Base Load Power Hub (BLPH)

Fire & Gas Cause & Effect Matrix

Document Number: 123A90-DDL-IN-CE-40002

Document Class: 1

Rev.	Date	Description	Prepared	Reviewed	Approved
05	23-09-2025	As-Built (ASB)	SPS	MGA	CGI
04	21-07-2025	Accepted for Construction (AFC)	DCA	MGA	CGI
03	11-02-2025	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08-10-2024	Accepted for Construction (AFC)	LCA	MGA	DLO
01	12-06-2024	Accepted for Construction (AFC)	LCA	MGA	DLO
00	08-03-2024	Issue for Acceptance (IFA)	LCA	MGA	DLO

This document undergoes an issuance cycle within EDMS "Fusionlive".
Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Table of Contents

SH.	DESCRIPTION	REVISIONS							
		00	01	02	03	04	05		
1	Cover	X	X	X	X	X	X		
2	Table of Contents	X	X	X	X	X	X		
3	Revision / Change Log	X	X	X	X	X	X		
4	NOTES	X	X	X	X	X	X		
5	FIRE ZONE 06: B-100 (HV CONTAINER)	X	X	X		X	X		
6	FIRE ZONE 04: B-200 (LV CONTAINER)	X	X	X		X	X		
7	FIRE ZONE 04: B-300 (UPS CONTAINER)	X	X	X		X	X		
8	FIRE ZONE 04: B-400 (ITER CONTAINER)	X	X	X		X	X		
9	FIRE ZONE 01: FUEL CELL	X	X	X		X	X		
10	FIRE ZONE 05: BESS	X	X	X		X	X		
11	FIRE ZONE 03: ELECTROLYZER	X	X	X		X	X		
12	FIRE ZONE 05: WATER TREATMENT	X	X	X		X	X		
13	FIRE ZONE 01/02/03/05: HYDROGEN OPEN AREA	X	X	X		X	X		
14	FIRE ZONE 03: OXYGEN OPEN AREA	X	X	X		X	X		
15	FIRE ZONE 01/02/03/04/05/06: FIRE OPEN AREA	X	X	X	X	X	X		
16	FIRE ZONE 01/02/03/04/05/06/7: MFA PUSH BUTTONS	X	X	X		X	X		
17	FIRE ZONE 01/02/03/04/05/06/7: SOUNDERS AND BEACONS	X	X	X		X	X		

This document undergoes an issuance cycle within EDMS "Fusionlive".
Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Revision / Change Log

Rev.	Description
00	ISSUE FOR ACCEPTANCE (IFA)
01	ACCEPTED FOR CONSTRUCTION (AFC)
02	ACCEPTED FOR CONSTRUCTION (AFC)
03	ACCEPTED FOR CONSTRUCTION (AFC)
04	ACCEPTED FOR CONSTRUCTION (AFC)
05	AS-BUILT (ASB)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

This document undergoes an issuance cycle within EDMS "Fusionlive".
Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

Notes:

1) Abbreviation

CCR = CENTRAL CONTROL ROOM (ONSHORE)
OER = ONSHORE EQUIPMENT ROOM
ITER = OFFSHORE CONTROL ROOM
R = RESET
EL = EVENT LOG
F = FLASHING LIGHT INDICATION ON CAP
T = TIME DELAY

ASD=ABANDON
ESD=EMERGENCY SHUTDOWN
MOB= MAN OVERBORD
FGS=FIRE & GAS SYSTEM
HMI=HUMAN MACHINE INTERFACE
SIS=SAFETY INSTRUMENTED SYSTEM

PKG=PACKGE
UPS=Uninterruptible Power Supply
P&ID=Piping and Instrument Diagram
HVAC=Heating, Ventilation and Air Condition.
BLPH=Base Load Power Hub
ITER=Instrument & Telecoms Equipment Room

2) Digital Input/Output on SIS System TAGs legend:

Digital Output from SIS	Digital Input to FGS
79-XS-001 (ASD activation)	79-XA-001 (ASD activation)
79-XS-002 (ESD-1D activation)	79-XA-002 (ESD-1D activation)
79-XS-003 (ESD-1 activation)	79-XA-003 (ESD-1 activation)
79-XS-004 (MOB activation)	79-XA-004 (MOB activation)

3) Digital Input/Output on FGS System TAGs legend:

Digital Output from FGS	Digital Input to SIS
70-XS-001 (ASD activation)	70-XA-001 (ASD activation)
70-XS-002 (ESD-1D activation)	70-XA-002 (ESD-1D activation)
70-XS-003 (S/D Electrolyzer)	70-XA-003 (S/D Electrolyzer)
70-XS-004 (Inhibit battery Charging B-300)	70-XA-004 (Inhibit battery Charging B-300)
70-XS-005 (H2 Open Area)	70-XA-005 (H2 Open Area)
70-XS-006 (H2/SMOKE B-100)	70-XA-006 (H2/SMOKE B-100)
70-XS-007 (H2/SMOKE B-200)	70-XA-007 (H2/SMOKE B-200)
70-XS-008 (Inhibit battery Charging B-100)	70-XA-008 (Inhibit battery Charging B-100)
70-XS-010 (H2/Smoke in water Treat.)	70-XA-010 (H2/Smoke in water Treat.)
70-XS-015 (H2/Smoke intake B-100)	70-XA-015 (H2/Smoke intake B-100)
70-XS-016 (H2/Smoke intake B-200)	70-XA-016 (H2/Smoke intake B-200)
70-XS-017 (H2/Smoke intake B-300)	70-XA-017 (H2/Smoke intake B-300)
70-XS-018 (H2/Smoke intake B-400)	70-XA-018 (H2/Smoke intake B-400)

4) Voting logic degradation:

1) in case of a MooN Loop, the FGS logic degradation will be as follow:
a) Detector in fault condition: (M-1)oo(N-1) if N≤3
b) 2 (Two) Detectors in fault condition→ "Trip Logic" if N≤3
c) Detector in fault condition: Moo(N-1) if N>3
d) Detector in by-pass condition: (M-1)oo(N-1) if N≤3 (with Loop 2oo3)
e) Detector in by-pass condition: Moo(N-1) if N≤3 (with Loop 1oo2)
f) Detector in by-pass condition: Moo(N-1) if N>3

5) Software push buttons for RESET FGS logics on HMI is provided

6) INTERNAL WIRING ISOLATION INSIDE FGS CABINETS:

70-XS-011	ELECTR. ISOLATION LIMIT SWITCHES FGS DAMPERS B-100 (77-ZSL-001/002/003)
70-XS-012	ELECTR. ISOLATION LIMIT SWITCHES FGS DAMPERS B-200 (77-ZSL-004/005/006)

This document undergoes an issuance cycle within EDMS "Fusionlive".
Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

FIRE ZONE 06
B-100 (HV CONTAINER)

