HEALTH, SAFETY, ENVIRONMENT, SECURITY AND SUSTAINABILITY (HSE/SA)

Requirements for HSE/SA Plan

in addition to any customer/site Health, Safety & Environment Plan

Project:	<Project Name>
ABB Order-No.:	<SAP Order-No.>
Equipment/Scope of Supply:	MEGADRIVE-LCI Control Upgrade

Site Responsible Unit:	**<Company>** <Address>
Project/Site Manager:	<Name> <email> <Phone>
HSE Manager:	<Name> <email> <Phone>

Customer Site:	**<Company>** <Address> <Name of Contact Person> <Phone>

PREPARED	STATUS	SECURITY LEVEL		
[YYYY-MM-DD] [Prepared by]	In Review	Internal		
APPROVED	DOCUMENT KIND			
[YYYY-MM-DD] [Approved by]	based on template 3BHS829864 E01 Rev. D			
OWNING ORGANIZATION	DOCUMENT ID.	REV.	LANG.	PAGE
Motion MOSE-MS	3BHSxxxxxx E01	-	en	1/18

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Contents

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1. Purpose and Basic Description

This document defines **requirements for Health, Safety, Environment, Security and Sustainability (HSE/SA)** which needs to be considered and incorporated into any overall customer/site HSE/SA plan.

The purpose of an effective safety and damage- / loss prevention program is to protect the life, health and safety of all personnel, as well as to eliminate the possibility of damage to property and equipment while carrying out an efficient work schedule. We will ensure that only the highest level of safety standards will be implemented during the duration of the project.

Project specific HSE/SA targets are to be set by site responsible unit/organization and needs to be in line with this document by:

- providing of a **site specific HSE/SA plan** for ABB staff and any involved subcontractors
- ensuring **access to medical facilities** / services on site (First aid, doctor, ambulance repatriation, etc.)
- having **Site Emergency and Evacuation Plans** in place
- providing Site **access regulation** concept including a **work permit concept**

Safety, Environmental and Quality principles and objectives are based on the following:

ABB strives to provide a safe and healthy working environment at all sites and facilities and to take adequate steps to prevent incidents and injury to health arising out of the course of work by minimizing or eliminating so far as is reasonably practicable, the causes of hazards inherent in the working environment.

2. Validity

for all onsite services provided by Global Service Center Switzerland (GSC CH) for MV Drives.

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3. General requirements

3.1. Site Responsible Unit (SRU)

3.1.1. HSE/SA plan for the customer site

The site responsible unit needs to consider and incorporate the content of this document *"Requirements for HSE/SA Plans in addition to any customer/site Health, Safety & Environment Plan"* into an overall HSE/SA plan for the customer site.

All safety relevant (local) regulations, documents and standards applicable to the project and customer site needs to be considered and incorporated into an overall HSE/SA plan by the site responsible unit.

All relevant documentation for the described scope of supply and work must be available on site for the ABB staff

3.2. ABB staff and equipment

3.2.1. Training and Competencies

The personnel dispatched to perform service activities is trained to fulfill ABB Switzerland's safety standards for travelling and performing the work on Medium Voltage Drive equipment.

The [3] *MV Drives Safety Pocket Guide* obliges ABB staff to report unsafe situations respectively to stop all activities and/or leave any unsafe place at any time and with all consequences, if the unsafe situation cannot be cleared immediately.

Certificates are available on request.

3.2.2. Personal Protective Equipment (PPE)

The ABB staff dispatched is equipped with standard field service personal protection equipment (PPE) according to [2] *MV Drives List of Standard PPE*. In case of additional PPE requirements from the customer site, the customer shall provide the extra suitable PPE for our ABB service staff.

3.2.3. ABB Measuring Equipment

The ABB staff dispatched is trained to work with measuring equipment provided by ABB. The measuring equipment has maintenance intervals according to ABB Standard.

