Amendment No 3
to the Contract for Work

for the "Personal Safety Interlock System"

concluded between the below identified parties on December 18th 2017 (hereinafter the "**Contract**" and the "**Amendment**").

I. Contractual Parties:

1. Client:

Fyzikální ústav AV ČR, v. v. i.

With its seat at: Na Slovance 2

Post code 182 21 Praha 8

Represented by:RNDr. Michael Prouza, PhD. - Director

Registered in the public research institutions registry maintained by the Ministry of Education, Youth and Sports of the Czech Republic

ID No.: 68378271

Tax Id. No.: CZ68378271

(hereinafter the "**Client**")

and

2. Supplier:

Rockwell Automation s.r.o.

with its registered office at Argentinská 1640/4, Holešovice, 170 00, Praha 7, Czech republic

registered in business registry maintained by the City Court Prague, section C, insert 18397

represented by Jiří Malíček, Proxy

Id. No.: 48590631

Tax Id. No.: CZ48590631

(Hereinafter the "**Supplier**"; the Client and the Supplier may be referred to herein jointly as the "**Contractual Parties**" or with respect to each individually as the "**Contractual Party**").

II. PROJECT RESCHEDULE AND EXTRA WORKS:

1. The Contractual Parties hereby agree on new schedules of implementation of the Phase E3, Phase E4, Phase E5 and the optional Phase E2 that are attached hereto as Annex 2. The schedules of implementation attached hereto are binding upon Contractual Paries.
2. Furthermore, in return for the price stipulated herein, the Supplier shall under the terms and conditions hereof provide extra services and supplies as stipulated in Annex No 1 hereto (Scope of the Extra Works - DCRs) (hereinafter the "**Extra Works**").
3. The Extra Works shall form part of the Work. The Annexes to the Contract No 1 Technical Specification and No 3 Contractor´s Bid are hereby amended by the Annex No 1 to this Amendment. In case of conflict, the Annex No 1 to this Amendment shall prevail over the

Technical Specification and Contractor´s Bid.

4. The subject matter of the Extra Works forms part of the Phases of the Work as identified in this Amendment and the Documented Change Requests (hereinafter the "**DCRs**") included in Annex No 1 hereto.

5. The price of the Extra Works excluding VAT is stipulated by Annex No 1 hereto in the individual DCRs:

   DCR #10: 109 344 EUR excl. VAT (corresponding Phases of the Work: E3/E4 and E2/E5)

   DCR #11: 39 764 EUR excl. VAT (corresponding Phases of the Work: E2 and E5)

   The Price of the Work, particularly item No 1 thereof PSI System Implementation Basic Scope, is hereby increased by the price of the Extra Works. For the purposes of art. XVI. of the Contract (Liability, sanctions) the original Price of the Work is considered unaltered by this Amendment.

6. The price of the Extra Works shall be paid as follows:

   DCR #10 – as stated in the DCR

   DCR #11 – individual Extra Works shall be paid for together with the D5 Deliverable (HW delivery to Client facility) instalment of the Phase E2 or E5.

III. CONCLUDING AND OTHER COVENANTS:

1. Terms herein starting with with capital letters which are not defined herein shall have the meaning stipulated by the Contract.
2. This Amendment was made only in the electronic form.
3. The following Annexes form integral parts of this Amendment:

   Annex 1: Scope of the Extra Works (DCRs)

   Annex 2: Schedules of implementation for Phases E2, E3, E4 and E5

4. By attaching their signature hereto the Contractual Parties express their consent with the content hereof in its entirety.

On behalf of the Client:	On behalf of the Supplier:
_____	_____
RNDr. Michael Prouza, PhD., the director	Jiří Malíček, Proxy

Annex 1: Scope of the Extra Works (DCRs)

Rockwell Automation

DOCUMENTED CHANGE REQUEST		
Document Title:		
Date Modified:	Revision:	V4.0
Revision Note:		
IFS Document #:	Alt Doc #:	

PROJECT INFORMATION	
Proposal Number:	QXQ1K1017B_V1.5
Project Number:	P4CZ009933
Project Name:	Personal Safety Interlock System
Project Manager:	Jozef Tilandy

CHANGE INFORMATION	
DCR#: 10	Date: 12-Nov-21
Subject: Project Reschedule	Initiated By: Eli Beam

Classification of Request:

[ ]	Functional Change	[ ]	Documentation Error
[ ]	Clarification	[ ]	Operational Suggestion
[ ]	Final Design Detail	[X]	Schedule Change
[ ]	Other:		

Recommended Priority: [X] High [ ] Medium [ ] Low

Areas Impacted:

[X]	Hardware & Engineering	[X]	Software & Engineering
[X]	Drafting	[X]	Assembly
[ ]	Other:		

Description of Change

Item No.	Item Description	Price
	Reason of the additional request: • Customer requires to replan the next project activities related to "Phase 2: Remaining parts of the Technology implementation" according to Annex 4 of the Contract of Work, as follows: **Phase 2 – E2 PSI + L3 Beam Transport PSI + E5 PSI + L2 Beam Transport PSI:** HRA + SRS – Jul/21 E2/E5/L3BT/L2BT delivery – Aug/22 **Phase 3 – E3 PSI + E4 PSI:** E3/E4 HRA update + SRS – Jun/22 E3/E4 delivery – Aug/23 • The reason of the overall replanning of the project activities is related to the execution of E3/E4 phase – E3/E4 phase has been started with HRA/SRS activities as planned, but the SRS finalization was delayed in Oct/20, in order to gain sufficient time to resolve outstanding queries and issues resulting from the HRA/SRS preparation up to now.	

