

P202X-000
LR Mate Kitting Cell
Validation Plan
Sample Report

LR Mate Kitting Cell

Customer Name
Machine Location



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1. Data

1.1 Contact Details

1st Validator

Name: Mike Poynter
Company: Safe-T-Sense
Address: 1665 N. Penny Lane
Schaumburg, IL 60173
Function: Engineering Manager
Contact
Telephone: 1-224-404-6610
E-mail: info@safe-t-sense.com
Signature
Date XX-XX-XXXX - XX-XX-XXXX

2nd Person

Name:
Company:
Address:

Function:
Contact
Telephone:
E-mail:
Signature
Date

3rd Person

Name:
Company:
Address:

Function:
Contact
Telephone:
E-mail:
Signature
Date

4th Person

Name:
Company:
Address:

Function:
Contact
Telephone:
E-mail:
Signature
Date

5th Person

Name:
Company:
Address:

Function:
Contact
Telephone:
E-mail:
Signature
Date

6th Person

Name:
Company:
Address:

Function:
Contact
Telephone:
E-mail:
Signature
Date

1.2 Project

Project name:	LR Mate Kitting Cell
Document Number	P202X-000
Version	1.0
Location	Schaumburg, IL

1.3 Version History

Version	Date	Author - Title	Description
V0.0	xx-xx-xxxx	Mike Poynter – Engineering Manager	Document Template Creation – Overall layout, format and included information.
V1.0	xx-xx-xxxx	Mike Poynter – Engineering Manager	Initial document generation

1.4 Documentation

Drawings	Name, Revision and date.
Program	Name, Revision and date.
Risk assessment file	Name, Revision and date.

1.5 Other Applicable Documents

Regulations, standards, information	Select Safety standards from the Validation Procedure Document.
Plant standards	Insert any plant standards or type n/a
Other applicable documents	Insert any applicable documents or type n/a

2. Description

The validation plan is a sequence of steps defined by Safe-T-Sense to validate the implemented safety concept and risk mitigation measures and the implemented safety concept on a machine. Machine specific validation checkpoints may be developed and integrated during this validation.

This document will serve as a record for the performance of the LR Mate Kitting Cell control system. However, the document is not intended to be the sole resource/knowledge for the validator to validate LR Mate Kitting Cell.

The validator is assumed to be familiar with the LR Mate Kitting Cell safety circuits functionality or shall be escorted by personnel who are familiar with the LR Mate Kitting Cell safety circuit functionality.

2.1 Scope

This validation plan is used to validate the safety control system functionality of the LR Mate Kitting Cell, it will not include reviewing original risk assessments or determining the current system PL with the risk mitigation measurements.

[Fill in the out of scope information here. This section need to be customized for individual machine.](#)

2.2 Safety Device List

No.	Device Name	PN	MFG	Safety Feature
1	Safety PLC	1769-L33ERM	Rockwell	Safety Logic Processor
2	Safety PointIO	1734-AENTR	Rockwell	Safety Logic Distributed IO
3	Sfty PointIO I	1734-IB8S	Rockwell	Safety Logic Distributed IO
4	Sfty PointIO O	1734-OB8S	Rockwell	Safety Logic Distributed IO
5	CTP L1 Interlock	124225	Euchner	Guard locking safety interlock
6	CES-I-AP Interlock	117328	Euchner	Non-Contact safety interlock
7	SZ-V Scanner	SZ-V04	Keyence	Safety Laser Scanner
8	Safety Valve	VP744-5DZ1-04N-M-X538	SMC	Pneumatic Safe dump valve

