PL826 Status Report

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1 Key license history

The PL826 license was awarded 5th of February 2016 to Pure E&P Norway AS (40% and Operator) and license partners Concedo ASA (30%) and Tullow Oil Norge (30%) as part of the APA 2015 (Fig. 1.1). The partnership at the lapse of the license period (5.2.2019) consisted of Vår Energi AS (Op, 40%), Concedo ASA (30%) and Pandion Energy AS (30%). The work obligations were as follows:

- Within 3 years: Reprocess seismic data and perform G&G studies as well as a drill or drop (DoD) decision.
- Within 5 years: Drill one exploration well and decide to Concretise (BOK) or drop.
- Within 7 years: Perform conceptual studies and decide on Continuation (BOV) or drop.
- Within 8 years: Prepare development plan, decide to submit PDO or drop.

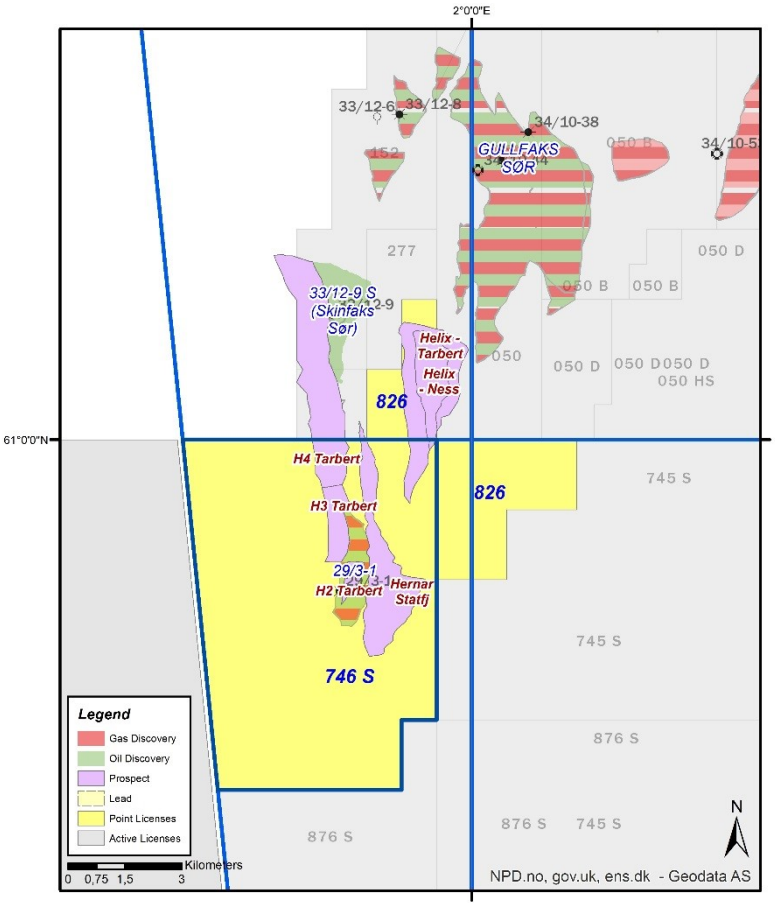

Fig. 1.1 License map with mapped prospect and leads
The Helix prospect is mainly within PL826, but is partly within PL050 and PL746S.

The voting rules to pass a resolution for the license were two of three companies to vote and a minimum 50% share needed for decision.

Regular license meetings were held at least once a year, with formal meetings and work meetings when deemed necessary. The license was closely linked to PL746S with related prospectivity and the same owners. Originally, the license acreage was applied for as additional acreage to PL746S.

The main objective of the license work was to mature prospect and leads in the area of PL826 to get a sufficient resource base combined with realistic positive commercial development solutions to recommend to the partnership to drill a well, alternatively to drop.

An integrated approach, with an area solution including prospective resources from the neighboring license PL 746S, was regarded necessary in order to make a robust economical basis for deciding to drill an exploration well. It seemed clear during the license history that drilling in PL826 was dependent upon an exploration drilling success in PL746S in order to get commercially attractive. The main effort within the two licenses was consequently made in PL746S. The main prospective resources in PL826 is regarded to be within the Brent Gp of the Helix prospect.

The license work obligations were fulfilled. Part of the ST9607 and NX0901 seismic 3Ds were purchased and reprocessed. Based on the results from the G&G work, the Management Committee of PL826 has concluded to not drill a well and therefore let the license lapse.

The reason for the license lapse is that the geological and geophysical work with the seismic 3D data and the relevant well information revealed too small risked prospective resources on the PL826 acreage to drill a well.

2 Database overview

2.1 Seismic database

The seismic database used for evaluation of PL826 with NPDID is shown in Table 2.1.

Table 2.1 Seismic Database Table.

Survey Name	NPDID	Status
ST9607	3832	Procured
NX0901	7005	Procured
NX10M02		Procured merge (original NPDID 7005)
PU16M01		Merged & Reprocessed (original NPDID 7005, 3832)

Parts of the NX10M02 seismic data were the initial seismic database for PL746S (Fig. 2.1). NX10M02 is a reprocessed and merged survey based upon NX0901 in the area of interest. As evaluation showed a need for correlation to discoveries to the North of the license, parts of ST9607 was also included in the database. ST9607 and NX0901 were merged and reprocessed in order to optimize the calibration towards the known discoveries North of the license, resulting in the PU16M01 survey (Fig. 2.2). PU16M01 was re-processed and migrated in several versions, both PSTM- and two PSDM-versions, see 3 Results of geological and geophysical studies for details.