There are also further new requirements to E3/E4 halls (L4p beam introduction in E3 hall and MOB delivery expected in Q1/22), which are expected to have impact on the E3/E4 Risk Analysis, SRS and further implementation. Therefore, the E3/E4 phase is shifted up to Aug/23.

Subject of the change:

- this DCR includes the new proposed project schedule, see attachment, which in detail is subject of further agreement
- this DCR includes additional costs related to the replanning of the activities and change of the project phases according to the new proposed schedule, due to:
  - extended project duration, additional project management effort, project will last up to Aug/23
  - escalation costs due to delayed execution – the engineering service and material purchasing was intended to be done at earlier point of time
  - escalation costs on Sensia engineering hours (FSE, FSA roles)
  - Mobilization costs of the project team for E3/E4 phase, which were put on hold at certain time (resume the work, get familiar with status, clarification meetings with customer, etc)

The increased price is evaluated based on Art.III Work Scope of the Contact of Work.

Assumptions:

- This DCR provides estimates of Rockwell costs with respect to the new proposed schedule, as attached. In case of further schedule changes, the final costs may be reevaluated, considering the real project phasing and the final duration of the project
- It is assumed the same project team, which was involved in E1 phase, will continue with the project activities at Rockwell side in the next phases. However, in case of the project duration will be further prolonged, the same engineers may not be available and additional handover/ knowledge transfer factors may have to be considered in the final DCR costs.
- Escalation costs 3% per year are assumed for any engineering activities or material purchases, in average. This DCR covers the new price of engineering and material, which is expected to be purchased at the point of time as per the proposed schedule.

Affected areas:

- E5, E2, E3, E4 PSIs,

Proposal includes:

A/ Material

- escalation costs on material to be purchased

DOCUMENTED CHANGE REQUEST

Document Title:
Date Modified: Revision: V4.0
Revision Note:
IFS Document #: Alt Doc #:

B/Services

- project management and administration
- related Functional Safety Consulting
- related Engineering

Proposal does not include:

- modification and changes of other parts then described
- modification and changes of other part of technologies

Item	Description	Labour (days/hours)	Price Rate	Sub Total cost
1	Project duration extension up to Jun/23, additional PM and Admin costs	405.0	[redacted]	[redacted] €
1a	Discount on PM and Admin costs - 25%			€
2	Escallation costs - remaining Engineering (Sensia eng)			€
2a	Escallation costs - remaining Engineering (Rockwell eng)			€
2b	Escallation costs - remaining Material purchase			€
3a	E3/E4 - project mobilisation - additional hours Technical Team	64.0	[redacted]	€
3b	E3/E4 - project mobilisation - additional hours Functional Safety Engineer & Safety Authority	64.0	[redacted]	€
	Total Cost			**109,344 €**
	Notes:			**excl. VAT**
	Payment milestones	**%**		**EUR**
	After E2/E5 delivery	50%		54,672 €
	After E3/E4 delivery	50%		54,672 €

Notes:

Project Impact Estimate			
Lost Time:		Labor	X
Schedule:	X	Expenses	
Other:		Material	X

Rockwell Automation

DOCUMENTED CHANGE REQUEST	
Document Title:	
Date Modified:	Revision: V4.0
Revision Note:	
IFS Document #:	Alt Doc #:

Offer Expires 30 Days from Date of Record ☐ Approved ☐ Rejected ☐ Revise as Noted & Re-submit Customer Approval: Date:	**DCR Value** | **109 344 €** Customer Notes: Date: 15-Feb-22

Rockwell Automation

DOCUMENTED CHANGE REQUEST	
Document Title:	
Date Modified:	Revision: V1.1.1
Revision Note:	
IFS Document #:	Alt Doc #:

PROJECT INFORMATION	
Proposal Number:	QXQ1K1017B_V1.5
Project Number:	P4CZ009933
Project Name:	Personal Safety Interlock System
Project Manager:	Jozef Tilandy

CHANGE INFORMATION	
DCR#: 11	Date: 12.10.2021
Subject: Scope changes identified for E2/E5 + L3/L2 BT implementation phase	Initiated By: Eli Beam

Classification of Request:

X	Functional Change		Documentation Error
	Clarification		Operational Suggestion
X	Final Design Detail		Schedule Change
	Other: Engineering Support		

Recommended Priority: [ ] High [X] Medium [ ] Low

Areas Impacted:

X	Hardware & Engineering	X	Software & Engineering
X	Drafting	X	Assembly
	Other:		

Description of Change

Item No.	Item Description	Price

1.1	**E2 PSI,: Provision of additional AV panel inside E2 hall:**
	• the original scope is to provide 1x AV panel in E2 control room and 1x AV panel in E2 room, now 2 AV panels inside E2 room are required.
	• Material / Services included:
	  ○ additional AV panel build
	  ○ cables to E2 hall (10x0.75 LiY-CY 50m), connection thru Roxtec
	  ○ additional surge protection for EMP area (7pcs)
	  ○ AV panel installation, incl. cabling & cable routes
	  ○ SW configuration, test and commissioning
	• note: extension of E2 PSI PLC PointIO with additional IO modules is considered in #4
		[redacted] €

DOCUMENTED CHANGE REQUEST

Document Title:
Date Modified: Revision: V1.1.1
Revision Note:
IFS Document #: Alt Doc #:

