

Risk assessment pursuant to sections 5 and 6 of the German Health and Safety at Work Act (incl. measures and documentation)				Legend				Document: 01/04/2020		Date of last revision: 01/04/2020										
Life phases				Risk assessment				Document: 01/04/2020		Date of last revision: 01/04/2020										
Type of work: after-sales service, erection and overhaul activities (not possible due to construction site activities)				AS: after-sales service				Document: 01/04/2020		Date of last revision: 01/04/2020										
Occupational category/persons: erection supervisors and erectors (leased staff and employees)				ER: erection				Document: 01/04/2020		Date of last revision: 01/04/2020										
Tasks: erection/overhaul of components for combustion and dry digestion systems				DH: overhaul				Document: 01/04/2020		Date of last revision: 01/04/2020										
				PB: probability				Document: 01/04/2020		Date of last revision: 01/04/2020										
				SV: severity				Document: 01/04/2020		Date of last revision: 01/04/2020										
				Risk assessment				Document: 01/04/2020		Date of last revision: 01/04/2020										
				H = high risk, urgent need for action; action must be taken immediately.				Document: 01/04/2020		Date of last revision: 01/04/2020										
				M = medium risk; devise an action plan and implement measures promptly.				Document: 01/04/2020		Date of last revision: 01/04/2020										
				L = low risk; action plan recommended.				Document: 01/04/2020		Date of last revision: 01/04/2020										
No.	Potential hazards associated with tasks performed and description thereof	Ordinances/regulations/Information	Hazard location/workplace	Life phases			According to MARTIN risk matrix				Measures that can be taken to eliminate the hazard or reduce its probability and severity	Responsible	To be carried out	Measures taken (mark with cross)	Carried out	Result of measures taken				Refer to notes in appendix
				K	M	OH	PB	SV	Total	Risk						PB	SV	Total	Risk	
8. Hazards related to work environment																				
8.1	Climate - Non-compliance with prescribed room temperatures and air humidity levels (not possible due to construction site activities) - Draughts (if induced draught fan is in operation) - Inadequate ventilation due to closed plant doors - Exposure to heat and cold when working outdoors (under any weather conditions)	ASR 5 ASR 6 ArbStättV DGUV Vorschrift 6	Entire site/plant area Combustion system/boiler area Entire site/plant area	X X X	X X X	X X X	A A A	E E E	AE AE AE	L L L	- Wear protective clothing suitable for prevailing room temperatures and air humidity levels - Make sure workers take sufficient breaks - Make sure workers are not exposed to draughts (optimize function of induced draught fan, erect separation walls) - Ensure adequate ventilation/fresh air supply, for example by opening gates and windows or using extraction facilities/fans - Instruct staff	Employee Employee Operator/erection supervisor Operator/erection supervisor Erection supervisor	Continuously Continuously Before work begins Continuously Before work begins	X X X X X	Continuously Continuously When work begins Continuously When work begins	A A A A A	E E E E E	AE AE AE AE AE	L L L L L	
8.2	Lighting - Inadequate lighting (no daylight during overhaul work), poor luminance distribution - Dazzling caused by incorrectly positioned halogen lights or similar - There are no emergency and safety lights in parts of the site - Dazzling due to solar radiation	ArbStättV DGUV Vorschrift 1 ASR 7 ASR 41	Entire site/plant area Entire site/plant area Entire site/plant area Entire site/plant area	X X X X	X X X X	X X X X	B C C C	B D D D	BB CD CD CD	H M M M	- Provide adequate lighting - Position lights and lamps such that they do not dazzle - Provide adequate emergency and safety lighting (especially in the vicinity of rescue and escape routes and in particularly hazardous workplaces). - Equip staff with flashlights where this is not possible, e.g. in the combustion system area - Shade workplace if necessary - Prevent sun dazzle, e.g. by wearing sunglasses	Operator/erection supervisor Employee Operator Employee Employee	Before work begins Continuously Before work on site begins Continuously Continuously	X X X X X	When work begins Continuously When work on site begins Continuously Continuously	E E E E E	E E E E E	EE EE EE EE EE	L L L L L	
8.3	Space constraints/transport and escape routes - Restricted freedom of movement due to local conditions - Rescue, escape and transport routes do not exist, are difficult to access or poorly marked	ArbStättV ASR 10 ASR 17 DGUV Vorschriften 1 DGUV Informationen 208-010 DGUV Vorschrift 68	Combustion system/boiler area Entire site/plant area	X X	X X	X X	A A	A A	AA AA	H H	- Discuss possible escape routes before starting work (if freedom of movement is restricted during work) - Allow enough space for rescue, escape and transport routes and mark them adequately - Keep escape routes and emergency exits clear of obstructions and do not narrow them - Draw up an escape and rescue plan - Instruct staff	Erection supervisor Operator Operator/employee Operator/health and safety coordinator Erection supervisor	Before work begins Before work on site begins Continuously Before work on site begins Before work begins	X X X X X	When work begins When work on site begins Continuously When work on site begins When work begins	C C C C C	C C C C C	CC CC CC CC CC	M M M M M	2 3
