ENERGY INFRASTRUCTURE SECURITY DIVISION

CANADIAN RESOURCES INFRASTRUCTURE RESILIENCE NEXUS

An all-hazards approach to critical energy infrastructure security and resilience

MANDATE

Canada's energy infrastructure is the backbone of our modern society, bringing the necessary fuel and power to keep our homes, businesses, schools, hospitals and transportation systems running. Without this infrastructure, our standard of living would simply not be possible, and because such infrastructure is vulnerable to accidents, natural hazards, espionage, and sabotage, it is critical that we keep these systems safe.

In 2001, Natural Resources Canada (NRCan) established the Energy Infrastructure Security Division (EISD). Its mandate is to undertake measures to strengthen the security and resilience of critical energy infrastructure to mitigate, prepare for, respond to, and recover from natural and man-made incidents through intelligence-informed research and development.

The Emergency Management Act (2007) and the National Strategy for Critical Infrastructure (2010) designated NRCan as the lead federal department for critical energy infrastructure security. Pursuant to legislative and policy requirements, the Minister of Natural Resources has legislative and policy commitments to identify risks. These include risks related to critical electricity infrastructure; preparing emergency management plans; maintaining, testing and implementing those plans; and conducting related training and exercises.

OBJECTIVES

NRCan is guided by the three strategic objectives of the National Strategy for Critical Infrastructure:

- ▶ Build partnerships to support and enhance critical infrastructure resiliency

- ▶ Implement an all-hazards approach to risk management

- ▶ Advance the timely sharing and protection of information among partners and stakeholders
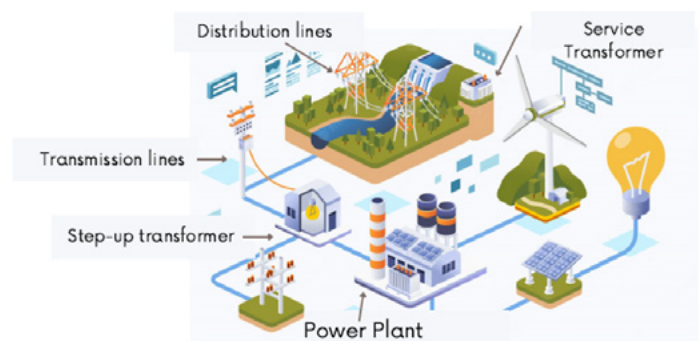
KEY ACTIVITIES

The Canadian Resources Infrastructure Resilience Nexus (CRIRN) helps by strengthening the links between technology, security and the energy sector stakeholders. The nexus occupies a unique position at the intersection of the Canadian critical infrastructure, the security and intelligence community, and research institutions. It leverages expertise and trusted relationships to provide the energy sector owners and operators with knowledge and skills to transform information into actions, including:

NRCan EISD-CRIRN Services

CRIRN horizontal collaboration with NRCan Labs, Academia and Industry
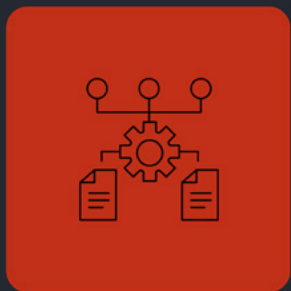
CRIRN led specific research

Research and development

Conduct innovative research and development to address current and future resilience and security challenges and threats to infrastructure operations.

International – G7

Lead hands-on technical exercises, regular technical webinars, and information sharing sessions.

Modelling, simulation and analysis

Model and simulate electricity infrastructure technology supply chains through data analytics, machine learning and deep learning.

Information sharing (symposiums and webinars)

Develop and proactively share technical analysis and value-added information products with industry, academia, and government.
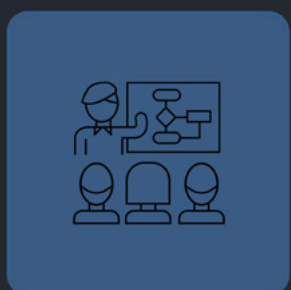
Emergency management and business continuity management

Proactively address emergency management and business continuity management challenges through planning, preparedness, and mitigation.
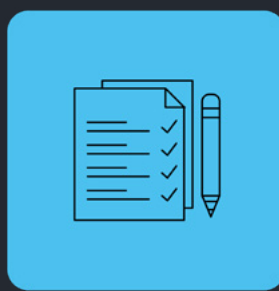
Facility assessment

Analyze and assess technologies, facilities and systems for digital and physical vulnerabilities.

