



Fairfield Betula Limited

Dunlin Alpha Topsides Decommissioning Programme Regulatory Close Out Report



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	Name	Signature	Date
Prepared by	Peter Lee	PL	19/09/24
Reviewed by	Caroline Laurenson	CL	19/09/24
Approved by	Peter Lee	PL	19/09/24

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CONTENTS

1	Summary	6
1.1	Summary of Decommissioning Programme	6
1.2	Schematic of Topsides	9
1.3	Project Delivery against Approved DP Schedule	10
1.4	Associated Decommissioning Approvals	10
2	Decommissioning Activities	11
2.1	Contracts Awarded	11
2.2	Platform Operations	12
2.3	Well Abandonment Activities	16
2.4	Subsea Installations	18
2.5	Pipelines / Umbilicals & Jumpers	18
2.6	Pipeline Stabilisation features	18
2.7	Drill Cuttings	18
2.8	Debris Clearance & Post Decommissioning Surveys	18
2.9	Key Milestones	18
2.10	Stakeholder Engagement	19
3	Impact on the Environment	20
3.1	Environmental Incidents	20
3.2	Future Monitoring & Management Planning	20
4	Impact on Health & Safety	21
4.1	Safety Case Updates	21
4.2	Safety Incidents	21
5	Waste Management	23
6	Lessons Learned	24
7	Cost Summary	26
8	Verifications	27
9	Photographs	29



Terms and Abbreviations

Term	Meaning
AFOD	AF Offshore Decom
AtoN	Aid to Navigation (or Navaid)
CA	Comparative Assessment
CGBS	Concrete Gravity Base Substructure
CGF	Conductor Guide Frame
COP	Cessation of Production
CSV	Construction Support Vessel
DCC	Document Control Centre
DESNZ	Department of Energy Security and Net Zero
DFGI	Dunlin Fuel Gas Import
DP	Decommissioning Programme
DPI	Dunlin Power Import
DSC	Dismantling Safety Case
EA	Environmental Appraisal
EPRD	Engineering, Preparation, Removal and Disposal
FBL	Fairfield Betula Limited
FFL	Fairfield Fagus Limited
HAZID	Hazard Identification Study
HLV	Heavy Lift Vessel
HMC	Heerema Marine Contractors
HSE	Health & Safety Executive
LAT	Lowest Astronomical Tide
MSF	Module Support Frame
mT	Metric Tonnes
N/A	Non Applicable
NEA	Norwegian Environmental Agency
NORM	Normally Occurring Radioactive Material
OEUK	Offshore Energies UK
OGA	Oil and Gas Authority (now North Sea Transition Authority)
OGUK	Oil and Gas UK
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSV	Offshore Support Vessel
P&A	Plug and Abandonment
PETS	UK Oil Portal Environmental Tracking System
PFP	Passive Fire Protection
PL	Pipeline



Term	Meaning
PLA	Pipeline Application
POB	Personnel On Board
PON	Petroleum Operations Notice
PWA	Pipeline Works Authorisation
RCF	Refractory Ceramic Fibre
ROGI	Report of an Oil and Gas Incident
ROVSV	Remotely Operated Vehicle Support Vessel
SEPA	Scottish Environment Protection Agency
SID	Subsea Infrastructure Decommissioning
SSCV	Semi-Submersible Crane Vessel
t	Tonnes
TFSW	Transfrontier Shipment of Waste
TFSRWSF	Transfrontier Shipment of Radioactive Waste and Spent Fuel Regulations
UKCS	United Kingdom Continental Shelf
WBS	Work Breakdown Structure
WFD	Waste Framework Directive
WMP	Waste Management Plan
WONS	Well Operations Notification System

Figures

Figure 1-1: Dunlin Alpha South and South-West Elevations.....	7
Figure 1-2: Dunlin Alpha Topside Modules.....	9
Figure 1-3: Actual Schedule versus Approved Schedule	10
Figure 2-1: Semi-Submersible Crane Vessels <i>Thialf</i> (left) and <i>Sleipnir</i> (right)	12

Tables

Table 1-1: Summary of Decommissioning Programme	6
Table 1-2: Associated Decommissioning Approvals.....	10
Table 2-1: Principal Contracts	11
Table 2-2: Platform Well Information	16
Table 2-3: Key Milestones	18
Table 3-1: Environmental Incidents	20
Table 4-1: Safety Case Updates.....	21
Table 4-2: Safety Incidents.....	22
Table 5-1: Waste Volumes (Tonnes)	23



1 Summary

1.1 Summary of Decommissioning Programme

Termination of Production from the Greater Dunlin Area was announced by Fairfield Betula Limited (FBL, also referred to here as Fairfield) in May 2015, having Maximised Economic Recovery from these oilfields. Termination of Production was agreed with the Oil & Gas Authority (OGA) on 9th July 2015 with Cessation of Production (COP) on 15th June 2015. The Dunlin Alpha Topsides Decommissioning Programme [[FBL-DUN-DUNA-HSE-01-PLN-00001-01](#)] was approved on 3rd May 2019. A summary of the infrastructure to be decommissioned and the approved decommissioning options is outlined in Table 1-1 below.

Table 1-1: Summary of Decommissioning Programme		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
1. Topsides		
Complete removal of topsides for recycling.	Regulatory requirements.	Cleaned equipment refurbished for re-use where possible. Other equipment recycled as appropriate.
2. Substructures		
N/A Addressed in the Dunlin Alpha Substructure Decommissioning Programme, with the exception that the removal of two Conductor Guide Frames (CGFs) was addressed within the Dunlin Alpha Topsides Decommissioning Programme (and this Close Out Report) despite the removal costs being shown against Substructure Removal in the Work Breakdown Structure (WBS). Please refer to document FBL-DUN-DUNA-HSE-01-PLN-0001-02 when approved and published.		
3. Subsea Installations		
N/A Addressed in Osprey & Merlin Decommissioning Programmes. Please refer to documents FFL-DUN-OSP-HSE-01-PLN-00001 and FFL-DUN-MER-HSE-01-PLN-0001 .		
4. Pipelines, Flowlines & Umbilicals		
N/A Addressed in Fuel Gas Import (DFGI) / Power Import (DPI) Decommissioning Programme. Please refer to document FBL-DUN-DUNA-HSE-01-PLN-00002 .		
5. Wells		
Abandoned in accordance with latest industry Guidelines for Abandonment of Wells.	Regulatory requirements.	Permitted as required under approved Chemical Permit, Oil Discharge Permit, Marine Licence (via PETS) and PON5 (via WONS) applications.
6. Drill Cuttings		
N/A Addressed in Dunlin Alpha Substructure Decommissioning Programme. Please refer to document FBL-DUN-DUNA-HSE-01-PLN-0001-02 when approved and published.		
7. Interdependencies		
None		



The Dunlin Alpha installation served as the production facility for the Greater Dunlin Area and is located in UK Continental Shelf Block 211/23a, approximately 137 km north east of Shetland and 11 km from the UK/Norwegian median line. It was installed in 1977 and two subsea tiebacks, Osprey and Merlin, were developed in 1991 and 1997 respectively. During its lifetime, over 522 million barrels of oil were produced from the Greater Dunlin Area.