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

EFFECT

No.	SYS	NOTES	DESCRIPTION	TAG No.
1	AUDIO / VISUAL ALERT		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
3	AUDIO / VISUAL ALERT		F&G ALARM ON CAP ONSHORE	
5	AUDIO / VISUAL ALERT	TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
7	AUDIO / VISUAL ALERT	TO SHEET 17	FIRE BEACON ACTIVATION - RED	
9	AUDIO / VISUAL ALERT	TO SHEET 17	SOUNDER ACTIVATION	
11	AUDIO / VISUAL ALERT		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
17	SIS SYSTEM	3	ESD-1D TO SIS SYTEM	70-XS-002
19	SIS SYSTEM	3	INHIBIT BATTERY CHARGING B-100 TO SIS	70-XS-008
21	SIS SYSTEM	3	H2/SMOKE INSIDE B-100 (ELECT. ISOLATION) TO SIS SYTEM	70-XS-006
23	SIS SYSTEM	3	H2/SMOKE INTAKE B-100 TO SIS SYTEM	70-XS-015
27	ELECTRIC ISOLATION	4	ELECTR. ISOLATION LIMIT SWITCHES FGS DAMPERS B-100 (77-ZSL-001/002/003)	70-XS-011
34	OTHER		CLOSE F&G DAMPER 77-HFD-001 B-100 (HV CONTAINER)	77-HY-001
35	OTHER		CLOSE F&G DAMPER 77-HFD-002 B-100 (HV CONTAINER)	77-HY-002
36	OTHER		CLOSE F&G DAMPER 77-HFD-003 B-100 (HV CONTAINER)	77-HY-003

CAUSE

TAG Nos	DESCRIPTION	VOTING	INHIBITION	REMARK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
950-GDZ-06204 950-GDZ-06205 950-GDZ-06206	H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo3	X		1	X		F																																																		
	H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo3	X		2	X		F																																																			
	H2 GAS HIGH CONFIRMED (ELECTROCHEM. POINT 10% LFL)	2oo3			3	X		F		X				X		(1)								(2)		(1)						(1)							(1)	(1)	(1)																	
					4																																																						
950-GDZ-06201 950-GDZ-06202 950-GDZ-06203	AIR INTAKE-H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo3	X		5	X		F																																																			
	AIR INTAKE -H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo3	X		6	X		F																																																		
	AIR INTAKE -H2 GAS HIGH CONFIRMED (ELECT. POINT 10% LFL)	2oo3			7	X		F		X				X		X						X						X											X	X	X																	
					8																																																					
					9																																																					
950-SDZ-06204 950-SDZ-06205 950-SDZ-06206	SMOKE DETECTION SINGLE	1oo3	X		10	X		F																																																			
	SMOKE DETECTION CONFIRMED	2oo3			11	X		F				X		X		X										X													X	X	X																	
					12																																																						
					13																																																						
950-SDZ-06201 950-SDZ-06202 950-SDZ-06203	AIR INTAKE - SMOKE DETECTION SINGLE	1oo3	X		14	X		F																																																		
	AIR INTAKE - SMOKE DETECTION CONFIRMED	2oo3			15	X		F				X		X		X						X						X											X	X	X																	
					16																																																						
79-XA-001	ASD PUSH BUTTON ACTIVATION FROM SIS SYSTEM			NOTE 3	17																																		X	X	X																	
					18																																																						
					19																																																						
					20																																																						
					21																																																						
					22																																																						
					23																																																						
					24																																																						
					25																																																						
					26																																																						
					27																																																						
					28																																																						
					29																																																						
					30																																																						
					31																																																						
					32																																																						
					33																																																						
					34																																																						
					35																																																						
					36																																																						
					37																																																						
					38																																																						
					39																																																						
					40																																																						
					41																																																						

NOTES:

1. Logic activation only in case of 2ooN H2 confirmed is caused by H2 detectors inside B-100 container and at least one of platform H2 detectors (excluded inside B-100 container) is Alarmed/Failed.

2. Logic activation only in case of 2ooN H2 confirmed is caused by H2 detectors inside B-100 container and all the others platform H2 detectors (excluded inside B-100 container) shall not be Alarmed/Failed.

3. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

4. INTERNAL WIRING ISOLATION INSIDE FGS CABINETS.

LEGEND

REFERENCE DOCUMENTS	
TITLE	**NUMBER**
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: B-100 (HV CONTAINER) DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

FIRE ZONE 04
B-200 (LV CONTAINER)

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

EFFECT

Column	SYS	NOTES	DESCRIPTION	TAG No.
1	AUDIO / VISUAL ALERT		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
3	AUDIO / VISUAL ALERT		F&G ALARM ON CAP ONSHORE	
5	AUDIO / VISUAL ALERT	TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
7	AUDIO / VISUAL ALERT	TO SHEET 17	FIRE BEACON ACTIVATION - RED	
9	AUDIO / VISUAL ALERT	TO SHEET 17	SOUNDER ACTIVATION	
11	AUDIO / VISUAL ALERT		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
17	SIS SYSTEM	1	ESD-1D TO SIS SYTEM	70-XS-002
19	SIS SYSTEM	1	H2/SMOKE INSIDE B-200 (ELECT. ISOLATION) TO SIS SYTEM	70-XS-007
21	SIS SYSTEM	1	H2/SMOKE INTAKE B-200 TO SIS SYTEM	70-XS-016
27	ELECTRIC ISOLATION	2	ELECTR. ISOLATION LIMIT SWITCHES FGS DAMPERS B-200 (77-ZSL-004/005/006)	70-XS-012
34	OTHER		CLOSE F&G DAMPER 77-HFD-004 B-200 (LV CONTAINER)	77-HY-004
35	OTHER		CLOSE F&G DAMPER 77-HFD-005 B-200 (LV CONTAINER)	77-HY-005
36	OTHER		CLOSE F&G DAMPER 77-HFD-006 B-200 (LV CONTAINER)	77-HY-006

CAUSE

TAG Nos	DESCRIPTION	VOTING	INHIBITION	REMARK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
950-GDZ-04216 950-GDZ-04217 950-GDZ-04218	H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo3	X		1	X		F																																																
	H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo3	X		2	X		F																																																
	H2 GAS HIGH CONFIRMED (ELECTROCHEM. POINT 10% LFL)	2oo3			3	X		F		X				X		X								X								X							X	X	X																	
					4																																																				
950-GDZ-04213 950-GDZ-04214 950-GDZ-04215	AIR INTAKE-H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo3	X		5	X		F																																																
	AIR INTAKE -H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo3	X		6	X		F																																																
	AIR INTAKE -H2 GAS HIGH CONFIRMED (ELECT. POINT 10% LFL)	2oo3			7	X		F		X				X		X						X				X													X	X	X																	
					8																																																				
					9																																																				
950-SDZ-04216 950-SDZ-04217 950-SDZ-04218	SMOKE DETECTION SINGLE	1oo3	X		10	X		F																																																
	SMOKE DETECTION CONFIRMED	2oo3			11	X		F				X		X		X								X															X	X	X																	
					12																																																				
					13																																																				
950-SDZ-04213 950-SDZ-04214 950-SDZ-04215	AIR INTAKE - SMOKE DETECTION SINGLE	1oo3	X		14	X		F																																																
	AIR INTAKE - SMOKE DETECTION CONFIRMED	2oo3			15	X		F				X		X		X						X				X													X	X	X																	
					16																																																				
79-XA-001	ASD PUSH BUTTON ACTIVATION FROM SIS SYSTEM			NOTE 1	17																																		X	X	X																	
					18																																																				
					19																																																				
					20																																																				
					21																																																				
					22																																																				
					23																																																				
					24																																																				
					25																																																				
					26																																																				
					27																																																				
					28																																																				
					29																																																				
					30																																																				
					31																																																				
					32																																																				
					33																																																				
					34																																																				
					35																																																				
					36																																																				
					37																																																				
					38																																																				
					39																																																				
					40																																																				
					41																																																				

