

Providing expertise in the field of HVDC transmission



Manitoba Hydro International (MHI) has a highly experienced, multi-disciplinary team of experts that can provide specialized engineering solutions for the HVDC power system community worldwide.

Manitoba Hydro International (MHI)'s team, with years of international experience, specializes in providing a wide variety of HVDC services. With over 40 years of design, maintenance, and operating experience, MHI offers customized and reliable solutions in the field of HVDC transmission. Over the years, the team has gained comprehensive knowledge of the industry, including the capability to prepare specifications, perform HVDC planning and feasibility studies, and provide operations and commissioning consulting services around the globe.

Capabilities

MHI applies a unique perspective throughout the process of acquiring HVDC technology and during the life cycle of the station. In addition to system impact planning studies, MHI has design review experience which includes: Protection and Control, Transformers, Reactors, Thyristor Valves, cooling systems, and AC remedial action schemes.

MHI uses a wide array of in-house tools and capabilities to support a variety of simulation studies.



From the landmark HVDC transmission projects from Nelson River Bipole I and II, Manitoba has developed as a center that excels in HVDC expertise.

HVDC System Impact Studies

MHI offers expertise in load flow transient stability fault studies and small signal stability studies.

PSCAD™ EMT Simulation Studies

PSCAD, developed by the Manitoba Hydro International, is the tool of choice for all major HVDC vendors, including ABB, Siemens, and Alstom Grid. MHI performs EMT studies to analyze and design HVDC controls to meet weak grid integration requirements.

Harmonic Impact Filters

MHI performs frequency scan and harmonic studies based on EMT simulations

MMC-VSC Model Development

Models are being developed for new HVDC schemes based on the new multi-level voltage source converter technology. The models developed are used to perform system level feasibility studies, evaluation of protection and control schemes, AC system requirements, equipment ratings, and project costs.

Renewable Energy Integration

MHI performs studies for the integration of renewable resources using multi-terminal HVDC that is based on VSC technology. Applications of FACTS devices and synchronous condensers are used to meet performance standards, as well as series compensation technologies.

RTDS Simulation Studies

Clients are provided with support and advice on real-time electromagnetic transient simulations for testing performance controls and other equipment.

Life Extension and Life Assessment

MHI's expertise and past project experience include: converter transformers, smoothing reactors, valves, equipment testing, HVDC controls, and post commissioning services.

Field and Corona Effects (FACE) HVDC Calculations

A study tool was developed in-house and has been used for over ten years to perform field and corona effects on high voltage power lines. It has been used to perform a number of field and corona effect studies.

HVDC Specification Bids and Tender Evaluations

MHI provides assistance in writing HVDC specification bids and tenders for clients. The MHI team, generally in close contact with the project owners, is available to answer technical questions throughout the bid process, review supplier specifications for equipment manufacturing, negotiate with preferred suppliers to arrive at a final contract, and participation in factory acceptance. To provide technical support throughout the entire HVDC project lifecycle.

Ground and Sea Electrode Studies

Many studies have been performed for the investigation of new ground electrodes in HVDC projects, replacement and upgrade of electrodes, and high level design of the electrode line and underground cables.

HVDC Training

MHI offers a specialized HVDC Theory & Controls training program that covers the fundamentals of HVDC technology and their applications. Topics covered include: HVDC fundamentals, controls, modeling, and advanced topics, including HVDC implementation and maintenance issues for HVDC systems.

Manitoba Hydro International Ltd. is a world leader in power system simulation innovation and applied engineering solutions. As the developers of the world-renowned PSCAD™/EMTDC™ software, we recognize the importance of collaborative partnerships and technologies in the global power industry.