Dunlin Alpha consisted of a four leg Concrete Gravity Base Substructure (CGBS), herein referred to as the substructure; a steel box girder Module Support Frame (MSF) deck; and two further levels of modules. The installation stands in 151 m of water with concrete legs extending to 8 m below Lowest Astronomical Tide (LAT) and steel transitions spanning the splash zone to approximately LAT+23 m. These transitions previously carried the installation topsides, with the top of the drilling derrick 240 m above the seabed as shown in Figure 1-1.

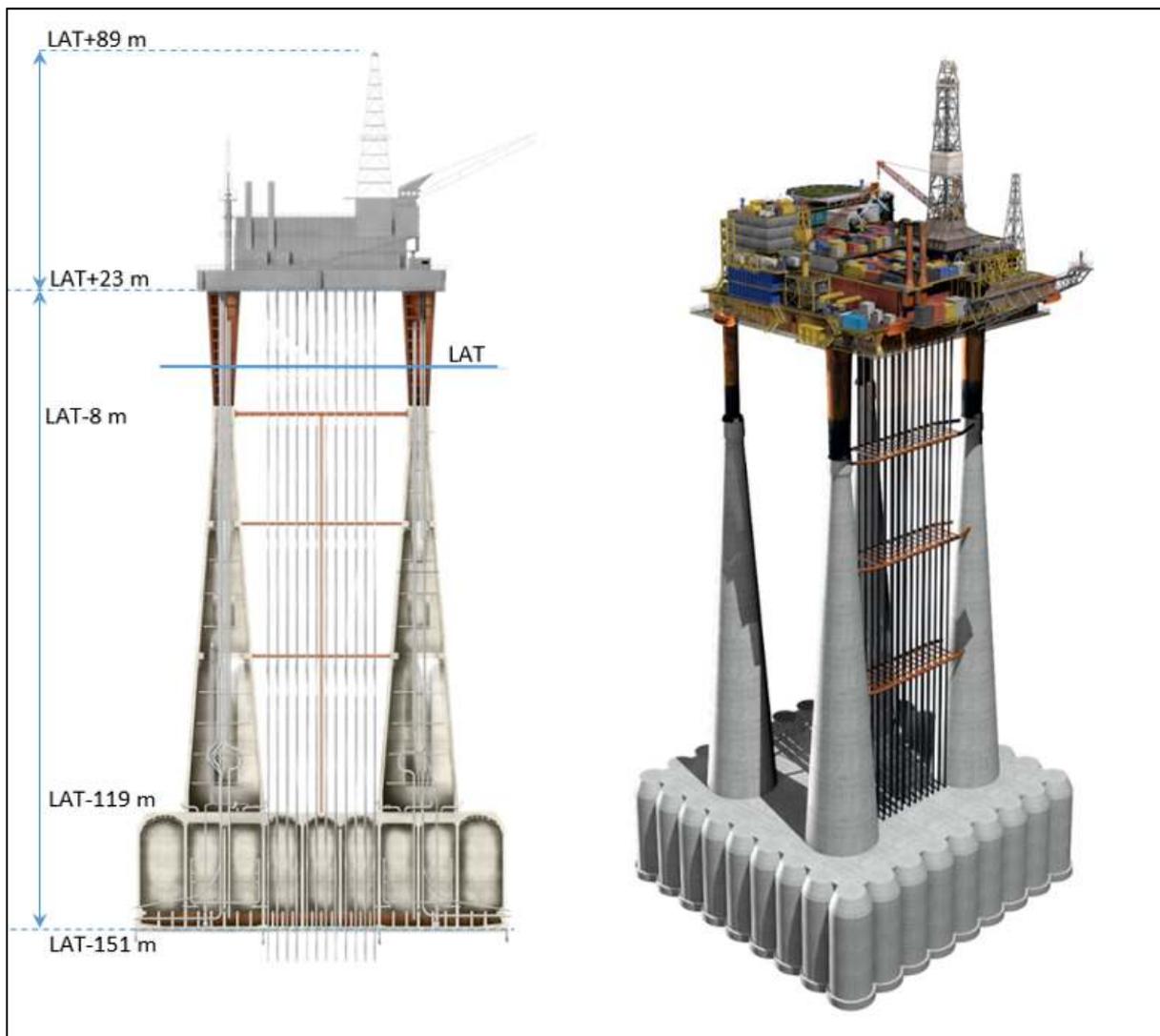


Figure 1-1: Dunlin Alpha South and South-West Elevations



The Dunlin Alpha topsides were designed as an integrated drilling and production facility as shown in Figure 1-2. These topsides have now been fully removed by optimised reverse installation for onshore recovery and disposal, in accordance with the Oslo and Paris Convention (OSPAR) Decision 98/3 and as described in the approved Decommissioning Programme. The Dunlin Alpha substructure is a candidate for derogation under Decision 98/3 and, as of 2Q'24, the Decommissioning Programme for the substructure is still under consultation with OSPAR Contracting Parties.

The interface between the topsides and substructure is at the LAT+23 m level between the top of the transitions and the underside of the MSF. To remove the topsides and conductors, the outline scope of work was as follows:

- a. Make safe and handover 'engineering down' including removal of bulk fluids
- b. Decommissioning of 45 platform wells (production and water injection wells)
- c. Removal of well conductors and drill strings down to LAT-74 m (39 wells from topsides)
- d. Removal of any hazardous material in the four concrete legs
- e. Clearing the associated transition internals for the cut zone
- f. Flooding of the legs to Mean Sea Level and capping of the upper legs
- g. Sever transitions at approximately LAT+23m (at underside of MSF)
- h. Removal of the entire platform topsides for onshore reuse and recycling
- i. Removal of remaining well conductors down to LAT-74 m (6 wells by subsea intervention)
- j. Removal of upper and middle CGFs (by subsea intervention)
- k. Installation of a Self-Contained Offshore Lighthouse (Navaid) on one leg



