HVDC CARE

Lifecycle Services for HVDC

Your uptime insurance

Lifecycle services for HVDC

We keep the power flowing, and never leave our customer

HVDC (high-voltage direct current) is a highly efficient alternative for transmitting large amounts of electricity over long distances and for special purpose applications. As a key enabler in the future energy system based on renewables, HVDC lifecycle service truly supports shaping the grid of the future. We divide our services into categories based on our customers needs. These categories are rapid response, lifecycle management, performance improvement, operational excellence, and HVDC Care agreements.

Lifecycle services from HVDC, HVDC Care, HVDC upgrades, and HVDC Care agreements give a uptime insurance for your installation. Production uptime, availability and reliability are of highest importance for our customers. Care service products such as 24/7 rapid response, maintenance, spare parts, partial upgrades, and upgrades are available. The total cost of ownership throughout the system lifecycle should be relevant in relation to the system capacity and performance requirements (service level). Our commitment is to listen and be responsive to our customers. We deliver customer satisfaction by providing timely and responsive service, with integrity, and a passion for excellence. ABB Ability™ is our portfolio of digital solutions and the platform they are built upon that help customers take advantage of digitalization.

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Health and safety is always our first priority

HVDC Care

We always strive for our customers trust

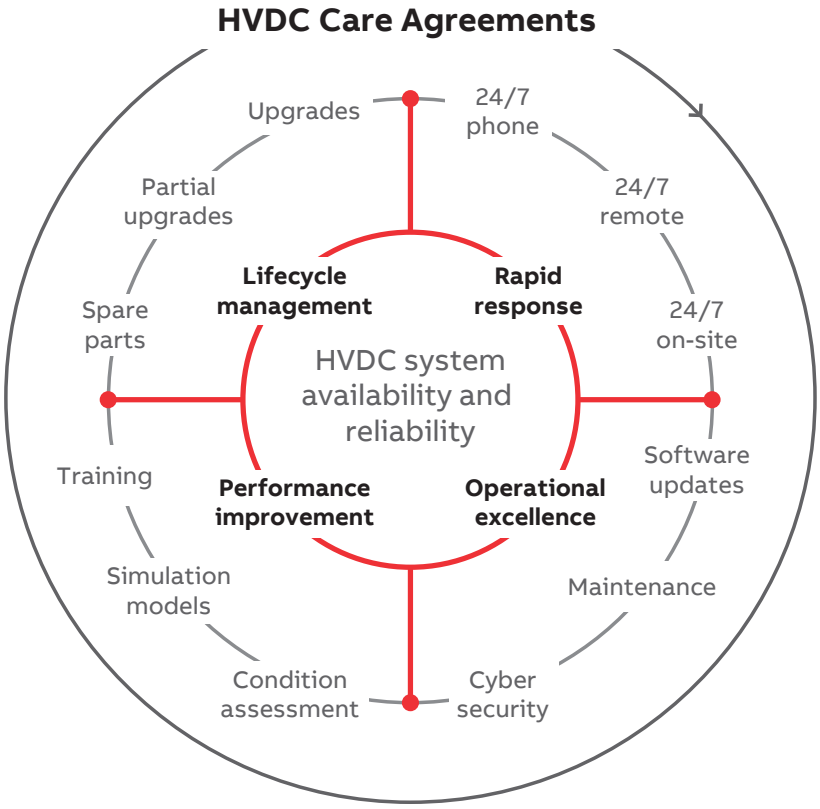
HVDC Service ensures continued support to the project throughout its lifetime. ABB has long experience in providing maintenance service and delivering upgrades for HVDC links all around the world.

The cost of ownership throughout the system lifecycle should be relevant. And the capital expenditures, incurred when investing in the plant, needs to be in balance with the operational expenditure, the ongoing maintenance (service) cost for running a product or system.

We value our customers, and always strive to earn their trust. Power companies tend to outsource services that are not seen as part of their core business. There is a trend that our customers wants longer term service agreements and managed services, where manufacturers take a larger responsibility for various service products and processes to the extent of day-to-day operation and management of the entire system. Already during design of the converter ABB service experts are involved to prepare for serviceability, future operation, and minimized downtime.

Our services starts already at take-over providing 24/7 and maintenance. Our support team strives to handle all issues that may arise during the warranty period. We stand fully behind the system delivery. During post-warranty (service) period, our support team continues to handle any issue that may arise. We also proactively minimize the risk of any issues by preventive scheduled activities.

