



BEATRICE FIELD, INNER MORAY FIRTH

A Case Study In The Management Of Well Integrity From CoP Through To Well Abandonment

Richard Conway 7th June 2023



Beatrice Field: Block 11/30a



- Discovered in 1976 by Mesa Petroleum
- 3 platforms, Alpha, Bravo & Charlie
- Sold to BNOC in 1978, first oil in 1981
- BNOC privatised to become Britoil in mid-80s
- ▶ BP acquired Britoil and became operator in 1988
- Acquired from BP by Talisman in 1997 as part of BP MAST
- Leased to Ithaca 2008 to 2015, Wood Group as Duty Holder
- Duty Holder transferred to Repsol Sinopec Resources UK Ltd in 2015
- Bravo & Charlie wells decommissioned 2017-18



Beatrice Alpha

REPSOL SINOPEC

- 30 wells in total (32 slots)
 - Free flow / ESP Producers
 - Water Injectors
- Wellheads 1978-80 vintage
- Most wells have had multiple workovers
- Q4 2018: All Alpha wells prepared for Not Normally Attended (NNA) operations:
 - All wells plugged
 - Flowlines removed
 - FWVs removed and blank-flanged
 - Wireless Digital Gauges installed on annuli & tree cap
- Well abandonment planned for 2024

PLATFORM WSIT

BEATRICE 🗸	Asset	Well	Slot No.	Well Type	Well Status	Potential Flow Rate (BBL/day)
All 🗸	BEATRICE	11/30a-A05	1	ESP/JET	Plugged	100.00
	BEATRICE	11/30a-B10	1	ESP/JET	Abandoned 2	0.00
ilot No.	BEATRICE	11/30a-A31	10	Water Injection	Plugged	101.00
All \checkmark	BEATRICE	11/30a-A09	11	Water Injection	Plugged	0.00
Vell Type	BEATRICE	11/30a-B07	11	Water Injection	Abandoned 2	0.00
All V	BEATRICE	11/30a-A26Z	12	ESP/JET	Plugged	100.00
Vell Status	WSIT Ma	p			i	\$ O
Vell Status All V	WSIT Ma	p	•		i	\$ C
Vell Status All 🗸	WSIT Ma	p			i	\$ C
Vell Status All × Highest Risk All ×	WSIT Ma	P			i	~ 0
Vell Status All ✓ Highest Risk All ✓	WSIT Ma	P O O			i	<i>P</i> 0



	SG / API	Vis. (temp.)	Pour Point (°C)	Wax Content (%)	Asphaltene (%)
Beatrice Crude	0.844 / 36.15	13.86 cSt @ 30°C	Min. 12 /Max. 24	28.5	0.05
Release source	Well blowout f	rom A18 (13)	Flow rate	147.86 m ³ / day	
Anticipated well self-k	ll (days)	Unli	kely to self-kill within relief w	ell drill timings (175 days)	
			Well Blowout		
			Probability of Surface Oil Mee	ting or Exceeding 0.3 μm	
Locat	on	Distance	Map Key	Probability (%) of surface oil me	eting or exceeding 0.3 µm
Lybster	UK 2	2 km (NNW)	Release Site		0 70 - 80 90 - 100
Orkney Is	lands	71 km (N)	Meutan Line		0 00 00
Beatrice	VIBITER LVBITER De Destro estrontion Por de Destrontion Por de Destro estrontion Por de Destrontion Por destrontion Por destrontion Por de Destrontion Por destrontiontion Por destrontion Por destrontion Por destrontiontion Por destrontiontiontion Por destrontiontion Por destrontion Por destrontion Por destrontiont	19 17 18 190 200 210 20 20 20 20 20 20 20 20 20 20 20 20 20	19 19 5 5 5 5 5 5 5 5 5 5 5 7 7 7 7 7 7 7 7	Dec - Feb	

Well Verification

- ► 6 Monthly WVR: March
 - Function all valves
 - Inflow test DHSV (where installed)
 - Pressure Test / Inflow Test Control Lines
 - Inflow test plugs (1 hour)
 - Wireless gauge verification
 - KP4 survey (external condition inspection)
- 12 Monthly WVR: September as above plus:
 - Inflow / pressure test tree and annulus valves
 - Sting wellhead voids
- Biennial Annulus Top-Up & Test
 - Each annulus topped up to surface with inhibited water
 - Pressure test to Operational MAASP





Verification Findings



- Trees and wellheads generally in good functional state very few issues
- A number of UMV seized open due to limited operation (not required as barriers)
- Control Line failures occur occasionally. Injected with sealant if leak-off rate is adequate
- Since 2019 a number of plug failures have been recorded (to be discussed on following slides)
- Main issue with Well Verification is NPT: WOW
- Typical down-time
 - March 30 40%
 - September 40 55%
- WOW is factored into the campaign duration and additional days may be added if required to complete the workscope

Well No.	A01	A02	A03	A04	A05	A06	A09	A10	A11	A12	A13	A14	A15
Tree Cap Inspection	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	N/A	Good	Good
Tree Cap Needle Valve	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Xmas Tree Body	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	N/A	Good	Good
Swab Valve SV	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	N/A	Good	Good
Upper Master Valve	Fail	Good	Fail	Good	ot Test	Fail	Fail	Good	Good	Good	N/A	Good	Fail
LMV	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	N/A	Good	Good
FWV	N/A	N/A	Good	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MFWV	Fail	Good	N/A	Good	Good	Good	Good	Good	Good	Good	N/A	Good	Good
KWV	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	N/A	Good	Good
KW Needle Valve	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	N/A	Good	Good
Susp. Flange Valve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Good	N/A	N/A
A-ann Valve – LS Inner	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
A-ann Valve – LS Outer	N/A	N/A	N/A	Good	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A-ann Valve – OS Inner	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
A-ann Valve – OS Outer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B-ann Valve – LS Inner	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
B-ann Valve – LS Outer	N/A	N/A	N/A	N/A	Good	N/A							
B-ann Valve – OS Inner	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
B-ann Valve – OS Outer	N/A	N/A	N/A	N/A	Good	N/A							
C-ann Valve – LS	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
C-ann Valve – OS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INRV / SAS – LS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INRV / SAS – OS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Visibility