Technical capacity building

Build technical capacity for future jobs through hands-on digital skills development, technology awareness sessions, and subject matter expertise knowledge transfer.

CRIRN

As part of the EISD, CRIRN is an in-house research and development facility at NRCan. It provides hands-on skills transfer, technology testing, and real-time simulation exercises. The owners and operators of energy infrastructure identify and respond to physical and cyber threats to strengthen the resilience of energy infrastructure in Canada.

REACTIONS FROM STAKEHOLDERS

"...Stakeholder consultations and documents reviewed confirm that the CRIRN is responding to industry needs in the domain of cyber security and providing tangible value-added to its efforts. They also see scope for expanding activities and offerings, such as site assessments, technology evaluations, and targeted research projects (e.g. sensors and analytics and unmanned aerial vehicles [UAV])..."

— *2016, NRCan Audit and Evaluation's Advisory Project Report on Cybersecurity of Canadian Energy Sector: Assessing Natural Resources Canada's Policy Leadership*

"The work being done is a key part of the continuing efforts around the security and protection of the energy infrastructure our member organizations have responsibility for."

— *Canadian Gas Association, February 7, 2013*

"...the energy and utilities sector network, managed through Natural Resources Canada, meets regularly and has active participation from all stakeholders. In our opinion, this result shows that networks can work and can be a valuable forum for exchanging needed information to protect critical infrastructure..."

— *Report of the Auditor General of Canada to the House of Commons Fall 2012 – Matters of Special Importance.*

G7 Hands-on Scenario Based Technical Exercise

CRIRN INDUSTRY TECHNICAL ADVISORY GROUP

The CRIRN Industry Technical Advisory Group is a forum of energy and utilities sector network members, including stakeholders from industry, industry associations, NRCan portfolio agencies, and academia. The group was created to provide NRCan's CRIRN subject matter experts with industry operational knowledge, perspective and advice to help enhance the security and resilience of critical resources infrastructure systems.

Industry Technical Information Sharing Meeting

Contact us at crirn-nrirc@nrcan-rncan.gc.ca

"Innovation as an Enabler for Electricity Infrastructure Resilience"

DIGITAL EXPLORTION OPPORTUNITIES PROGRAM

The Digital Exploration Opportunities Program (DEOP) is a unique opportunity for high school students who are interested in exploring digital technology and related career opportunities. The CRIRN at NRCan offers sessions that include hands-on demonstrations of digital technologies as they are applied to real-world problems. The program teaches basic principles and concepts of digital technologies applied in social sciences, science, technology, engineering and math.

The DEOP is a free, virtual series of lectures and training that provides hands-on demonstrations. The program leverages participants' interests and skills applied to digital technologies and complex systems such as sensors, microcontrollers, artificial intelligence, machine learning, and much more.

Students can register by contacting the DEOP at deop-poen@nrcan-rncan.gc.ca

REACTIONS FROM STAKEHOLDERS

"...There are going to be significant gaps in digital skills and knowledge that can only be filled by you (the youth of Canada). The shortfall expected in renewable energy technologies, cyber security and digital skills will only continue to grow as you enter the workforce..."

— *Associate Deputy Minister Mollie Johnson, August 2021 – address to DEOP students*

"Connecting today's youth to the digital future and preparing them for work in a digital economy are key."

— *Professor James Green, Systems and Computer Engineering, Carleton University*

"The DEOP offers fun and innovative programming that encourages youth to explore their interests, make new friends, and learn about the exciting world around them!"

— *Dr. Robyn Fiori, Ionospheric Physicist, Canadian Hazards and Information Branch and Space Weather Observatory, NRCan*

"As these technologies continue to advance at a rapid rate, the skills needed to develop and operate this equipment continue to expand and change. Initiatives such as the DEOP are helpful for introducing the next generation of renewable energy experts to key topics and challenges..."

— *Phil McKay, P.Eng., M.Sc., Senior Director, Operations Canadian Renewable Energy Association*

Contact us at deop-poen@nrcan-rncan.gc.ca

CRIRN Control Monitoring Room