NOTES:

1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

2. INTERNAL WIRING ISOLATION INSIDE FGS CABINETS.

LEGEND

REFERENCE DOCUMENTS	
TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND | ROSETTI MARINO

Fire & Gas Cause & Effect Matrix : B-200 (LV CONTAINER)

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

 05

FIRE ZONE 04
B-300 (UPS CONTAINER)

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

CAUSE

TAG Nos	DESCRIPTION	VOTING	INHIBITION	REMARK	Row
950-GDZ-04210 950-GDZ-04211 950-GDZ-04212	H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo3	X		1
	H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo3	X		2
	H2 GAS HIGH CONFIRMED (ELECTROCHEM. POINT 10% LFL)	2oo3			3
					4
950-GDZ-04207 950-GDZ-04208 950-GDZ-04209	AIR INTAKE-H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo3	X		5
	AIR INTAKE -H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo3	X		6
	AIR INTAKE -H2 GAS HIGH CONFIRMED (ELECT. POINT 10% LFL)	2oo3			7
					8
					9
950-SDZ-04210 950-SDZ-04211 950-SDZ-04212	SMOKE DETECTION SINGLE	1oo3	X		10
	SMOKE DETECTION CONFIRMED	2oo3			11
					12
					13
950-SDZ-04207 950-SDZ-04208 950-SDZ-04209	AIR INTAKE - SMOKE DETECTION SINGLE	1oo3	X		14
	AIR INTAKE - SMOKE DETECTION CONFIRMED	2oo3			15
					16
79-XA-001	ASD PUSH BUTTON ACTIVATION FROM SIS SYSTEM			NOTE 3	17
					18
					19
					20
					21
					22
					23
					24
					25
					26
					27
					28
					29
					30
					31
					32
					33
					34
					35
					36
					37
					38
					39
					40
					41

EFFECT

Col	SYS	NOTES	DESCRIPTION	TAG No.
1	AUDIO / VISUAL ALERT		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
3	AUDIO / VISUAL ALERT		F&G ALARM ON CAP ONSHORE	
5	AUDIO / VISUAL ALERT	TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
7	AUDIO / VISUAL ALERT	TO SHEET 17	FIRE BEACON ACTIVATION - RED	
9	AUDIO / VISUAL ALERT	TO SHEET 17	SOUNDER ACTIVATION	
11	AUDIO / VISUAL ALERT		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
17	SIS SYSTEM	Note 1,3	ASD TO SIS SYTEM	70-XS-001
19	SIS SYSTEM	Note 2, 3	INHIBIT BATTERY CHARGING B-300 TO SIS	70-XS-004
21	SIS SYSTEM	3	ESD-1D TO SIS SYTEM	70-XS-002
23	SIS SYSTEM	3	H2/SMOKE INTAKE B-300 TO SIS SYTEM	70-XS-017
27–32	ELECTRIC ISOLATION			
34	OTHER		CLOSE F&G DAMPER 77-HFD-007 B-300 (UPS CONTAINER)	77-HY-007
35	OTHER		CLOSE F&G DAMPER 77-HFD-008 B-300 (UPS CONTAINER)	77-HY-008
36	OTHER		CLOSE F&G DAMPER 77-HFD-009 B-300 (UPS CONTAINER)	77-HY-009
37	OTHER		CLOSE F&G DAMPER 77-HFD-010 B-300 (UPS CONTAINER)	77-HY-010
38	OTHER		CLOSE F&G DAMPER 77-HFD-011 B-300 (UPS CONTAINER)	77-HY-011

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
1	X		F																																																		
2	X		F																																																		
3	X		F		X				X		(1)						(1)		(2)															(1)	(1)	(1)	(1)	(1)															
4																																																					
5	X		F																																																		
6	X		F																																																		
7	X		F		X				X		X										X		X											X	X	X	X	X															
8																																																					
9																																																					
10	X		F																																																		
11	X		F				X		X		X						X																	X	X	X	X	X															
12																																																					
13																																																					
14	X		F																																																		
15	X		F				X		X		X										X		X											X	X	X	X	X															
16																																																					
17																																		X	X	X	X	X															
18																																																					
19																																																					
20																																																					
21																																																					
22																																																					
23																																																					
24																																																					
25																																																					
26																																																					
27																																																					
28																																																					
29																																																					
30																																																					
31																																																					
32																																																					
33																																																					
34																																																					
35																																																					
36																																																					
37																																																					
38																																																					
39																																																					
40																																																					
41																																																					

NOTES:

1. Logic activation only in case of 2ooN H2 confirmed is caused by H2 detectors inside UPS container and at least one of platform H2 detectors (excluded inside UPS container) is Alarmed/Failed.

2. Logic activation only in case of 2ooN H2 confirmed is caused by H2 detectors inside UPS container and all the others platform H2 detectors (excluded inside UPS container) shall not be Alarmed/Failed.

3. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

LEGEND

REFERENCE DOCUMENTS

TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND
ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: B-300 (UPS CONTAINER)

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

 05

FIRE ZONE 04
B-400 (ITER CONTAINER)

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

EFFECT

No.	SYS	NOTES	DESCRIPTION	TAG No.
1	AUDIO / VISUAL ALERT		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
3	AUDIO / VISUAL ALERT		F&G ALARM ON CAP ONSHORE	
5	AUDIO / VISUAL ALERT	TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
7	AUDIO / VISUAL ALERT	TO SHEET 17	FIRE BEACON ACTIVATION - RED	
9	AUDIO / VISUAL ALERT	TO SHEET 17	SOUNDER ACTIVATION	
11	AUDIO / VISUAL ALERT		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
17	SIS SYSTEM	1	ASD TO SIS SYTEM	70-XS-001
19	SIS SYSTEM	1	ESD-1D TO SIS SYTEM	70-XS-002
21	SIS SYSTEM	1	H2/SMOKE INTAKE B-400 TO SIS SYTEM	70-XS-018
27–32	ELECTRIC ISOLATION			
35	OTHER		CLOSE F&G DAMPER 77-HFD-012 B-400 (ITER CONTAINER)	77-HY-012
36	OTHER		CLOSE F&G DAMPER 77-HFD-013 B-400 (ITER CONTAINER)	77-HY-013
37	OTHER		CLOSE F&G DAMPER 77-HFD-014 B-400 (ITER CONTAINER)	77-HY-014
38	OTHER		CLOSE F&G DAMPER 77-HFD-015 B-400 (ITER CONTAINER)	77-HY-015
39	OTHER		CLOSE F&G DAMPER 77-HFD-016 B-400 (ITER CONTAINER)	77-HY-016