WSIT Well Status

Risk Assessment	Field	Well
WRA2473	Beatrice	A01
WRA2474	Beatrice	A19
WRA2475	Beatrice	A12z
WRA2476	Beatrice	A18
WRA2551	Beatrice	A01
WRA2552	Beatrice	A12
WRA2553	Beatrice	A18
WRA2554	Beatrice	A19
WRA2555	Beatrice	A29
WRA2556	Beatrice	A30
WRA2690	Beatrice	A32
WRA2706	Beatrice	A15
WRA2757	Beatrice	A04
WRA2758	Beatrice	A05
WRA2759	Beatrice	A10
WRA2760	Beatrice	A14
WRA2761	Beatrice	A16
WRA2762	Beatrice	A17
WRA2763	Beatrice	A22
WRA2764	Beatrice	A25
WRA2765	Beatrice	A26z
WRA2766	Beatrice	A27

Risk Assessment

Dispensation

				Impair	me	nt
Site			Location	· ·		We
Beatrice	`	/	Platfor	m	\sim	
WDISP No.			WellTyp	pe		Sta
	```	/			$\sim$	
Procedure(s)	Contravene	ed	Conseq	uence		Sev
	```	1			$\sim$	
Primary Failure			Seconda	ary Failure		Sco
	```	1			$\sim$	
VDISP No.	Site	L	ocation	Impairment Type	Stat	tus
VDISP No.	Site	L	ocation	Impairment Type	Stat	tus
VDISP002222	Beatrice	P	atform	Prohibition	Plug	ged
VDISP002221	Beatrice	P	atform	Prohibition	Plug	ged
VDISP002220	Beatrice	P	atform	Prohibition	Plug	ged
VDISP002219	Beatrice	P	atform	Prohibition	Plug	ged
WDISP002218 Beatrice		P	atform	Prohibition	Plug	ged
VDISP002217	Beatrice	P	atform	Prohibition	Plug	ged

Prohibition

Prohibition

Plugged

Plugged

WDISP002145 Beatrice Platform

WDISP002139 Beatrice Platform

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	Well	Statu	IS	Sum	mary
on /	Asset	Well	Slot No.	Well Type	Well Status

		No.		
	•	•		
BEATRICE	11/30a-A05	1	ESP/JET	Plugged
BEATRICE	11/30a-B10	1	ESP/JET	Abandoned 2
BEATRICE	11/30a-A31	10	Water Injection	Plugged
BEATRICE	11/30a-A09	11	Water Injection	Plugged
BEATRICE	11/30a-B07	11	Water Injection	Abandoned 2
BEATRICE	11/30a-A26Z	12	ESP/JET	Plugged

#### WSIT Map



#### Well Status Indicator

No.

11/30a-A19 /15 WI

11/30a-A01 /07 FF 11/30a-A01 /07 FF

11/30a-A01 /07 FF

11/30a-A01 /07 FF

11/30a-A01 /07 FF

11/30a-A01 /07 FF

11/30a-A01 /07 FF

11/30a-A01 /07 FF

11/30a-A02 /05 WI

11/30a-A02 /05 WI 11/30a-A02 /05 WI

Slot Well Type WSIT

Rank No.

26

11

11

11

11

11

11

11

11

28

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28

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Asset Name Well

Beatrice A

Beatrice A

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Microsoft Bing

Well Status Map

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	uni	110

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Des or iption
Beatrice 11/30a-B6A Suspended Well (Stage 1)
Beatrice 1 1/30a-A3 Suspended Well (Stage 1)
Beatrice 1 1/30a-A6 Suspended Well (Stage 1)
Beatrice 11/30a-A29 Suspended Well (Stage 1)
Beatrice 11/30a-A2 Suspended Well (Stage 1)
Beatrice 11/30a-A4 Suspended Well (Stage 1)
Beatrice 11/30a-A1 Suspended Well (Stage 1)
Beatrice 11/30a-A5 Suspended Well (Stage 1)
Beatrice 11/30a-B10 Suspended Well (Stage 1)
Beatrice 11/30a-B8 Suspended Well (Stage 1)
Beatrice 11/30s-A23 Suspended Well (Stage 1)
Beatrice 11/30a-A20 Suspended Well (Stage 1)
Beatrice 11/30a-A17 Suspended Well

(Stage 1) Beatrice 11/30s-A33Z Sus pended Wel (Stage 1)

## KP4 Inspection: External Condition Assessment



- We are required by HSE / BEIS to conduct a KP4 inspection every campaign due to NNA status, as a means to monitor any ongoing degradation (other platforms every two years)
- The crews score each component against a set of reference photos
- In addition, on each campaign a set of digital photos of each component are taken as a record
- Scoring and photo references are recorded in a spreadsheet (one worksheet per well)

R	EPSU						4.9.4				
SI .	NOPI	EC			11	-121					
Platform		Arb	roath	Well No.		Date:	16/12	/2020			
WH Manufact	urer	McEvoy/	Cameron	Tree Man	ufacturer		Techniciar				
MPORTANT:	Refer t	o WEL-PR	O-TLM-073	when usir	e this Worl	ksheet	Good	Moderate	Bad		
					0						
REE CONDITI	ON				Tree Size	4 1/16"	Press	ure Rating	5000p		
SWAB				3	7						
JMV				4	2			Weeps?			
MV				3	9						
<wv< td=""><td></td><td></td><td></td><td>3</td><td>3</td><td></td><td></td><td></td><td></td></wv<>				3	3						
WV						4	5				
Fest/grease fi	ttings					3	7	16			
Needle Valve	s			3	3	4					
Gauge		Rating						Calib Cert			
mpulse Line	to Gaug	ge						Weeps?			
Free Can				4	1	8		Weeps?			
nee cap											



## KP4 Inspection: Findings / Further Action



- Scoring from each well is pulled into a heat-map
- A delta heat-map is produced to highlight areas of change
- Components scoring 4 or 5 will trigger a secondary inspection by Beatrice FIE. This may include NDT such as Ultra Sonic Wall Thickness Measurement