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4. Organization and Responsibilities

4.1. Organizational Responsibilities and Communication

The **site responsible unit (SRU)** must ensure that an appropriate

- **HSE/SA plan** is established,
- **risk assessment** has been made,
- **roles and responsibilities** of all involved parties are clearly defined and
- site specific **(safety) trainings** are held before any start of work.
- site specific **Alarm Table and Emergency Procedure** is available and
- **Tool Box Meeting** are conducted daily before start of work.

The **ABB Switzerland** Site Supervisor/Lead Engineer/Field Service Engineer is responsible to

- carry out **Job Hazard Assessment** (Work Method Statements), if deemed necessary for the work activities as per defined scope of work.
- **Site Inspection / Safety Observation Tours** should be made regularly, and findings reported to the site responsible unit.

Actions **(R)** Responsible for doing the work **(A)** Accountable as the approver or final authority to sign-off on a decision or activity **(C)** Consulted as experts or specialists on a particular matter **(I)** Informed	**Site Responsible Unit**	**ABB Switzerland Ltd**				
		Project Manager (Back Office)	Site Supervisor / Lead Engineer (On Site)	Field Service Engineer (On Site)	Sub-Contractor (On Site)	HSE/SA Manager (Back Office)
HSE/SA plan	**A/R**	**C**	**I**	**I**	**I**	
Risk Assessment	**A/R**	**C**	**C**	**C**	**I**	
Alarm Table / Emergency Procedure	**A/R**	**I**	**I**	**I**	**I**	
Site Organization Chart / Contact List	**A/R**	**C**	**I**	**I**	**I**	
Onsite Training for staff	**A/R**	**I**	**R**	**R**	**I**	
Tool Box Meeting (Regular) Sustainability Observation Tour (SOT)	**A/R**	**I**	**C**	**C**	**C**	
Job Hazard Assessment (Work Method Statement), if needed	**A**	**I**	**R**	**C**	**C**	
Site Inspection (Regular)	**A**	**I**	**R**	**C**	**C**	
Accident Report	**I**	**C**	**R**	**I**	**I**	**I**

Figure 1: RACI Chart for Organizational Responsibility

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5. Determination of Hazards & Planning of Measures

Risk Assessments and/or Job Hazards Assessment (Work Method Statement) shall be prepared for work activities and tasks including, but not limited to:

- road traffic management
- Working on MV Drives equipment
- Measurement on MV Drive equipment
- confined spaces
- working at heights
- use of cranes
- lifting of equipment

5.1. Risk Assessment

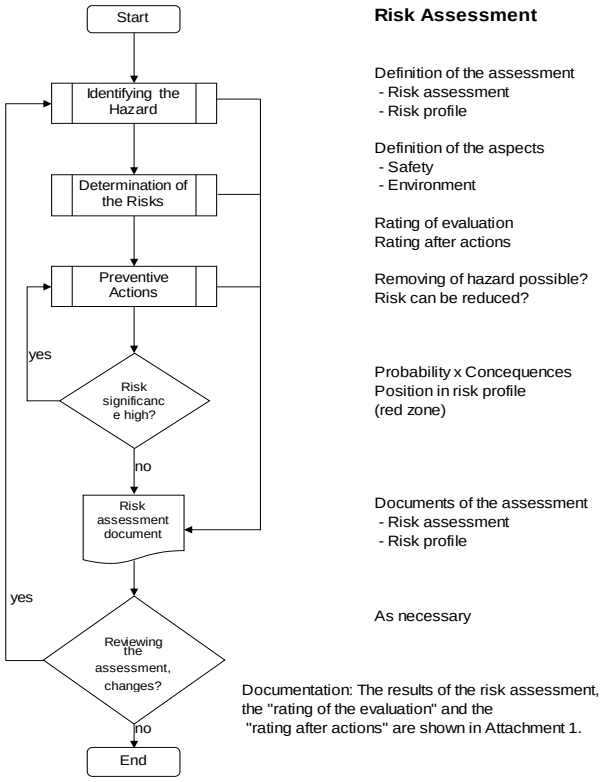

Figure 2: Flowchart of Risk Assessment Methodology

5.1.1. Identifying Hazards

The first step of a risk assessment is to **identify possible hazards** or group of hazards. It should also be considered who might be harmed and how.