1.2	**E5 PSI,: Provision of additional 2x AV panel inside E5 hall:**
	• the original scope is to provide 1x AV panel in E5 control room and 1x AV panel in E5 room, now 3 AV panels inside E5 hall are required,
	• Material / Services included:
	  ○ additional AV panel build (2pcs)
	  ○ cables to E5 hall (10x0.75 LiY-CY 50m), connection thru Roxtec
	  ○ additional surge protection for EMP area (7pcs)
	  ○ AV panel installation, incl. cabling & cable routes
	  ○ SW configuration, test and commissioning
	• note: extension of E2 PSI PLC PointIO with additional IO modules is considered in #4
		[redacted]	**€**

2.1	**E2 PSI: 4x local lasers (LS-20) & 1x interlock socket in E2 hall**
	• the interface to 4x local shutters in E2 hall was included in the original scope of supply, however, the interface for PSI system was considered to be located in control room area, close to the E2 PSI cabinet. Actually, the interfaces to local shutters shall be located inside E2 hall (EMP area), so additional wiring is required, including the signal back distribution to ELI E2 MSS system located inside E2 hall, as well
	• the next request is to provide hardwired interface to power feed / sockets inside the E2 experimental hall from which up to four Local Lasers will be powered. It is assumed the required safety contactors and termination strips (for four power outlet cables) will be located in ELI power distribution cabinet inside E2 hall
	• Material / Services included:
	  ○ interface design and documentation
	  ○ additional surge protection (4x per local laser, 3x for interlock sockets)
	  ○ safety contactors for power sockets (2x 100S-C09EJ23C),
	  ○ safety relays for galvanic isolation and extension for signal back distribution (440R-E23097)
	  ○ cables to E2 hall (20x0.75 LiY-CY), connection thru Roxtec
	  ○ installation services & cabling
	  ○ SW configuration, test and commissioning
	• note: extension of E2 PSI PLC PointIO with additional IO modules is considered in #4
		[redacted]	**€**

2.2	**E5 PSI: 4x local lasers (LS-20) & 1x interlock socket in E5 hall**	[redacted]	**€**

	• the interface to 4x local shutters in E5 hall was included in the original scope of supply, however, the interface for PSI system was considered to be located in control room area, close to the E5 PSI cabinet. Actually, the interfaces to local shutters shall be located inside E5 hall (EMP area), so additional wiring is required, including the signal back distribution to ELI E5 MSS system located inside E5 hall, as well
	• the next request is to provide hardwired interface to power feed / sockets inside the E5 experimental hall from which up to four Local Lasers will be powered. It is assumed the required safety contactors and termination strips (for four power outlet cables) will be located in ELI power distribution cabinet inside E5 hall
	• Material / Services included:
	  ○ interface design and documentation
	  ○ additional surge protection (4x per local laser, 3x for interlock sockets)
	  ○ safety contactors for power sockets (2x 100S-C09EJ23C),
	  ○ safety relays for galvanic isolation and extension for signal back distribution (440R-E53097)
	  ○ cables to E5 hall (20x0.75 LiY-CY), connection thru Roxtec
	  ○ installation services & cabling
	  ○ SW configuration, test and commissioning
	• note: extension of E5 PSI PLC PointIO with additional IO modules is considered in #4	

3.1	**E2 PSI: additional Trapped Keys:** • the original scope considered interface to use 5 Trapped Key modules for E2 PSI system, however as per design requirements 7 TKs are required to be equipped in E2 Control Room. • Material / Services included: ○ additional TK modules (2pcs 440T-MSRUE11) • note: extension of E2 PSI PLC PointIO with additional IO modules is considered in #4	[redacted] €
3.2	**E5 PSI: additional Trapped Keys:** • the original scope considered interface to use 5 Trapped Key modules for E5 PSI system, however as per design requirements 7 TKs are required to be equipped in E5 Control Room. • Material / Services included:	[redacted] €

	○ additional TK modules (2pcs 440T-MSRUE11) • note: extension of E2 PSI PLC PointIO with additional IO modules is considered in #4	
4	**E2/E5/L2BT/L3BT/Central PSI: additional IO signals:** • the original scope considered 570 IO signals for E2/E5/L2/L3/Beam Distribution/Central PSI unit, but based on Phase2 design of E3/E5/L2BT/L3BT 722 IOs are required. The scope change includes addition Point IO modules, cabinet extensions and engineering services required for this change • Material / Services included: ○ additional Point IO modules (1734-IB8S, 1734-OBS, 1734-IE4S) ○ engineering services (documentation, PLC logic, HMI) ○ cabinet design, wiring for additional IOs ○ SW test and commissioning	[redacted] €
5	**E2 PSI, E5 PSI: new interface to service doors:** • it is required that PSI shall prevent opening the sliding doors to service corridor, instead of locking labyrinth doors next to sliding door. However, this requires additional interface to Door PLC and cutting power to door motors. The interface shall be done to Central PSI with sw interface to E2/E5 PSI unit. In total 3 service doors are to be interlocked (2x E5 hall, 1x E2 hall) • Material / Services included: ○ interface design & documentation ○ additional cabinet next to door PLCs, incl. safety contactors for 3 door motors ○ cabinet design, build, installation, wiring to Central PSI and door PLC ○ engineering services (documentation, PLC logic, HMI) ○ test and commissioning • note: extension of Central PSI PLC PointIO with additional IO modules is considered in #4	[redacted] €
6.1	**L3 Beam Distribution: interface to 4x shutters (SGV502, 504, 505, blue laser) inside E3 hall:** • the original scope considered interface to shutters for L3 Beam distribution, however this interface was considered to be located in Control room area, close to the L3BT PSI cabinet. Now, the interfaces to L3 shutters shall be	[redacted] €