- As a result of a recent FIE inspection, a Fabric Maintenance Campaign is scheduled for 2023 (surface passivation / coating)





SINOPEC		105			1.05	1.000												1.075		4.35	1.025	4.35		4.37	1.075	1.75	1.75	1.07	4.35	
	A01	A02	A03	A04	A05	A06	A09	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A25	A26	A27	A28	A29	A30	A31	A32	A33
CENTRALISATION	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr.	Centr
Conductor to Sea Condition:	3	3	3	3	Tes 3	3	3	Tes 3	3	3	105	3	3	3	3	3	3	3	3	3	3	3	3	3	Tes	3	3	Tes	3	3
Conductor Movement:	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Sligh
CASING HEAD / STARTER HEAD	3	3	3	3	3	4	3	4	3	4	4	4	3	4	4	3	4	4	3	4	3	3	3	4	4	4	3	3	4	3
Annulus Valves	4	3	4	4	3	5	3	4	3	4	4	4	3	3	-	4	4	3	3	4	4	4	3	5	4	4	3	3	4	3
Flange bolting	3	4	5	5	4	5	5	5	5	5	5	5	5	2		5	5	3	3	5	5	5	4	5	3	5	4	3	5	3
Line pipe condition	4	4	5	5	4	5	5	5	5	4	4	5	5	3	5	4	5	4	3	5	4	4	3	5	5	5	4	5	5	4
Annulus valve test/injection fittings	3	3	4	4	5	3	3	4	3	4	4	3	3	5		3	3	3	2	4	4	3	3	3	2	4	3	3	3	3
CASING SPOOL	3	4	3	3	4	4	3	4	3	4	4	4	3	4	4	4	4	4	3	4	3	4	3	3	3	4	4	3	4	3
Flange bolting (Between Wellheads)	3	4	5	3	5	5	4	5	3	4	5	4	5	5	5	3	5	5	3	5	3	5	3	5	3	5	5	5	5	3
1 NPT Test/injection fitting	3	3	3	3	3	3	3	3	3	3	5	4	4	3	3	3	3	4	1	4	4	4	3	5	3	3	3	3	5	3
GSP fitting/ 1/2" NPT fitting	2	3	3	3	2	3	2	1	2	2	2	2	3	2	3	2	3	2	3		4	2	3	3	3	3	2	4	3	4
Annulus Valves	3	4	4	3	4	4	4	4	3	4	3	3	4	4	4	4	4	4	3	4	3	4	3	5	2	4	3	4	4	5
Flange bolting	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	4	5	5	5	3	5	4	4	5	3
Annulus valve test/injection fittings	4	3	4	4	4	4	3	4	4	4	4	3	4	4	3	3	3	3	3	3	3	4	3	4	3	4	3	3	3	2
IUBING HEAD	3	4	4	4	4	4	3	3	3	4	4	4	3	4	4	4	4	3	2	4	3	3	3	3	2	4	3	3	3	3
nange politing (Between Weilheads)	3	2	4	4	4	5	5	5	5	5	5	5	5	5	5	4	5	4	3	5	3	4	3	4	3	2	4	5	5	3
7/8" bleed screw condition	3	4	3	2	3	3	3	4	4	2	3	4	4	4	4	3	4	4	3	4	4	4	4	4	4	3	3	4	4	2
Autoclave fitting	5	4	4	3	4	0	3	5	5	4	0	0	0		4	5	4	3	,		3	4	3	3	3	,	3	3		3
Annulus Valves	4	4	4	3	4	4	5	3	5	5	3	3	3	4	5	5	5	4	2	4	3	3	4	3	3	3	3	5	4	4
Flange bolting	3	3	4	3	5	5	3	3	3	3	5	5	4	5	4	4	4	2	3	5	4	2	3	3	3	4	3	3	5	3
Annulus valve test/injection fittings	2	2	2	2	4	3	2	2	2	2	3	3	3	3	2	2	2	2	3	4	2	2	2	2	2	3	2	2	3	4
TUBING HEAD ADAPTOR	3	4	3	2	3	4	3	3	3	2	3	3	3	3	4	3	3	4	2	3	3	4	3	3	2	3	4	3	3	3
Bolting (Between Adapter & Wellhead)	3	4	3	3	4	4	4	5	5	3	4	3	5	5	4	3	4	4	3	3	3	4	3	3	3	4	4	4	4	3
Clamp bolting (Between Adapter & Tree	3	4	4	3	4	3	4	4	4	3	3	3	4	4	4	3	4	4	3	3	3	4	3	3	3	4	4	4	3	3
1 NPT fitting/bleed screw condition	2	2	3	2	2	4	2	2	5	2	2	1	5	1	3	2	3	3	3	2	4	2	2	2	2	1	3	2	2	2
7/8" bleed screw condition	2	4	3	3	3	4	3	4	5	0	4	4	5	5	5	3	4	4	3	4	4	3	4	4	4	3	3	4	4	3
TREE CONDITION LMV	3	3	3	2	3	3	4	2	3	2	4	2	3	2	2	3	4	3	2	2	2	4	3	3	2	3	4		4	3
UMV	5	3	5	2	4	5	4	2	3	2		2	4	2	2	4	4		2	2	2	4	3	3	2	4	5			3
SWAB	3	3	3	2	3	4	4	2	3	2		2	3	2	2	3	4		2	2	2	4	3	3	2	3	4			3
KWV	3	3	3	2	3	3	4	2	3	2		2	3	2	2	3	4		2	2	2	4	3	3	2	3	4			3
FWV	3	3	3	2	3	3	4	2	3	2		2	3	2	2	3	4		2	2	2	4	3	3	0	3	4			0
ilee cap			2	2	2	2		2				2	2	2	2	2		2	2	2	2		2	2	2	2	2		2	2
· · · · · · · · · · · · · · · · · · ·	3	3	3	2	3	3	4	2	4	2	4	2	3	2	2	3	4	2	2	2	2	4	3	3	2	3	3		3	3
	3	3	3	2	3	3	4	2	4	2	4	2	3	2	2	3	4	2	2	2	2	4	3	3	2	3	3		3	3
REPSOL	3 Beatric	3 :e KP4 D	3 elta: Ap	2 oril 2022	3 vs. Aug	3 ust 2020	4	2	4	2	4	2	3	2	2	3	4	2	2	2	2	4	3	3	2	3	3		3	3
REPSOL	3 Beatric	3 :e KP4 D	3 e Ita: Ap	2 oril 2022	3 vs. Aug	3 ust 2020	4	2	4	2	4	2	3	2	2	3	4	2	2	2	2	4	3	3	2	3	3		3	3
	Be atric	3 e KP4 D A02	3 elta: Ap A03	2 oril 2022 A04	3 vs. Aug A05	3 ust 2020 A06	4 A09	2 A10	4 A11	2 A12	4 A13	2 A14	3 A15	2 A16	2 A17	3 A18	4 A19	2 A20	2 A21	2 A22	2 A23	4 A25	3 A26	3 A27	2 A28	3 A29	3 A30	A31	3 A32	3 A33
	Beatric A01 Centr.	a KP4 D A02 Centr.	3 elta: Ap A03 Centr.	2 aril 2022 A04 Centr.	3 vs. Aug A05 Centr.	3 ust 2020 A06 Centr.	A09 Centr.	A10 Centr.	4 A11 Centr.	A12 Centr.	4 A13 Centr.	2 A14 Centr.	A15 Centr.	2 A16 Centr.	2 A17 Centr.	3 A18 Centr.	4 A19 Centr.	2 A20 Centr.	2 A21 Centr.	2 A22 Centr.	2 A23 Centr.	4 A25 Centr.	3 A26 Centr.	3 A27 Centr.	2 A28 Centr.	A29 Centr.	3 A30 Centr.	A31 Centr.	3 A32 Centr.	A33 Cent
CENTRALISATION Are the chocks or centralisers visible :	Beatric A01 Centr. Yes	a KP4 D A02 Centr. Yes	3 elta: Ap A03 Centr. Yes	2 aril 2022 A04 Centr. Yes	3 vs. Aug A05 Centr. Yes	3 ust 2020 A06 Centr. Yes	4 A09 Centr. Yes	A10 Centr. Yes	4 A11 Centr. Yes	A12 Centr. Yes	4 A13 Centr. Yes	2 A14 Centr. Yes	3 A15 Centr. Yes	2 A16 Centr. Yes	2 A17 Centr. Yes	3 A18 Centr. Yes	4 A19 Centr. Yes	2 A20 Centr. Yes	2 A21 Centr. Yes	2 A22 Centr. Yes	2 A23 Centr. Yes	4 A25 Centr. Yes	3 A26 Centr. Yes	3 A27 Centr. Yes	2 A28 Centr. Yes	3 A29 Centr. Yes	3 A30 Centr. Yes	A31 Centr. Yes	3 A32 Centr. Yes	3 A33 Cent Yes