CAUSE

TAG Nos	DESCRIPTION	VOTING	INHIBITION	REMARK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
950-GDZ-04204 950-GDZ-04205 950-GDZ-04206	H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo3	X		1	X		F																																																			
	H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo3	X		2	X		F																																																			
	H2 GAS HIGH CONFIRMED (ELECTR. POINT 10% LFL)	2oo3			3	X		F		X				X		X						X																		X	X	X	X	X														
					4																																																				
950-GDZ-04201 950-GDZ-04202 950-GDZ-04203	AIR INTAKE-H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo3	X		5	X		F																																																			
	AIR INTAKE -H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo3	X		6	X		F																																																			
	AIR INTAKE -H2 GAS HIGH CONFIRMED (ELECT. POINT 10% LFL)	2oo3			7	X		F		X				X		X								X		X														X	X	X	X	X														
					8																																																				
					9																																																				
950-SDZ-04204 950-SDZ-04205 950-SDZ-04206	SMOKE DETECTION SINGLE	1oo3	X		10	X		F																																																			
	SMOKE DETECTION CONFIRMED	2oo3			11	X		F				X		X		X						X																		X	X	X	X	X														
					12																																																				
					13																																																				
950-SDZ-04201 950-SDZ-04202 950-SDZ-04203	AIR INTAKE - SMOKE DETECTION SINGLE	1oo3	X		14	X		F																																																			
	AIR INTAKE - SMOKE DETECTION CONFIRMED	2oo3			15	X		F				X		X		X								X		X														X	X	X	X	X														
					16																																																				
79-XA-001	ASD PUSH BUTTON ACTIVATION FROM SIS SYSTEM			NOTE 1	17																																			X	X	X	X	X														
					18																																																				
					19																																																				
					20																																																				
					21																																																				
					22																																																				
					23																																																				
					24																																																				
					25																																																				
					26																																																				
					27																																																				
					28																																																				
					29																																																				
					30																																																				
					31																																																				
					32																																																				
					33																																																				
					34																																																				
					35																																																				
					36																																																				
					37																																																				
					38																																																				
					39																																																				
					40																																																				
					41																																																				

NOTES:

1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

LEGEND

REFERENCE DOCUMENTS

TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: B-400 (ITER CONTAINER)

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

FIRE ZONE 01
FUEL CELL

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

EFFECT

No.	SYS	NOTES	DESCRIPTION	TAG No.
1	AUDIO / VISUAL ALERT		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
2				
3			F&G ALARM ON CAP ONSHORE	
4				
5		TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
6				
7		TO SHEET 17	FIRE BEACON ACTIVATION - RED	
8				
9		TO SHEET 17	SOUNDER ACTIVATION	
10				
11			WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
12				
13				
14				
15				
16				
17	SIS SYSTEM	1	ESD-1D TO SIS SYTEM	70-XS-002
18				
19				
20				
21				
22				
23				
24				
25				
26				
27	ELECTRIC ISOLATION			
28				
29				
30				
31				
32				
33	OTHER			
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				

CAUSE

TAG Nos	DESCRIPTION	VOTING	INHIBITION	REMARK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
80-XA-001	H2 GAS CONFIRMED IN FUEL CELL				1	X		F		X				X		X						X																																				
					2																																																						
80-XA-002	SMOKE CONFIRMED IN FUEL CELL				3	X		F				X		X		X						X																																				
					4																																																				
					5																																																					
					6																																																					
					7																																																					
					8																																																					
					9																																																					
					10																																																					
					11																																																					
					12																																																					
					13																																																					
					14																																																					
					15																																																					
					16																																																					
					17																																																					
					18																																																					
					19																																																					
					20																																																					
					21																																																					
					22																																																					
					23																																																					
					24																																																					
					25																																																					
					26																																																					
					27																																																					
					28																																																					
					29																																																					
					30																																																					
					31																																																					
					32																																																					
					33																																																					
					34																																																					
					35																																																					
					36																																																					
					37																																																					
					38																																																					
					39																																																					
					40																																																					
					41																																																					

NOTES:
1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

LEGEND

REFERENCE DOCUMENTS

TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND | ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: FUEL CELL

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

 05

FIRE ZONE 05
BESS

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

					SYS	AUDIO / VISUAL ALERT																SIS SYSTEM										ELECTRIC ISOLATION						OTHER																				
					NOTES					TO SHEET 17		TO SHEET 17		TO SHEET 17								1																																				
				EFFECT	DESCRIPTION	OPERATOR WORKSTATION DISPLAY - EVENT/ALARM		F&G ALARM ON CAP ONSHORE		GAS BEACON ACTIVATION - AMBER		FIRE BEACON ACTIVATION - RED		SOUNDER ACTIVATION		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS						ESD-1D TO SIS SYTEM																																				
					TAG No.											72-XS-001						70-XS-002																																				
TAG Nos	CAUSE																																																										
	DESCRIPTION	VOTING	INHIBITION	REMARK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
85-XA-001	GAS CONFIRMED IN BESS				1	X		F		X				X		X						X																																				
					2																																																						
85-XA-002	SMOKE CONFIRMED IN BESS				3	X		F				X		X		X						X																																				
					4																																																						
					5																																																						
					6																																																						
					7																																																						
					8																																																						
					9																																																						
					10																																																							
					11																																																							
					12																																																							
					13																																																							
					14																																																							
					15																																																							
					16																																																							
					17																																																							
					18																																																							
					19																																																							
					20																																																							
					21																																																							
					22																																																							
					23																																																							
					24																																																							
					25																																																							
					26																																																							
					27																																																							
					28																																																							
					29																																																							
					30																																																							
					31																																																							
					32																																																							
					33																																																							
					34																																																							
					35																																																							
					36																																																							
					37																																																							
					38																																																							
					39																																																							
					40																																																							
					41																																																							

NOTES:
1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

LEGEND

REFERENCE DOCUMENTS	
TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND — ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: BESS	DATE: 23-09-2025
HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	Sheet. 10 of 17 — 05