	located in E3 hall (EMP area), so additional wiring is required. In addition, the signal back distribution to ELI systems is required inside E3 hall (EMP area), what requires additional wiring and surge protections. • this DCR covers additional services related to E2/E5 phase and interfaces to SGV502, 504, 505, blue laser. Wiring to SGV503 is not considered and will be done in the next project phase E3/E4. • Material / Services included: ○ additional surge protection (10x per shutter, 5x blue laser shutter) ○ safety relays for galvanic isolation and extension for signal back distribution (440R-E23097, 6x per shutter) ○ cables to E3 hall (20x2x0.75 PiMS per shutter, 50m), connection thru Roxtec	
6.2	**L2 Beam Distribution: interface to 4x shutters (SGV522, 523, 524, 525) inside E2 hall:** • the original scope considered interface to shutters for L4 Beam distribution, however this interface was considered to be located in Control room area, close to the L4BT PSI cabinet. The new request is to provide L2 BeamTransport PSI instead L4 BD. The interfaces to L2 shutters shall be located in E2 hall (EMP area), In addition, the signal back distribution to ELI systems is required inside E2 hall (EMP area), what requires additional wiring and surge protections. • Material / Services included: ○ additional surge protection (10x per shutter) ○ safety relays for galvanic isolation and extension for signal back distribution (440R-E23097, 6x per shutter) ○ cables to E2 hall (20x2x0.75 PiMS per shutter, 50m), connection thru Roxtec	[redacted] €
7.1	**L3BT PSI: Trapped Key & HMI panel :** • the original scope did not consider dedicated TK panel and HMI panel for Beam transport PSI, as it was intended to be controlled from central control room. The scope change is related to provision of dedicated cabinet with TK panel and HMI panel inside L3 control room. • Material / Services included: ○ cabinet design documentation , cabinet build ▪ incl. additional TK modules (5pcs 440T-MSRUE11) ▪ incl. HMI Panelview (6200P-15WS3C1) ○ cabinet installation services, wiring	[redacted] €

	○ SW configuration, ○ test and commissioning • note: extension of L3BT PSI PLC PointIO with additional IO modules is considered in #4	
7.2	**L2BT PSI: Trapped Key & HMI panel :** • the original scope did not consider dedicated TK panel and HMI panel for Beam transport PSI, as it was intended to be controlled from central control room. The scope change is related to provision of dedicated cabinet with TK panel and HMI panel inside L2 control room. • Material / Services included: ○ cabinet design documentation , cabinet build ▪ incl. additional TK modules (5pcs 440T-MSRUE11) ▪ incl. HMI Panelview (6200P-15WS3C1) ○ cabinet installation services, wiring ○ SW configuration, ○ test and commissioning • note: extension of L2BT PSI PLC PointIO with additional IO modules is considered in #4	[redacted] €
8.1	**L3BT PSI: Provision of additional AV panel inside E3 hall:** • the original scope did not consider dedicated AV panel for L3BT PSI. The requirement is to provide 1x AV panel in E3 hall (EMP area) with 5 segments. The panel shall be connected to L3BT PSI PointIO in E3 control room • Material / Services included: ○ additional AV panel build ○ cables to E3 hall (10x0.75 LiY-CY 50m), connection thru Roxtec ○ additional surge protection for EMP area (5pcs) ○ AV panel installation in E3 hall, incl. cabling & cable routes • note: extension of L3BT PSI PLC PointIO with additional IO modules is considered in #4	[redacted] €
8.2	**L2BT PSI: Provision of additional AV panel inside E2 hall:** • the original scope did not consider dedicated AV panel for L2BT PSI. The requirement is to provide 1x AV panel in E2 hall (EMP area) with 5 segments. The panel shall be connected to L2BT PSI PointIO in E2 control room	[redacted] €

DOCUMENTED CHANGE REQUEST		
Document Title:		
Date Modified:	Revision:	V1.1.1
Revision Note:		
IFS Document #:	Alt Doc #:	

	• Material / Services included:
	  ○ additional AV panel build
	  ○ cables to E2 hall (10x0.75 LiY-CY 50m), connection thru Roxtec
	  ○ additional surge protection for EMP area (5pcs)
	  ○ AV panel installation in E2 hall, incl. cabling & cable routes
	• note: extension of L2BT PSI PLC PointIO with additional IO modules is considered in #4	

9.1	**North Plant room PSI PLC:**
	• the original scope considerer delivery of dedicated PLC for North Plant Room area. The dedicated PLC is not required anymore.
	• Material / Services reduced:
	  ○ AV panel build
	  ○ 1x cabinet with PLC HW (103 IOs)
	  ○ engineering services for Plant Room PSI
		[redacted] €

9.2	**South Plant room PSI PLC:**
	• the original scope considerer delivery of dedicated PLC for North Plant Room area. The dedicated PLC is not required anymore.
	• Material / Services reduced:
	  ○ AV panel build
	  ○ 1x cabinet with PLC HW (103 IOs)
	  ○ engineering services for Plant Room PSI
		-[redacted] €

	TOTAL	**39.764 €**

Notes:

Project Impact Estimate			
Lost Time:		Labor	X
Schedule:	X	Expenses	
Other:		Material	X