5.1.2. Determination of Risk

Once the hazard has been identified, the next step is to determine the actual risk. This is done by deciding upon the **Probability (P)** (with a value from 1 – 6, with 1 being *impossible* and 6 being *often*) that the hazard is going to have an effect.

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Following this, it must be decided what the severity of the **Consequences (C)** (with a value from 1 – 4, with 1 being *low* and 4 being *very high*) if an accident were to occur due to the identified hazard.

The **Risk Level** will be calculated by multiplying the Probability (P) by the Consequences (C).

The different colors used in the charts (9.1 ATTACHMENT 1 – RISK ASSESSMENT FOR TYPICAL SERVICE ACTIVITIES ON MV DRIVES) indicate the severity of the risk (green = acceptable; red = not acceptable).

5.1.3. Preventive Actions

If the risk assessment has determined that severity of risk is not within an acceptable range, appropriate actions needs to be implemented by removing the hazard or, if not possible by controlling risks so that harm is unlikely.

Once the preventive actions have been implemented, the Risk Assessment process should be repeated to quantify the residual risk. The remaining risk severity should be within acceptable range.

5.1.4. Reviewing the Assessment

The assessment must be reviewed and revised as necessary, for example if there is a significant change to the work area or if for any other reason it is suspected that the assessment is no longer valid.

5.2. Job Hazard Assessment

A Job Hazards Assessment (work method statement) is a document typically used to describe specific instructions on how to safely perform a work-related task or operate a piece of plant or equipment.

Job Hazards Assessment (work method statement) [4] shall be produced for specific situations on site which are not foreseen in the Risk Assessment (9.1 ATTACHMENT 1 – RISK ASSESSMENT FOR TYPICAL SERVICE ACTIVITIES ON MV DRIVES)