CENTRALISATION Are the chocks or centralisers visible : Conductor to Sea Condition:	Beatric A01 Centr. Yes 3	A02 Centr. Yes 3	3 elta: Ap A03 Centr. Yes 3	2 A04 Centr. Yes 3 Sliabt	3 vs. Aug A05 Centr. Yes 3	3 ust 2020 A06 Centr. Yes 3	4 A09 Centr. Yes 3	A 10 Centr. Yes 3	4 A11 Centr. Yes 3 Sliabt	A12 Centr. Yes 3	4 A13 Centr. Yes 3 Slight	2 A14 Centr. Yes 3	3 A15 Centr. Yes 3	2 A16 Centr. Yes 3 Slight	2 A17 Centr. Yes 3	3 A18 Centr. Yes 3	4 A19 Centr. Yes 3	2 A20 Centr. Yes 3 Slight	2 A21 Centr. Yes 3	2 A22 Centr. Yes 3	2 A23 Centr. Yes 3 Slight	4 A25 Centr. Yes 3 Slight	3 A26 Centr. Yes 3	3 A27 Centr. Yes 3	2 A28 Centr. Yes 3 Slight	A29 Centr. Yes 3	3 A30 Centr. Yes 3 Slight	A31 Centr. Yes 3	3 A32 Centr. Yes 3	3 A33 Cent Yes 3
CENTRUISATION Are the chocks or centralisers visible : Conductor to Sea Condition: Conductor Movement: Conductor Movement:	3 Beatric A01 Centr. Yes 3 Slight	A02 Centr. Yes 3 Slight	3 elta: Ap A03 Centr. Yes 3 Slight	2 aril 2022 A04 Centr. Yes 3 Slight	3 vs. Aug A05 Centr. Yes 3 Slight	3 ust 2020 A06 Centr. Yes 3 Slight 0	A09 Centr. Yes 3 Slight	A10 Centr. Yes 3 Slight	4 A11 Centr. Yes 3 Slight	A12 Centr. Yes 3 Slight	4 A13 Centr. Yes 3 Slight	2 A14 Centr. Yes 3 Slight	A15 Centr. Yes 3 Slight	2 A16 Centr. Yes 3 Slight	2 A17 Centr. Yes 3 Slight	3 A18 Centr. Yes 3 Slight	4 A19 Centr. Yes 3 Slight	2 A20 Centr. Yes 3 Slight	2 A21 Centr. Yes 3 Slight	2 A22 Centr. Yes 3 Slight	2 A23 Centr. Yes 3 Slight	4 A25 Centr. Yes 3 Slight	A26 Centr. Yes 3 Slight	3 A27 Centr. Yes 3 Slight	2 A28 Centr. Yes 3 Slight	A29 Centr. Yes 3 Slight	3 A30 Centr. Yes 3 Slight	A31 Centr. Yes 3 Slight	3 A32 Centr. Yes 3 Slight	3 A33 Cent Yes 3 Sligt
CENTRALISATION Are the chocks or centralisers visible : Conductor to Sea Condition: Conductor Mexement: CASING HAD / STATRER HEAD Amulier Values	3 Beatric A01 Centr. Yes 3 Slight 0	a KP4 D A02 Centr. Yes 3 Slight 0	3 elta: Ap A03 Centr. Yes 3 Slight 0	2 A04 Centr. Yes 3 Slight 0	3 vs. Aug A05 Centr. Yes 3 Slight 0	3 A06 Centr. Yes 3 Slight 0	A09 Centr. Yes 3 Slight 0	A10 Centr. Yes 3 Slight 0	4 A11 Centr. Yes 3 Slight 0	A12 Centr. Yes 3 Slight 0	4 A13 Centr. Yes 3 Slight 1	2 A14 Centr. Yes 3 Slight 0	A15 Centr. Yes 3 Slight 0	2 A16 Centr. Yes 3 Slight 1	2 A17 Centr. Yes 3 Slight 0	3 A18 Centr. Yes 3 Slight 0	4 A19 Centr. Yes 3 Slight 0	2 A20 Centr. Yes 3 Slight 0	2 A21 Centr. Yes 3 Slight 0	2 A22 Centr. Yes 3 Slight 1	2 A23 Centr. Yes 3 Slight 0	4 A25 Centr. Yes 3 Slight 0	A26 Centr. Yes 3 Slight 0	3 A27 Centr. Yes 3 Slight 0	2 A28 Centr. Yes 3 Slight 0	A29 Centr. Yes 3 Slight 0	A30 Centr. Yes 3 Slight 0	A31 Centr. Yes 3 Slight 0	3 A32 Centr. Yes 3 Slight 0	3 A33 Cent Yes 3 Sligh 0
CENTRALSATION Are the chocks or centralisers visible : Conductor Vase Condition: Conductor Mavement: Canductor Mavement: Casting HaaD / STARTER HEAD Annulus Valves Flages bolitor	3 Beatric A01 Centr. Yes 3 Slight 0 0	A02 Centr. Yes 3 Slight 0 0	3 elta: Ap A03 Centr. Yes 3 Slight 0 0 0	2 oril 2022 A04 Centr. Yes 3 Slight 0 0 0	3 vs. Aug A05 Centr. Yes 3 Slight 0 -1 0	3 ust 2020 A06 Centr. Yes 3 Slight 0 0 0	4 A09 Centr. Yes 3 Slight 0 0	2 A10 Centr. Yes 3 Slight 0 0	4 A11 Centr. Yes 3 Slight 0 0 0	A12 Centr. Yes 3 Slight 0 0	4 A13 Centr. Yes 3 Slight 1 1	A14 Centr. Yes 3 Slight 0 0	A15 Centr. Yes 3 Slight 0 0	A16 Centr. Yes Slight 1 0	2 A17 Centr. Yes 3 Slight 0 0	3 A18 Centr. Yes 3 Slight 0 0	4 A19 Centr. Yes 3 Slight 0 0 0	2 A20 Centr. Yes 3 Slight 0 0	2 A21 Centr. Yes 3 Slight 0 0	2 A22 Centr. Yes 3 Slight 1 1	A23 Centr. Yes 3 Slight 0 0	4 A25 Centr. Yes 3 Slight 0 0	A26 Centr. Yes 3 Slight 0 0	3 A27 Centr. Yes 3 Slight 0 0	2 A28 Centr. Yes 3 Slight 0 0	3 A29 Centr. Yes 3 Slight 0 -1	3 A30 Centr. Yes 3 Slight 0 -1	A31 Centr. Yes 3 Slight 0 0	3 A32 Centr. Yes 3 Slight 0 0	3 A33 Cent Yes 3 Sligh 0 0 0
CENTRALISATION Are the chocks or centralisers visible : Conductor to sea Condition: Conductor to sea Condition: Conductor Newment: CASING HEAD / STATER HEAD Annulus Valves Finage botting Use glues condition	A01 Centr. Yes 3 Slight 0 0 0	A02 Centr. Yes 3 Slight 0 0 0	A03 Centr. Yes Slight 0 0 0	2 ril 2022 A04 Centr. Yes 3 Slight 0 0 0 0 0 0	3 vs. Aug A05 Centr. Yes 3 Slight 0 -1 0 -1	3 ust 2020 A06 Centr. Yes 3 Slight 0 0 0 0	4 A09 Centr. Yes 3 Slight 0 0 0 0	2 A10 Centr. Yes 3 Slight 0 0 0	4 A11 Centr. Yes 3 Silght 0 0 0 0	A12 Centr. Yes 3 Slight 0 0 0	4 A13 Centr. Yes 3 Slight 1 1 0 0	2 A14 Centr. Yes 3 Slight 0 0 0	A15 Centr. Yes 3 Slight 0 0 0	2 A16 Centr. Yes Slight 1 0 0	2 A17 Centr. Yes 3 Slight 0 0 0	3 A18 Centr. Yes 3 Slight 0 0 0	4 A19 Centr. Yes 3 Slight 0 0 0 0	2 A20 Centr. Yes 3 Slight 0 0 0	2 A21 Centr. Yes 3 Slight 0 0 0	2 A22 Centr. Yes 3 Slight 1 1 0	2 A23 Centr. Yes 3 Slight 0 0 0 0	4 A25 Centr. Yes 3 Slight 0 0 0	3 A26 Centr. Yes 3 Slight 0 0 0	3 A27 Centr. Yes 3 Slight 0 0 0	2 A28 Centr. Yes 3 Slight 0 0 0 0	3 A29 Centr. Yes 3 Slight 0 -1 0 0	3 A30 Centr. Yes 3 Slight 0 -1 0 0	A31 Centr. Yes 3 Slight 0 0 0	3 A32 Centr. Yes 3 Slight 0 0 0 0	3 A33 Cent Yes 3 Sligh 0 0 0 0