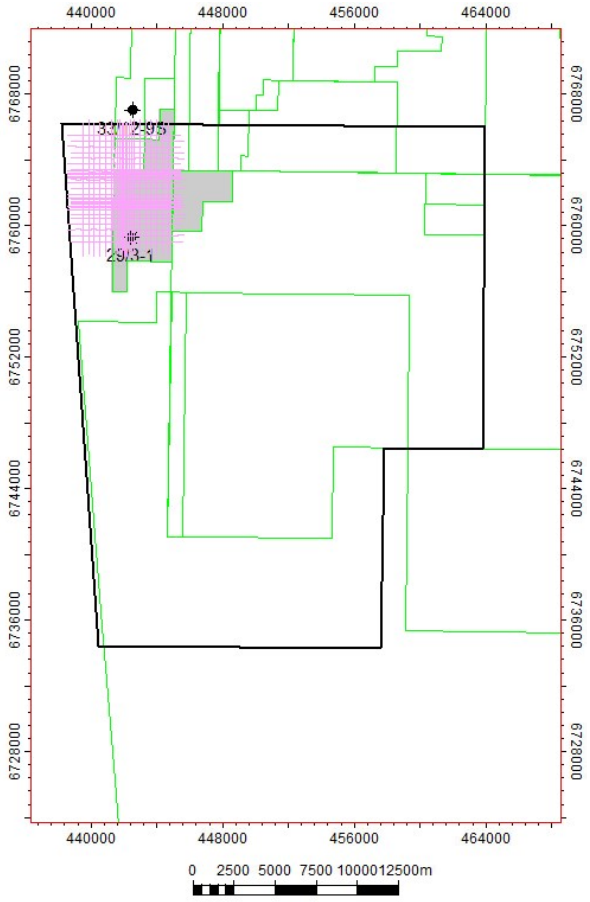

Fig. 2.1 PL826 Seismic data
Black outline shows NX10M02 seismic survey. The pink lines are the PL746S RS15300 site survey lines. PL746S and PL826 are marked with grey fill.

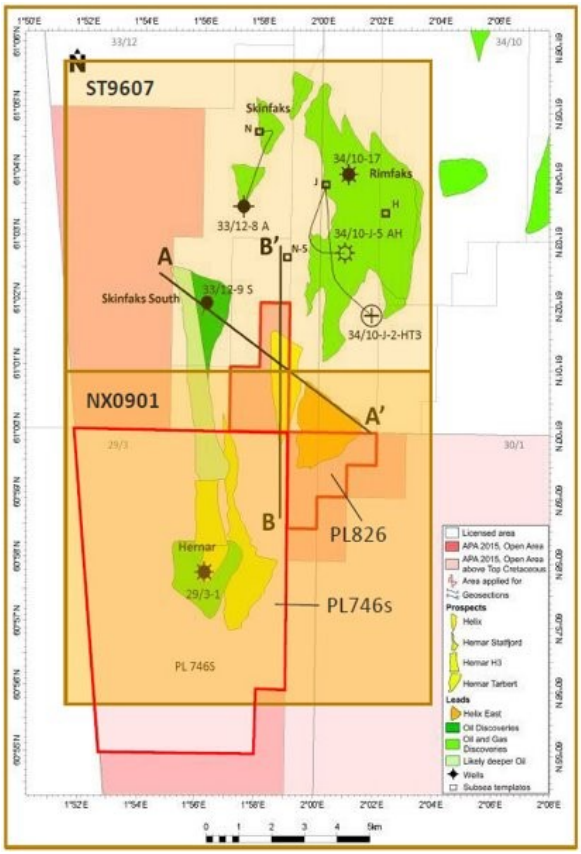

Fig. 2.2 PU16M01 seismic outline
PU16M01 is a merge of ST9607 and NX0901

The reprocessed seismic PU16M01 data have a generally good to excellent seismic data quality for structural interpretation, well ties and seismic data analysis. However, some quality challenges remain for parts of the data directly below the Base Cretaceous Unconformity.

2.2 Well database

The common well database established for PL826 consisted of all publicly available well data in the area, with the main wells shown in Table 2.2.

Table 2.2 Well Database with NPDID Table.

Wellbore name	Well name (NPDID)
29/3-1	904
33/12-9S	6729
33/12-8S	4493
33/12-8A	4532
34/10-17	5
34/10-44S	4422
34/10-J-3H	4131
34/10-J-5AH	4642
29/6-1	375
34/10-38S	2517
34/10-43S	4247
34/10-49S	5140
34/10-53S	6212
34/10-K-2AH	3568

34/10-J-5AH	4642
30/4-2	378
33/12-7	1358
34/10-35	1874
34/4-13S	6442
30/5-3S	6043
30/6-24S	1855
33/12-6	119
34/10-13	431
34/10-30	877
34/10-35	1874
34/10-H-2H	3379
34/10-J-2-HT3	4010
34/10-J-5H	4523
34/7-6	465
34/8-4S	1683
34/7-5	458
34/7-12	1187
34/10-18	23
34/10-37	2431
34/10-37A	2530
34/10-1	424
34/10-3	426
34/10-4	427
34/10-8	230
34/10-9	140
34/10-34	1747