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6. Incident Reporting

6.1. Reporting of Incident/Accident

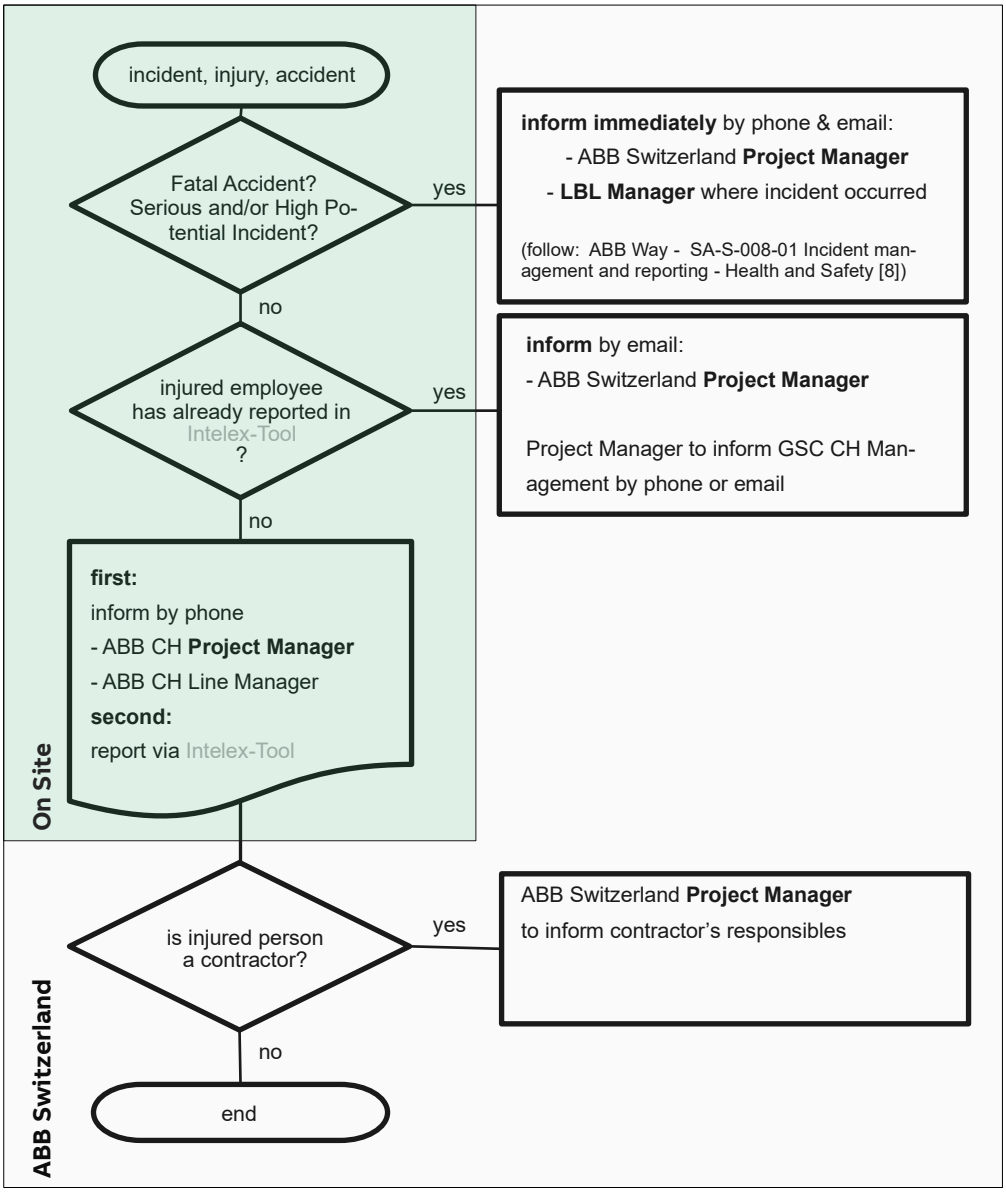

Figure 3: General reporting flow in case of incident/accident

6.2. Reporting of Fatal Accidents and Serious Incidents

A fatal accident or serious incident requires **immediate reporting and notification by phone and** email to ABB Switzerland **Project Manager**. A prompt investigation on the accidents and incidents is needed where ABB employees, sub-contractors, and other persons for whom ABB has responsibility, are involved.

ABB internal process as per [8] *ABB Way – Management System Instruction SA-S-008 Incident management and reporting* needs to be followed.

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7. Additional Information

7.1. Listing of related documents

Ref #	Document Kind, Title	Document No.
[1]	MV Drives Health & Safety Policy	3BHS827563 E01
[2]	MV Drives List of Standard PPE	3BHS827536 E01
[3]	MV Drives Safety Pocket Guide	3BHS827530 E01
[4]	MV Drives Job Hazard Assessment (template)	3BHS880490 E00
[5]	MV Drives Job Hazard Assessment JHA_001_Standard Field Service Activities	3BHS880490 E01
[6]	ABB Way - Management System SA-I-01-01 Glossary - The ABB Way (for ABB internal use only)	9AAL000142A0120
[7]	ABB Way - Management System SA-S-004-01 Job hazard assessment template (for ABB internal use only)	9AAL000142A0022
[8]	ABB Way - Management System SA-S-008-01 Incident management and reporting - Health and Safety (for ABB internal use only)	9AAL000142A0090
[9]		

7.2. Abbreviations and key terms

7.2.1. Abbreviations

GSC CH – Global Service Center Switzerland

HSE – Health, Safety and Environment

HSE/SA – Health, Safety, Environment, Security and Sustainability

LBL – Local Business Line

LOTO – Lock out/Tag out

MV Drives – Medium Voltage Drives

PPE - Personal Protective Equipment

SRU – Site Responsible Unit

7.2.2. Key Terms

ABB staff – ABB employees and/or contractors dispatched by GSC CH

ABB unit – Business Line (BL), Local BL, Product Group (PG) LPG, geographical location for a group function or Sales and Services according to the Small Country Model.