1.2 Schematic of Topsides

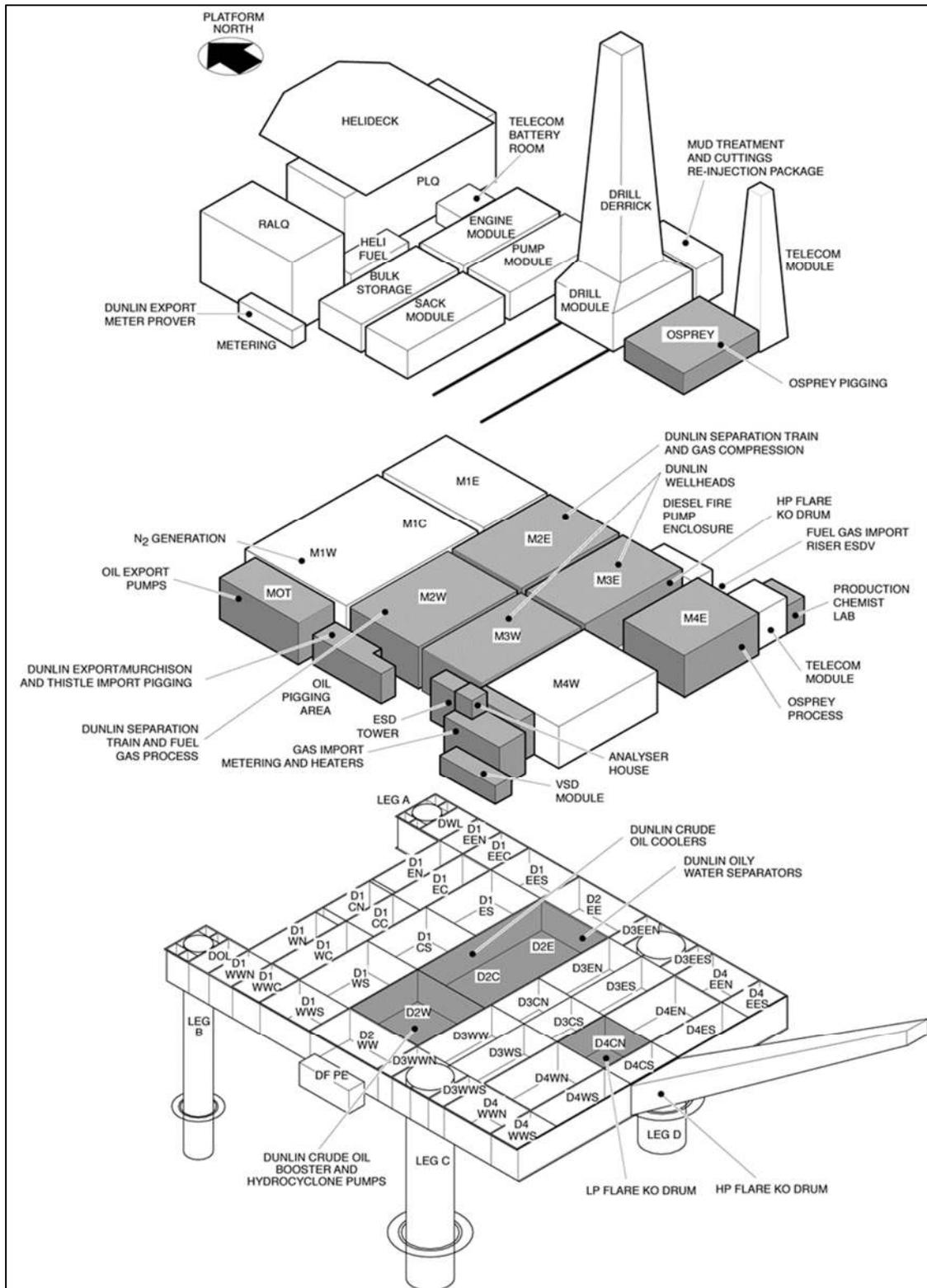


Figure 1-2: Dunlin Alpha Topside Modules



1.3 Project Delivery against Approved DP Schedule

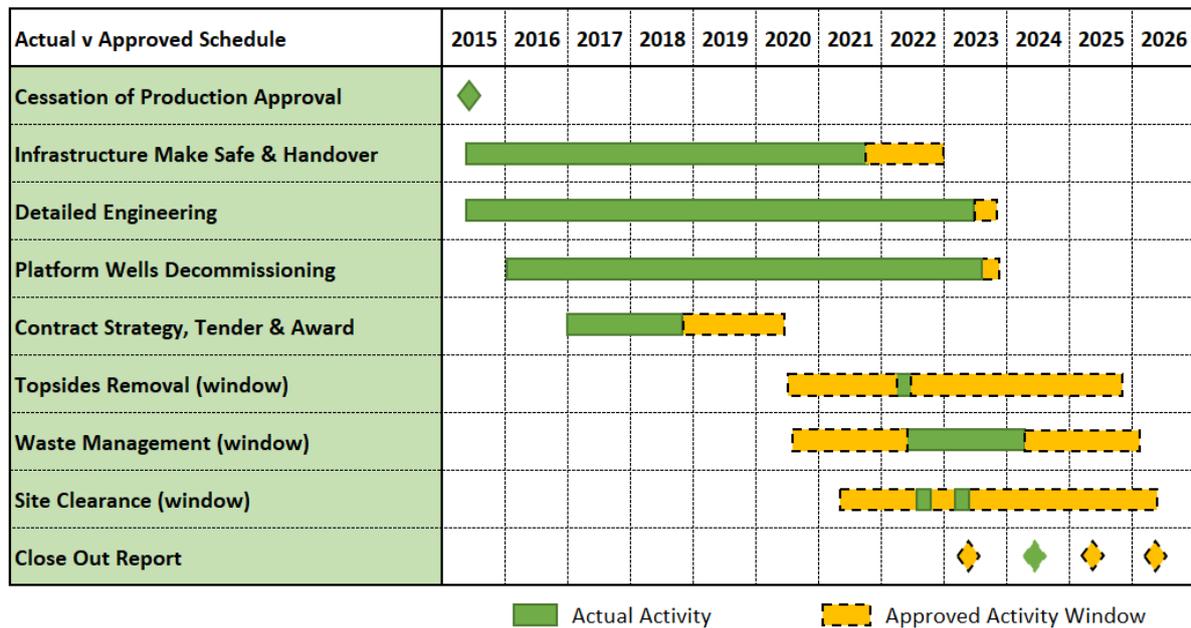


Figure 1-3: Actual Schedule versus Approved Schedule

1.4 Associated Decommissioning Approvals

A summary of the associated decommissioning approvals is included in Table 1-2 below:

Table 1-2: Associated Decommissioning Approvals		
Cessation of Production	15/06/2015	
Decommission Programme Approval	03/05/2019	
Marine Licences	ML/459	ML/847
	ML/542	ML/949
	ML/639	ML/987
PETS Master Applications	DCA/44	DCA/178
	DCA/83	WIA/959
	DCA/161	WIA/1119

Supporting documents are:

- Dunlin Alpha Topsides Decommissioning Programme
[[FBL-DUN-DUNA-HSE-01-PLN-00001-01](#)]
- Dunlin Alpha Installation Comparative Assessment Report
[[A-301649-S07-REPT-005](#)]
- Dunlin Alpha Topsides Environmental Appraisal
[[XOD-DUN-HSE-RPT-00005-01](#)]
- Dunlin Alpha Topsides Cost Summary Report (confidential)
[FBL-DUN-DUNA-HSE-01-RPT-00004]



2 Decommissioning Activities

2.1 Contracts Awarded

While the entirety of the project scope involved several hundred third party service providers, the principal contracts either carried into the decommissioning phase or awarded during execution are listed in Table 2-1.

Table 2-1: Principal Contracts	
Company	Scope
AquaTerra (Group) Limited	Specialist Access Services
Archer (UK) Limited	Well Plugging and Abandonment
Asco (UK) Limited	Logistics and Warehousing
Augean North Sea Services Limited	Onshore Waste Management
CAN (Offshore) Limited	Inspection Services
Cape Industrial Services Limited	Fabric Maintenance
CHC Scotia Services	Helicopter Flight Services
Control Cutter AS	Conductor Cutting System & Services
DeepOcean Subsea Services Limited	ROV Services (Conductor & CGF Removals)
Fugro GB (North) Marine Limited	Debris Clearance
HAF Consortium (HMC & AFOD)	Topsides Removal EPRD
Halliburton Manufacturing & Services Limited	Drilling Fluids & Cementing Services
Kent Energies UK Limited	Structural Engineering Consultancy
London Offshore Consultants Aberdeen Ltd	Marine Warranty
Optimus Engineering	Engineering Consultancy
Romar International Limited	Swarf Handling Equipment
Sabik Marine (now SPX oy)	Aids to Navigation
Schlumberger Oilfield UK plc	Casing Milling & Cutting Services
Seabrokers	Vessel Charters
Smith International (North Sea) Limited	Downhole Fishing, Milling & Cutting Services
Sodexo Remote Sites Scotland Limited	Offshore Facilities Management
Sparrows Offshore Services Limited	Offshore Crane Services
Underwater Cuttings Solutions	Conductor Clamp Cutting Services
Veolia ES (UK) Limited	Onshore Waste Management
WellGear Limited	Rigless Intervention System & Services
Worley Services UK Limited	O&M and Engineering Services
Xodus	Environmental Consultancy



2.2 Platform Operations

The period between Cessation of Production (June 2015) and down-manning of the installation (October 2021) was dominated by plugging and abandonment of the platform wells and making safe (engineering down) the topsides facilities ahead of handover to a topsides removal contractor. While not addressed in detail in this Close Out Report, the plugging and abandonment of the platform well stock was viewed as, and remained, the critical path activity for achieving cold stack status prior to topsides removal.

