

ABB Ability™ Safety Plus for hoists

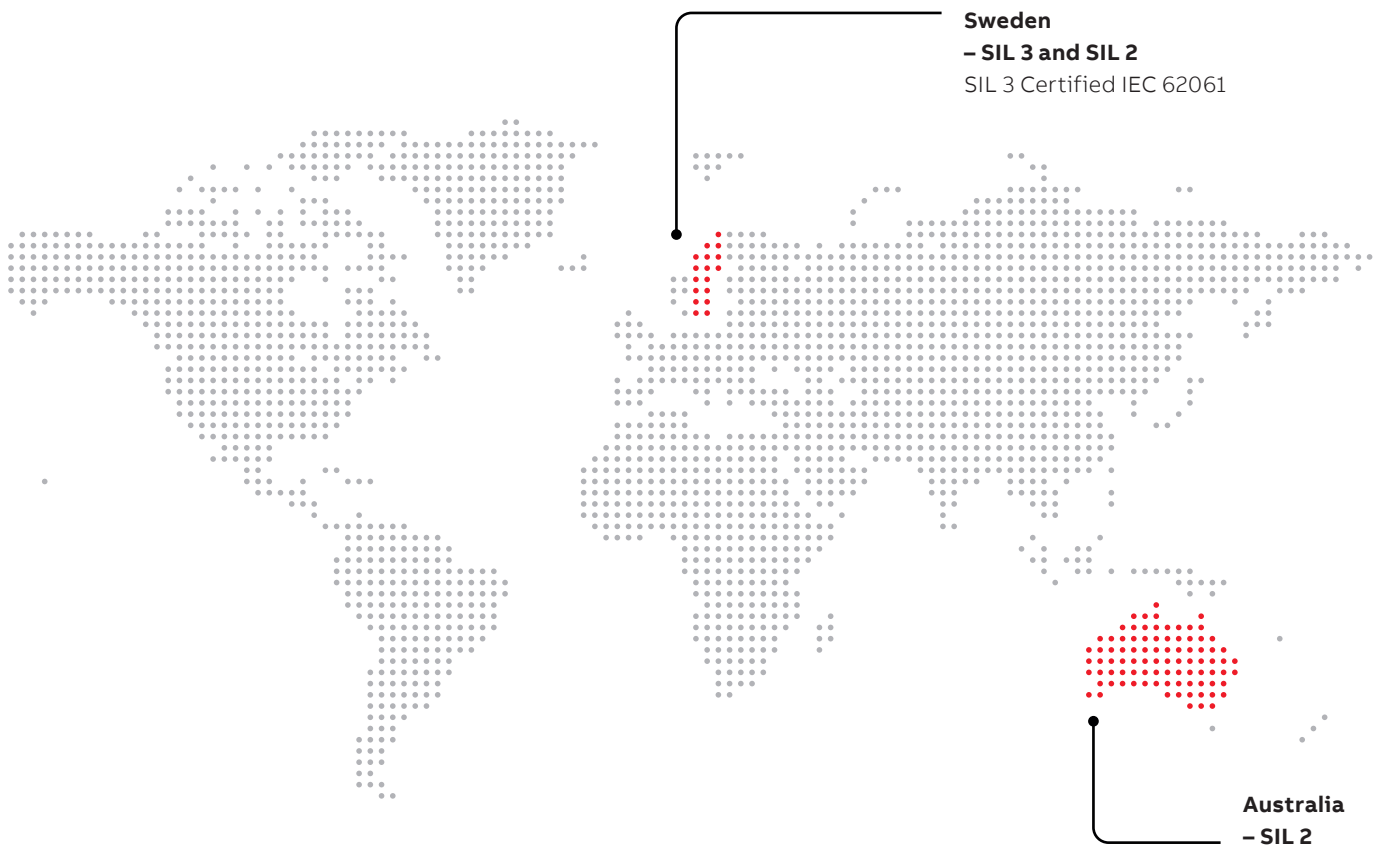
Reaching new levels
of safety



• SIL 3 Certified IEC 62061

Legislation is changing to comply with SIL

Safety Integrity Level



What is SIL?