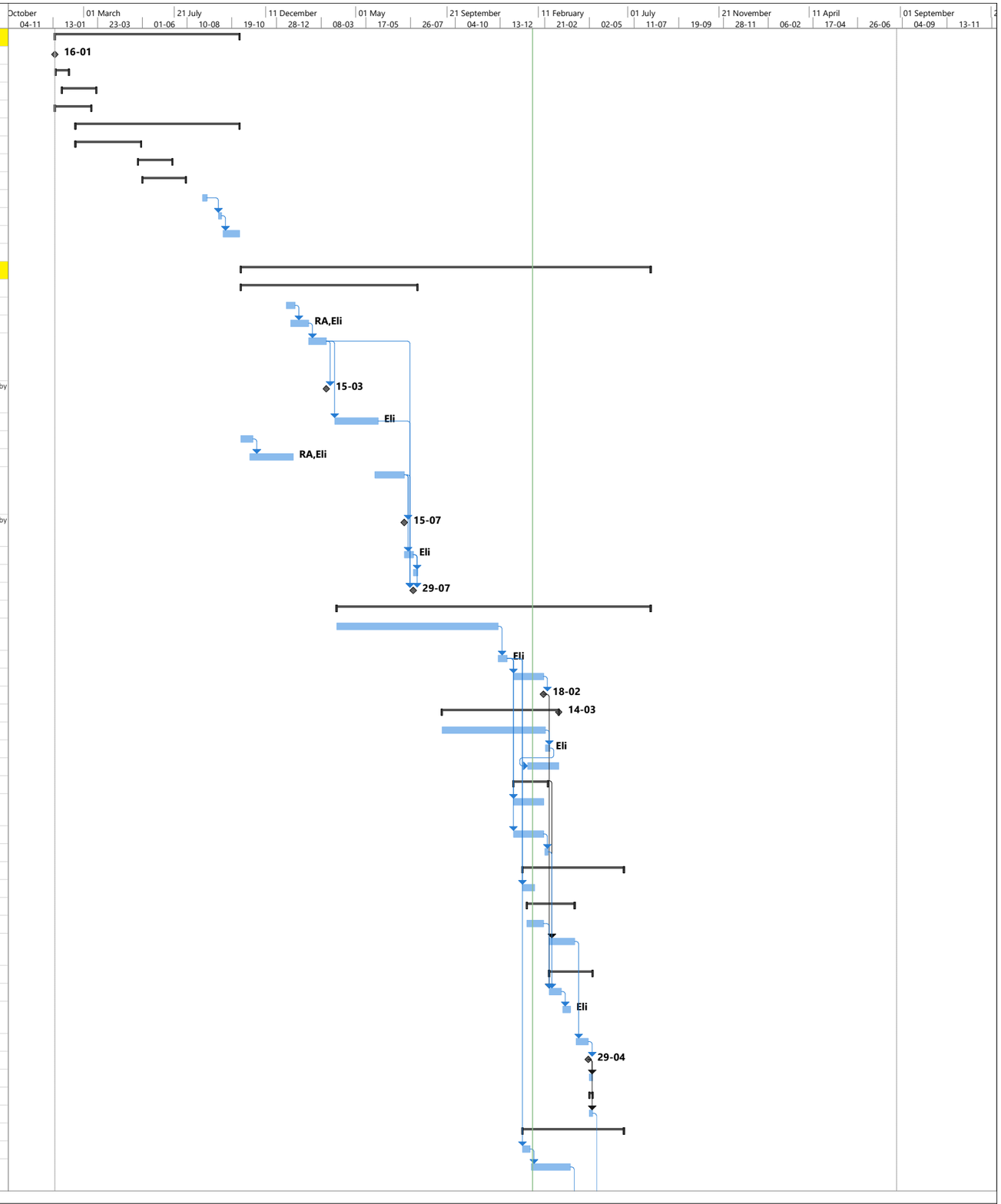
Rockwell Automation

DOCUMENTED CHANGE REQUEST	
Document Title:	
Date Modified:	Revision: V1.1.1
Revision Note:	
IFS Document #:	Alt Doc #:

Offer Expires 30 Days from Date of Record	**DCR Value** | **39.764 €**
☐ Approved ☐ Rejected ☐ Revise as Noted & Re-submit	Customer Notes: 1)
Customer Approval: Date:	Rockwell Approval: Date: 12.10.2021