Make Safe & Handover of the topside modules progressed throughout this period with the flushing, isolation and segregation of topsides modules and equipment therein. An appropriate disposal well was retained for as long as possible for the management of bulk fluids, after which residual fluids were skipped and shipped ashore for appropriate waste management.

Following substantive progress with the draft Decommissioning Programme and engagement with the market via a competitive dialogue process, the principal topsides removal contract was awarded in 2018 to the HAF Consortium, consisting of Heerema Marine Contractors (HMC) and AF Offshore Decom (AFOD). The contract was awarded on a lump sum Engineering, Preparation, Removal and Disposal (EPRD) basis.

HAF personnel mobilised to Dunlin in May 2019 to progress offshore surveys in support of their detailed engineering and to verify the accuracy of technical information supplied as part of the topsides removal contracting process. A programme of non-destructive testing of critical module structure and lift points was conducted at this time, following which HAF optimised the topsides removal sequence into two proposed phases.

The first phase would be conducted using the Semi-Submersible Crane Vessel (SSCV) *Thialf*, from which the majority of the preparation work would be conducted and a number of platform modules would be removed. This would be followed by a campaign utilising HMC's newly commissioned (July 2019) SSCV *Sleipnir* (see Figure 2-1) to remove a number of remaining modules and to then lift and transport the platform MSF to the nominated disposal yard in Vats, Norway.



Figure 2-1: Semi-Submersible Crane Vessels *Thialf* (left) and *Sleipnir* (right)



Progress through 2019 had maintained the possibility of topsides removal in 2021. Unfortunately, the COVID-19 pandemic and the resultant reduction in offshore personnel numbers required a re-baselining of the overall project schedule and a Fairfield decision to nominate 2022 as the lift year. HAF agreed to complete the technical verification process and any key engineering deliverables already started (weight reconciliation, module lift structural analyses and lift point designs) after which the HAF engineering effort was rescheduled to support a 2022 removal.

FBL held early engagement with the Health & Safety Executive (HSE) in March 2020 to discuss expectations for the cold stack and dismantling safety cases (DSC). Early engagement was also conducted with the Scottish Environment Protection Agency (SEPA) to understand the requirements for transfrontier shipment of waste in the event of any decommissioned materials needing to be repatriated to the UK from the Norwegian disposal yard.

By autumn 2020, HAF had completed all surveys required for its technical verification and completed 90% of its non-destructive testing of critical module structure and lift points. Following completion of the verification process, HAF assumed responsibility for any residual risk that might arise with respect to execution of their removal methodology. HAF highlighted a number of areas containing Refractory Ceramic Fibre (RCF) within areas of Passive Fire Protection (PFP) which would require particular attention during the removal process. Please refer to Section 6 for lessons learned.

A platform module handover procedure had been compiled and jointly agreed between FBL and HAF. Trial module handovers were conducted to test the procedure, all of which were carried out successfully. With completion of Phase 2 well plug and abandonment in spring 2021 the platform was declared hydrocarbon free, thereby releasing the remainder of the modules for handover preparation. An independent audit of the HAF key engineering deliverables was conducted in support of the decision to perform the topsides removal in 2022 and the detailed engineering of the platform Navaid support plinth was also progressed.

FBL continued engagement with the HSE to discuss the DSC and conducted a Hazard Identification (HAZID) Study with the removal contractor in support of the DSC submission. Engagement also continued with SEPA and it was identified that the platform's smoke detectors (which contain low level radioactive sources) needed to be repatriated to the UK from the Norwegian disposal yard. Fairfield liaised with HAF, SEPA and the Norwegian Environmental Agency (NEA) to understand the requirements for transfrontier shipment of this waste and any waste streams contaminated with Normally Occurring Radioactive Material (NORM).

By summer 2021, the majority of the well conductors had been removed to 74 m below LAT (a level just above the lowest of the guide frames). Although air-gapped, six conductors remained at a higher level for future subsea removal due to the presence of clamps on their lower sections. Maersk Supply Services had been contracted to undertake this conductor recovery scope and evaluated the use of shaped explosive charges as a potential cutting solution which, following onshore trials, was ultimately determined to carry too much execution risk for adoption.

By this time, all topside module preparation certificates had been accepted by HAF with no exceptions. Fairfield confirmed its nomination of 2022 as the lift year and the HAF project team was remobilised. Final cold stack preparations were completed, with all remaining areas of foreseeable risk to the future topsides removal execution phase addressed by Fairfield and verified by HAF. The final cold stack status of the platform was formally agreed and jointly documented with HAF. Dunlin platform cold stack subsequently occurred on 14th October 2021. HAF then completed the overall EPRD engineering programme, with all remaining actions from the previous independent audit of key engineering deliverables confirmed as having been closed out satisfactorily.



An extensive marine vessel assurance scope of work was performed by London Offshore Consultants on both Heerema-owned *Thialf* and *Sleipnir* Heavy Lift Vessels (HLVs), in advance of offshore operations commencing at the Dunlin location. In parallel to project execution planning, FBL continued engagement with the HSE and submitted a formal Dunlin Alpha Dismantling Safety Case (DSC) which was subsequently accepted for use prior to commencement of the topsides removal execution.

It had previously been identified that repatriation of NORM-contaminated waste and smoke detector radioactive sources would be required (from Norway, back to the UK) upon completion of recycling and disposal operations at the Vats yard. Engagement progressed with SEPA and the NEA, culminating in approval of the Transfrontier Shipment of Waste (TFSW) Notification, ahead of commencement of topsides removal execution.

In advance of 2022 offshore operations commencing, FBL worked with Bureau Veritas to develop a verification programme for Dunlin topsides removal execution, aligned to HAF performance standards and the requirements of the Dunlin Alpha DSC. A desk-top study of EPRD documentation, including a focused engineering review of the platform in-place analysis (after leg cutting operations had been completed), was performed by Bureau Veritas and all observations were closed out in advance of commencement of offshore execution activities. An extensive one week offshore verification exercise was then conducted by BV during the *Thialf* HLV campaign with no actions identified.

The EPRD offshore execution phase commenced with mobilisation of the *Thialf* HLV to Dunlin on 30th March 2022. Upon safe arrival at Dunlin location on 1st April, *Thialf* commenced a planned programme of module hook-down and reverse installation removal operations, involving the use of up to 160 personnel per shift, for a duration of approximately six weeks. This campaign progressed as planned, encountering approximately six days of weather interruption, with a total of 12 module related lifts successfully completed, all of which were subject to independent Marine Warranty Survey approval.