3 Results of geological and geophysical studies

The following geological and geophysical work and studies have been performed jointly for PL746S and PL826:

- Detailed structural mapping of stratigraphy from sea floor to Statfjord Fm.
- Fault seal study performed by Badleys (PL746S)
- Petrophysical study of relevant wells with focus on Jurassic reservoirs.
- Hydrocarbon migration study
- In-depth pore pressure work including effects of depletion due to production over time
- Merge & reprocessing of ST9607 & NX0901 seismic surveys
- Broadband reprocessing of merged seismic with focus on multiple removal
- PSTM and 2 different PSDM seismic reprocessing efforts
- Gather analysis of re-processed and conditioned seismic data
- De-noise for AVA applied on pre-stack gathers
- Frequency Decomposition Analysis (RGB Blending)
- AVO and Rock physics
- 4D seismic feasibility study
- Integration of above studies and work for prospect analysis

The 29/3-1 Hernar Ness Fm discovery is located on the PL746S license area, SW of the PL826 Helix prospect (Fig. 3.1). The middle Jurassic Ness Fm reservoir proven in the well has challenging reservoir properties. The 33/12-9S Skinfaks Sør well was drilled about 3 km North of the PL746S northern license border, and discovered oil in an oil-down-to setting in the middle Jurassic Tarbert Fm.

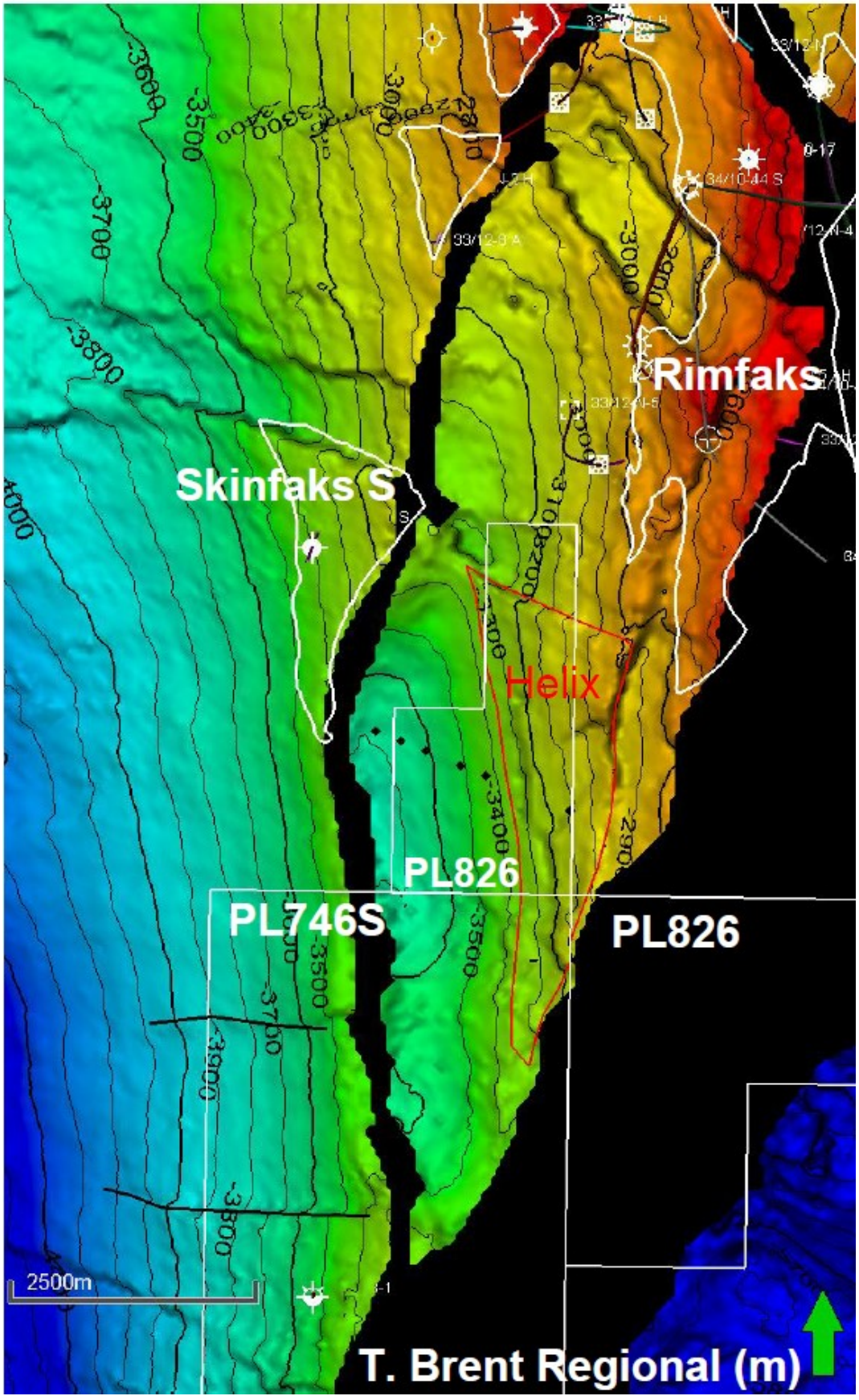

Fig. 3.1 Top Brent Depth map

Detailed stratigraphic and structural mapping on improved seismic data confirmed the stratigraphic and structural setting presented in the application document with generally N-S to NNE-SSW trending normal faults defining a series of rotated Jurassic fault blocks with a dip towards West. The 29/3-1 Hernar and 33/12-9S Skinfaks S discoveries are accumulations within these rotated fault blocks, and they are partly delimited by E-W trending smaller faults, see Fig. 3.2. The stratigraphy from sea floor to the Statfjord Group has been interpreted on different versions of the seismic data, without any significant changes compared to what was presented in the application document.