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Contractors – Persons employed by third party (or self-employed) with a contractual (by written contract only) relationship with an ABB Group Company, including any Subcontractors and Suppliers.

Customer site – Customer location where ABB employees and/or contractors perform a workrelated activity (servicing of utilities, machinery and/or equipment) on behalf of ABB.

Fatal incident – Occurring directly as a result of a work-related incident, including those that occur sometime after the incident as a direct result of the injuries sustained. An employee, contractor or sub-contractor fatality should be reported, when it is work-related. If a person receives an injury or contracts an illness from their work activities that on a later date results in death this should be recorded. Excluded are fatalities arising from natural causes, unless there is evidence of a failure in the application of health and safety procedures, e.g. inadequate provision of emergency first aid. An employee, contractor and sub-contractor serious injury should be reported when it is work-related.

High potential incident (HiPo) – Characteristic of an incident which realistically, under different circumstances, would very likely cause serious injuries, permanent disability or death to one or more persons and/or major environmental damage. HiPo is not a separate category of incident.

Near miss – Incidents that could have caused injury but did not with the only reason for no injury being the luck of the individual(s) involved in the incident. The reporting of near misses should focus on true near misses and not on physical conditions or unsafe situations.

Risk Assessment – The systematic process used to evaluate the magnitude of health, safety, environment and sustainability risks.

Serious injury incidents – Incidents resulting in any of the following injuries: amputation / serious or multiple fractures / loss of sight in one or both eyes / serious burns / any other injury or incident resulting in unconsciousness requiring resuscitation or admission to hospital for more than 24 hours. Serious injury incidents may or may not include lost time.

Service – ABB staff based on, or visiting, customer sites to undertake servicing of facility, machinery and/or equipment.

Significant risk or **high risk –** A risk, after being assessed, has both high probability and severity resulting in “red zone” classification. The risk must be addressed immediately with suitable and effective control measures or task avoidance.

Site Responsible Unit (SRU) - The organization (typical: local ABB unit or customer representative) which has overall accountability for ensuring HSE responsibilities are fully established and agreed for any planned services activity at customer site.

Sustainability Observation Tour (SOT) – A Sustainability Observation Tour is a visit and walk around of a work location, undertaken by Managers and Supervisors to observe working practices, engage with people and talk about Heath, Safety, Environment, Security and Sustainability and everyday working behaviors.

Tool Box Meeting - A Tool Box Meeting is an informal safety meeting that focuses on safety topics related to the specific job, such as workplace hazards and safe work practices. Meetings are normally short in duration and are generally conducted at the job site prior to the commencement of a job or work shift.

Work Method Statement - A work method statement is a description of how the work will be carried out safely. This document is usually used for higher risk work, to provide information to employees about how the work should be done, and the precautions needed.

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8. Revisions

Rev.	Page (P) Chapt. (C)	Description	Date Dept./Init.
-			

Template: 3BHS829864 E01

Rev.	Page (P) Chapt. (C)	Description	Date Dept./Init.
-	1, 7, 13-16 Att. 2-5	Initial version this updated document 3BHS829864 E01 substitutes document 3BHS353840 E02	2016-02-19 C. Fiordimela DMDR-SP
A	all	check and update on several chapters	2016-04-22 M. Buschmann DMDR-SP
B	all	new layout and structure	2016-11-15 D. Fenz DMDR-SP
C	all	reworked and new layout adapted to meet requirements of “the ABB Way - HSE/SA management system”	2020-01-24 MOSE-MS/ D. Fenz
D		Attachment 2 – Contact list updated Attachment 3 – Job Hazard Analysis NEW C 7.1 Update of related documents	2020-06-05 MOSE-MS/ D. Fenz