The *Thialf* HLV then departed the Dunlin location and transited to the Vats yard in Norway, where all Dunlin platform inventory was safely offloaded onto the quayside, completing the scope of work, as designated by HAF. All planned HLV Campaign #1 objectives had been achieved, along with all preparatory works for the planned HLV Campaign #2, ahead of the HAF schedule and within FBL budget.

The second planned HLV campaign commenced on 30th May 2022, when *Sleipnir* HLV mobilised to the Dunlin location for a planned duration of 7-10 days. Upon safe arrival, *Sleipnir* performed a total of five module removals via reverse installation, followed by leg transition separation activities and subsequent removal of the Dunlin MSF from the platform leg transitions. This completed the removal of the Dunlin Alpha topsides. All lifts were successfully performed as per plan and were subject to independent Marine Warranty Survey approval.

Upon safe completion of the circa 12,500 mT lift of the MSF, *Sleipnir* repositioned itself and installed the permanent Navaid onto Dunlin Leg D. *Sleipnir* then departed the Dunlin location with the MSF suspended in the dual cranes of the HLV for the duration of the transit to Vats, Norway. Upon safe arrival at Vats, *Sleipnir* completed the load-in of the Dunlin MSF and the five remaining modules, thereby completing the offshore execution scope of work. All planned HLV Campaign #2 objectives had been achieved, ahead of the HAF schedule and within FBL budget.



Onshore recycling and disposal of Dunlin inventory commenced in May 2022 and proceeded to schedule thereafter. AFOD safely completed site moves of the platform modules and the MSF, ahead of commencing main structural demolition and processing activities. Project close out of the offshore execution phase of the Dunlin EPRD project continued with HAF and was concluded by August. By year end 2022, AFOD had achieved approximately 75% completion of the demolition activities for the Dunlin topsides.

The 2022 campaign of debris recovery was impacted by vessel availability and resultant schedule slippage. A revised schedule was agreed with Fugro whereby initial scoping works would be undertaken in 2022 by the Remotely Operated Vehicle Support Vessel (ROVSV) *Atlantis Dweller* and the full debris recovery scope would be completed in 2023 by the ROVSV *Edda Jane*. Fugro ultimately mobilised the ROVSV *Edda Jane* in April 2023 and completed all planned debris removal and inspection activities without incident. The survey results from the 2022 campaign were used to plan an efficient execution of the 2023 scope.

In addition to the above activity, FBL liaised with OPRED as the Competent Authority on the requirements for the post-decommissioning as-left survey. This engagement enabled a detailed scope of work to be developed and a contract awarded to DeepOcean for planned execution in late 2023.

Demolition of the former topsides of the installation continued at Vats Environmental Base until April 2023. Despite a significant safety incident on an unrelated project at Vats, the mechanical dismantlement of the Dunlin facilities proceeded well and the recycling rate improved as expected, with significant volumes of steel being shipped to local smelters for recycling.

With demolition works concluded, the focus moved to repatriation of the NORM-contaminated waste and a quantity of ionisation Smoke Detectors. Dialogue with Scottish and Norwegian authorities had confirmed that NORM would be repatriated under the *Waste Shipment Regulations*, whereas the Smoke Detectors would be repatriated under the *Transfrontier Shipment of Radioactive Waste and Spent Fuel Regulations* (TFSRWSF). Fairfield worked with AFOD to build a credible schedule for these various regulatory approvals and subsequent shipments. As a result, the smoke detectors were successfully repatriated in September 2023 under the TFSRWSF following approval by SEPA.

On CGF Removals, Maersk advised Fairfield in February 2023 that it would be unable to perform the scope of work that year due to a damaged crane on its intended execution vessel (CSV Maersk Implementer). Fairfield therefore awarded the scope of work to DeepOcean and the CSV *Edda Freya*. Engineering and procurement activities were completed ahead of mobilisation of the *Edda Freya* in August 2023. Removal of the six remaining conductors and the upper and middle CGFs commenced in July 2023 and proceeded to plan. Work was completed in September, followed by in-load of the removed steelwork to Dales Voe in Shetland.

Following completion of all planned scopes of work in the field, DeepOcean's Offshore Support Vessel Deep Vision was mobilised to perform post-decommissioning as-left survey and sampling. The surveys were completed in September 2023 and will be used in support of the (separate) Dunlin Alpha Substructure Decommissioning Programme and its eventual Close Out Report.

The analysis and quantification of the NORM-contaminated waste at Vats was completed in September 2023 but its intended repatriation from Norway to the United Kingdom was then prohibited by a reinterpretation of post-Brexit rules on waste shipments. The Dunlin project was one of a number of projects effectively stranded at Vats while regulatory authorities determined an appropriate and compliant method for local treatment and disposal in Norway or repatriation to the UK for the same purpose.



Ultimately, it was determined by the Norwegian *Direktoratet for Strolevern og Atomsikkerhet* (DSA) and the NEA that NORM waste could be managed locally in Norway at the Wergeland-Halsvik underground repository. Due to the need to extend this repository, the physical disposal of the Dunlin wastes is forecast to be completed around year end 2025 and the project undertakes to formally notify OPRED when this activity has been concluded.

2.3 Well Abandonment Activities

All 45 platform wells have been decommissioned and are currently designated as '*Phase 2 Abandoned (Awaiting Derogation Decision)*' as listed in Table 2-2. A total of 39 wells were decommissioned from the topsides by either the platform rig or by a pulling unit. Due to historic integrity issues on the well conductors, a variety of clamps and connectors had been installed over the installation's life. Six of the wells had clamps or connectors installed below the uppermost CGF which prevented them from being pulled through that CGF and decommissioned from the topsides. These six well conductors (and internal strings) were therefore removed by a subsea intervention following topsides removal.

Table 2-2: Platform Well Information				
Common Name	Well Name	Designation	Status ¹	Category
DA-01	211/23-A48	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-02	N/A	N/A	Caisson removed	N/A
DA-03	211/23-A19	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-04	211/23-A18	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-05	211/23-A8	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-06S2	211/23-A17	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-07S3	211/23-A7	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-08	211/23-A34	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-09	N/A	N/A	Caisson removed	N/A
DA-10	211/23-A24	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-11S1	211/23-A5	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-12	211/23-A30	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-13S1	211/23-A56	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-14S2	211/23-A49Z	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-15S2	211/23-A61	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-16S1	211/23-A9	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-17	211/23-A6	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-18	211/23-A10	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-19	211/23-A43	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-20S1	211/23-A63	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0

¹ Although all wells are considered to be in their likely final state, the regulatory designation of the wells is '*Phase 2 Abandoned (Awaiting Derogation Decision)*'. This designation will not change to '*Phase 3 Abandoned*' until approval of the Substructure Decommissioning Programme.



Table 2-2: Platform Well Information

Common Name	Well Name	Designation	Status ¹	Category
DA-21	211/23-A44	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-22	211/23-A1	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-23S1	211/23-A54	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-24S1	211/23-A58	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-25S4	211/23-A62	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-26S6	211/23-A52Y	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-27S1	211/23-A46	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-28	211/23-A23	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-29	211/23-A26	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-30S6	211/23-A57W	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-31	211/23-A38	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-32S2	211/23-A42	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-33S1	211/23-A59	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-34S1	211/23-A53	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-35	211/23-A41	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-36S2	211/23-A55	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-37S1	211/23-A50	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-38	211/23-A27	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-39	211/23-A39	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-40S1	211/23-A37	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-41	N/A	N/A	Caisson removed	N/A
DA-42S2	211/23-A47Z	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-43S3	211/23-A65	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-44S4	211/23-A20Z	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-45S3	211/23-A28Z	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-46S1	211/23-A60	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-47S2	211/23-A64Z	Oil Producer	Phase 2 Abandoned (ADD)	PL-0-0-0
DA-48S1	211/23-A2	Water Injector	Phase 2 Abandoned (ADD)	PL-0-0-0
Subsea Wells				
N/A		N/A	N/A	N/A



2.4 Subsea Installations

Not applicable. Please refer to the relevant Decommissioning Programmes and associated Close Out Reports for the Osprey and Merlin subsea installations and pipelines.

