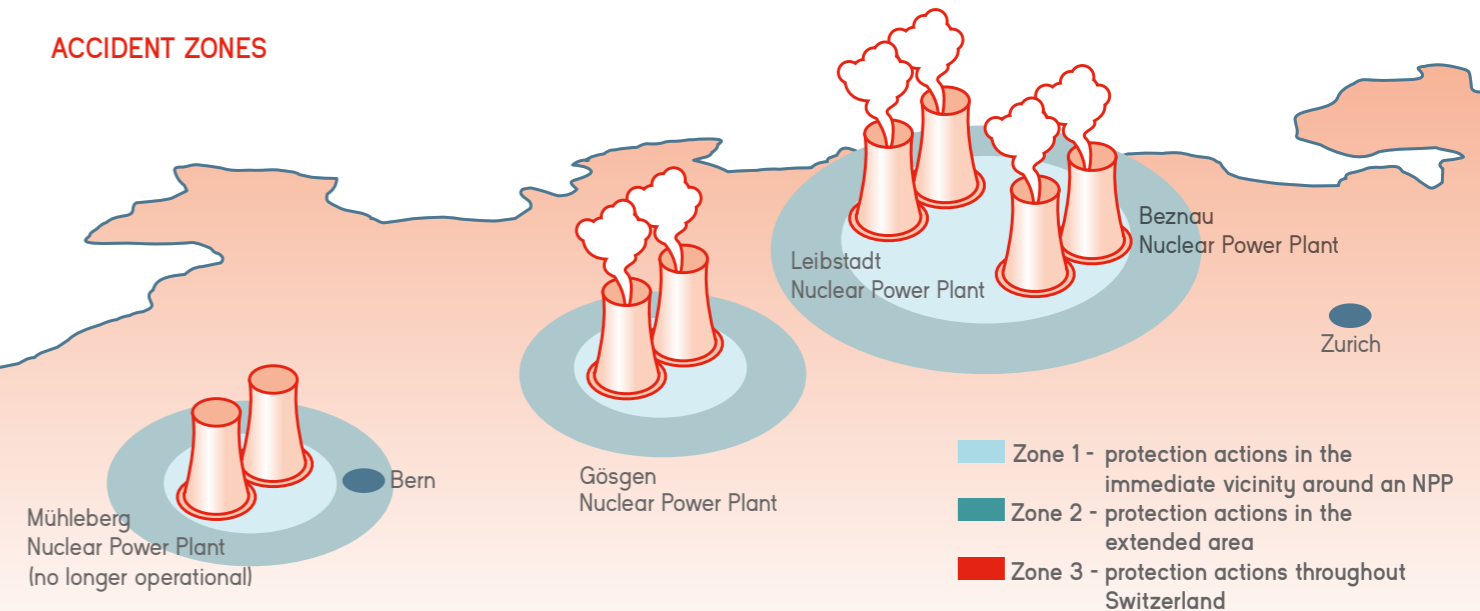
RADIATION PROTECTION IN NUCLEAR INSTALLATIONS: ENSI monitors compliance with radiation protection regulations and the adequate implementation of the emergency preparedness precautions of the nuclear installations. This serves to protect installation personnel, the population and the environment.

RADIATION MONITORING IN THE SURROUNDING AREA: ENSI monitors ionising radiation and radioactivity with its own measuring probes in the vicinity of nuclear power plants. Moreover, it carries out inspections and obtains test samples for independent evaluation in its accredited laboratory.



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ACCIDENT ZONES



FEEDBACK

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Do you have any questions? Do you want more information or do you want to send us a message about topics relating to ENSI? Please get in touch.