Annex 2: Schedules of implementation for Phases E2, E3, E4 and E5

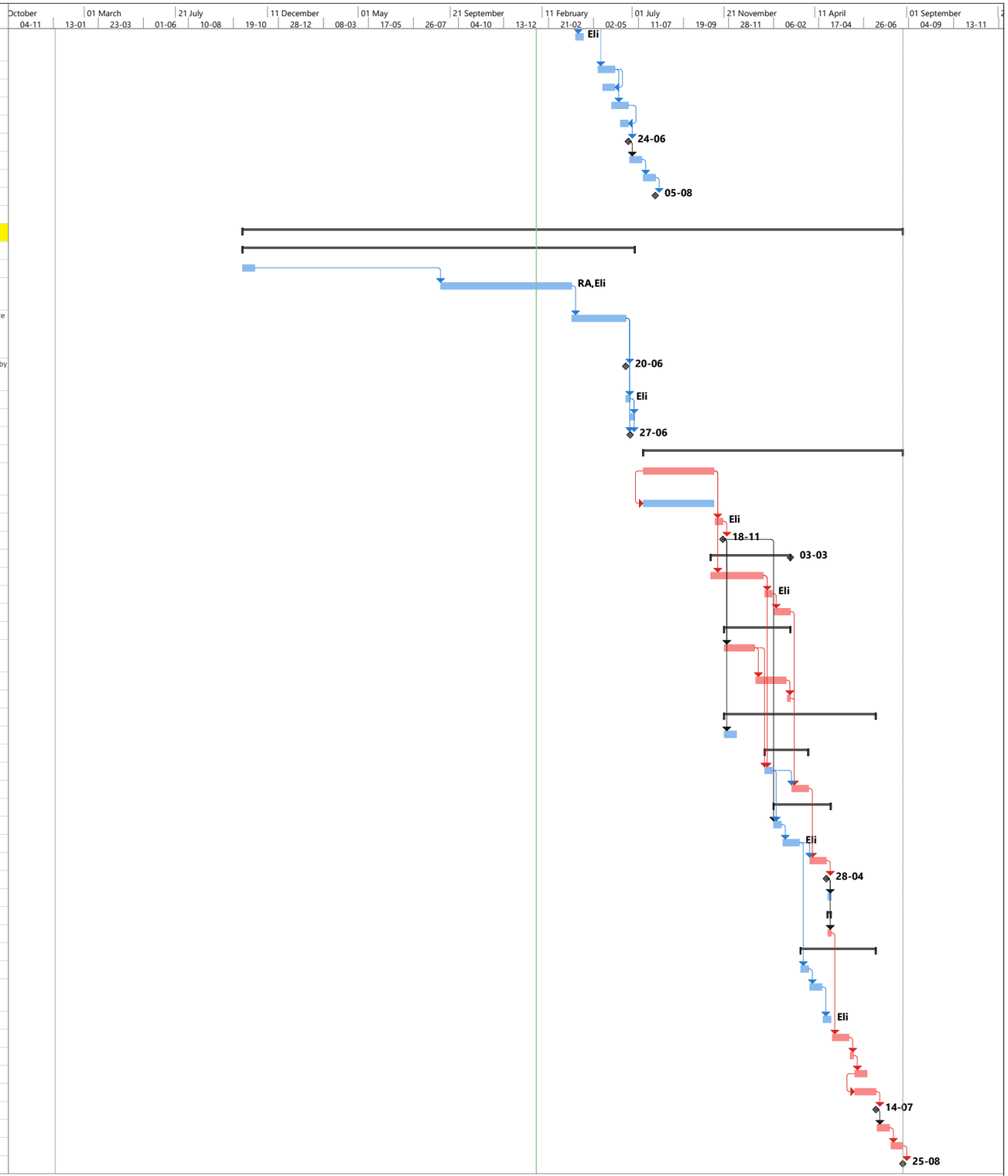
ID	Task Mode	Task Name	Duration	Start	Finish	Resource Names	Predecessors	Text1
1		**Phase 1: Eli Beam E1 & Central PSI Implementation**	**207 days**	**Thu 16-01-20**	**Fri 30-10-20**			
2		FDS complete	0 days	Thu 16-01-20	Thu 16-01-20			
3		**Documentation**	**15 days**	**Fri 17-01-20**	**Thu 06-02-20**			
10		**SW Engineering**	**40 days**	**Mon 27-01-20**	**Fri 20-03-20**			
21		**HW Enginering & Doc**	**41 days**	**Thu 16-01-20**	**Thu 12-03-20**			
35		**Testing**	**185 days**	**Mon 17-02-20**	**Fri 30-10-20**			
36		**Internal Test**	**75 days**	**Mon 17-02-20**	**Fri 29-05-20**			
42		**FAT**	**40 days**	**Mon 25-05-20**	**Fri 17-07-20**			
48		**SAT**	**50 days**	**Mon 01-06-20**	**Fri 07-08-20**			
52		Safety Audit (after Stage 3)	5 days	Thu 03-09-20	Wed 09-09-20		51,46	
53		Safety Assement	5 days	Mon 28-09-20	Fri 02-10-20		52,47	
54		E1 ready for use [D7, D8]	20 days	Mon 05-10-20	Fri 30-10-20		53	incl. final doc
55								
56		**Phase 2: Eli Beam E2 & L3 BT & E5 & L2BT**	**453 days**	**Mon 02-11-20**	**Fri 05-08-22**			
57		**Safety part**	**198 days**	**Mon 02-11-20**	**Thu 05-08-21**			
58		E2-TOR	10 days	Tue 12-01-21	Mon 25-01-21			incl. review and approval
59		E2-HRA + L3 BT HRA	20 days	Tue 19-01-21	Mon 15-02-21	RA,Eli	58FS-5 days	incl. review and approval
60		E2-SRS + L3 BT SRS	20 days	Tue 16-02-21	Mon 15-03-21		59	incl.all items in E2 Safety issue lists are resolved for further steps. Includes SRS Design Review
61		E2 interface design inputs received	0 days	Mon 15-03-21	Mon 15-03-21	Eli	60	PSI interface to other system is clarified by ELI and design is defined
62		E2-SRS + L3BT-SRS Review and Approval	50 days	Mon 29-03-21	Fri 04-06-21	Eli	60	final approval & sign-off
63		E5-TOR	15 days	Mon 02-11-20	Fri 20-11-20			incl. review and approval
64		E5-HRA + L2 BT HRA	50 days	Mon 16-11-20	Fri 22-01-21	RA,Eli	63FS-5 days	incl. review and approval
65		E5-SRS + L2 BT SRS	33 days	Mon 31-05-21	Thu 15-07-21			incl.all items in E5 Safety issue lists are resolved for further steps. Includes SRS Design Review
66		E5 interface design inputs received	0 days	Thu 15-07-21	Thu 15-07-21	Eli	65	PSI interface to other system is clarified by ELI and design is defined
67		E5-SRS + L2BT-SRS Review and Approval	10 days	Fri 16-07-21	Thu 29-07-21	Eli	65	final approval & sign-off