2.5 Pipelines / Umbilicals & Jumpers

Not applicable. Please refer to the relevant Decommissioning Programmes and associated Close Out Reports for the Osprey, Merlin, Dunlin Fuel Gas, Dunlin Power Import and PL5 infrastructure.

2.6 Pipeline Stabilisation features

Not applicable. Please refer to the relevant Decommissioning Programmes and associated Close Out Reports for the Osprey, Merlin, Dunlin Fuel Gas, Dunlin Power Import and PL5 infrastructure.

2.7 Drill Cuttings

Not applicable. Please refer to the Dunlin Alpha Substructure Decommissioning Programme.

2.8 Debris Clearance & Post Decommissioning Surveys

As described in Sections 2.2 and 2.9, debris clearance activities were successfully completed by Fugro in 2022 and 2023, followed by post-decommissioning survey and sampling activities by DeepOcean in September 2023. Verification of these scopes is included in Section 8. The post-decommissioning environmental surveys will be used in support of the Dunlin Alpha Substructure Decommissioning Programme, its eventual Close Out Report and any future monitoring or management activities.

2.9 Key Milestones

Table 2-3: Key Milestones	
Milestone	Date
Cessation of Production	Jun 2015
Topsides Removal Contract Award	Dec 2018
Decommissioning Programme Approval	May 2019
Phase 2 Well Decommissioning Complete (Hydrocarbon Free)	Apr 2021
Platform Cold Stack (Disembarkation)	Oct 2021
Dismantling Safety Case Approval	Nov 2021
Topsides Removal (MSF Lift)	Jun 2022
Completion of Debris Recovery	Apr 2023
Conductor & CGF Recovery	Aug 2023
As Left Survey and Sampling	Sep 2023
Continuing Safety Case Approval	Feb 2024
Completion of Waste Accounting	Apr 2024
Regulatory Close Out Report	Sep 2024



2.10 Stakeholder Engagement

At the time of publication of this report there has been no additional stakeholder correspondence since that received in response to statutory and public consultation on the Topsides Removal programme. The Fairfield website has been updated to reflect the completion of the Topsides Removal scope.



3 Impact on the Environment

3.1 Environmental Incidents

Table 3-1 lists all environmental incidents that occurred following the approval of the Dunlin Alpha Topsides Decommissioning Programme in May 2019. All incidents were duly reported, investigated and closed out. There were no significant impacts to the environment.

Table 3-1: Environmental Incidents		
Date	Report	Description
22 Aug 19	PON1	Minor (< 18 kg) release of rapeseed oil from DA28 'D' annulus (between 20" 30")
27 Oct 19	PON1	Fitting failed on an underwater saw resulting in 93kg of non-toxic hydraulic fluid lost to sea. Fluid is not classified as dangerous to the environment
17 Dec 19	PON1	Leaking fitting on 2" blowdown line from DA30 wireline lubricator
22 Jan 20	Environmental Non Compliance	Container manifested as scrap metal was found to contain NORM pipework This was reportable to SEPA
27 Mar 20	PON1	Minor (< 1 kg) of diesel from hose manifold during bunkering operations
27 Jun 20	PON1	Minor (< 4 kg) release of oil based mud while cutting 20" casing on DA19
01 Jul 20	PON1	Minor (< 2 kg) release of water based mud to sea during transfer to vessel
16 Sep 20	PON1	Minor (< 5 kg) release of diesel to sea from air compressor diesel return line
26 Feb 21	PON1	Minor (< 2 kg) release of drilling slops (oil & barite) during transfer to vessel
27 Mar 21	PON1	Minor (< 21 kg) release of diesel during bunkering operations
13 May 21	PON2	One scaffold board lost to sea when it fell through a small gap in walkway
01 Jul 21	PON1	Displaced base oil fluid from DA10 lost to sea via overflow of gauge tank
05 Jan 22	PON10	Navaid failure due to Insufficient daylight to charge the AtoN batteries
31 Jan 23	PON10	Navaid failure due to Insufficient daylight to charge the AtoN batteries
30 Jul 23	PON 1	Minor (< 1 kg) release of hydraulic oil during ROV activities due to O-ring failure
19 Aug 23	PON 1	Minor (< 12 kg) release of hydraulic oil during ROV activities due to failed hose

3.2 Future Monitoring & Management Planning

As-left surveys have been undertaken following completion of the topsides removal scopes described herein. These surveys will be used in support of the (separate) Dunlin Alpha Substructure Decommissioning Programme and its eventual Close Out Report, at which time a programme of ongoing monitoring will be agreed with the Competent Authority. It is anticipated that this monitoring regime would apply to the substructure (if derogation granted) and the local marine environment. It will not apply to the infrastructure removed under this Topsides Decommissioning Programme.



4 Impact on Health & Safety

4.1 Safety Case Updates

The various Safety Case submissions pertinent to the execution of the Dunlin Alpha Topsides Decommissioning Programme are summarised in Table 4-1 below. There were no inspections from either HSE or OPRED during the execution of the decommissioning scope.

Table 4-1: Safety Case Updates				
Issue No.	Rev	Description	Date	Detail
DUN-HSE-SCA-001	A6	Resubmission for Continuing Safety Case	Nov 2023	Update to satisfy regulatory requirements for the surviving structure following completion of dismantling operations
DUN-HSE-SCA-001	A5	Resubmission for Continuing Safety Case	Mar 2023	Draft shared with HSE for purposes of gaining alignment on Major Accident Hazards of the surviving structure
DUN-HSE-SCA-001	A4	Resubmission for Dismantling SCR15 r.20	Nov 2021	Updated to cover dismantling operations including removal of topsides (2022) and conductor tails and guide frames (2023)
DUN-HSE-SCA-001	A3	Material Change resubmission SCR15 r.24(2)	Nov 2020	Updated to include material changes such as completion of wells P&A, leg flooding to Mean Sea Level and platform cold stack
DUN-HSE-SCA-001	A2	Material Change resubmission SCR15 r.24(2)	Jul 2019	Updated to include material and other changes associated with cessation of the Dunlin to Cormorant pipeline service
DUN-HSE-SCA-001	A1	Material Change resubmission SCR15 r.24(2)	Jan 2019	Updated to include material and other changes including deluge coverage reduction

Following completion of all planned offshore decommissioning scopes in 2023, a Material Change revision to the Safety Case was submitted in November 2023 to describe the remaining structure and any associated major accident hazards. This Safety Case was subsequently approved in Feb 2024.

4.2 Safety Incidents

It should be noted that during HLV Campaign #1, approximately 220,000 man-hours were worked with only three first aid cases and four near misses recorded. No major incidents were reported. During HLV Campaign #2, approximately 27,500 man-hours were worked, with no incidents reported. No high potential incidents, dropped objects or lifting operations related incidents were recorded during either campaign.