CENTRALISATION Are the chocks or central lisers visible : Conductor to See Acondition: Conductor Movement: Caline CHao (Tattare RHAD Annulus Valves text)Iniertation Une gipe condition	3 Beatric A01 Centr. Yes 3 Slight 0 0 0 0 0	3 e KP4 D Centr. Yes 3 Slight 0 0 0 0	3 elta: Ap A03 Centr. Yes 3 Slight 0 0 0 0 0	2 A04 Centr. Yes 3 Slight 0 0 0 0 0	3 vs. Aug A05 Centr. Yes 3 Slight 0 -1 0 -1	3 ust 2020 A06 Centr. Yes 3 Slight 0 0 0 0 0 0 0	4 A09 Centr. Yes 3 Slight 0 0 0 0	2 A10 Centr. Yes 3 Slight 0 0 0 0	4 A11 Centr. Yes 3 Slight 0 0 0 0	A12 Centr. Yes 3 Slight 0 0 0 0	4 A13 Centr. Yes 3 Slight 1 1 0 0 0	2 A14 Centr. Yes 3 Slight 0 0 0 0	3 A15 Centr. Yes 3 Slight 0 0 0 0	2 A16 Centr. Yes 3 Slight 1 0 0 0	2 A17 Centr. Yes Slight 0 0 0 0 0	3 A18 Centr. Yes 3 Slight 0 0 0 0	4 A19 Centr. Yes 3 Slight 0 0 0 0	2 A20 Centr. Yes 3 Slight 0 0 0 0 1	2 A21 Centr. Yes 3 Slight 0 0 0 0	2 A22 Centr. Yes 3 Slight 1 1 0 1	2 A23 Centr. Yes 3 Slight 0 0 0 0	4 A25 Centr. Yes 3 Slight 0 0 0 0	3 A26 Centr. Yes 3 Slight 0 0 0 0	3 A27 Centr. Yes 3 Slight 0 0 0 0	2 A28 Centr. Yes 3 Slight 0 0 0 0	3 A29 Centr. Yes 3 Slight 0 -1 0 0 0	3 A30 Centr. Yes 3 Slight 0 -1 0 0 -1	A31 Centr. Yes 3 Slight 0 0 0 0	3 A32 Centr. Yes 3 Slight 0 0 0 0	3 A33 Cent Yes 3 Sligh 0 0 0 0 0
CENTRALISATION Are the hoods as centralitiers visible : Centralisation Centralisation Cashed Head / STATER Head Annulus Villes Tinge botting Use gipte condition Annulus ville text/injection fittings CASHOS PPOL.	3 Beatric A01 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0	3 A02 Centr. Yes 3 Slight 0 0 0 0 0 1 0	3 elta: Ap A03 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0	2 A04 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 vs. Aug Centr. Yes 3 Slight 0 -1 0 -1 0 0 -1	3 A06 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0	4 A09 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0	2 A10 Centr. Yes 3 Slight 0 0 0 0 0 0	4 A11 Centr. Yes 3 Slight 0 0 0 0 0 0 0	A12 Centr. Yes 3 Slight 0 0 0 0 0	4 A13 Centr. Yes 3 Slight 1 1 0 0 0 0	2 A14 Centr. Yes 3 Slight 0 0 0 0 0	3 A15 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A16 Centr. Yes 3 Slight 1 0 0 0 0	2 A17 Centr. Yes 3 Slight 0 0 0 0 0	3 A18 Centr. Yes 3 Slight 0 0 0 0 0	4 A19 Centr. Yes 3 Slight 0 0 0 0 0 0	2 A20 Centr. Yes 3 Slight 0 0 0 0 1 0 0	2 A21 Centr. Yes 3 Slight 0 0 0 0 0	2 A22 Centr. Yes 3 Slight 1 1 0 1 1	2 A23 Centr. Yes 3 Slight 0 0 0 0 0	4 A25 Centr. Yes 3 Slight 0 0 0 0 0	3 A26 Centr. Yes 3 Slight 0 0 0 0 0	3 A27 Centr. Yes 3 Slight 0 0 0 0 0	2 A28 Centr. Yes 3 Slight 0 0 0 0 0 0	3 A29 Centr. Yes 3 Slight 0 -1 0 0 0 0	3 A30 Centr. Yes 3 Slight 0 -1 0 0 -1	A31 Centr. Yes 3 Slight 0 0 0 0 0 0	3 A32 Centr. Yes 3 Slight 0 0 0 0 0 0	3 A33 Cent Yes 3 Sligt 0 0 0 0 0 0 0 0 0 0 0 0 0
CENTRALISATION Are the chocks or centralisers visible : Conductor to Sea Condition: Conductor Novement: Casher Casher Charlon Condition: Casher Casher Charlon Charlon Annulus view text/injection fittings CASNe SPOOL Thane boilting (litewen Weilheads)	3 Beatric A01 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 E KP4 D A02 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	3 elta: Ap A03 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A04 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 vs. Aug A05 Centr. Yes 3 Slight 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A06 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A09 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0	2 A10 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0	4 A11 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0	2 A12 Centr. Yes 3 Silght 0 0 0 0 0 0 0 0 0 0	4 A13 Centr. Yes 3 Slight 1 1 0 0 0 0 0 0	2 A14 Centr. Yes 3 Slight 0 0 0 0 0 0 1	3 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0	2 A16 Centr. Yes Slight 1 0 0 0 0 0 0 0 1	2 A17 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0	3 A18 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0	4 A19 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0	2 A20 Centr. Yes Slight 0 0 0 0 1 0 0 0 0 0	2 A21 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0	2 A22 Centr. Yes 3 Slight 1 1 0 1 1 1 0	2 A23 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0	4 A25 Centr. Yes Slight 0 0 0 0 0 0 0 0	3 A26 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0	3 A27 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A28 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A29 Centr. Yes 3 Slight 0 -1 0 0 0 0 0 0 0 0 0 0	3 A30 Centr. Yes Slight 0 -1 0 0 -1 0 0 0	A31 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0	3 A32 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A33 Cent Yes 3 Sligh 0 0 0 0 0 0 0 0 0 0 0 0 0