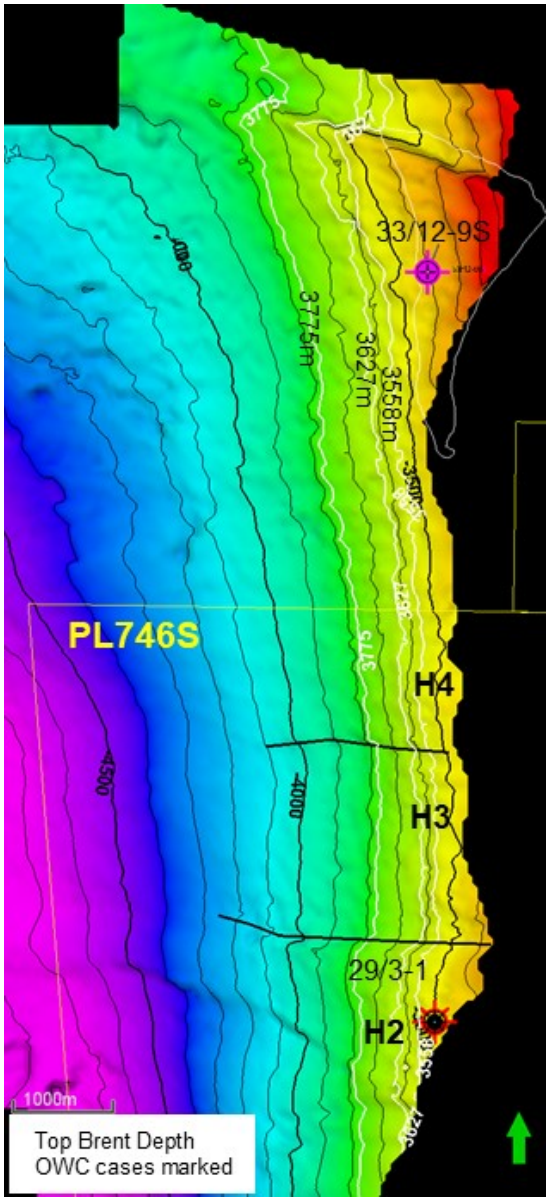

Fig. 3.2 Skinfaks Sør prospect (PL746S)
The westerly dipping mid Jurassic fault block is drilled by 29/3-1 (South) and 33/12-9S (North). 29/3-1 discovered oil and gas in Ness Fm and 33/12-9S oil in Tarbert Fm.

Petrophysical work was performed in order to analyse variations in reservoir properties in the area, with focus on the Jurassic section of the two discovery wells on 29/3-1 and 33/12-9S. The result showed a generally good reservoir quality in the Tarbert Fm, whilst the Ness Fm and

Statfjord Gp proved more variations in reservoir quality, see Table 3.1. Petrophysical work was also used for input to rock physics work, which was further utilized into the AVO and seismic data analysis work performed.

Table 3.1 Petrohysical Summary for 29/3-1 and 33/12-9S

WELL	INTERVAL	MD_TOP	MD_BASE	TVDSS_TOP	TVDSS_BASE	GROSS	NET	NTG	PHI_AV	SW_AV	PERM_AV
		m	m	m	m	m	m	fr	fr	fr	mD
29/3-1	TARBERT ALL	3523	3624	3497	3598	101	62	0.61	0.18	0.52	120.14
29/3-1	NESS	3624	3852	3598	3826	228	61	0.27	0.16	0.42	61.14
29/3-1	ETIVE	3852	3862	3826	3836	10	9	0.89	0.14	-	3.09
29/3-1	RANNOCH	3862	3912	3836	3864	28	23	0.82	0.10	-	0.51
29/3-1	COOK	4046	4147	4020	4120	101	1	0.01	0.11	-	-
29/3-1	STATFJORD	4389	4427	4363	4400	38	3	0.09	0.09	-	-

WELL	INTERVAL	MD_TOP	MD_BASE	TVDSS_TOP	TVDSS_BASE	GROSS	NET	NTG	PHI_AV	SW_AV	PERM_AV
		m	m	m	m	m	m	fr	fr	fr	mD
33/12-9S	TARBERT ALL	3420	3511	3350	3436	85	53	0.62	0.19	0.22	86.53
33/12-9S	NESS	3511	3706	3436	3621	185	58	0.32	0.17		129.57
33/12-9S	ETIVE	3706	3727	3621	3640	20	19	0.96	0.19		52.56
33/12-9S	RANNOCH	3727	3775	3641	3686	45	41	0.90	0.13		3.19

A hydrocarbon migration study was performed by Migris for the APA application, calibrated to the discoveries in the area. This study was regarded sufficient and valid throughout the license period, as no significant new relevant information was registered in the area during the license period.