Safety Integrity Level

Safety Integrity Level or SIL is a term used by International Functional Safety Standards including IEC61508 and IEC62061. SIL levels range from 1 to 4. The higher the number, the higher the level of safety and the lower the probability that the safety-related system will fail to carry out the required safety functions.

While there are four SIL levels, IEC62061 does not recognize SIL 4 as if the process requires SIL 4, it's sometimes said that the process needs to be reconsidered.

Safety Integrity Level (SIL)	Probability of dangerous failure per hour in continuous mode (mine hoists)		Relative Safety Level
	Equal to/greater than	Less than	
4	$>10^{-9}$	$<10^{-8}$	↑
3	$>10^{-8}$	$<10^{-7}$	
2	$>10^{-7}$	$<10^{-6}$	
1	$>10^{-6}$	$<10^{-5}$	

Your challenges

Some countries, including Sweden and Australia, have included in their mining regulations that hoist systems must include functional safety systems. Other regions are considering implementing similar legislation.

Mandatory or not, more and more mining companies have anyway decided to increase the level of safety of their mine hoists to ensure their employees and equipment are safe.

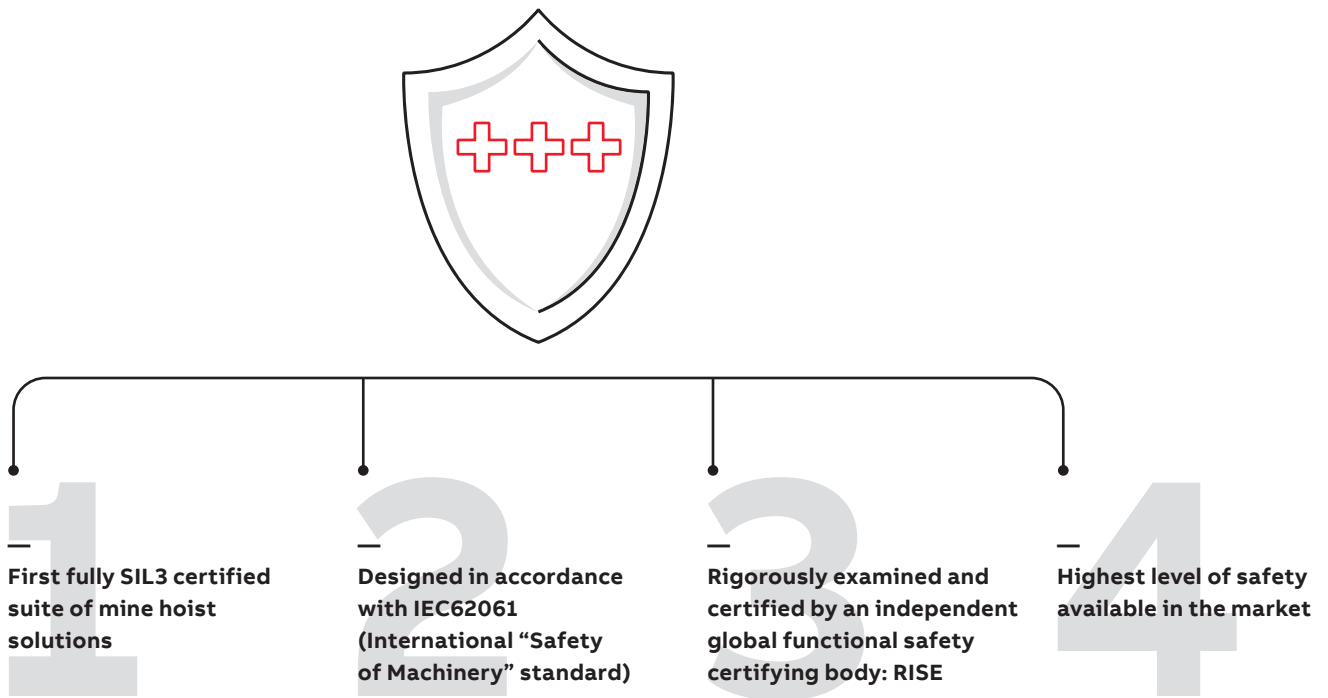
**“I need to get
compliant with
SIL certification”**