9. Addendum

9.1 ATTACHMENT 1 – RISK ASSESSMENT FOR TYPICAL SERVICE ACTIVITIES ON MV DRIVES

9.2 ATTACHMENT 2 – Contact List

9.3 ATTACHMENT 3 – Job Hazard Assessment

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9.1. ATTACHMENT 1 – RISK ASSESSMENT FOR TYPICAL SERVICE ACTIVITIES ON MV DRIVES

Significance of the Risks

	P x C = R			
	Probability 1-6	**C**onsequences 1-4	**R**isk-Level	
Acceptable	2	2	**4**	**< 6**
Not acceptable; Must take action to reduce the hazard	2	3	**6**	**> = 6**

Probability	**P**	
6	often	happened in similar projects in the past
5	probable	to anticipate in the project
4	sometimes	more then one case in similar projects in the past
3	seldom	at least one case in similar projects in the past
2	improbable	never happened in similar projects in the past
1	impossible	not possible

Consequences	**C**	
4	very high	fatal accident
3	high	serious injury
2	medium	recoverable injury
1	low	first aid accident (no medical treatment)

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Hazard Evaluation				P x C = R			Measures		P x C = R		
No.	**Hazard**	**Danger Zone**	**Risk Description**	**P (1-6)**	**C (1-4)**	**Risk**	**Guidelines / Rules**	**Preventive Action**	**P (1-6)**	**C (1-4)**	**Risk**
	General			P	C	**R**			P	C	**R**
1	language	whole communication listen / speak / read	injuries or loss of life	2	4	**8**	legal regulations work instruction site instructions	request an interpreter	2	2	**4**
2	road accident	travel from or to the site	injuries or loss of life	2	3	**6**	legal regulations ABB travel management	restrict travel time use local customer transport	2	2	**4**
3	escape impossible	site converter - container	to be trapped on site	4	3	**12**	legal regulations	escape procedure remove obstacles order & tidiness put up signs	1	2	**2**
4	industrial accident	site	injuries or loss of life	2	3	**6**	legal regulations work instruction site instructions	training of personnel apply correct equipment wear protective equipment and clothing	2	2	**4**
5	working at height	converter - container ladders - scaffolding	injuries or loss of life	2	3	**6**	legal regulations	training of personnel apply correct equipment and clothing	2	2	**4**
6	high voltage	electrical equipment	injuries or loss of life	2	4	**8**	legal regulations instructions in user manual Electrical safety concept ABB Safety guideline (5+5)	training of personnel protection concept apply correct equipment and clothing	2	2	**4**
7	fire	site	injuries or loss of life damages	3	3	**9**	legal regulations user manual	check availability / use of fire extinguisher training of personnel comply with alarm instruction	2	2	**4**
8	explosion	components converter capacitor	injuries or loss of life damages	3	3	**9**	legal regulations assembly instructions - user manual	training of personnel keep doors closed apply best available technology restrict access	2	2	**4**
9	hot surfaces	converter - capacitor components	burn	2	2	**4**	user manual	check / apply safety labels check protection covers wear protective equipment and clothing	2	1	**2**
10	falling tools / objects	site	injuries or loss of life damages	2	3	**6**	legal regulations	comply with instructions wear protective equipment and clothing	2	1	**2**