In-depth pore pressure work was performed during the license period. The effect of depletion over time and distance was studied in order to understand the implications for PL746S and PL826 prospectivity. Significant information has been collected and interpreted from central and southern Tampen Spur wells, with focus on the Gullfaks, Rimfaks and Gullfaks Sør wells. The timing of the depletion, and the lateral and vertical extension of the depletion was documented in the larger Rimfaks /Skinfaks /Gullveig area. The results of the pressure and depletion analysis were used to evaluate the potential for a deep OWC in the Skinfaks S accumulation, with the possibility of significant oil accumulated into the PL746S part of the structure. Unfortunately, it still remains uncertain how to explain the pressure differences within and between the two wells in PL746S (33/12-9S and 29/3-1).

For all geophysical studies the new re-processed PU16M01 data were used. This data set was re-processed from field tapes by Seismic imaging Processing (SIP) in 2016 and consist of a pre-mig merge of parts of NX0901 and ST9607 surveys. The objectives of the processing were to get a consistent broadband dataset covering the licenses as well as the Rimfaks, Skinfaks and Skinfaks South discoveries to the North. Additional objectives were:

- Remove multiple and or "shadow" under BCU
- Improve fault definition
- Distinguish potential hydrocarbon response from seismic artefacts

The processing sequence established to fulfil these objectives consisted of several passes of de-multiple and de-noise as well as a pre-mig merge to common grid. Velocities for the PSDM was generated using SIP's AutoImager which led to a detailed velocity model which could be accurately related to the geology. In addition to pre and post stack deliveries from PSTM/PSDM Kirchhoff migration, a Generalized Radon Transform (GRT) migration was also produced with a full suite of stacks and gathers in the angle domain.

Both the Kirchhoff and the GRT migrated data where evaluated, however the GRT data had the best signal-to-noise ratio, and gave the most consistent anomaly map. Both data sets had issues

with remnant bubble energy and/or remnant multiples below the BCU. In addition to the stacks delivered by SIP, new stacks were generated by the operator after internal targeted pre-stack re-processing in order to optimize the data for AVA studies.

The following geophysical studies were carried out to help de-risk identified prospects and leads as well as identifying new possibilities:

De-noise for AVA applied on pre-stack gathers

- Parabolic Radon mute to attenuate remaining multiples
- Linear radon mute to attenuate dipping noise
- Structural filtering to attenuate random noise
- Targeted low frequency parabolic radon to remove remnant low frequency noise below BCU

Frequency Decomposition Analysis (RGB Blending) was done on the full stack as well as the sub stacks on the top Tarbert interpreted horizon. The resulting RGB results were used to identify geological features and investigated for any DHI.

AVO and Rock physics - The following cubes were generated to use for AVO scanning:

- Fluid substitution and EEI was done on well 33\12-9S as this was the only well within the data with measured shear wave velocity.
- Avocube = envelope (far) – envelope (near)
- Extended Elastic Impedance (EEI) "fluid" cube from intercept and gradient using angles from 5-35° for the full survey as well as 5-45° for the southern part covered by the NX0901 acquisition. For both fluid cubes a chi angle rotation of 25 was used, which also corresponds with well 33\12-9S
- Post stack inversion of near (EI13) and far (EI40). These cubes were used to identify polygons of known fields within the data in the cross-plot of EI13 vs EI40. These polygons/ classifications where then used to identify other areas within the data with the same elastic properties.

In addition to the impedance and AVO cubes, pre-stack gather data inspection was done on all identified leads to identify any far offset amplitude anomalies that could be caused by critical and/ or converted energy.

Seismic attribute and AVO analysis on a number of seismic cubes show a remarkably good match to Tarbert Fm discovery outlines in the Gullfaks - Skinfaks area (example in Fig. 3.3). These observations were promising for using seismic to de-risk potential hydrocarbon accumulations in PL746S and PL826. However, the PL746S prospects are deeper than these discoveries, thus making seismic analysis less predictable for hydrocarbon detection. Several observations of fairly depth consistent seismic anomalies were observed within the Skinfaks Sør Tarbert structure, but no such depth consistent anomaly observations could be observed on the PL826 Helix prospect.