3. Validation Documentation

3.1 Pre-Test Inspection Check

Not Applied	Pass	No.	Description	Acceptance Criteria	Notes
Pre-trip Preparation					
		1.1	Obtain Documents	Verify that the following documents have been received and reviewed: 1) Drawings 2) STS documents 3) Safety programs	
		1.2	Review documents	Review drawings and program to confirm that the system has been appropriately wired to obtain 'certain category'	
		1.3	Identify hazardous environment	Identify any possible hazardous environment: • Classification • Span/Area • Plant Requirements	Information to be provided by plant or 3 rd party. STS is not qualified to determine hazardous environment conditions.
		1.4	Documents review and on-site walk through		
Safety Task Configuration (See Validation Procedure)					
Guarding					
N		3.1	Installation	All guarding has been installed appropriately and implemented correctly as designed	STS Did not perform the installation
		3.2	Verify the minimum reaching upward distance	Guarding prevents reaching upwards according to ISO 13857 4.2.1	

Not Applied	Pass	No.	Description	Acceptance Criteria	Notes
		3.3	Verify the minimum reaching over distance	Guarding prevents reaching over according to ISO 13857 4.2.2	
		3.4	Verify the minimum reaching around distance	Guarding prevents reaching around according to ISO 13857 4.2.3	
		3.5	Verify the minimum reaching through distance	Guarding prevents reaching through according opening according to ISO 13857 4.2.4	
		3.6	Verify the minimum distance for preventing access by lower limbs	Guarding prevents access to lower limbs according to ISO 13857 4.3	
		3.8	Verify the essential design	The essential requirements for design, construction, and selection of guards are satisfied according to ISO14120 7.3	
Interlock Switch					
N		4.1	Installation	All switches have been installed appropriately and implemented correctly as designed	STS Did not perform the installation
		4.2	Verify interlock switch locations	Position switches shall be arranged so that they are sufficiently protected against a changed of their position according to ISO14119	
		4.3	Verify the interlock switch	Actuators shall be fastened to minimize the possibility that they come loose or change their intended position relative to the actuation systems during the intended lifetime according to ISO14119	
		4.4	Verify the interlock switch actuation	Interlocking device shall be actuated appropriately to the actuation principle of the applied switch according to ISO14119	
		4.5	Verify the function of use interlock switch	The output system of the interlocking device shall be suitable for inclusion in a control system in accordance with ISO13849-1 and IEC 62061 according to ISO14119	
		4.6	Verify whether the interlock is used as end stop	An interlock switch shall not be used as mechanical stop. If it is declared by manufacture of the device to be suitable for use as mechanical stop, then the maximum impact energy withstand value shall be given	
		4.7	Verify interlock escape release function	The actuation of escape release on a guard locking interlock (where applicable) can only be manually operated from inside the safeguarded area and generates a stop command upon unlocking the interlock in accordance to ISO 14119 – 5.7.5.2	
N			Verify the interlock environment requirements	Verify that the interlock switches have been appropriately selected and designed to meet the requirements for use in the hazardous environment: Class/Div or Zone	STS is not qualified to validate conformity with hazardous environment conditions.
ESPE					
		5.1	Verify the configuration and positioning of the ESPE device	The safeguards shall be configured and positioned to ensure that the undetected access to the hazard zone is not possible according to ISO13855	
		5.2	Verify the minimum distance orthogonal to detection zone	The minimum distance with the detection zone orthogonal to the direction of the approach is satisfied according to ISO13855	