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Hazard Evaluation				P x C = R			Measures		P x C = R		
No.	Hazard	Danger Zone	Risk Description	P (1-6)	C (1-4)	Risk	Guidelines / Rules	Preventive Action	P (1-6)	C (1-4)	Risk
	Shipment			##	##	##			##	##	##
11	handling / lifting (heavy loads)	converter - container	falling tilting	2	3	**6**	instruction for lifting in user manual	training of personnel comply with instructions apply correct equipment and clothing	2	2	**4**
12	environmental pollution spill of liquids	site	contamination / health risk	2	3	**6**	environmental regulation local regulations installation instructions	supervised installation civil works	2	1	**2**
	Installation			##	##	##			##	##	##
13	injury	various	sharp edges	3	1	**3**	legal regulations comply with instructions in user manual	training of personnel apply correct equipment wear protective equipment clothing wear protective sharp clothes	2	1	**2**
14	high voltage	electrical equipment	injuries or loss of life / damages	2	4	**8**	user manual Electrical safety concept ABB Safety guideline (5+5)	training of personnel installation according to the instructions in the manual wear protective equipment and clothing	2	2	**4**
15	falling tools / objects	site	injuries	2	3	**6**	legal regulation	comply with instructions wear protective equipment and clothing	2	1	**2**
16	handling / lifting (heavy loads)	site	falling tilting	2	3	**6**	instruction for lifting in user manual	training of personnel comply with instructions apply correct equipment	2	1	**2**
17	environmental pollution spill of liquids	site	contamination / health risk	2	3	**6**	environmental regulation local regulations installation instructions	supervised installation civil works	2	1	**2**

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Hazard Evaluation				P x C = R			Measures		P x C = R		
No.	Hazard	Danger Zone	Risk Description	P (1-6)	C (1-4)	Risk	Guidelines / Rules	Preventive Action	P (1-6)	C (1-4)	Risk
	Commissioning			##	##	##			##	##	##
18	failing of safety system	converter - container	injuries or loss of life	2	3	**6**	user manual test procedure - commissioning check list	frequent tests of safety system apply redundant safety system	2	2	**4**
19	interference on implants (medical) High magnetic field	converter - container	malfunction	2	3	**6**	warning regulations IEC instruction in user manual	apply safety label	1	2	**2**
20	injuries or danger of life of unauthorized persons	converter - container	injuries or loss of life	3	2	**6**	local guidelines warning regulations IEC instruction in user manual	restrict access use of door interlocking system apply safety label training of personnel	2	2	**4**
21	exhaustion of personnel	site	negligence	2	2	**4**	legal regulations company regulations	comply with regulations	2	2	**4**
22	high voltage	site	injuries or loss of life	2	4	**8**	Electrical safety concept ABB Safety guideline (5+5) user manual	restrict access use of door interlocking system apply safety label install protection cover training of personnel	2	2	**4**
	Operation			##	##	##			##	##	##
23	malfunction of safety relevant processors	processors	malfunction	1	2	**2**	test procedure	conduct tests	1	2	**2**
24	access of unauthorized persons	converter - container	injuries or loss of life damages	2	2	**4**	warning regulations IEC instruction in user manual	restrict access training of personnel mobilize qualified manpower	1	2	**2**
25	high voltage / malfunction of earth disconnector	converter	injuries or loss of life / damages	1	4	**4**	user manual ABB training concept	comply with instructions	1	4	**4**
26	interference on implants (medical) High magnetic field	converter - container	malfunction	2	3	**6**	warning regulations IEC instruction in user manual	apply safety label	1	2	**2**