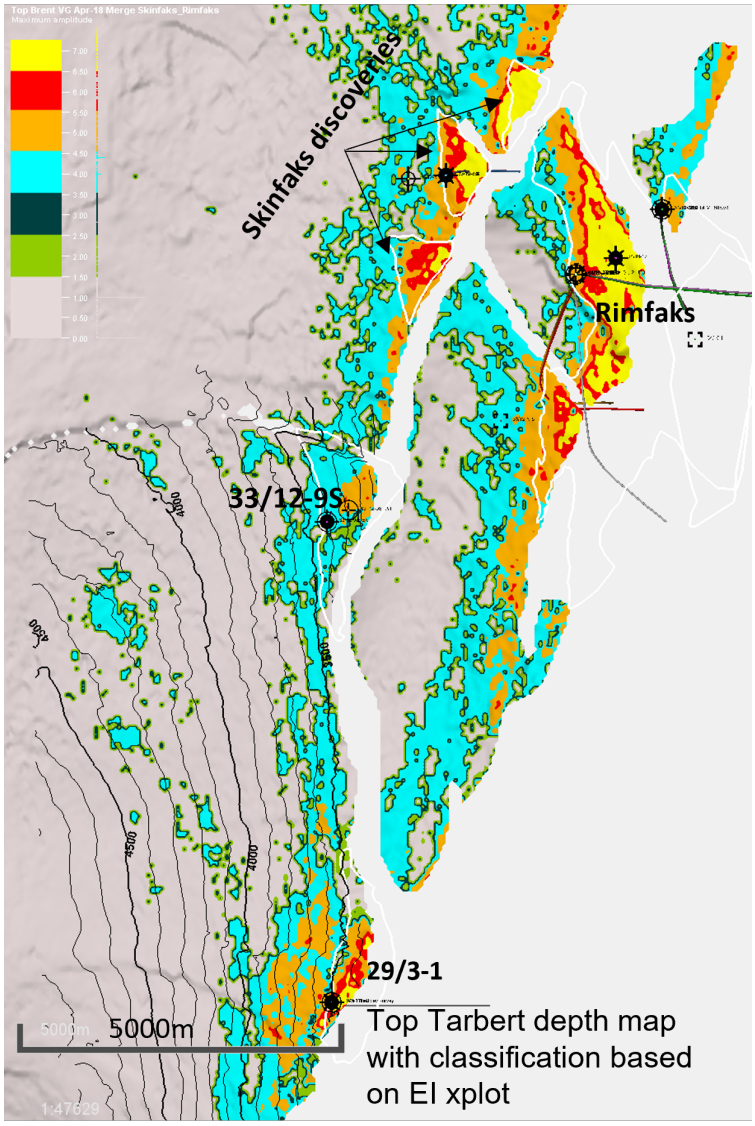

Fig. 3.3 EI classification in the Rimfaks area
Example of excellent match of hydrocarbon fill with seismic response. The area of the Helix prospect does not show any depth consistent seismic response.

4 Prospect update

The Brent Gp Helix prospect in the APA2015 application remained the main target throughout the license period. The Helix prospect is identified as a westerly rotated fault block dependent upon fault seal in a E-W fault in the northern part of the structure in order to separate the prospect from the upflank Rimfaks Field (Fig. 3.1). Tarbert and Ness Fm were identified as the target reservoirs.

The seismic imaging that was basis for the application work showed poor imaging in the critical area in the northern part of the prospect. Improved seismic imaging achieved through the license work revealed that the critical E-W fault in the northern part of the prospect has very limited throw (Fig. 4.1), thus leading to an increased trap risk for the Helix prospect (Fig. 4.2).

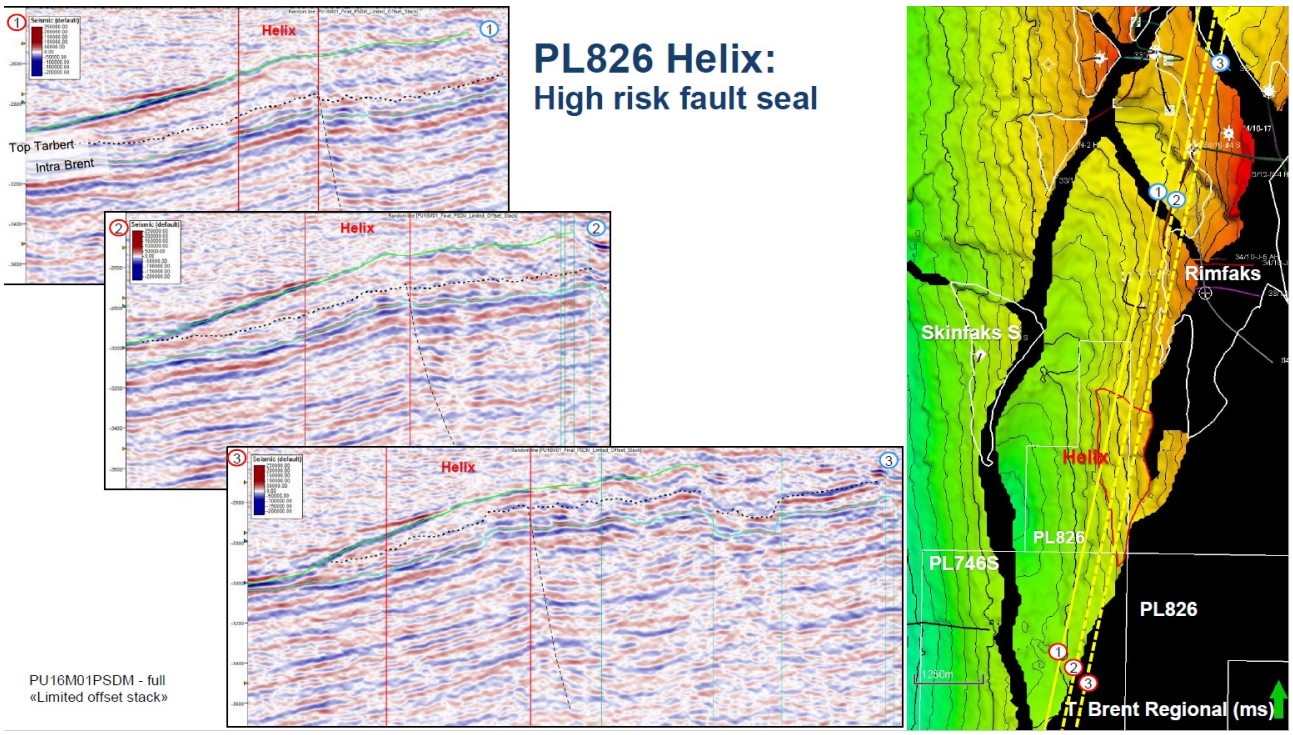

Fig. 4.1 Helix prospect critical fault
The cross-sections 1-3 show that the fault throw critical for the Helix trap is minimal. In fact, at the apex (sect 3) the throw is close to zero.