FIRE ZONE 03
ELECTROLYZER

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

				EFFECT	SYS	AUDIO / VISUAL ALERT																SIS SYSTEM										ELECTRIC ISOLATION						OTHER																				
					NOTES					TO SHEET 17		TO SHEET 17		TO SHEET 17								1																																				
					DESCRIPTION	OPERATOR WORKSTATION DISPLAY - EVENT/ALARM		F&G ALARM ON CAP ONSHORE		GAS BEACON ACTIVATION - AMBER		FIRE BEACON ACTIVATION - RED		SOUNDER ACTIVATION		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS						ESD-1D TO SIS SYTEM																																				
TAG Nos	CAUSE				TAG No.											72-XS-001						70-XS-002																																				
	DESCRIPTION	VOTING	INHIBITION	REMARK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
20-XA-001	GAS CONFIRMED IN ELECTROLYZER				1	X		F		X				X		X						X																																				
					2																																																						
20-XA-002	SMOKE CONFIRMED IN ELECTROLYZER				3	X		F				X		X		X						X																																				
					4																																																						
					5																																																						
					6																																																						
					7																																																						
					8																																																						
					9																																																						
					10																																																						
					11																																																						
					12																																																						
					13																																																						
					14																																																						
					15																																																						
					16																																																						
					17																																																						
					18																																																						
					19																																																						
					20																																																						
					21																																																						
					22																																																						
					23																																																						
					24																																																						
					25																																																						
					26																																																						
					27																																																						
					28																																																						
					29																																																						
					30																																																						
					31																																																						
					32																																																						
					33																																																						
					34																																																						
					35																																																						
					36																																																						
					37																																																						
					38																																																						
					39																																																						
					40																																																						
					41																																																						

NOTES:

1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

LEGEND

REFERENCE DOCUMENTS	
TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: ELECTROLYZER

DATE	23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

 05

FIRE ZONE 05
WATER TREATMENT

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

EFFECT

SYS	Columns
AUDIO / VISUAL ALERT	1–16
SIS SYSTEM	17–26
ELECTRIC ISOLATION	27–32
OTHER	33–53

Effect No.	NOTES	DESCRIPTION	TAG No.
1		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
3		F&G ALARM ON CAP ONSHORE	
5	TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
7	TO SHEET 17	FIRE BEACON ACTIVATION - RED	
9	TO SHEET 17	SOUNDER ACTIVATION	
11		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
17	1	H2/SMOKE IN WATER TREAT. (ELECT. ISOLATION) TO SIS SYTEM	70-XS-010

CAUSE

	TAG Nos	DESCRIPTION	VOTING	INHIBITION	REMARK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
1	50-XA-001	GAS CONFIRMED IN WATER TREATMENT PKG				X		F		X				X		X						X																																		
2																																																										
3	50-XA-002	SMOKE CONFIRMED IN WATER TREATMENT PKG				X		F				X		X		X						X																																		
4																																																										
5																																																										
6																																																										
7																																																										
8																																																										
9																																																										
10																																																										
11																																																										
12																																																										
13																																																										
14																																																										
15																																																										
16																																																										
17																																																										
18																																																										
19																																																										
20																																																										
21																																																										
22																																																										
23																																																										
24																																																										
25																																																										
26																																																										
27																																																										
28																																																										
29																																																										
30																																																										
31																																																										
32																																																										
33																																																										
34																																																										
35																																																										
36																																																										
37																																																										
38																																																										
39																																																										
40																																																										
41																																																										

NOTES:
1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

LEGEND

REFERENCE DOCUMENTS	
TITLE	**NUMBER**
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND — ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: WATER TREATMENT

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

Sheet. 12 of 17 | 05

FIRE ZONE 01/02/03/05
HYDROGEN OPEN AREA

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

NOTES:
1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

EFFECT

SYS	No.	NOTES	DESCRIPTION	TAG No.
AUDIO / VISUAL ALERT (1–16)	1		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
	2			
	3		F&G ALARM ON CAP ONSHORE	
	4			
	5	TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
	6			
	7	TO SHEET 17	FIRE BEACON ACTIVATION - RED	
	8			
	9	TO SHEET 17	SOUNDER ACTIVATION	
	10			
	11		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
	12–16			
SIS SYSTEM (17–26)	17	1	H2 IN OPEN AREA TO SIS SYST. (TRIP EQ. NOT FOR ZONE 1 IN OPEN AREA)	70-XS-005
	18–26			
ELECTRIC ISOLATION (27–32)	27		ELECTRICAL ISOLATION VISIBILITY METER NOT SUITABLE FOR ZONE IIC or (IIB+H2)	72-XS-002
	28–32			
OTHER (33–53)	33–53			

CAUSE

TAG Nos	DESCRIPTION	VOTING	INHIBITION	REMARK	Row
950-GDZ-02101 950-GDZ-02102 950-GDZ-02103 950-GDZ-02104 950-GDZ-02105 950-GDZ-02106 950-GDZ-02107 950-GDZ-02108 950-GDZ-02109 950-GDZ-02110 950-GDZ-02111 950-GDZ-02112 950-GDZ-02113 950-GDZ-02114 950-GDZ-02115 950-GDZ-02116 950-GDZ-02117 (ULTRAS.) 950-GDZ-02118 (ULTRAS.) 950-GDZ-02119 (ULTRAS.) 950-GDZ-02120 (ULTRAS.)	FZ-02 - H2 GAS LOW (ELECT./ ULTRAS. POINT 5% LFL)	1oo20	X		1
	FZ-02 - H2 GAS HIGH (ELECT./ ULTRAS. POINT 10% LFL)	1oo20	X		2
	FZ-02 - H2 GAS HIGH CONFIRMED (ELECT./ ULTRAS. POINT 10% LI	2oo20			3
					4
					5
					6
					7
					8
					9
					10
					11
					12
950-GDZ-01101 (ULTRAS.) 950-GDZ-01102 (ULTRAS.) 950-GDZ-01103 (POINT)	FZ-01 - H2 GAS LOW (ULTRAS. POINT 5% LFL)	1oo3	X		13
	FZ-01 - H2 GAS HIGH (ULTRAS. POINT 10% LFL)	1oo3	X		14
	FZ-01 - H2 GAS HIGH CONFIRMED (ULTRAS. POINT 10% LFL)	2oo3			15
					16
950-GDZ-03101 (ULTRAS.) 950-GDZ-03102 (ULTRAS.) 950-GDZ-03103 (ULTRAS.) 950-GDZ-03104 (POINT) 950-GDZ-03105 (POINT)	FZ-03 - H2 GAS LOW (ULTRAS. POINT 5% LFL)	1oo5	X		17
	FZ-03 - H2 GAS HIGH (ULTRAS POINT 10% LFL)	1oo5	X		18
	FZ-03 - H2 GAS HIGH CONFIRMED (ULTRAS POINT 10% LFL)	2oo5			20
					21
950-GDZ-05101 950-GDZ-05102 950-GDZ-05103 950-GDZ-05104 950-GDZ-05105 950-GDZ-05106	FZ-05 - H2 GAS LOW (ELECTROCHEM. POINT 5% LFL)	1oo6	X		22
	FZ-05 - H2 GAS HIGH (ELECTROCHEM. POINT 10% LFL)	1oo6	X		23
	FZ-05 - H2 GAS HIGH CONFIRMED (ELECTROCHEM. POINT 10% LFL)	2oo6			24
					25
					26
					27
					28
					29
					30
					31
					32
					33
					34
					35
					36
					37
					38
					39
					40
					41