Table 4-2 lists all safety incidents that have occurred following the approval of the Dunlin Alpha Topsides Decommissioning Programme in May 2019. All incidents were duly reported, investigated and closed out.



Table 4-2: Safety Incidents

Date	Report	Description
02 Sep 19	Dangerous Occurrence	Platform pedestal crane lost control of a food container during back-load to a supply vessel, resulting in an uncontrolled landing on the vessel deck
23 Oct 19	Restricted Work Case	Injured Party sustained broken metacarpal (ring finger) on his left hand whilst torquing a hold down bolt on an alternator.
01 Jul 20	ROGI – Lost Time Injury	Injured Party sustained soft tissue damage to his left arm whilst torquing the plate bolts of the 'Quik-Deck' underdeck access platform
10 Dec 20	ROGI - Equipment Failure	Oil release from compressor causing General Platform Alarm (GPA). No release to sea.
10 Jul 21	ROGI - Near Miss	Platform crane snagged a 30ft tool basket on a section of handrail which lifted from its sockets and fell from the skid deck to the deck below.



5 Waste Management

Fairfield held early engagement with SEPA who provided positive feedback on the project waste management strategy [FBL-DUN-HSE-STR-00003]. This was a key document for informing the production of an Active Waste Management Strategy to ensure compliance with the Waste Framework Directive.

Waste was generated through three distinct phases: Platform Make Safe and Handover and Well Abandonment; Topsides Removal; and subsea-based Conductor and CGF Removal scopes. The quantity of waste from these project scopes is detailed in Table 5-1 below.

Table 5-1: Waste Volumes (Tonnes)				
Infrastructure	MS&H and P&A	Topsides Removal	Conductor Recovery	Project Total
Metals (Steels, Aluminium, etc)	1,898	16,687	863	19,488
Non-Metals (Wood, Sweepings, etc)	0	446	176	622
WEEE (Copper, Electrical Fittings, etc)	0	636	0	636
Hazardous Waste (Oily Water, Diesel, NORM)	9	1,156	0	1,165
Other (Components Sold for Reuse)	0	135	0	135
Total (t)	1,908	19,060	1,039	22,007

All waste streams from Platform Make Safe & Handover and Well Abandonment were discharged at Peterhead for processing. Topsides Removal waste streams were all processed through Vats Environmental Base in Norway, with a small number of Smoke Detectors repatriated via Aberdeen for appropriate treatment and disposal. Subsea-based Conductor and CGF waste streams were discharged at Dales Voe in Shetland. All wastes were tracked through to common waste streams and audited as appropriate.

As described in Section 2.2, Norwegian authorities have agreed to the disposal of Dunlin's NORM-contaminated waste into the Wergeland-Halsvik underground repository. Upon final disposal of the NORM, a total of 1,027 tonnes of waste will have been disposed to landfill, representing 4.7% of the total recovered weight. The project therefore ended with a reuse/recycle rate in excess of 95%.



6 Lessons Learned

6.1 EPRD Contractor Access to Installation

Platform Personnel on Board (PoB) facilities (*i.e.* beds) were made available to the EPRD contractor, HAF, from contract award. This allowed good integration between HAF engineering and operations teams and the Fairfield offshore team. Additionally, this allowed the majority of the HAF engineering team to gain familiarisation with the facility, translating into well-informed, detailed engineering deliverables.

6.2 Strong Operator / EPRD Interfaces

Through various team building activities between Fairfield and the HAF project team and agreement during contract negotiations to hold monthly project meetings revolving between the FBL, HMC and AFOD offices, a strong working relationship was formed. As part of the detailed engineering programme, HAF held engineering workshops to review and improve offshore workpacks. Although such workshops had previously been internal HAF activities, Fairfield representatives were invited to these sessions, ensuring platform knowledge added value to EPRD contractor engineering deliverables.

6.3 Technical Verification

As part of the EPRD contracting strategy developed by Fairfield, the contract required that HAF perform a full verification of the technical information, supplied as part of the contract package, and produce a verification report outlining any and all additional work not identified within the technical information. As part of the overall offshore survey campaign, HAF checked and verified all areas and items that they had deemed critical to their proposed removal methodology. A contractual deadline enabled these checks to be performed and the technical information to be scrutinised at a relatively early stage in the engineering progress. This allowed HAF to produce engineering deliverables and plans in fine detail, minimising the need for rework or late execution schedule changes, whilst also aiming to mitigate the potential risk of variation claims against Fairfield.

6.4 Clear Roles & Responsibilities

As part of the jointly agreed Dunlin module handover procedure, key roles and responsibilities were identified for all parties and it was agreed that only a single member of each of HMC and AFOD (with authorised responsibility) were required to be present during the module handover process. This allowed for a more focused handover process and enabled a significant reduction to the pre-agreed offshore PoB required to perform these tasks which, in turn, allowed for increased offshore productivity by Fairfield in other areas of the overall project.

6.5 Ceramic Fibres in PFP

As part of the verification of technical information process, HAF investigated a number of locations containing Passive Fire Protection (PFP). It was found that the PFP at four of these locations contained Refractory Ceramic Fibres (RCF). These fibres are generally well bonded to PFP material so pose very low risk of exposure to personnel whilst *in situ* offshore. However, the removal contractor would be required to remove portions of this PFP at areas local to any offshore cutting (necessary for removal of platform modules) which would cause the RCF to become more friable. A number of additional work controls, similar to those for asbestos removal, were required to be put in place in order to facilitate the safe removal of PFP at such locations. Similar additional controls were also required at the disposal site. This had an impact on the agreed project cost. It is recommended for future projects that all PFP is tested not only for asbestos, but also for RCF, to ensure that the full hazardous material inventory is identified in advance of the competitive tender process.



6.6 Completion of Key Engineering Deliverables

As part of Fairfield's decision process to nominate the removal year, it was discussed and agreed with the EPRD contractor early in the project that a number of specific key engineering deliverables would be completed prior to the nomination date. However, in the months prior to the nomination date the EPRD contractor advised Fairfield that a small number of these deliverables would not be completed on time. Fairfield and HAF worked together to gain the necessary confidence and assurance that there were no underlying technical issues causing such delays. It is recommended that any key engineering deliverables that are deemed critical for major contractual decisions are identified upfront and incorporated into the contract to ensure requirements are in place for the contractor to provide such deliverables for specific dates / project milestones.

6.7 Shaped Explosive Charges

While some upside potential on schedule/cost had been identified in the use of Shaped Charge Explosives for severing the CGFs, the onshore trials demonstrated significant technical difficulties. It was determined that these could not be overcome with sufficient confidence that the method could be relied upon in the field for this particular application.

6.8 Destination of NORM-Contaminated Waste

The original project assumption was that NORM-contaminated waste from the topsides modules would be managed in Norway. The project was later informed that this waste stream would need to be repatriated to the UK and this had been the project assumption since before topsides removal in 1H'22. In 3Q'23, the project was informed that the imminent repatriation to the UK was prohibited due to a reinterpretation of post-Brexit rules on waste shipments. The Dunlin project became one of a number of projects effectively stranded in Norway while regulatory authorities determined an appropriate and compliant method for local treatment and disposal in Norway or repatriation to the UK for the same purpose. While this issue has now been resolved for Dunlin's waste, other projects are advised that overseas treatment and disposal of NORM-contaminated wastes may represent the critical path on project close out.