**Swiss Federal Nuclear
Safety Inspectorate ENSI**

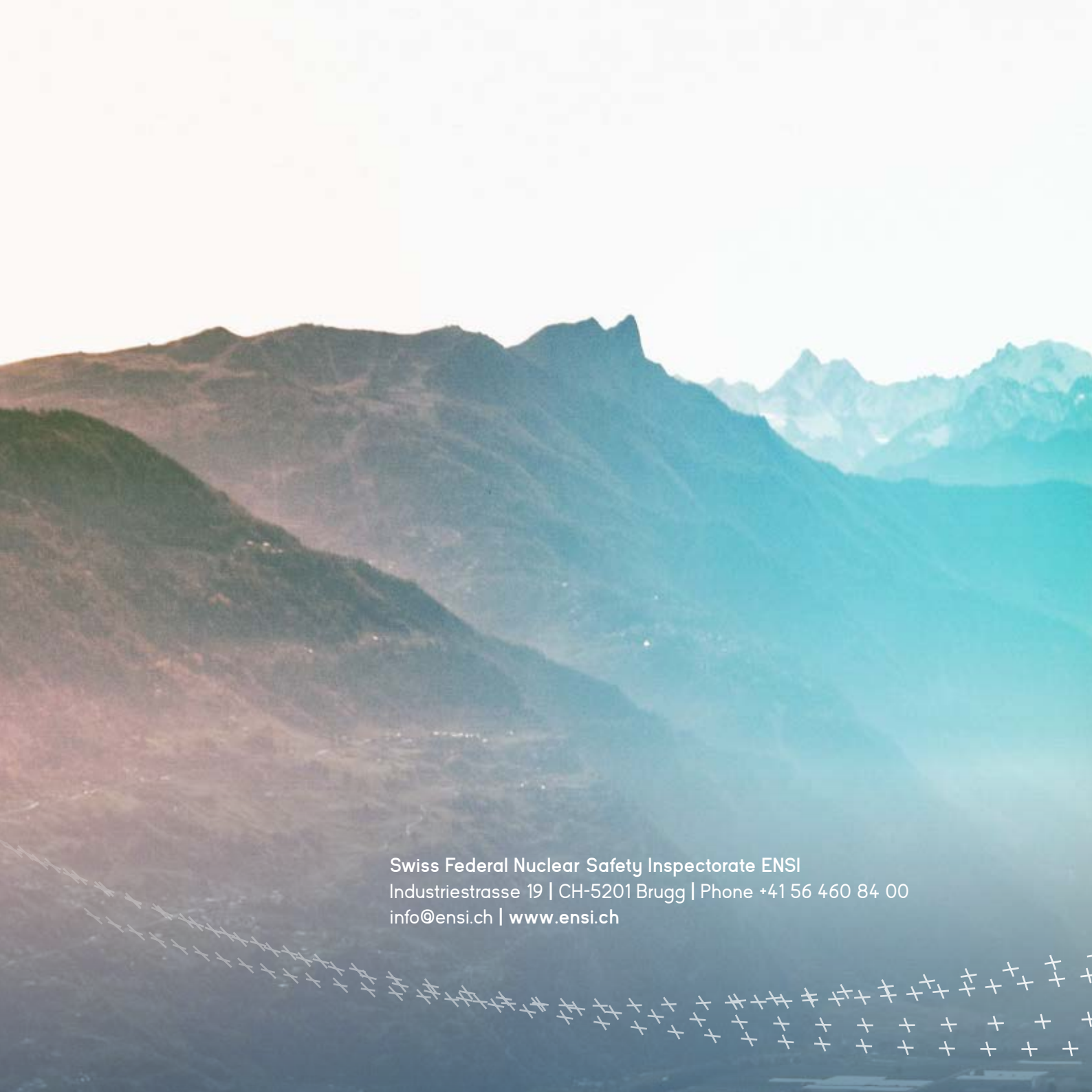
Industriestrasse 19 | CH-5201 Brugg
Phone +41 56 460 84 00 | info@ensi.ch
www.ensi.ch



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Swiss Federal Nuclear Safety Inspectorate ENSI
Industriestrasse 19 | CH-5201 Brugg | Phone +41 56 460 84 00
info@ensi.ch | www.ensi.ch