CENTRALISATION Are the thois so entertalisers visible : CENTRALISATION Are the thois so entertalisers visible : CASING HARD / STATTER HARD Annulus Viles Trange bolting Use pipe condition Annulus vile test/injection fittings CASING SPOC. Trange bolting (iterween Wellheads) 1 Her Test/injection fitting	3 Beatric A01 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 Ce KP4 D A02 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	3 e Ita: Ap A03 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A04 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 vs. Aug A05 Centr. Yes 3 Slight 0 -1 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A06 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A09 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A10 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A11 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A12 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A13 Centr. Yes 3 Slight 1 1 0 0 0 0 0 0 0 0	2 A14 Centr. Yes 3 Slight 0 0 0 0 0 0 1 1 1	3 A15 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0	2 A16 Centr. Yes Slight 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A17 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A18 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A19 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A20 Centr. Yes Slight 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0	2 A21 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A22 Centr. Yes 3 Slight 1 1 1 0 1 1 1 0 1	2 A23 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A25 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A26 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A27 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A28 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A29 Centr. Yes Slight 0 -1 0 0 0 0 0 0 0	3 A30 Centr. Yes 3 Slight 0 -1 0 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A31 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	3 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A33 Cent Yes 3 Sligh 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
CENTRALISATION Are the chocks or centralisers visible : Conductor to Sea Condition: Conductor Newment: Conductor Newment: Casher Casher Charles and the Annulus view test/injection fittings Annulus view test/injection fittings CASING 5900 Tiange botting (letween Weitheads) Tiange botting (letween Weitheads) Tiange botting (letween Weitheads) 114PT test/injection fittings)	3 Be atric Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A02 Centr. Yes 3 Slight 0 0 0 0 0 1 0 0 0 0 1 0 0 0 1	3 e Ita: Ap A03 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A04 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 vs. Aug A05 Centr. Yes 3 Slight 0 -1 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A06 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A09 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A10 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A11 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A12 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A13 Centr. Yes 3 Slight 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A14 Centr. Yes 3 Slight 0 0 0 0 0 0 1 1 1 0	3 A15 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 1 2	2 A16 Centr. Yes 3 Slight 1 0 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1	2 A17 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A18 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A19 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A20 Centr. Yes 3 Slight 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A21 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A22 Centr. Yes 3 Slight 1 1 1 1 0 1 1 1 0 1 0 1 0	2 A23 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A25 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A26 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A27 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A28 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A29 Centr. Yes Slight 0 -1 0 0 0 0 0 0 0 0 0 0 0	3 A30 Centr. Yes 3 Slight 0 -1 0 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A31 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A32 Centr. 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A33 Cent Yes 3 Sligh 0 0 0 0 0 0 0 0 0 0 0 0 0