6.9 Battery Capacity of Navaid

The solar-powered, self-contained offshore lighthouse, installed as an Aid to Navigation (AtoN) on one of the legs of the remaining substructure, failed in January 2022 and January 2023. Both failures rectified themselves some weeks later, suggesting that the unit simply had insufficient battery charge to support its full functionality. While it is not possible to be certain of the cause until the unit has been returned ashore and examined, Fairfield is confident that additional battery capacity will remove this failure mode. The stand-by unit has had additional batteries installed and will be changed out in due course as part of the Substructure Decommissioning Programme.



7 Cost Summary

Details have been provided to OPRED in confidence.



8 Verifications



FUGRO
Fugro GB (North Marine) Limited
Fugro House
Denmore Road
Aberdeen AB23 8JW
United Kingdom

20 June 2023
For the attention of James Clarkson

Dear Sir,

Utilising ROV mounted side scan sonar, multibeam sonar and visual inspection techniques, Fugro GB North Marine Limited have completed the post decommissioning survey and debris clearance of the Dunlin Alpha Drop Zone and Cell Tops within the 500mZ. Works were undertaken as defined in the Fairfield Betula scope of work (DUN-SSP-33-SOW-0001) and associated variations.

Fugro GB North Marine can confirm that based on the activities undertaken, the area has been cleared of recoverable oilfield related debris.

Yours faithfully,

Robert Robb
Project Manager



DEEPOCEAN

James Clarkson
Fairfield Energy
Westpoint House
Prospect Road
Westhill
AB32 6FJ
27th November 2023

Dear James,

During the 2023 Survey and sampling campaign DeepOcean Subsea Services UK Ltd performed acoustic surveys of an area 1km by 1km centered on the Dunlin Alpha Platform.

These works were set out by the 2023 Survey & Sampling Campaign – Scope of Work (DUN-SSP-01-SOW-001 Rev A2).

This survey was performed using MBES and SSS sensors mounted on a Remotely Operated Vehicle (ROV). The results of these surveys were used to provide information to complete a post decommissioning environmental field report.

DeepOcean Subsea Services Ltd can confirm and is satisfied that the surveys and environmental campaign were completed to the specifications as stated in the client's scope of work document.

Yours sincerely

Lee Robertson
Project Manager

DeepOcean Subsea Services Ltd
Kingshill View
Kingswells Causeway
Prime Four Business Park
Kingswells
Aberdeen
AB15 8PU

www.deepoceangroup.com



9 Photographs

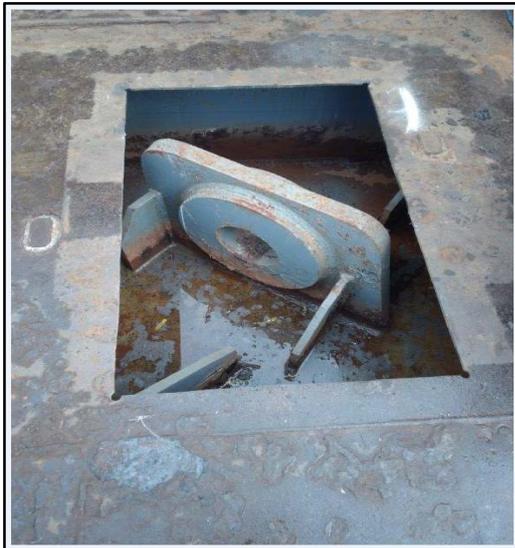
2020



(a) Preparations for Module Separation



(b) Investigation of PFP Ceramic Fibres



(c) Installation of Module Lift Points



(d) Deck Reinstated over Lift Points



2021



(a) Leg Caps in situ below MSF Cut Point



(b) Well Bay Cleared for Cold Stack



(c) Air Gap Cleared of Conductors



(d) Dunlin Alpha at Cold Stack



2022



(a) East Helideck Removal (by *Thialf*)



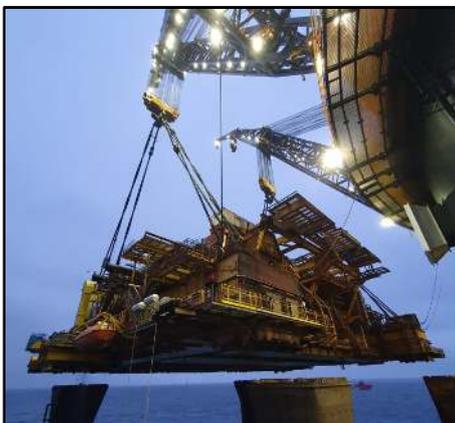
(b) RALQ Removal (by *Thialf*)



(c) MSF Lift Point Installed at Leg A



(d) RALQ Inload (by *Thialf* at Vats)



(e) MSF Lift (by *Sleipnir*)



(f) Navaid Installed on Leg D



2022



(g) *Sleipnir* in Transit with MSF on Hooks



(h) MSF Inload (by *Sleipnir* at Vats)



(i) Waste Processing of PLQ Module



(j) Drilling Package Destruct Commenced



(k) MSF Destruct in Progress



(l) MSF Part Remains (Nov'22)



2023



(a) Destruct of Drilling Module



(b) Waste Processing Building



(c) Drilling Derrick Topped



(d) Last Remaining Steel (Apr'23)



(e) Before: Aerial View of Vats (Jul'22)



(f) After: Aerial View of Vats (May'23)



2023



(g) ROVSV *Atlantis Dweller* on Location



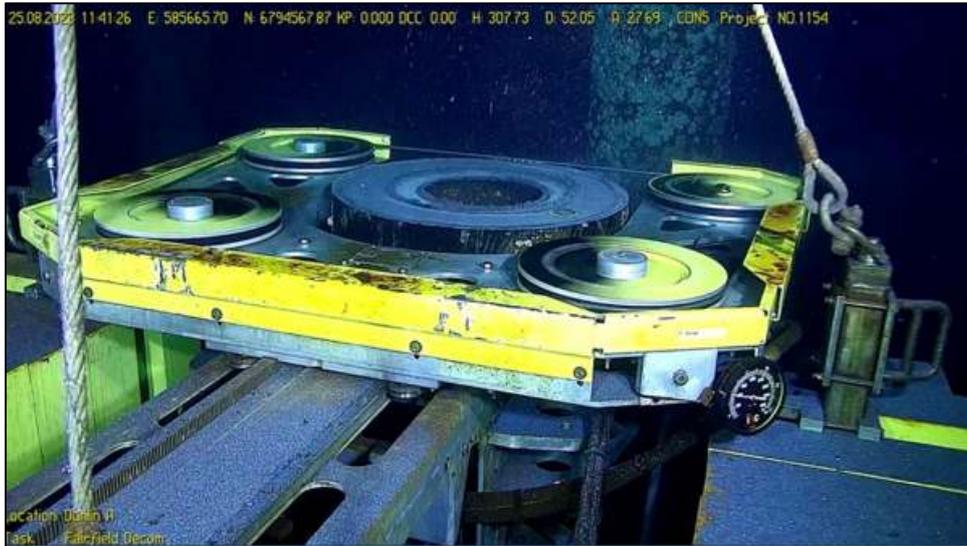
(h) ROVSV *Edda Jane*



(i) CSV *Edda Freya*



2023



(j) Diamond Wire Cut of DA48 Conductor (Aug'23)



(k) Upper CGF at Dales Voe Yard (Aug'23)



2023



(l) OSV Deep Vision



(m) NORM Waste at Vats, Norway