**“I want to ensure
the highest level
of safety for my
employees and
equipment”**

ABB does not compromise on safety

ABB introduces ABB Ability™
Safety Plus for hoists



About RISE, Research Institute of Sweden

Independent global functional safety certifying body

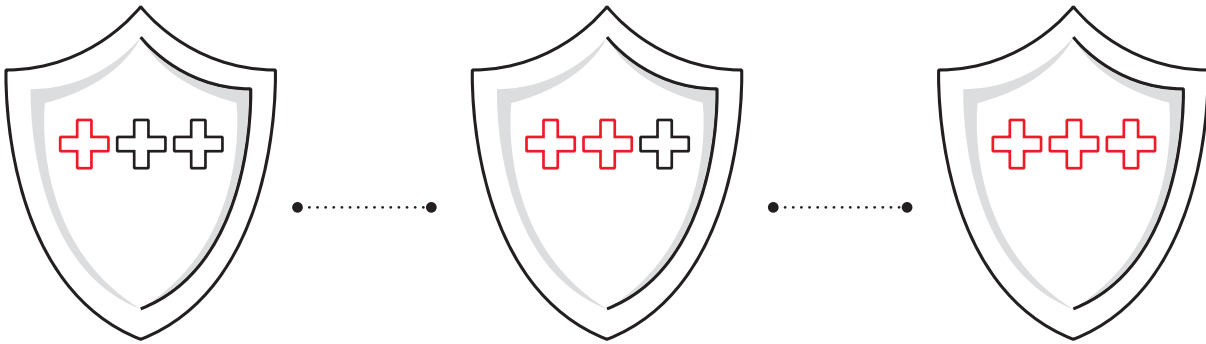
- RISE is an independent organization that certified ABB’s functional safety products “fulfill the requirements in standard IEC62061” – International Standard for Functional Safety of Machinery.
- RISE provide a wide range of advanced services and support to industry.
- Their roots go back to 1960s and currently, they employ over 2800 “problem solvers”. RISE has a high level of expertise in functional safety and have presented technical papers on functional safety within the mine hoist industry. RISE also provides independent certification services.
- <https://www.ri.se/en/about-rise/about-rise>

**RI
SE**

Research
Institutes
of Sweden

ABB's approach to mine hoist safety

ABB Ability™ Safety Plus for hoists portfolio



Safety Plus Hoist Monitor (SPHM) is the world's first mine hoist safety monitor designed in accordance with IEC62061 international functional safety standards (Safety of Machinery) and achieving Safety Integrity Level 3 for the majority of its safety protections (SRCFs).

SPHM can be easily installed on any mine hoist with any type of control system. It connects into the existing hoist control "safety circuit" and trips the existing "safety circuit" in case it detects a safety hazard.

In addition to the critical "overspeed", overwind/underwind, SPHM also includes the following additional safety protections:

- Roll-Back, incorrect direction
- Encoder drive failure
- Protection bypass
- Worn friction linings
- Rope Slip
- Rope Miscoiling
- Slack Rope
- Unclutched Drum Movement

Safety Plus Brake System (SPBS) provides the highest level of safety available to the critically important mine hoist brake system. It is the world's first mine hoist brake system designed in accordance with IEC62061 functional safety standards (machinery) and achieving independent certification by an outside 3rd party organization.


Integrated Electrical and Hydraulic Design ensures fast and reliable brake operation providing ease of mind to you and your employees.