CAUSE / EFFECT MATRIX

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
1	X		F																																																		
2	X		F																																																		
3	X		F		X				X		X						X										X																										
4																																																					
5																																																					
6																																																					
7																																																					
8																																																					
9																																																					
10																																																					
11																																																					
12																																																					
13	X		F																																																		
14	X		F																																																		
15	X		F		X				X		X						X										X																										
16																																																					
17	X		F																																																		
18	X		F																																																		
20	X		F		X				X		X						X										X																										
21																																																					
22	X		F																																																		
23	X		F																																																		
24	X		F		X				X		X						X										X																										
25																																																					
26																																																					
27																																																					
28																																																					
29																																																					
30																																																					
31																																																					
32																																																					
33																																																					
34																																																					
35																																																					
36																																																					
37																																																					
38																																																					
39																																																					
40																																																					
41																																																					

LEGEND

TITLE	NUMBER

REFERENCE DOCUMENTS	
TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

Fire & Gas Cause & Effect Matrix: HYDROGEN OPEN AREA	DATE 23-09-2025
HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	Sheet. 13 of 17 — 05

FIRE ZONE 03
OXYGEN OPEN AREA

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

NOTES:
1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

EFFECT

Col	SYS	NOTES	DESCRIPTION	TAG No.
1	AUDIO / VISUAL ALERT		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
2	AUDIO / VISUAL ALERT			
3	AUDIO / VISUAL ALERT		F&G ALARM ON CAP ONSHORE	
4	AUDIO / VISUAL ALERT			
5	AUDIO / VISUAL ALERT	TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
6	AUDIO / VISUAL ALERT			
7	AUDIO / VISUAL ALERT	TO SHEET 17	FIRE BEACON ACTIVATION - RED	
8	AUDIO / VISUAL ALERT			
9	AUDIO / VISUAL ALERT	TO SHEET 17	SOUNDER ACTIVATION	
10	AUDIO / VISUAL ALERT			
11	AUDIO / VISUAL ALERT		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
12	AUDIO / VISUAL ALERT			
13	AUDIO / VISUAL ALERT			
14	AUDIO / VISUAL ALERT			
15	AUDIO / VISUAL ALERT			
16	AUDIO / VISUAL ALERT			
17	SIS SYSTEM	1	SHUT-DOWN ELECTROLYZER TO SIS SYSTEM	70-XS-003
18	SIS SYSTEM			
19	SIS SYSTEM			
20	SIS SYSTEM			
21	SIS SYSTEM			
22	SIS SYSTEM			
23	SIS SYSTEM			
24	SIS SYSTEM			
25	SIS SYSTEM			
26	SIS SYSTEM			
27	ELECTRIC ISOLATION			
28	ELECTRIC ISOLATION			
29	ELECTRIC ISOLATION			
30	ELECTRIC ISOLATION			
31	ELECTRIC ISOLATION			
32	ELECTRIC ISOLATION			
33	OTHER			
34	OTHER			
35	OTHER			
36	OTHER			
37	OTHER			
38	OTHER			
39	OTHER			
40	OTHER			
41	OTHER			
42	OTHER			
43	OTHER			
44	OTHER			
45	OTHER			
46	OTHER			
47	OTHER			
48	OTHER			
49	OTHER			
50	OTHER			
51	OTHER			
52	OTHER			
53	OTHER			

CAUSE

Row	TAG Nos	DESCRIPTION	VOTING	INHIBITION	REMARK
1					
2	950-GDZ-03107 950-GDZ-03108 950-GDZ-03109	O2 GAS HIGH (ELECTROCHEM. POINT 23 % VOL)	1oo3	X	
3		O2 GAS HIGH CONFIRMED (ELECTROCHEM. POINT 23% VOL)	2oo3		
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
1																																																					
2	X		F																																																		
3	X		F		X				X		X						X																																				
4																																																					
5																																																					
6																																																					
7																																																					
8																																																					
9																																																					
10																																																					
11																																																					
12																																																					
13																																																					
14																																																					
15																																																					
16																																																					
17																																																					
18																																																					
19																																																					
20																																																					
21																																																					
22																																																					
23																																																					
24																																																					
25																																																					
26																																																					
27																																																					
28																																																					
29																																																					
30																																																					
31																																																					
32																																																					
33																																																					
34																																																					
35																																																					
36																																																					
37																																																					
38																																																					
39																																																					
40																																																					
41																																																					

LEGEND

REFERENCE DOCUMENTS	
TITLE	**NUMBER**
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: OXYGEN OPEN AREA

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

Sheet. 14 of 17 | 05

FIRE ZONE 01/02/03/04/05/06
FIRE OPEN AREA

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

EFFECT

No.	SYS	NOTES	DESCRIPTION	TAG No.
1	AUDIO / VISUAL ALERT		OPERATOR WORKSTATION DISPLAY - EVENT/ALARM	
2	AUDIO / VISUAL ALERT			
3	AUDIO / VISUAL ALERT		F&G ALARM ON CAP ONSHORE	
4	AUDIO / VISUAL ALERT			
5	AUDIO / VISUAL ALERT	TO SHEET 17	GAS BEACON ACTIVATION - AMBER	
6	AUDIO / VISUAL ALERT			
7	AUDIO / VISUAL ALERT	TO SHEET 17	FIRE BEACON ACTIVATION - RED	
8	AUDIO / VISUAL ALERT			
9	AUDIO / VISUAL ALERT	TO SHEET 17	SOUNDER ACTIVATION	
10	AUDIO / VISUAL ALERT			
11	AUDIO / VISUAL ALERT		WAVE-OFF LIGHT ACTIVATION TO NAVAIDS	72-XS-001
12–16	AUDIO / VISUAL ALERT			
17	SIS SYSTEM	1	ESD-1D TO SIS SYTEM	70-XS-002
18–26	SIS SYSTEM			
27–32	ELECTRIC ISOLATION			
33–53	OTHER			

TAG Nos	CAUSE DESCRIPTION	VOTING	INHIBITION	REMARK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
950-FDZ-01101 950-FDZ-01102 950-FDZ-01103 950-FDZ-01104	FZ-01 - FLAME (UV/IR)	1oo4	X		1	X		F														
	FZ-01 - FLAME CONFIRMED (UV/IR)	2oo4			2	X		F				X		X		X						X
					3																	
950-FDZ-02101 950-FDZ-02102 950-FDZ-02103 950-FDZ-02104	FZ-02 - FLAME (UV/IR)	1oo4	X		4	X		F														
	FZ-02 - FLAME CONFIRMED (UV/IR)	2oo4			5	X		F				X		X		X						X
					6																	
950-FDZ-03101 950-FDZ-03102 950-FDZ-03103 950-FDZ-03104	FZ-03 (ELECTROLYZER AREA) - FLAME (UV/IR)	1oo4	X		7	X		F														
	FZ-03 (ELECTROLYZER AREA) - FLAME CONFIRMED (UV/IR)	2oo4			8	X		F				X		X		X						X
					9																	
950-FDZ-04101 950-FDZ-04102 950-FDZ-04103 950-FDZ-04104	FZ-04 - FLAME (UV/IR)	1oo4	X		10	X		F														
	FZ-04 - FLAME CONFIRMED (UV/IR)	2oo4			11	X		F				X		X		X						X
					12																	
950-FDZ-05101 950-FDZ-05102 950-FDZ-05103 950-FDZ-05104	FZ-05 - FLAME (UV/IR)	1oo4	X		13	X		F														
	FZ-05 - FLAME CONFIRMED (UV/IR)	2oo4			14	X		F				X		X		X						X
					15																	
950-FDZ-06101 950-FDZ-06102	FZ-06 - FLAME (UV/IR)	1oo2			16	X		F														
	FZ-06 - FLAME CONFIRMED (UV/IR)	2oo2			17	X		F				X		X		X						X
					18																	
					19																	
					20																	
					21																	
					22																	
					23																	
					24																	
					25																	
					26																	
					27																	
					28																	
					29																	
					30																	
					31																	
					32																	
					33																	
					34																	
					35																	
					36																	
					37																	
					38																	
					39																	
					40																	
					41																	

NOTES:
1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP.