Think globally, act locally
Locally and globally we are one team, i.e. our local service engineers are an extension of the global team, so that our customers get access to the local service engineer and the global expertise.



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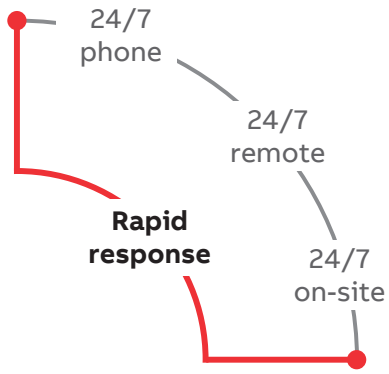
01 Lifecycle Services for HVDC consists of service categories divided into service products, each with a specific customer value.

Rapid response
We keep the power flowing 24/7

Corrective actions are needed from time to time when unscheduled problems occur. ABB is committed to supplying support solutions that meet our customers needs and specifications. To rectify a problem as soon as possible, we provide several support options. Rapid Response provides expert support via phone, e-mail, or other agreed means of contact. Short response-time to a knowledgeable ABB engineer provides immediate access to solutions, saving valuable time. Minor incidents can be resolved quickly, and in the event of a major issue, immediate support is available.

24/7 phone
In the event of a problem, 24/7 phone support provides the security of a hotline at any time by phone, e-mail, or some other agreed upon means of contact. Quick connection to a skilled, knowledgeable ABB engineer offers direct access to the solutions you need immediately, and saves valuable time. Minor incidents are usually solved quickly, and in the event of a major issue, you will have the right support from the start.

24/7 remote
The remote assistance for HVDC enables ABB to immediately start troubleshooting and monitor a converter station from a secure remote location within the ABB network. Remote assistance is a key feature from both a monitoring management and corrective maintenance perspective. In addition, being able to perform a system data and alarm analysis from the HVDC system helps our Customers to stay one step ahead.



24/7 access to HVDC experts and minimized downtime

24/7 on-site
The on-site corrective maintenance service offers you the assurance that there are skilled ABB personnel on standby to assist you in the case of a problem. Besides 24/7 contact support, the service guarantees that a support engineer will arrive on your site within an agreed period of time.

Operational excellence

We together manage your assets, operations, and risk

ABB Ability is our portfolio of digital solutions and the platform they are built upon that helps customers take advantage of digitalization. Today, we offer solutions that range from remote monitoring systems to systems that maximize availability, reliability and security. Many customers have already deployed these solutions. ABB has for many years worked with digital solutions, supporting the reliability and availability of our customer's installations. Our services are built from our HVDC knowledge, operational and information technology, digital expertise, knowledge of critical infrastructure, and comprises cyber security for HVDC, software updates and backups for HVDC, and maintenance based on digital tools and systems.

Increased availability, security, reliability, and performance

Cyber security for HVDC
Using internet based communication technologies requires protection against cyber attacks. Viruses, ransomware and other malware have increased the awareness and need for cyber security methods. Cyber security must be addressed continuously, which requires a comprehensive program including human resources with the appropriate skills. Cyber security is a key requirement and we are committed to providing products, systems and services that clearly address this issue. We take a systematic approach to cyber security through our operations on a global level.

Software updates
We offer update packages to bring older installations closer to the functionality we supply in today's installations. Software updates that improve reliability, add functionality and accessibility, secure spare part availability and increase overall performance. Software updates also includes updates to computer operating systems, security, malware detection, or specific updates tailored to the customer needs.

Maintenance
We manage preventive and corrective maintenance programs. Preventive maintenance helps you to check the condition of your system and its components. It will determine the best solution to ensure system performance, safety, availability and reliability.

We design for maintainability, and use digital tools to minimize maintenance outage periods. In addition, our recommendations are based on input from our sub-suppliers, and experience from our field engineers and experts. These recommendations are continuously updated with new knowledge and experiences.

Operational excellence
Cyber security

Cyber security is an integral part of the system lifecycle, and is incorporated in our system deliveries. Cyber security is not a single, one-time activity, but an integrated part of the lifecycle management.

We are committed to support cyber security standards, our subject matter experts continuously monitors these evolving standards, and adapts the system and processes to meet these evolving requirements.
Our current cyber security offering includes annual security refresh, security update management service, auditing & assessment, centralized data logging & monitoring, system hardening, and other service tailored to the customer's individual needs.