SPBS provides the following SIL 3 based protective functions:

- Bringing the hoist to a safe state (Stop) after a safety circuit trip and maintaining the safe state (emergency braking)
- Holding the hoist unbalance when stopped (service braking)
- Prevention of unexpected brake release when mine personnel are embarking/disembarking the cage (brake channel isolation)
- Holding the unclutched drum unbalance (brake channel disabling)
- Control of hazardous energy during maintenance (brake channel disabling)
- Lowering the hoist unbalance under gravity force in case of extended power outage or failure of the drive system (gravity winding).

Safety Plus Hoist Protector (SPHP) includes all the safety functionality of Safety Plus Hoist Monitor, interfaces with Safety Plus Brake System, with additional SIL based protective functionality to not only the mine hoist itself but as well to the rest of the mine hoist infrastructure including:

- Remote emergency stops in hoist house, headframe, shaft locations, etc.
- Maintenance lock-outs in hoist house, headframe, shaft locations, etc.
- Shaft gate interlock
- Cage door interlock
- Tail rope loop
- Inspection platform monitoring
- Shaft obstruction monitoring

A man wearing a white hard hat with the ABB logo, sunglasses, and an orange safety vest over a dark long-sleeved shirt, stands in a desert landscape with mountains in the background. He is smiling slightly and looking to the right.

We offer the safest, optimized and fit-for-purpose hoisting solutions.

With ABB Ability™ Safety Plus, take safety to the next level.

ABB Ability™ Safety Plus for hoists offers you peace of mind



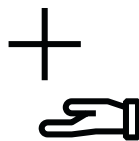
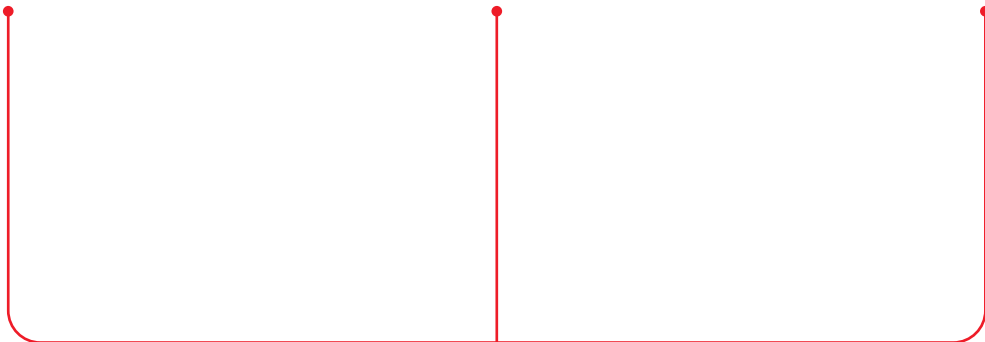
Protect personnel,
equipment and
infrastructure