Not Applied	Pass	No.	Description	Acceptance Criteria	Notes
		5.3	Verify the minimum distance parallel to detection zone	The minimum distance with the detection zone parallel to the direction of approach is satisfied according to ISO13855	
		5.4	Verify the minimum distance angled to detection zone	The minimum distance with the detection zone angled to the direction of approach is satisfied according to ISO13855	
		5.5	Verify the minimum vertical reaching over distance	The minimum reaching over the vertical detection zone of ESPE equipment is satisfied according to ISO13855	
		5.6	Verify the minimum angled reaching over distance	The minimum reaching over the angled detection zone of ESPE equipment is satisfied according to ISO13855	
N		5.7	Verify the ESPE environment requirements	Verify the ESPE has been appropriately selected and designed to meet the requirements for use in the hazardous environment: Class/Div or Zone	STS not qualified to validate conformity with hazardous environment conditions.
Operators					
		6.1	All Operators nameplate	All operators are installed appropriately with a clear and easy to understand nameplate	
		6.2	Reset pushbutton color	All reset pushbuttons are either blue, black, gray or white. The reset pushbutton is not green.	
		6.3	E-Stop device positioning	All E-Stop devices shall be positioned so that they are directly accessible and capable of non-hazardous actuation by the operator or others who need actuate them	
		6.4	E-Stop device Color	All E-Stop devices shall be colored red with a yellow background. No text or symbols shall be labeled on actuator or background according to ISO13850	
		6.5	E-Stop Device Latching Function	All E-Stop devices latch when pressed. They remain latched until the device's actuator is manually reset by an intentional human action.	
N		6.6	Verify the operator environment requirements	Verify the operators have been appropriately selected and designed to meet the requirements for use in the hazardous environment: Class/Div or Zone	STS not qualified to validate conformity with hazardous environment conditions.
Electrical System					
		7.1	Documents	All electrical schematics are located in the panel enclosures	
N		7.2	Installation	All panel and field devices have been installed appropriately and implemented correctly as designed	STS Did not perform the installation
		7.3	Labels and marking	All components, cables, panels, and wires are clearly labeled and marked	
		7.4	Finger safe verification	All high voltage devices are IP20 rated (finger safe) or sufficiently guarded to prevent accidental contact.	
		7.5	Circuit Protection Component Selection	All circuit protection devices have been appropriately sized for the application - Overloads $\geq 115\%$ FLA - Circuit breakers $\geq 125\%$ FLA	
		7.6	Motor Control Component Selection	Redundant contactors have been appropriately sized for the application Contactors $\geq 150\%$ FLA	

Not Applied	Pass	No.	Description	Acceptance Criteria	Notes
N		7.7	Components selection	All electrical components and circuits have been appropriately selected and designed to meet the requirements for use in the hazardous environment: Class/Div or Zone	STS not qualified to validate conformity with hazardous environment conditions.
Hydraulic System					
N		8.1	Installation	All hydraulic valves have been installed appropriately and implemented correctly as designed	STS Did not perform the installation
		8.2	Component selection	All hydraulic valves have been appropriately selected according to materials, port size, flow rate and pressure requirements.	
		8.3	Component mounting	All hydraulic valves shall be mounted in such a way that minimizes their exposure to inadvertent shifting or destruction by the effects of gravity, vibration, or impact according to ISO 4413, 2010 - 5.4.3.2	
		8.4	Fluid Filtration	Verify appropriate fluid filtration and maintenance is provided according to ISO 4413, 2010 – 5.4.5.3	
		8.5	Over dimensioning	Valves shall be pressure rated to at least 1.5 times in the safety related application	
N		8.6	Verify the hydraulic controls environment requirements	Verify the hydraulic controls have been appropriately selected and designed to meet the requirements for use in the hazardous environment: Class/Div or Zone	STS not qualified to validate conformity with hazardous environment conditions.
Pneumatic System					
N		9.1	Installation	All Pneumatic valves have been installed appropriately and implemented correctly as designed	STS Did not perform the installation
		9.2	Components selection	All Pneumatic valves have been appropriately sized according to materials, port size, and pressure	
		9.3	Component mounting	All pneumatic valves shall be mounted in such a way that minimizes their exposure to inadvertent shifting or destruction by the effects of gravity, vibration, or impact according to ISO 4414, 2010 - 5.4.3.2	
		9.4	Protection from foreign matter	Pneumatic valves, connections, fittings, and fluid passages must remain free from foreign matter that can restrict flow or cause damage/malfunction to any component in accordance to ISO 4414, 2010 – 5.4.5.4	
		9.5	Over dimensioning	Valves shall be pressure rated to at least 1.5 times in the safety related application	
N			Verify the pneumatic controls environment requirements	Verify the pneumatic controls have been appropriately selected and designed to meet the requirements for use in the hazardous environment: Class/Div or Zone	STS not qualified to validate conformity with hazardous environment conditions.
2 Hand Control (per ISO 13851)					
		10.1	Use of both hands (Synchronous actuation)	2-hand control device is designed so that personnel must use both hands at the same time, one hand on each actuating device, to operate. An output signal shall be generated only when both control actuating devices are actuated in a time lag less than or equal to 0.5 seconds according to ISO 13851, 2018 – 5.2 / 5.8	
		10.2	Relationship between input & output signals	Input signals from two separate control actuating devices shall together initiate & maintain output signal only so long	