Keep your system secure using security update service

Security update management service is meant to help customers deal with the activities of identifying, tracking, testing and implementing a patch management program for their MACH control and protection system. It includes three different levels of security update services to verify that all needed security updates are tested, documented, and installed safely. Each level builds on the one before with further service enhancements designed to ease the compliance burdens faced by the customer. The levels are called Bronze, Silver and Gold:

Features of security update management service	Bronze	Silver	Gold
Listing of security patches for all known software installed by ABB	●	●	●
Listing of validated security patches tightly coupled to a system´s actual configuration		●	●
Configuration baseline collection		●	●
Monthly report of available and recommended patches		●	●
On-site annual security refresh			●

OPERATIONAL EXCELLENCE

Cyber security is not a single, one-time activity, but an integrated part of the lifecycle management

We are comitted to support cyber security standards such as NERC CIP, ISO 27000, and other standards

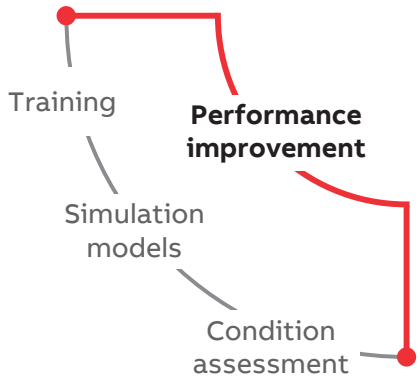
Performance improvement

We optimize connectivity, reliability and efficiency of your assets

Performance improvement includes training and consultancy services that helps you identify ways to improve the reliability, availability and security of your HVDC system. Our team of experts can check the current status of your system.

Training
ABB provides comprehensive training for engineers, operators, programmers and maintenance personnel, including up-to-date technical expertise and support for a full range of products, systems and applications. Training is available at ABB facilities worldwide, at customer sites and online. It includes theoretical and hands-on training sessions designed to provide operation and maintenance personnel with the skills they will need to maximize the reliability, productivity and safety of their systems.

Simulation models
ABB provides system simulation models for both HVDC Classic and HVDC Light®. These can simulate the live system based on replicas for large scale systems, and simulate new functionality in realtime models.



Optimized asset management for life extension

Condition assessment
ABB can help assess/identify critical equipment and how to minimize risks. Via onsite visit, visual inspection and evaluation, we do an assessment of age, condition and failure risk.

Lifecycle management

We optimize and extend your equipment life

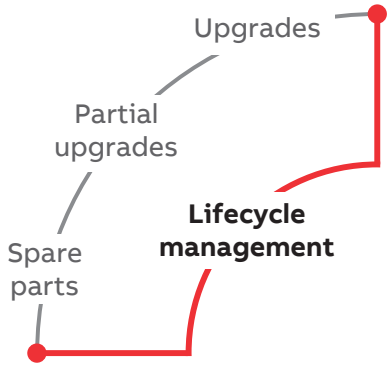
Modernizing an HVDC installation has been shown to extend system lifetime, improve availability and reliability, increase cost efficiency, improve performance, increase the capacity, and increase the power rating of the link.

Upgrades
After some years of operation, an assessment of the equipment or systems can extend a system's lifecycle and reduce downtime. Not only can new generation hardware and software provide new functionalities, but the upgrade can be completed within a relatively short downtime, and is a proven, efficient way to prolong high performance. ABB is a world-leader in upgrading HVDC links, and upgrades older installations to modern systems.

Proactively upgrading a system before a severe outage occurs can save time and money. The need for upgrading depends mainly on age, the general condition of the equipment, and the potential unavailability of spare parts.

Partial upgrades
An upgrade may consist of a new control system, new functionality and a new generation of hardware and software. Upgrades of one or more of the following, can be addressed as partial upgrades:

- MACH control system
- Cooling system
- Thyristor valve



Extended lifetime and new functionality

Partial upgrades of the MACH control system can be tailored to customer needs.

Spare parts
The right part, at the right place, in the right time is our goal. ABB strives to continuously increase the lifetime of your components. Using high-quality spare parts management, we are able to inform you what spare parts are needed to minimize unnecessary downtime.