68		FS Assessment Stage 1	5 days	Fri 30-07-21	Thu 05-08-21		67	common for E2 & E5
69		SRSs Phase 2 completed [D2]	0 days	Thu 29-07-21	Thu 29-07-21		60,62,65,67	
70		**E2 + E5 + L3/L2 BT combined implementation**	**345 days**	**Thu 01-04-21**	**Fri 05-08-22**			
71		Fs phase (incl. ICD, FDS)	180 days	Thu 01-04-21	Thu 09-12-21			includes Functional Design and Design Review
72		ELI: Review & Approval	10 days	Fri 10-12-21	Thu 23-12-21	Eli	71	final approval & sign-off
73		SIL verification	35 days	Mon 03-01-22	Fri 18-02-22		72	incl. internal review
74		FS phase complete [D3]	0 days	Fri 18-02-22	Fri 18-02-22		73	
75		**HW**	**125 days**	**Mon 13-09-21**	**Mon 14-03-22**			
76		HW Design (Drawings)	110 days	Mon 13-09-21	Mon 21-02-22			incl. HW Design Review
77		ELI: HW review and approval	5 days	Tue 22-02-22	Mon 28-02-22	Eli	76	
78		Cabinet building	35 days	Tue 25-01-22	Mon 14-03-22		77FS-25 days	incl. material purchasing
79		**SW**	**40 days**	**Mon 03-01-22**	**Fri 25-02-22**			
80		Detailed Spec (SDS, CAE, SFC)	35 days	Mon 03-01-22	Fri 18-02-22		72	incl. SW Design Review, HMI Design Review
81		SW Engineering	35 days	Mon 03-01-22	Fri 18-02-22		72	
82		Code review	5 days	Mon 21-02-22	Fri 25-02-22		81	
83		**Testing**	**115 days**	**Mon 17-01-22**	**Fri 24-06-22**			
84		Supplier (Factory) Test Plan	15 days	Mon 17-01-22	Fri 04-02-22		72FS+10 days	incl. review and approval
85		**Internal Test**	**55 days**	**Mon 24-01-22**	**Fri 08-04-22**			
86		Internal test plan (HW & SW)	20 days	Mon 24-01-22	Fri 18-02-22			
87		Internal test execution (@ RA)	30 days	Mon 28-02-22	Fri 08-04-22		79	internal test SW in RA office, HW in Manag
88		**FAT**	**50 days**	**Mon 28-02-22**	**Fri 06-05-22**			
89		FAT plan & Protocol	15 days	Mon 28-02-22	Fri 18-03-22		74,86,82	
90		FAT Plan & Protocol - Review and Approval (ELI)	10 days	Mon 21-03-22	Fri 01-04-22	Eli	89	
91		FAT Execution (@ RA)	15 days	Mon 11-04-22	Fri 29-04-22		87	
92		FAT complete	0 days	Fri 29-04-22	Fri 29-04-22		91	
93		FS Assessment Stage 2	5 days	Mon 02-05-22	Fri 06-05-22		92	
94		**HW delivery to Site**	**5 days**	**Mon 02-05-22**	**Fri 06-05-22**			
95		HW delivered [D5]	5 days	Mon 02-05-22	Fri 06-05-22		92	
96		**Installation & Commissioning**	**115 days**	**Mon 17-01-22**	**Fri 24-06-22**			
97		Supplier (Site) Test Plan	10 days	Mon 17-01-22	Fri 28-01-22		72FS+10 days	incl. review and approval
98		SAT plan & Protocol	45 days	Mon 31-01-22	Fri 01-04-22		97	incl. Installation & Commissioning Procedures