Best in
Class Safety



Highest
Reliability



Fit for your purpose
and requirements –
ready made safety
solutions



Rugged solutions
specifically designed
for tough mine
environment

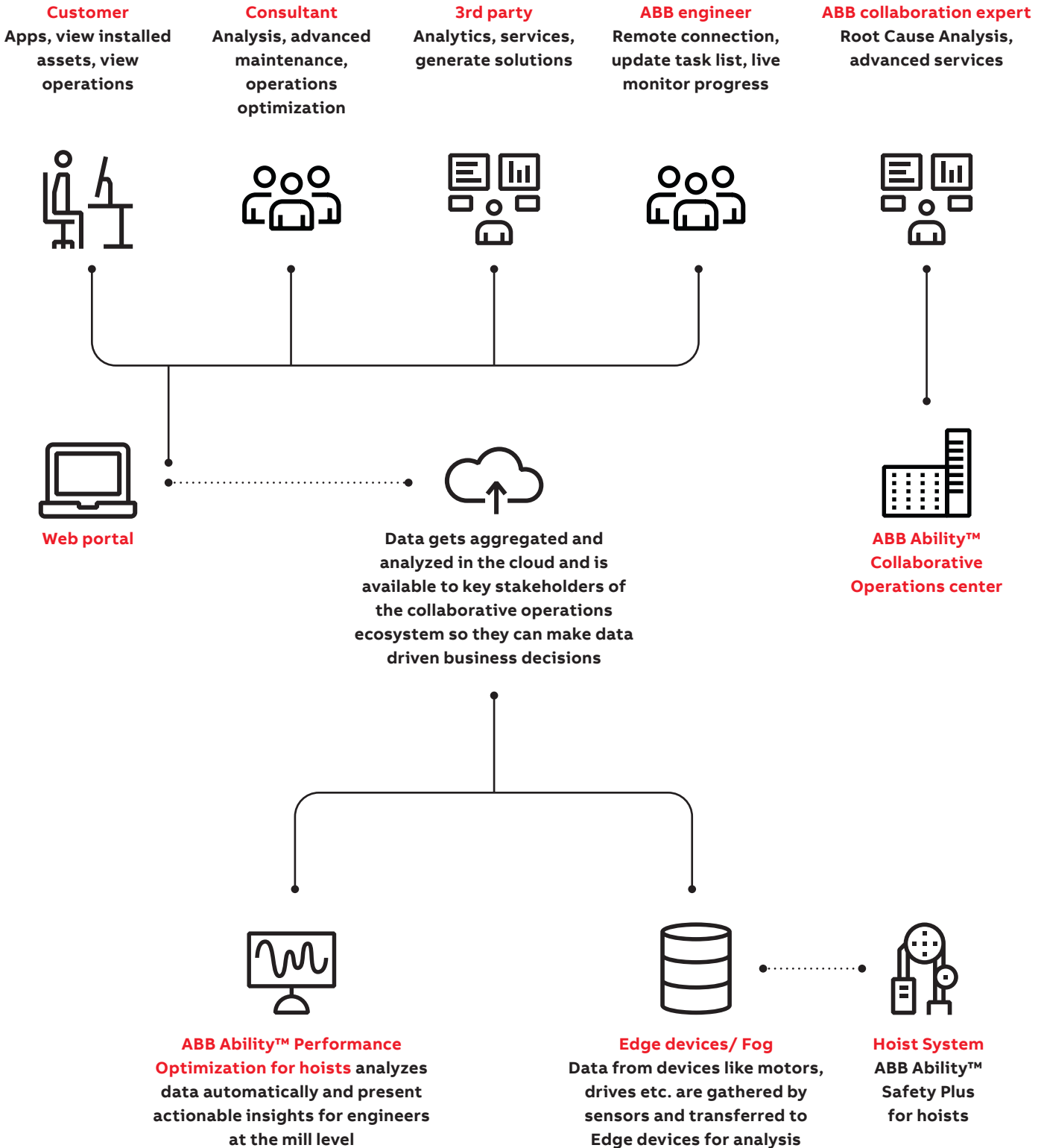


Exhaustively tested in house,
approved by an independent
global body and already
proven at some mine sites