CENTRALISATION Are the hocks as centralisers visible : CENTRALISATION Are the hocks as centralisers visible : CENTRALISATION CONTRALISATION CANNON YORK Transperiod Contralisers (Contralisers) Annulus view text/injection fittings CASNON SPOCE Transperiodition fitting CASNON SPOCE Transperiodition fitting CASNON SPOCE Interpretation fitting CoP fitting/ 1/27: NPT fitting Annulus View Text Annulus View Text Contralisers (Contralisers)	3 Be atric Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A02 Centr. Yes 3 Slight 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0	3 elta: Ap A03 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A04 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 vs. Aug A05 Centr. Yes 3 Slight 0 -1 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A06 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A09 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A10 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A11 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A12 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A13 Centr. Yes Slight 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A14 Centr. Yes 3 Slight 0 0 0 0 0 1 1 1 0 0 0	3 A15 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 1 2 1	2 A16 Centr. Yes 3 Slight 1 0 0 0 0 0 1 0 0 0 0 1 1 0 0 0 1 1	2 A17 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A18 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A19 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A20 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A21 Centr. Yes Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A22 Centr. Yes 3 Slight 1 1 0 1 1 1 0 1 1 0 0 1 0 0 0 0	2 A23 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 A25 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A26 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A27 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 A28 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A29 Centr. Yes 3 Slight 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A30 Centr. Yes 3 Slight 0 -1 0 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A31 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1	3 A32 Centr. Yes 3 Slight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 A33 Cent Yes Sligh 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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## Remote Annulus Management: Digital Gauge System



- 10 year battery life
- No maintenance / No calibration
- Data sampling every 1 minute
- Live data feed to PI Vision
- Email alerts for % of MAASP and for Rate of Change (ROC)
- Response routinely verified in PI
- Data can be extracted to Excel using PI DataLink



9 26 27/08/2020 09:29:49 27/08/2020 09:49:41 A-ann GaugeTest 100% of Range Open DHSV A-ann GaugeTest 10% of Range Inflow Test DHSV Digital data extracted to produce Horner Plot (left) to verify DHSV 9:25 9:30 9.55 10:00

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27/08/2020 09:22:00

#### Routine Verification Tests For Gauge Response



## **Annulus Reviews**



- Detailed annulus monitoring program in place long before NNA
- Annulus behaviour is well understood
- No threat of MAASP excursions during winter unmanned period (end of September to start of March)
- No reactive annulus management to date



## Annulus Sampling



- Annulus reviews identify wells of interest, based on:
  - Sustained annulus pressure (SAP)
  - Charging after blowdown
  - Effluent properties (i.e. regularly blowing down gas)
- Extensive sampling campaign conducted September 2022 (40 total)
- Sampling objectives:
  - Determine fluid contents of annulus (gas / liquid) and potential source
  - Gas: C1-C10, N2, CO2, H2S by Gas Chromatography
  - Hydrocarbon liquid base oil / refined oil / crude by Gas Chrom / Fingerprint Analysis
  - Water 16 Ion analysis
- Results to form input to well abandonment design

Well	A-ann	B-ann	C-ann	Well	A-ann	B-ann	C-ann	
A01/07		1		A18/13		1		
A02/05	1			A19/15	1	1		
A03/03		1		A20/16	1			
A04/06		1		A21/17	1			
A05/01				A22/32	1	1	1	
A06/04	1	1		A23/09		1		
A09/11		1		A25/14	1			
A10/31	1	1		A26z/12	1	1		
A11/22	1	1		A27/24	1			
A12/27		1	1	A28/18				
A13/29				A29/02	1	1		