Lifecycle management
High voltage switchgear sub-components

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01 HVDC Service are backed by ABB Transformer Service (TRES), whom consists of professional engineers experienced in transformer installations and maintenance worldwide.
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02 HVDC Service backed by ABB HV Breakers Service, have available resources and experts for maintenance and life extension during circuit breaker lifecycle.
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03 HVDC Service are backed by ABB HV Components Capacitors experts from Ludvika Sweden.
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04 HVDC Lifecycle Service team keeps the power flowing and acts like a service and system integrator, backed by ABB HV Components experts in Transformers, Capacitors, and Breakers.

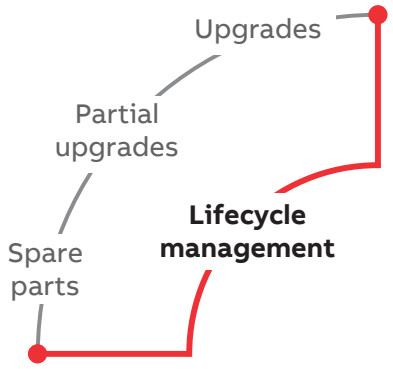
HVDC Systems include a range of high-voltage sub-components. Various maintenance procedures can be performed to keep the equipment in its original new condition. Access to sub-components expertise is also available through HVDC Care channel.

HVDC Service
- HVDC Classic
- HVDC Light
- MACH control system
- Valves, cooling system

Transformer Service
- Transformer Intelligence
- Site Services
- Repair
- Parts
- Training

Capacitor Service
- Capacitance measurement
- Cleaning, cracks & leakage
- Painting damage / formation of rust
- Replacement of faulty capacitor units

HV Breakers Service
- Installation and commissioning
- Preventive maintenance kits
- Spare parts, repair, and replacement
- Training (hands on & theory)



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The right sub component, at the right place, in the right time

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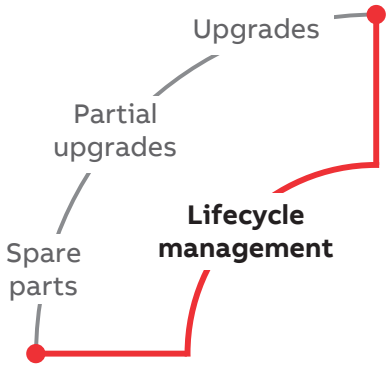
Upgrades
Extended operational lifetime

Being proactive and planning an upgrade is far better than passively waiting for a breakdown. Based on many years of experience from complex installations, ABB offers services to evolve or upgrade the installation to the next generation, to extend system lifetime, to improve availability and reliability.

Upgrades
There are several reasons to upgrade a system. First, many installations are critical for the supported system, transmission, or network. Additionally, there are challenges to maintain competence in limited and obsolete technologies when key staff members leave the company. Finally, parts from other equipment manufacturers may be unavailable, which causes long lead times and higher costs. Upgrades allows us to mitigate these risks. Upgrading will also help you keep maintenance costs on a controlled level, thanks to better design and state.

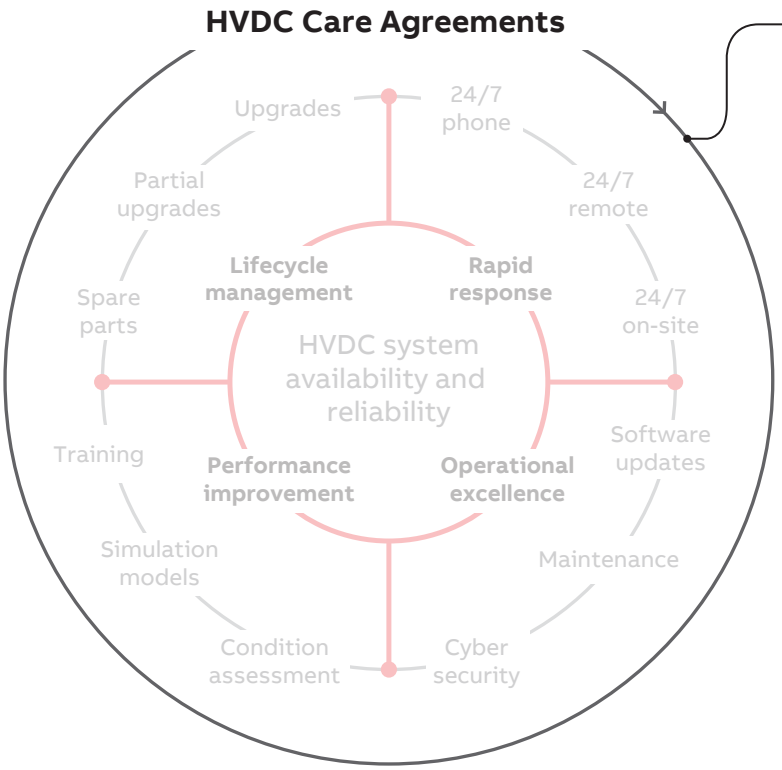


Proactive upgrade reduces risk of outage and long down period

Minor incidents, major incident and breakdown
Upgrades extends the systems operational lifetime, its value and production capacity. Also an upgrade significantly increases reliability and availibility even more.