8.4	Ergonomics - Back, shoulder or neck pain due to incorrect arrangement of individual pieces of equipment such as desk, screen, height of machine/plant component, etc. - Lighting and room climate in office, container and at building site - Poor concentration due to noise	ArbStättV BildschirmV ArbStättV	Office workplace Entire site/plant area Office, site/plant area Office, site/plant area	X X X X	X X X X	X X X X	D E E D	C E E C	DC EE EE DC	M M M M	- Screen off workplaces adequately if working in draughty areas cannot be avoided - Equip offices/containers such that staff can adapt to local conditions, for example by providing adequate lighting, heating, air conditioning units, sanitary facilities, etc. - Use ear protection if necessary - Provide workplace with adequate lighting - Instruct staff with regard to workplace ergonomics - Inspection of the offices at MARTIN's premises as part of industrial safety committee meetings	Everyone for themselves Superior/project manager Everyone for themselves Everyone for themselves Superior Industrial safety committee team	Continuously Before work begins Continuously Continuously Once a year Continuously	X X X X X X	--- Before work begins --- --- Once a year ---	E E E E E E	E E E E E E	EE EE EE EE EE EE	L L L L L L	
9.1	Physical stress/heavy work Heavy dynamic work (dynamic whole-body work) - Heavy and dynamic whole-body work when handling grate surface elements (performed temporarily) - Use of personal protective equipment - Work in strenuous climatic conditions	BetrSichV DGUV Information 208-006	Combustion system area	X X X	X X X	X X X	C C C	C E E	CC CE AE	M L L	- Keep work requiring large groups of muscles (arm, leg and torso muscles) to the minimum absolutely necessary (use conveyor belt) - Make sure workers take short breaks when performing physical work in strenuous climatic conditions - Make sure workers take sufficient breaks when working with respiratory equipment - Ensure that individual workers rotate tasks if possible - Use lifting equipment/conveyor belt if required - Instruct staff	Erection supervisor Erection supervisor Erection supervisor Erection supervisor Erection supervisor	Before work begins Continuously Continuously Before work begins Before work begins	X X X X X	When work begins Continuously Continuously When work begins When work begins	C C C C C	C E E E E	CC CE AE AE AE	M L L L L	4
9.2	One-sided dynamic work - Handling of grate bars	BetrSichV DGUV Information 208-006	Combustion system area	X X	X X	X X	C C	C C	CC CC	M M	- Make sure workers take short breaks when performing physical work in strenuous climatic conditions - Make sure workers take sufficient breaks when working with respiratory equipment - Make sure that individual workers rotate tasks if possible - Instruct staff	Employee Erection supervisor Erection supervisor Erection supervisor	Continuously Continuously Continuously Before work begins	X X X X	Continuously Continuously Continuously When work begins	C C C C	C C C C	CC CC CC CC	M M M M	5
9.3	Static work - Forced posture due to space constraints when performing welding/installation work in the undergrate hopper, discharger, leader/slag removal system, etc.	DGUV Information 208-006 BetrSichV	Combustion system area	X X	X X	X X	A E	E AE	L L	L	- Avoid performing static work without changing posture - Avoid tasks involving strong bending or twisting of the torso - Make sure that workers take sufficient breaks - Ensure that individual workers rotate tasks if possible - Optimize workplace, equipment, etc. - Provide auxiliary and body support equipment such as knee pads, supports, etc. - Change posture, e.g. alternate between sitting and standing - Instruct staff	Employee Erection supervisor Erection supervisor Erection supervisor Erection supervisor Employee Erection supervisor	Continuously Continuously Continuously Before work begins Before work begins Continuously Before work begins	X X X X X X X	Continuously Continuously Continuously When work begins When work begins Continuously When work begins	A A A A A	E E E E E	AE AE AE AE AE	L L L L L	