Not Applied	Pass	No.	Description	Acceptance Criteria	Notes
				as both input signals are applied according to ISO 13851, 2018 – 5.3	
		10.3	Cessation of the output signal	The release of either one or both control actuating devices shall initiate the cessation of the output signal according to ISO 13851, 2018 – 5.4	
		10.4	Prevention of defeat & accidental operation.	The probability of operating the control actuating devices accidentally or without the use of both hands shall be minimized according to ISO 13851, 2018 – 5.5 / 5.6	
		10.5	Re-initiation of the output signal	The re-initiation of the output signal shall only be possible after the release of both control actuating devices according to ISO 13851, 2018 – 5.7	
		10.6	Color	Control actuating devices shall not be red according to ISO 13851, 2018 – 8.4.2	
		10.7	Position	Two-Hand control enclosures shall be mounted in a position that does not allow the operator to release an actuator and reach the hazardous motion until it has stopped according to ISO 13851, 2018 – 8.3.5	
N		10.8	Verify the two-hand controls environment requirements	Verify the two-hand controls have been appropriately selected and designed to meet the requirements for use in the hazardous environment: Class/Div or Zone	STS not qualified to validate conformity with hazardous environment conditions.
Mechanical Press (per ANSI B11.3)					
			Brakes Capacity	Brake capacity shall be capable of holding the ram and attachments at any point in its cycle with the motor de-energized.	
			Brake Motor	The brakes shall be engaged when the main motor is de-energized on a direct drive press in accordance with ANSI B11.3.	
			Operation Selection	Where a selector switch is used for mode selection, an OFF mode must be provided. If used with an HMI, means of fixing the operation shall be implemented.	
			Trip Control	The Trip control shall be protected against inadvertent or unintended actuation and shall not allow the operator to reach into the point of operation while operating the control in accordance with ANSI B11.3.	
			Fluid Die Clamps	The die clamps shall have the capability of holding the upper and lower die in the clamped position throughout the slide cycle in accordance with ANSI B11.3.	
			Die Fastening	Both the Upper and Lower die sections shall have provisions for secure mounting in accordance with ANSI B11.3.	

3.2 Safety Function Test

3.2.1 Function Test

(See Project Procedure and Case Example)

No.	Description	Test Step	Verification/ Acceptance Criteria	Instruction Notes
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Checklist

All devices need to go through all test step listed above. Mark "P" for pass, 'F' for fail and 'N' for n/a.

Device Name	1	2	3	4	5	6	7	8	9	10	Notes

3.3 Forced Fault Test

3.3.1 Forced Fault Test 1

(See Project Procedure and Case Example)

No.	Description	Test Step	Verification/ Acceptance Criteria	Instruction Notes
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Checklist

All devices need to go through all test step listed above. Mark "P" for pass, 'F' for fail and 'N' for n/a.

Device Name	1	2	3	4	5	6	7	8	9	10	Notes

4. Safety Program Signature

No.	Description	Safety Signature	Date	Validator	Notes Change description
1					
2					
3					
4					

SAMPLE

5. Summary

Issues found in during the validation process

REF Number	By	Date	Action Required?	Issue & Solution Description
4.x.x.x	Initial	mm-dd-yyyy	Yes/No/Na	Issue description Recommended solutions

SAMPLE

6. Signature

Engineering Manager

Mike Poynter
Safe-T-Sense, LLC



Contact, xxx-xxx-xxxx

Place, Date, Signature

Review

Name.

Customer company name.

Contact, xxx-xxx-xxxx.

Place, Date, Signature