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Hazard Evaluation				P x C = R			Measures		P x C = R		
No.	Hazard	Danger Zone	Risk Description	P (1-6)	C (1-4)	Risk	Guidelines / Rules	Preventive Action	P (1-6)	C (1-4)	Risk
	Maintenance and Troubleshooting			##	##	##			##	##	##
27	high voltage	converter / incorrect cable connection	injuries or loss of life	2	4	**8**	service and maintenance manual cable diagram	mobilize qualified manpower	2	2	**4**
28	high voltage	converter / non-conforming components	injuries or loss of life	2	4	**8**	parts list cable diagram	use specified spare parts training of personnel	2	2	**4**
29	maintenance by unqualified manpower	converter	injuries or loss of life damages	4	2	**8**	ABB training concept PCS = People certification system	mobilize qualified manpower use specified spare parts	2	1	**2**
30	high voltage	site	injuries or loss of life	2	4	**8**	Electrical safety concept ABB Safety guideline (5+5) service and maintenance manual	restrict access apply safety labels training of personnel mobilize qualified manpower check protection cover	2	2	**4**
31	interference on implants (medical) High magnetic field	converter - container	malfunction	2	3	**6**	warning regulations IEC instruction in user manual	apply safety label	1	2	**2**
	Upgrade of Converter			##	##	##			##	##	##
32	high voltage energized components	converter	injuries or loss of life damages	2	3	**6**	technical concept with specification service and maintenance manual parts list cable diagram	mobilize qualified manpower use specified spare parts apply test procedure training of personnel according to: PCS = People Certification System	2	2	**4**
	Disassembly of Converter			##	##	##			##	##	##
33	emission of hazardous substances	converter	contamination / health risk	2	3	**6**	environmental regulation environmental information recycling instructions	follow instructions	2	2	**4**
	Disposal / Recycling			##	##	##			##	##	##
34	environmental pollution disposal of waste	site	contamination / health risk	2	3	**6**	environmental regulation local regulations recycling instructions	legal recycling	2	2	**4**

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9.2. ATTACHMENT 2 – Contact List

ABB Switzerland

	Name	Function	E-Mail	Phone	Mobile Phone
GSC Switzerland Project Manager	Michael Buschmann	Project Manager	michael.buschmann@ch.abb.com		+41 79 468 2237
	Michael Oswald	Project Manager	michael.oswald@ch.abb.com		+41 79 580 09 21
	Christoph Püschner	Project Manager	christoph.pueschner@ch.abb.com		+41 79 519 32 61
	Stefan Holbach	Project Manager	stefan.holbach@ch.abb.com		+41 79 535 4879
	Georg Näf	Project Manager	georg.naef@ch.abb.com		+41 79 906 0664
	Daniel Scheuble	Project Manager	daniel.scheuble@ch.abb.com		+41 79 176 2071
	Vanessa Wenger	Project Manager	vanessa.wenger@ch.abb.com		+41 79 535 4956
GSC Switzerland Management Team	Dietmar Fenz	Head of Project Management	dietmar.fenz@ch.abb.com	+41 58 589 2243	+41 79 828 3577
	Christoph Pueschner	Head of Field Service	Christoph.pueschner@ch.abb.com	+41 58 589 2072	+41 79 464 1505
	Mark Knechtle	Head of Modernization	mark.knechtle@ch.abb.com	+41 58 589 3729	+41 79 698 1062
	Kristjan Ljubec	Head of Service Operations	kristjan.ljubec@ch.abb.com	+41 58 589 32 19	+41 79 540 9718
	Samuel Bäni	Head of Global Service Center CH	samuel.baeni@ch.abb.com	+41 58 589 2796	+41 79 770 9134
HSE Team	Herbert Künzi	HSE/SA Specialist - Global Service Center CH	herbert.kuenzi@ch.abb.com	+41 58 589 3350	+41 79 619 3511
	Nick Marolf	Health & Safety and Security Manager - Motion CH	nick.marolf@ch.abb.com	+41 58 589 29 19	+41 79 591 3778
ABB Switzerland	Andreas Koch	Country Sustainability & Security - ABB CH	andreas.koch@ch.abb.com	+41 58 585 6018	-
	Martina Heiniger	HR Business Partner - Motion CH	martina.heiniger@ch.abb.com		+41 79 627 62 21
	Nicole Kamm Steiner	Country HR Manager - ABB CH	nicole.kamm-steiner@ch.abb.com	+41 58 589 27 35	+41 79 102 1986
	Robert Itschner	Country Managing Director - ABB CH & Local BL Manager - Motion CH	robert.itschner@ch.abb.com	+41 58 588 42 81	+41 79 458 0715

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9.3. ATTACHMENT 3 – Job Hazard Assessment

available on request

JHA #	Document Kind, Title	Document No.
001	MV Drives Job Hazard Assessment JHA_001_Standard Field Service Activities	3BHS880490 E01

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