Risk element	Helix Brent	
	POS	Comment
Reservoir presence	0.9	proven by 29/3-1 & 33/12-9S, Rimfaks wells
Reservoir effectiveness	1	proven by 29/3-1 & 33/12-9S, Rimfaks wells
Trap	0.25	Trap not properly defined due to lack of fault throw on apex
Seal	0.8	If trap is present still seal*retention risk
Migration	1	Similar setting to Rimfaks
Source	0.9	Similar setting to Rimfaks, limited quantities of mature source?
Retention	0.8	If trap is present still seal*retention risk
Probability	0.13	All risk linked to the trap and its' effectiveness

Fig. 4.2 Helix POS is 13%

Reference is given to PL746S status report which describes in detail the geophysical efforts to understand Skinfaks Sør seismic anomalies in relation to the discoveries in the area. The

discoveries show clear anomalies reflecting the hydrocarbon filling of these structures. No depth consistent anomalies are observed over the Helix prospect, leading to a downgrade of the prospect (Fig. 4.3).

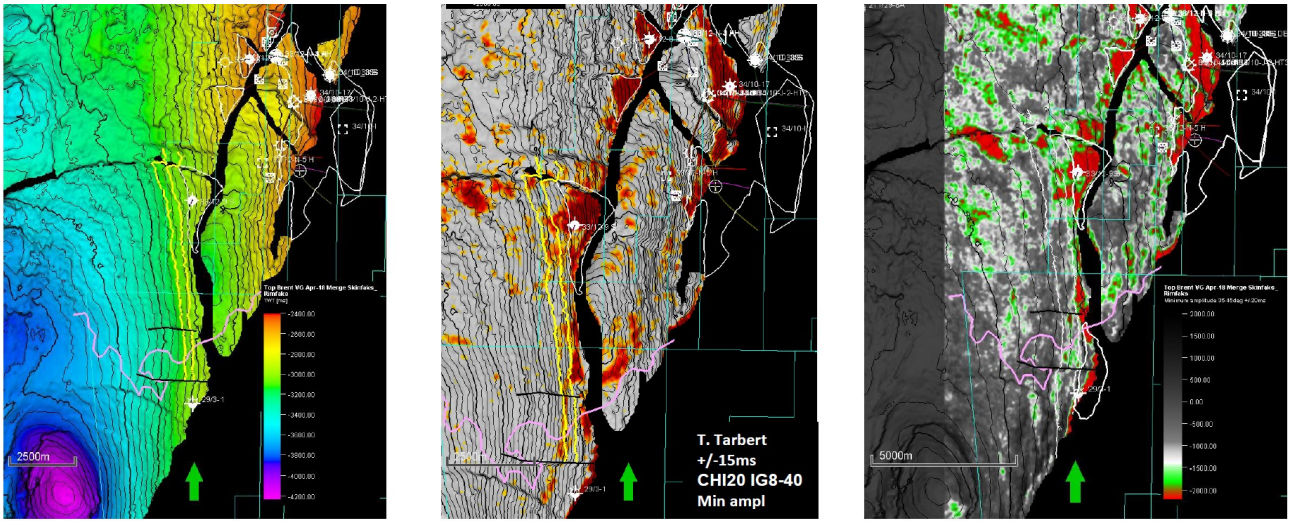

Fig. 4.3 Attribute maps showing no depth consistent anomalies over Helix
From left: 1. Top Brent TWT, 2. Top Brent CHI20 minimum amplitude, 3. Base Tarbert UFAR maximum amplitudes.

The chance of a discovery in Helix is evaluated to be 13% (was 26% and 19% in APA application), the estimated PL826 prospective resources of 29 mmboe rec in Tarbert Fm (Fig. 4.4) and 19 mmboe rec in Ness Fm have not changed compared to the original volumes estimated in the 2015 APA application.