HVDC Care agreements

An uptime insurance tailored to your needs



Part of ABB standard Care agreements

There is a growing demand for HVDC Care agreements, an uptime insurance for increased peace of mind, enabling the customer to focus on their core business. The best effect of a Care agreement is achieved when implemented early in the system lifecycle. Following that, necessary services can be applied throughout all stages of the life of your system.

HVDC Care agreements defines the service level, validity time, and whether it is a recurrent (licensed) or one-time delivery. HVDC Care agreements, are available for all phases of an installation's life cycle, and in many cases, corrective action is needed only occasionally. ABB is committed to the concept of customized support, and provides several service options.

By signing a HVDC Care agreement with ABB for all services needed for the converter station, maximized availability and reliability is obtained. Rapid response , lifecycle management, performance improvement, operational excellence, and other services are tailored to our customer needs. HVDC Care service products is a foundation for our HVDC Care agreements, and tailored to the customer needs. ABB can in agreement with the customer be the sole provider, single-point-of-contact, to service your asset. This includes 24/7 support, and we follow international standard for maintenance.

HVDC Care agreements, tailored to Customer needs

Rapid response

We guarantee fast and flexible response to maximize your equipment uptime

Lifecycle management

We employ powerful tools and knowledge to optimize and extend your equipment life

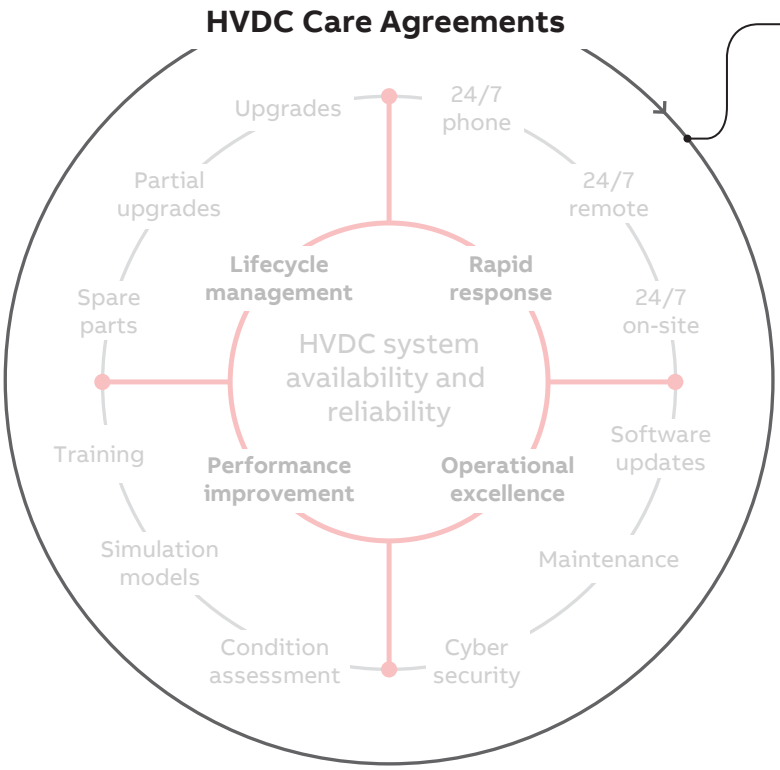
Performance improvement

We optimize connectivity, reliability and efficiency of your assets to increase speed and yield

Operational excellence

We together manage your assets operations, and risk to deliver strategic business results

HVDC Care agreements
Service description



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Peace of mind for our customers

The HVDC Care agreement is the key to ensuring the reliability and availability of an HVDC link during its entire lifetime.

By providing the technical support and the preventive maintenance package the contractor delivers the best possible products to achieve maximum of benefits from a proactive service culture and keeping the total costs of ownership as low as possible over the entire lifetime of the HVDC converter station.