Project: P4CZ009933-SCH-en P
Date: Wed 02-02-22

Task	Summary	Inactive Milestone	Duration-only	Start-only	External Milestone	Critical Split
Split	Project Summary	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline	Progress
Milestone	Inactive Task	Manual Task	Manual Summary	External Tasks	Critical	Manual Progress

ID	Task Mode	Task Name	Duration	Start	Finish	Resource Names	Predecessors	Text1
99		SAT Plan & Protocol - Review and Approval (ELI)	10 days	Mon 04-04-22	Fri 15-04-22	Eli	98	
100		HW/SW Installation (Part 1)	20 days	Mon 09-05-22	Fri 03-06-22		95	- E2, L2, E5 halls
101		SAT Execution - Part 1	15 days	Mon 16-05-22	Fri 03-06-22		100FF	incl. IO testing of RA deliverables
102		HW/SW Installation (Part 2)	20 days	Mon 30-05-22	Fri 24-06-22		100FS-5 days	- E3, L3 hall
103		SAT Execution - Part 2	10 days	Mon 13-06-22	Fri 24-06-22		102FF	incl IO testing of ELI interfaces
104		SAT complete	0 days	Fri 24-06-22	Fri 24-06-22		103	
105		Final documentation set	15 days	Mon 27-06-22	Fri 15-07-22		104	incl. O&M Manual update
106		FS Assessment Stage 3	15 days	Mon 18-07-22	Fri 05-08-22		105	final Safety Audit and FSA
107		E2 + E5 + L2/L3BT ready for use [D7, D8]	0 days	Fri 05-08-22	Fri 05-08-22		106	
108								
109		**Phase 3: Eli Beam E3 & E4 Implementation**	**728 days**	**Mon 02-11-20**	**Fri 25-08-23**			
110		**Safety part**	**429 days**	**Mon 02-11-20**	**Mon 04-07-22**			
111		E3-TOR + E4-TOR	15 days	Mon 02-11-20	Fri 20-11-20			already approved
112		E3-HRA + E4 HRA	140 days	Mon 06-09-21	Mon 28-03-22	RA,Eli	111FS-5 days	incl. new updates for L4p & MOB, incl. review and approval
113		E3-SRS + E4 SRS	60 days	Tue 29-03-22	Mon 20-06-22		112	incl.all items in E3/E4 Safety issue lists are resolved for further steps. Includes SRS Design Review
114		interface design inputs received	0 days	Mon 20-06-22	Mon 20-06-22	Eli	113	PSI interface to other system is clarified by ELI and design is defined
115		E3-SRS + E4-SRS Review and Approval	5 days	Tue 21-06-22	Mon 27-06-22	Eli	113	final approval & sign-off
116		FS Assessment Stage 1	5 days	Tue 28-06-22	Mon 04-07-22		115	
117		SRSs E3 & E4 completed [D2]	0 days	Mon 27-06-22	Mon 27-06-22		113,115	
118		**E3 + E4 combined implementation**	**290 days**	**Mon 18-07-22**	**Fri 25-08-23**			
119		Fs phase (incl. ICD, FDS, CAE, SFC)	80 days	Mon 18-07-22	Fri 04-11-22			includes Functional Design and Design Review
120		SIL verification	80 days	Mon 18-07-22	Fri 04-11-22		119SS	incl. internal review
121		ELI: Review & Approval	10 days	Mon 07-11-22	Fri 18-11-22	Eli	119	final approval & sign-off
122		FS phase complete [D3]	0 days	Fri 18-11-22	Fri 18-11-22		121	
123		**HW**	**90 days**	**Mon 31-10-22**	**Fri 03-03-23**			
124		HW Design (Drawings)	60 days	Mon 31-10-22	Fri 20-01-23		119FS-5 days	incl. HW Design Review
125		ELI: HW review and approval	10 days	Mon 23-01-23	Fri 03-02-23	Eli	124	
126		Cabinet building	20 days	Mon 06-02-23	Fri 03-03-23		125	incl. material purchasing
127		**SW**	**75 days**	**Mon 21-11-22**	**Fri 03-03-23**			
128		Detailed Spec (SDS,)	35 days	Mon 21-11-22	Fri 06-01-23		122	incl. SW Design Review, HMI Design Review
129		SW Engineering	35 days	Mon 09-01-23	Fri 24-02-23		128	
130		Code review	5 days	Mon 27-02-23	Fri 03-03-23		129	
131		**Testing**	**170 days**	**Mon 21-11-22**	**Fri 14-07-23**			
132		Supplier (Factory) Test Plan	15 days	Mon 21-11-22	Fri 09-12-22		122	incl. review and approval
133		**Internal Test**	**50 days**	**Mon 23-01-23**	**Fri 31-03-23**			
134		Internal test plan (HW & SW)	10 days	Mon 23-01-23	Fri 03-02-23		124,128	
135		Internal test execution (@ RA)	20 days	Mon 06-03-23	Fri 31-03-23		126,130,134	internal test in Manag
136		**FAT**	**65 days**	**Mon 06-02-23**	**Fri 05-05-23**			
137		FAT plan & Protocol	10 days	Mon 06-02-23	Fri 17-02-23		122,134	
138		FAT Plan & Protocol - Review and Approval	20 days	Mon 20-02-23	Fri 17-03-23	Eli	137	
139		FAT Execution (@ RA)	20 days	Mon 03-04-23	Fri 28-04-23		135,138	
140		FAT complete	0 days	Fri 28-04-23	Fri 28-04-23		139	
141		FS Assessment Stage 2	5 days	Mon 01-05-23	Fri 05-05-23		140	
142		**HW delivery to Site**	**5 days**	**Mon 01-05-23**	**Fri 05-05-23**			
143		HW delivered [D5]	5 days	Mon 01-05-23	Fri 05-05-23		140	
144		**Installation & Commissioning**	**85 days**	**Mon 20-03-23**	**Fri 14-07-23**			
145		Supplier (Site) Test Plan	10 days	Mon 20-03-23	Fri 31-03-23		138	incl. review and approval
146		SAT plan & Protocol	15 days	Mon 03-04-23	Fri 21-04-23		145	incl. Installation & Commissioning Procedures
147		SAT Plan & Protocol - Review and Approval	10 days	Mon 24-04-23	Fri 05-05-23	Eli	146	
148		HW/SW Installation (Part 1)	20 days	Mon 08-05-23	Fri 02-06-23		143	
149		SAT Execution - Part 1	5 days	Mon 05-06-23	Fri 09-06-23		148	incl. IO testing of RA deliverables
150		HW/SW Installation (Part 2)	15 days	Mon 12-06-23	Fri 30-06-23		149	connection of ELI interfaces (GV, etc)
151		SAT Execution - Part 2	25 days	Mon 12-06-23	Fri 14-07-23		150SS	incl IO testing of ELI interfaces
152		SAT complete	0 days	Fri 14-07-23	Fri 14-07-23		151	
153		Final documentation set	15 days	Mon 17-07-23	Fri 04-08-23		152	incl. O&M Manual update
154		FS Assessment Stage 3	15 days	Mon 07-08-23	Fri 25-08-23		153	final Safety Audit and FSA
155		E3 + E4 ready for use [D7, D8]	0 days	Fri 25-08-23	Fri 25-08-23		154	



Project: P4CZ009933-SCH-en P
Date: Wed 02-02-22

Task	Summary	Inactive Milestone	Duration-only	Start-only	External Milestone	Critical Split
Split	Project Summary	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline	Progress
Milestone	Inactive Task	Manual Task	Manual Summary	External Tasks	Critical	Manual Progress