A14/28	1			A30/08	1	1		
A15/21	1			A31/10				
A16/30	1	1		A32/26	1	1		
A17/19	1			A33z/20	1	1		
Total A-ann							19	
	18							
Total C-ann							2	

## Gas Ratio Analysis



- Haworth, Sellens & Whittaker: 1985
  - Wetness:
     [(C2+C3...+C10)/(C1+C2
     ...+C10)] x 100
  - Balance: (C1+C2)/(C3+iC4+nC4+.... .+C10)
- Key to markers:
  - Red A-ann
  - Blue B-ann
  - Green C-ann
  - Black Flare Gas



## Plug Monitoring / Remediation



- All wells plugged by summer 2018 ahead of down-manning in Q4
- First plug failures were recorded in 2019
- Currently have 16 wells with failed plugs
- The plugs comprise a wide range of makes & models and include cement. In some cases the well has been plugged several times with repeated failures
- It is believed that the common failure mechanism may be related to the tubing condition rather than the plug
- During the initial field development phase, the reservoir was sweet and the wells were completed with N80 tubing
- ▶ By late field life, the recommended metallurgy was 13Cr due to reservoir souring
- All passing plugs to date have been set in low alloy tubulars
- New plug monitoring procedure implemented
  - Record CITHP when UMV is opened
  - One hour inflow test recorded on a digital gauge



## **Plug Evaluation**



Wells divided into four categories based on leak rate characteristics

- Cat.1 minimal pressure as found, no PBU
- Cat.2 low pressure as found, definite PBU
- Cat.3 higher asfound pressure no PBU
- Cat.4 higher asfound pressure





	Oil Release Tonnage				Oil Release Tonnage				Oil Release Tonnage			
	4.5	litres/day	Oil De	ensity	73.6	litres/day		Oil Density	301.7	litres/day		Oil Density
	0.005	cu.m/d	0.844	sg	0.074	cu.m/d		0.844 sg	0.302	cu.m/d		0.844 sg
_	0.004	tonnes/day			0.062	tonnes/day			0.255	tonnes/day		
7 —	Ax			Ay				Az				
6 — 5 — 4 —									50			
3 — 2 — 1 —								30 20 10				
O.112037037	0.113773148 0.115509259 0.11724537 0.118981481	0.120717593 0.122453704 0.124189815 0.125925926 0.127662037 0.127338148 0.131134759	0.13287037 0.13287037 0.134606481 0.136342593 0.138078704 0.133814815 0.141550926 0.141550926 0.1445023148	0.146759259 0.14849537 0.150231481 0.151967593 0.153703704	0.065277778 0.06712963 0.068981481	0.072685185 0.072685185 0.074537037 0.076388889 0.078240741 0.080092593 0.081944444	0.083796296 0.083648148 0.085648148 0.089351852 0.089351852 0.091203704	0.093055556 0.094907407 0.096759259 0.098611111 0.100462963 0.100462963 0.104166667 0.10618519	0.006944444	0.010948148 0.0125 0.014351852 0.016203704 0.018055556 0.019907407 0.021759259 0.023611111	0.025462963 0.027314815 0.029166667 0.031018519 0.03287037 0.034722222	0.036574074 0.0385574074 0.038425926 0.040277778 0.04212963 0.042833333 0.047685185 0.047685185

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## **Plug Remediation**



- Eight wells identified for plug remediation through intervention
- Two technologies have been selected
  - Alloy / Thermite Plugs deployed on wireline
  - Gel plug spotted on depth using CoilHose with brine above
- Crew and equipment mobilised mid May for a 56 day campaign
- Day-time operations only, daily transfer by boat
- Well abandonment to commence Q2, 2024 with a planned completion of Q4, 2026 (from a jack-up)
- To avoid potential complications to abandonment, Alloy / Thermite plugs will only be run in wells where sufficient depth can be achieved



## Cured gel, upright & tilted



### Plug removed from jar and deformed by hand

Re-Cap

- Beatrice is an old field, all wells plugged, platform in NNA status since 2018
- The crude is high wax and would beach in the event of a release
- The wells are subject to 6 month and 12 month verification to the same level of scrutiny as wells still in operation
- KP4 inspections are conducted every six months. Any component in poor condition is subject to a secondary inspection by FIE and may result in replacement or FM
- A wireless gauge system was installed prior to NNA and allows remote monitoring via PI with email alerts
- Annulus reviews based on gauge data were used to identify candidates for sampling. Sample analysis has provided input to well abandonment design
- A number of plugs have been identified as passing based on as-found CITHP and 1hour inflow tests. The plugs have been categorised by leak rate
- A plug remediation campaign is currently in progress (Q2, 2023). The objectives are to restore reservoir isolation on a number of key wells until final well abandonment operations are completed in Q4, 2026









# Thank You

Repsol Sinopec Resources UK