LEGEND

REFERENCE DOCUMENTS

TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND | ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: FIRE OPEN AREA

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

 05

FIRE ZONE 01/02/03/04/05/06/7
MFA PUSH BUTTONS

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

EFFECT

TAG Nos	CAUSE: DESCRIPTION	VOTING	INHIBITION	REMARK		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
					SYS	AUDIO / VISUAL ALERT																SIS SYSTEM										ELECTRIC ISOLATION						OTHER																				
					NOTES					TO SHEET 17		TO SHEET 17		TO SHEET 17																																												
					DESCRIPTION	OPERATOR WORKSTATION DISPLAY - EVENT/ALARM		F&G ALARM ON CAP ONSHORE		GAS BEACON ACTIVATION - AMBER		FIRE BEACON ACTIVATION - RED		SOUNDER ACTIVATION																																												
					TAG No.																																																								
					1																																																			
950-MFA-01101	FZ-01 MFA ACTIVATION		X	1	2	X		F				X		X																																										
950-MFA-01102	FZ-01 MFA ACTIVATION		X	1	3	X		F				X		X																																										
950-MFA-01103	FZ-01 MFA ACTIVATION		X	1	4	X		F				X		X																																										
					5																																																				
950-MFA-02101	FZ-02 MFA ACTIVATION		X	1	6	X		F				X		X																																										
					7																																																				
950-MFA-03101	FZ-03 MFA ACTIVATION		X	1	8	X		F				X		X																																										
950-MFA-03102	FZ-03 MFA ACTIVATION		X	1	9	X		F				X		X																																										
950-MFA-03103	FZ-03 MFA ACTIVATION		X	1	10	X		F				X		X																																										
950-MFA-03104	FZ-03 MFA ACTIVATION		X	1	11	X		F				X		X																																										
					12																																																				
950-MFA-04101	FZ-04 MFA ACTIVATION		X	1	13	X		F				X		X																																										
950-MFA-04102	FZ-04 MFA ACTIVATION		X	1	14	X		F				X		X																																										
					15																																																				
950-MFA-04201	FZ-04 MFA ACTIVATION - B-400 INDOOR		X	1	16	X		F				X		X																																										
950-MFA-04202	FZ-04 MFA ACTIVATION - B-400 INDOOR		X	1	17	X		F				X		X																																										
950-MFA-04203	FZ-04 MFA ACTIVATION - B-400 INDOOR		X	1	18	X		F				X		X																																										
					19																																																				
950-MFA-05101	FZ-05 MFA ACTIVATION		X	1	20	X		F				X		X																																										
950-MFA-05102	FZ-05 MFA ACTIVATION		X	1	21	X		F				X		X																																										
950-MFA-05103	FZ-05 MFA ACTIVATION		X	1	22	X		F				X		X																																										
950-MFA-05104	FZ-05 MFA ACTIVATION		X	1	23	X		F				X		X																																										
					24																																																				
950-MFA-05201	FZ-05 MFA ACT. - WATER TREAT. PK INDOOR		X	1	25	X		F				X		X																																										
					26																																																				
950-MFA-06101	FZ-06 MFA ACTIVATION		X	1	27	X		F				X		X																																										
950-MFA-06102	FZ-06 MFA ACTIVATION		X	1	28	X		F				X		X																																										
					29																																																				
950-MFA-06201	FZ-06 MFA ACTIVATION - B-100 INDOOR		X	1	30	X		F				X		X																																										
					31																																																				
950-MFA-07101	FZ-07 MFA ACTIVATION		X	1	32	X		F				X		X																																										
					33																																																				
					34																																																				
					35																																																				
					36																																																				
					37																																																				
					38																																																				
					39																																																				
					40																																																				
					41																																																				

NOTES:
1. THE FLASHING ALARM ON CAP ONSHORE IS A CUMULATIVE OF ALL ASD PUSH BUTTONS ACTIVATION.

LEGEND

REFERENCE DOCUMENTS	
TITLE	**NUMBER**
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

Fire & Gas Cause & Effect Matrix: MFA PUSH BUTTONS

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

 05

FIRE ZONE 01/02/03/04/05/06/7
SOUNDERS AND BEACONS

FZ-01= FUEL CELL AREA
FZ-02= H2 STORAGE VESSELS AREA
FZ-03= ELECTROLYZER AREA
FZ-04= B-200/B-300/B-400 CONTAINERS AREA
FZ-05= BESS AREA
FZ-06= B-100 CONTAINER AREA
FZ-07= MASTER POINT AREA
FZ-08= TRANSITION PIECE AREA

EFFECT — GAS VISUAL ALERT BEACONS (AMBER)