Strict observation of health, safety and environmental issues, rules and regulations are built into all services provided.

HVDC Care agreement scope:

Technical support line
- 24/7 phone
- Corrective maintenance
- 24/7 remote

Preventive maintenance
- 10 year preventive maintenance plan
- Project management, review and reporting
- Asset management
- Spare parts management
- Other according to customer needs
- Improvements

Cyber security update service

Software preventive maintenance

HVDC CARE AGREEMENTS

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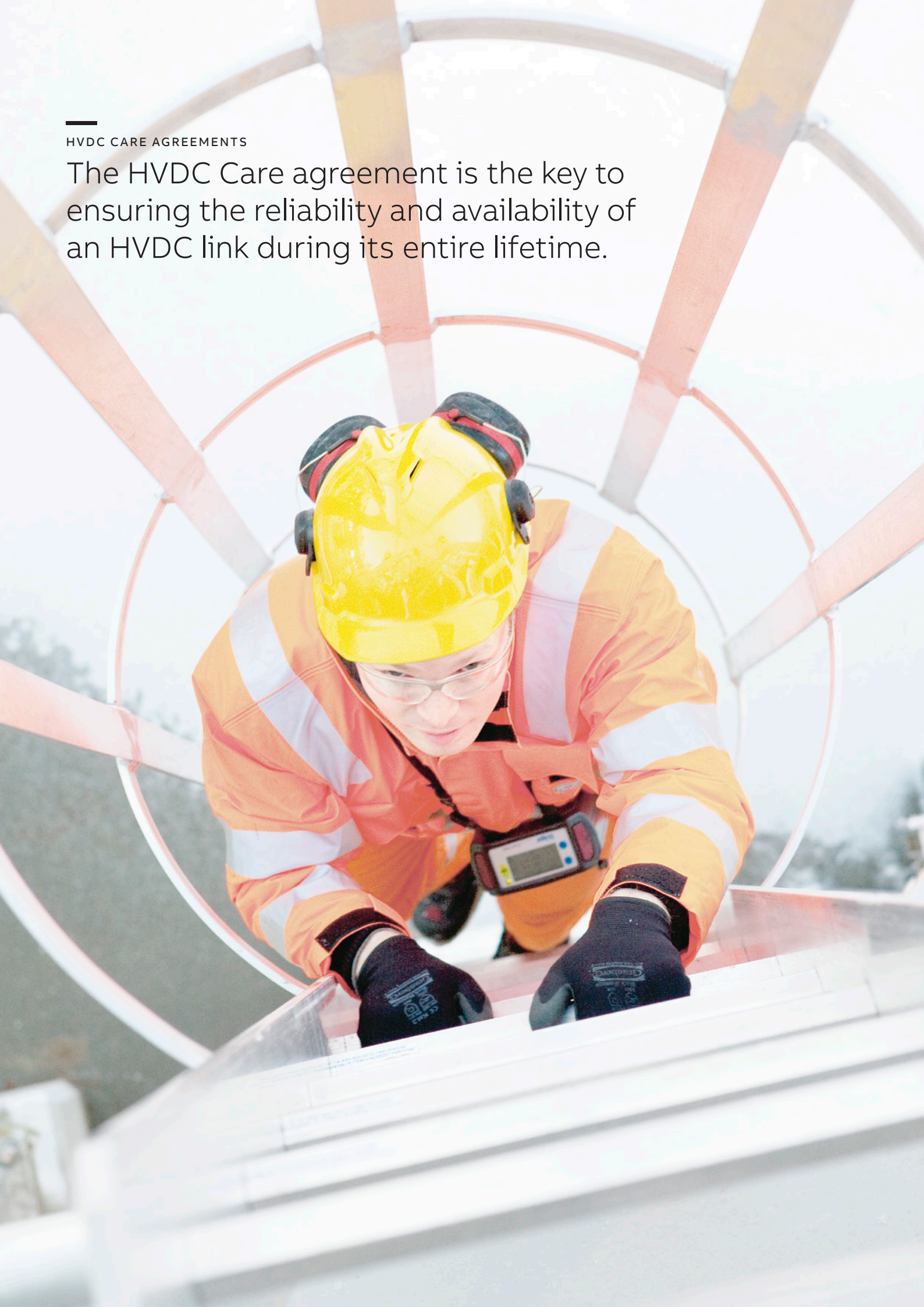

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ABB ID NO: POW0079, REV.B