9.4	Combination of static and dynamic work - Handling weights of 20 kg and above (e.g. grate surface elements = 20 to 35 kg) during dismantling and installation work (twisting/bending the torso, turning the torso sideways)	DGUV Information 208-006 BetrSichV	Combustion system area	X X	X X	X X	C C	C C	CC CC	M M	- Involve other persons - Work more slowly - Reduce distances over which heavy parts have to be carried - Ensure that individual workers rotate tasks if possible - Make sure that workers take sufficient breaks - Avoid tasks involving strong bending or twisting of the torso - Instruct staff - Regular medical check-ups of the musculoskeletal system (G46); not absolutely necessary for MARTIN employees but check-ups are performed at the employees' request. This type of check-up is recommended for leased workers.	Erection supervisor Employee Erection supervisor Erection supervisor Erection supervisor Employee Erection supervisor Industrial safety expert	Continuously Continuously Before work begins Before work begins Before work begins Continuously Before work on site begins	X X X X X X X	Continuously Continuously When work begins When work begins When work begins Continuously When work on site begins	C C C C C	C C C C C	CC CC CC CC CC	M M M M M	6
10.1	Perception; handling of equipment Perception of information - Warning signals in the furnace/digester/vessels are difficult to hear	BetrSichV	Working area	X X X	X X X	X X X	E A	A EA	EA EA	H H	- Employees outside the combustion system area who can hear the warning signal must inform people working inside said area immediately - Instruct staff	Employee Erection supervisor	Continuously Before work begins	X X	Continuously When work begins	E E	C C	EC EC	L L	
10.2	Scope of perception - Not applicable																			
10.3	Difficulty in handling equipment - Not applicable																			
11.1	Other hazards Unsuitable personal protective equipment - Improper use of personal protective equipment	Personal protective equipment, operating instructions DGUV Vorschriften 1 DGUV Vorschrift 6 DGUV Regel 112-189 DGUV Regel 112-201	Entire site/plant area	X X X	X X X	X X X	D A	A DA	DA DA	H H	- Instruct staff	Erection supervisor	Before work begins	X	When work begins	E E	E E	EE EE	L L	
11.2	Skin exposure - Skin dehydrated by dust or skin-irritating substances - Skin may become severely soiled (e.g. during overhauls) - Skin may be exposed to irritating materials, oils and greases - Skin is exposed to abrasive materials	GrStoffV DGUV Vorschriften 6 DGUV Regel 112-195	Entire site/plant area Entire site/plant area Entire site/plant area	X X X	X X X	X X X	A A A	E E E	AE AE AE	L L L	- Provide suitable skin protection, cleaning and care products for employees - Wear suitable personal protective equipment, protective overalls, etc. - Instruct staff	Site management Employee Erection supervisor	Before work begins Continuously Before work begins	X X X	When work begins Continuously When work begins	A A A	E E E	AE AE AE	L L L	
11.3	Persons - Inattentiveness towards other persons working on site - Lack of safety awareness (colleagues, other subcontractors/lot contractors) - Character traits	DGUV Vorschriften 6 DGUV Vorschriften 38 BetrSichV DGUV Vorschriften 1	Entire site/plant area Entire site/plant area Entire site/plant area	X X X	X X X	X X X	B B B	C C C	BC BC BC	H H H	- Only assign suitable staff to individual tasks - Coordinate activities of different lots, suppliers, working groups, etc. - Make sure suitable protective equipment is available for individual workplaces - Instruct employees concerning the tasks to be performed and the associated hazards and inform them about the work coordinated with third parties - Choose suitable subcontractors -> draw up supplier evaluations	Erection supervisor Site manager/operator Erection supervisor/operator Erection supervisor	Before work on site begins Before work begins Before work begins Before work on site begins	X X X X	When work on site begins When work begins When work begins When work on site begins	E E E	C C C	EC EC EC	L L L	
11.4	Animals - Due to unknown waste composition: infections, irritations, poisoning, injuries	TierSG #5G	Combustion system/boiler area	X X X	X X X	X X X	E C	C EC	EC EC	L L	- Avoid contact (skin, eyes, inhalation) if possible - Before work begins, the working areas must be cleaned to the extent possible and waste and bottom ash must be removed - Wear suitable protective clothing (dust masks, protective gloves, safety footwear with anti-puncture steel sole, etc.) - Observe general hygiene rules - Instruct staff	Employee Operator Employee Employee Erection supervisor	Continuously Before work on site begins Continuously Continuously Before work begins	X X X X X	Continuously When work on site begins Continuously Continuously When work begins	E E	C C	EC EC	L L	
11.5	Plants - Due to unknown waste composition: infections, irritations, poisoning, injuries	Guv-SI 8018 VSG 1.1	Combustion system, boiler, biogas plant	X X X	X X X	X X X	E C	C EC	EC EC	L L	- Wear suitable protective clothing (dust masks, protective gloves, safety footwear with anti-puncture steel sole, etc.) - Observe general hygiene rules - Instruct staff	Employee Employee Erection supervisor	Continuously Continuously Before work begins	X X X	Continuously Continuously When work begins	E E	C C	EC EC	L L	