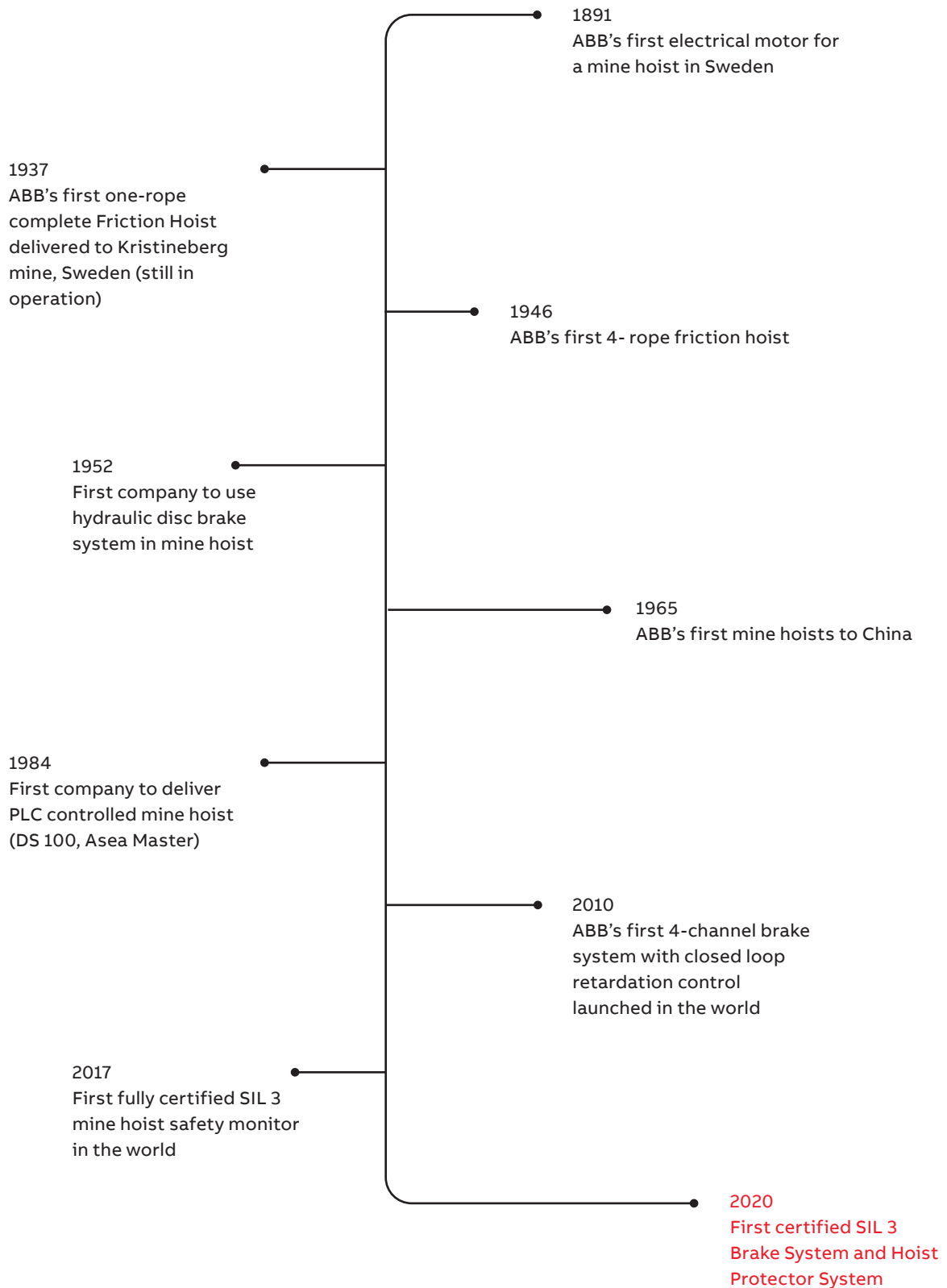
ABB Ability™ Collaborative
Operations: new ways of
working together



Collaboration in data-driven ecosystem



A new first of its kind for ABB in mine hoist systems



Let's talk

We design our solutions to your safety requirements

Benefit from ABB's mine hoist expertise of almost 130 years

ABB functional safety experts can design your specific safety requirements according to IEC62061 functional safety standards and integrate those protections into our solutions.

Our mining engineering team has been designing the safest, optimized and fit-for-purpose hoisting solutions for almost 130 years and over 1000 hoisting solutions worldwide, integrated with advanced digital services. Our engineers have become domain experts in mine hoist control and safety – an unbeatable combination for the mine hoist industry. They are available to assist you in performing mine hoist risk assessments and SIL determination, implementing functional safety management processes or providing after sales assistance with safety audits.





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**For contact details,
please visit our website:
abb.com/mining/safetyplus
Or send an email to
minerals@ch.abb.com**