TAG Nos	CAUSE DESCRIPTION	VOTING	INHIBITION	REMARK	No.	1	2 950-XL-01101 FZ-01 GAS BEACON ACTIVATION	3 950-XL-02101 FZ-02 GAS BEACON ACTIVATION	4 950-XL-03101 FZ-03 GAS BEACON ACTIVATION	5 950-XL-03103 FZ-03 GAS BEACON ACTIVATION	6 950-XL-04101 FZ-04 GAS BEACON ACTIVATION	7 950-XL-04103 FZ-04 GAS BEACON ACTIVATION	8 950-XL-04201 FZ-04 GAS BEACON ACT. - B-400 INDOOR	9 950-XL-04203 FZ-04 GAS BEACON ACT. - B-300 INDOOR	10 950-XL-04205 FZ-04 GAS BEACON ACT. - B-200 INDOOR	11 950-XL-05201 FZ-05 GAS BEACON ACT. - WATER T. INDOOR	12 950-XL-06101 FZ-06 GAS BEACON ACTIVATION	13 950-XL-06103 FZ-06 GAS BEACON ACTIVATION	14 950-XL-06201 FZ-06 GAS BEACON ACT. - B-100 INDOOR	15 950-XL-07101 FZ-07 GAS BEACON ACTIVATION	16
	GAS CONFIRMED IN B-100 (HV CONTAINER)			From sheet 5	1		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	GAS CONFIRMED B-200 IN (LV CONTAINER)			From sheet 6	2		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	GAS CONFIRMED IN B-300 (UPS CONTAINER)			From sheet 7	3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	GAS CONFIRMED IN B-400 (ITER CONTAINER)			From sheet 8	4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	GAS CONFIRMED IN FUEL CELL			From sheet 9	5		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	GAS CONFIRMED IN BESS			From sheet 10	6		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	GAS CONFIRMED IN ELECTROLYZER			From sheet 11	7		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	GAS CONFIRMED IN WATER TREAT. PKG			From sheet 12	8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	HYDROGEN OPEN AREA			From sheet 13	9		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
					10																
	SMOKE CONFIRMED IN B-100 (HV CONTAINER)			From sheet 5	11																
	SMOKE CONFIRMED B-200 IN (LV CONTAINER)			From sheet 6	12																
	SMOKE CONF. IN B-300 (UPS CONTAINER)			From sheet 7	13																
	SMOKE CONF. IN B-400 (ITER CONTAINER)			From sheet 8	14																
	SMOKE CONFIRMED IN FUEL CELL			From sheet 9	15																
	SMOKE CONFIRMED IN BESS			From sheet 10	16																
	SMOKE CONFIRMED IN ELECTROLYZER			From sheet 11	17																
	SMOKE CONFIRMED IN WATER TREAT. PKG			From sheet 12	18																
	FIRE OPEN AREA			From sheet 15	19																
					20																
	O2 GAS HIGH CONFIRMED			From sheet 14	21		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
					22																
	MFA PUSH BUTTONS ACTIVATION FZ 01/02/03/04/05/06/7			From sheet 16	23																
					24																
79-XA-001	ASD ACTIVATION FROM SIS SYSTEM			NOTE 1	25		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
79-XA-002	ESD-1D ACTIVATION FROM SIS SYSTEM			NOTE 1	26		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
79-XA-003	ESD-1 ACTIVATION FROM SIS SYSTEM			NOTE 1	27		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
					28																
79-XA-004	MOB PUSH BUTTONS ACTIVATION FROM SIS SYSTEM			NOTE 1	29		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
					30																
					31																
					32																
					33																
					34																
					35																
					36																
					37																
					38																
					39																
					40																
					41																

EFFECT — FIRE VISUAL ALERT BEACONS (RED)

No.	17	18 950-XL-01102 FZ-01 FIRE BEACON ACTIVATION	19 950-XL-02102 FZ-02 FIRE BEACON ACTIVATION	20 950-XL-03102 FZ-03 FIRE BEACON ACTIVATION	21 950-XL-03104 FZ-03 FIRE BEACON ACTIVATION	22 950-XL-04102 FZ-04 FIRE BEACON ACTIVATION	23 950-XL-04104 FZ-04 FIRE BEACON ACTIVATION	24 950-XL-04202 FZ-04 FIRE BEACON ACT. - B-400 INDOOR	25 950-XL-04204 FZ-04 FIRE BEACON ACT. - B-300 INDOOR	26 950-XL-04206 FZ-04 FIRE BEACON ACT. - B-200 INDOOR	27 950-XL-05202 FZ-05 FIRE BEACON ACT. - WATER T. INDOOR	28 950-XL-06102 FZ-06 FIRE BEACON ACTIVATION	29 950-XL-06104 FZ-06 FIRE BEACON ACTIVATION	30 950-XL-06202 FZ-06 FIRE BEACON ACT. - B-100 INDOOR	31 950-XL-07102 FZ-07 FIRE BEACON ACTIVATION	32	33
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
12		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
13		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
14		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
15		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
16		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
17		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
18		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
19		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
20																	
21																	
22																	
23		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
24																	
25		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
26		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
27		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
28																	
29		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
30																	
31																	
32																	
33																	
34																	
35																	
36																	
37																	
38																	
39																	
40																	
41																	

EFFECT — AUDIO ALERT SOUNDERS

No.	34 950-XZ-01101 FZ-01 SOUNDER ACTIVATION	35 950-XZ-01102 FZ-01 SOUNDER ACTIVATION	36 950-XZ-02101 FZ-02 SOUNDER ACTIVATION	37 950-XZ-03101 FZ-03 SOUNDER ACTIVATION	38 950-XZ-03102 FZ-03 SOUNDER ACTIVATION	39 950-XZ-04101 FZ-04 SOUNDER ACTIVATION	40 950-XZ-04102 FZ-04 SOUNDER ACTIVATION	41 950-XZ-04201 FZ-04 SOUNDER ACT. - B-400 INDOOR	42 950-XZ-04202 FZ-04 SOUNDER ACT. - B-300 INDOOR	43 950-XZ-04203 FZ-04 SOUNDER ACT. - B-200 INDOOR	44 950-XZ-05101 FZ-05 SOUNDER ACTIVATION	45 950-XZ-05102 FZ-05 SOUNDER ACTIVATION	46 950-XZ-05103 FZ-05 SOUNDER ACTIVATION	47 950-XZ-05104 FZ-05 SOUNDER ACTIVATION	48 950-XZ-05201 FZ-05 SOUNDER ACTIVATION - WTER T. INDOOR	49 950-XZ-06101 FZ-06 SOUNDER ACTIVATION	50 950-XZ-06201 FZ-06 SOUNDER ACT. - B-100 INDOOR (NOTES: 2)	51 950-XZ-07101 FZ-07 SOUNDER ACTIVATION	52	53 72-XS-001 WAVE-OFF LIGHT ACTIVATION TO NAVAIDS
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
10																				
11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
20																				
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
22																				
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
24																				
25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
28																				
29	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
30																				
31																				
32																				
33																				
34																				
35																				
36																				
37																				
38																				
39																				
40																				
41																				

NOTES:
1. FGS AND SIS SYSTEM EXCHANGE DATA BETWEEN THEM BY USING THE Vnet/IP NETWORK. THIS IS IMPLEMENTED AS REDUNDANT SAFETY COMMUNICATION, APPROVED FOR SIL 3 LOOP

2. It will be possible to deactivate the sounder 950-XZ-07101 (installed in Master Area) from CAP onshore.

LEGEND

REFERENCE DOCUMENTS

TITLE	NUMBER
Process Safety Cause and Effect Matrix	123A90-DDL-IN-CE-40000
Process Safety Cause and Effect Block Diagram	123A90-DDL-PR-DG-80000
F&G detectors Layout - Lower deck and Upper deck	123A90-DDL-SAF-DL-30027
F&G detectors Layout - Below Lower deck	123A90-DDL-SAF-DL-30028

Rev.	Date	Status	Description	DRN	CHKD	APPD
00	08/03/2024	IFA	Issue for Acceptance (IFA)	LCA	MGA	DLO
01	12/06/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
02	08/10/2024	AFC	Accepted for Construction (AFC)	LCA	MGA	DLO
05	23/09/2025	ASB	As-Built (ASB)	SPS	MGA	GCI

CROSSWIND — ROSETTI MARINO

Fire & Gas Cause & Effect Matrix: SOUNDERS AND BEACONS

DATE 23-09-2025

HOLLANDSE KUST NOORD WIND PARK Project
Contract No. CW-I-WP4-2023-05

05