Block	33/12, 34/10	Prospect name	Helix	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Oil&Gas	Reported by company	Vår Energi	Reference document	Status report			Assessment year	2018
This is case no.:	1 of 1	Structural element	Tampen Spur	Type of trap	Structural	Water depth [m MSL] (>0)	130	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		**Main phase**				**Associated phase**			
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10^6 Sm^3] (>0.00)	3.01	5.47	5.97	8.92	0.57	0.86	0.90	1.27
	Gas [10^9 Sm^3] (>0.00)	0.90	1.26	1.39	1.93	0.75	1.25	1.52	2.36
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	1.30	2.27	2.69	4.19	0.15	0.24	0.31	0.51
	Gas [10^9 Sm^3] (>0.00)	0.58	0.80	0.90	1.26	0.32	0.55	0.68	1.10
Reservoir Chrono (from)	Bajocian	Reservoir litho (from)	Tarbert	Source Rock, chrono primary	Tithonian	Source Rock, litho primary	Draupne Fm	Seal, Chrono	Callovian
Reservoir Chrono (to)	Bajocian	Reservoir litho (to)	Tarbert	Source Rock, chrono secondary	Callovian	Source Rock, litho secondary	Heather Fm	Seal, Litho	Heather
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.13	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	0.00	Oil & Gas case (0.00-1.00)	1.00		
Reservoir (P1) (0.00-1.00)	0.90	Trap (P2) (0.00-1.00)	0.20	Charge (P3) (0.00-1.00)	0.90	Retention (P4) (0.00-1.00)	0.80		
Parametres:	Low (P90)	Base	High (P10)	*Comments*					
Depth to top of prospect [m MSL] (> 0)	2940	2970	3000						
Area of closure [km^2] (> 0.0)	1.8	2.0	2.3						
Reservoir thickness [m] (> 0)	85	90	95						
HC column in prospect [m] (> 0)	175	265	280						
Gross rock vol. [10^9 m^3] (> 0.000)	0.109	0.154	0.194						
Net / Gross [fraction] (0.00-1.00)	0.50	0.61	0.70						
Porosity [fraction] (0.00-1.00)	0.20	0.22	0.24						
Permeability [mD] (> 0.0)	300.0	600.0	900.0						
Water Saturation [fraction] (0.00-1.00)	0.15	0.24	0.30						
Bg [Rm3/Sm3] (< 1.0000)	0.0042	0.0040	0.0038						
1/Bo [Sm3/Rm3] (< 1.00)	0.60	0.57	0.55						
GOR, free gas [Sm^3/Sm^3] (> 0)	200	256	320						
GOR, oil [Sm^3/Sm^3] (> 0)	550	650	750						
Recov. factor, oil main phase [fraction] (0.00-1.00)	0.35	0.45	0.55						
Recov. factor, gas ass. phase [fraction] (0.00-1.00)	0.35	0.45	0.55						
Recov. factor, gas main phase [fraction] (0.00-1.00)	0.60	0.65	0.70						
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)	0.20	0.35	0.50	For NPD use:					
Temperature, top res [°C] (>0)	105			Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)	422			Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	Por=0.12	2.	3.					Kart nr	NPD will insert value

Fig. 4.4 Helix Tarbert prospect details

5 Technical assessment

A discovery in Helix could be developed as a tie back to Rimfaks or as a co-development with Skinfaks Sør with tie-back to Gullfaks A (Fig. 5.1).

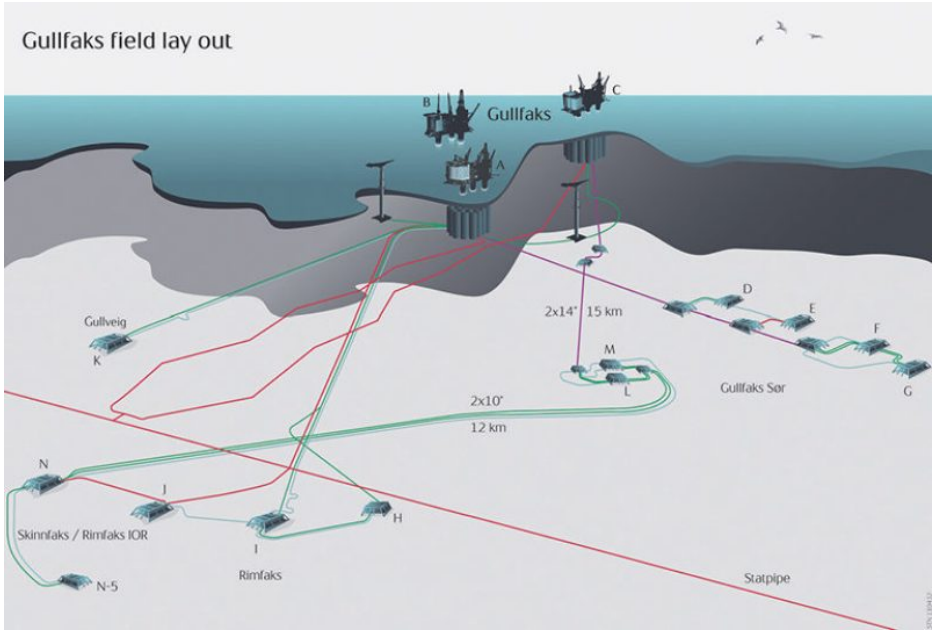

Fig. 5.1 Existing Gullfaks/Rimfaks infrastructure
Source: Equinor.

6 Conclusion

The work program for PL826 has been completed with the ST9607 and NX0901 merge and reprocessing, resulting in the PU16M01 survey, in addition to the G&G studies described in 3 Results of geological and geophysical studies.

The evaluation of the license has downgraded the partnership's view of the prospective potential of PL826. Better seismic imaging through reprocessing has revealed a weak trapping mechanism for the Helix prospect, resulting in a downgrade of the chance of success (POS 13%). The limited volume potential combined with the low POS gives no commercial sound basis for drilling an exploration well on the Helix prospect. The partnership has decided to let PL826 lapse at the drill or drop decision point.