



# Process and Flow Technologies

Wellstream Processing





**1978**

Fjords Processing is founded (Group within Kvaerner at the time)



**1979**

Merpro is founded



**1989**

First sale of TEG gas dehydration



**1990**

Kvaerner acquires Paladon



**1991**

Tore™ technology is developed



**1993**

Tore™ sand handling technology is patented



**1994**

Petrex is founded



**1997**

First sale of MEG reclamation system to Asgard



**2000**

First sale of Sulfate Removal Unit



**2002**

First Petro-Pile™ sold



**2011**

NOV acquires Merpro



**2012**

NOV acquires Petrex



**2014**

Demerger of Aker Process Systems from Aker Solutions - renamed Fjords Processing, part of Akastor



**2015**

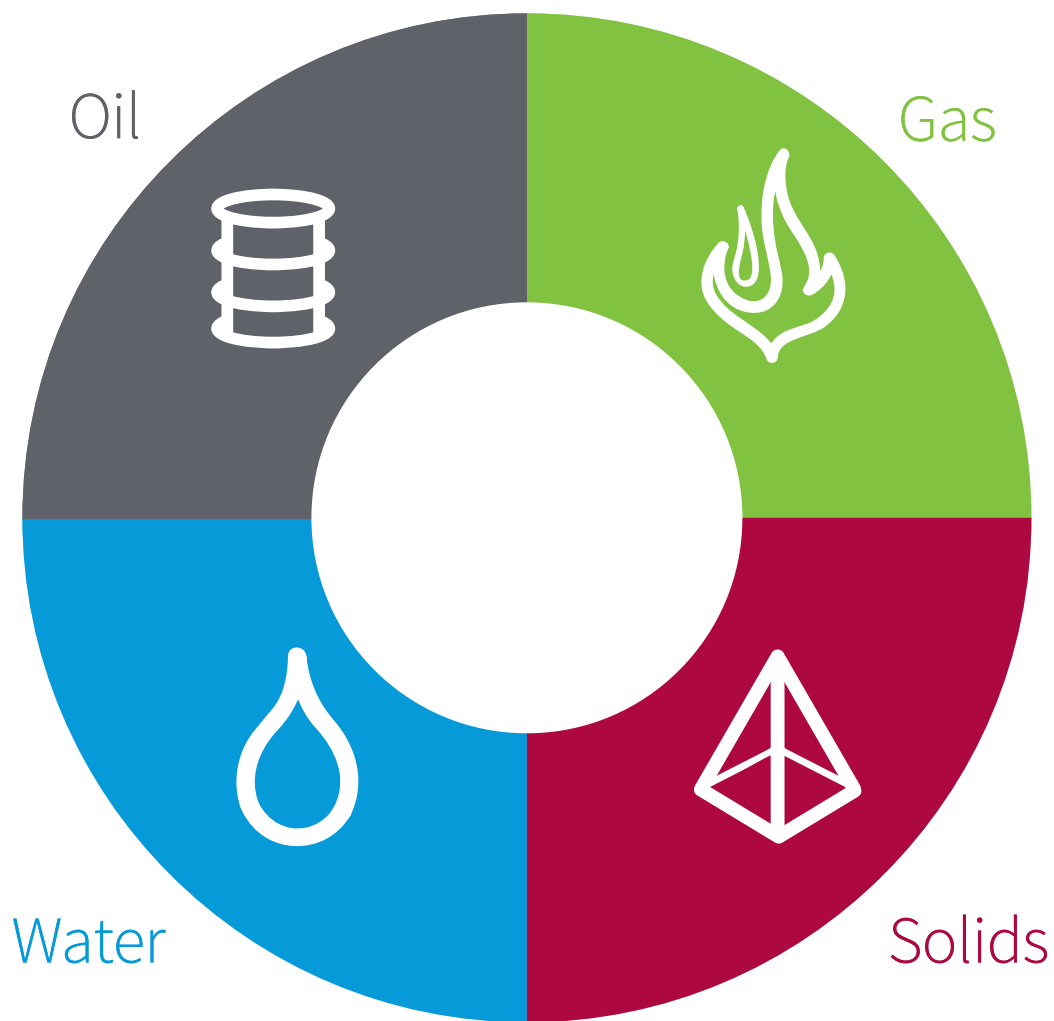
ProFab fabrication yard in Indonesia is acquired by NOV



**2016**

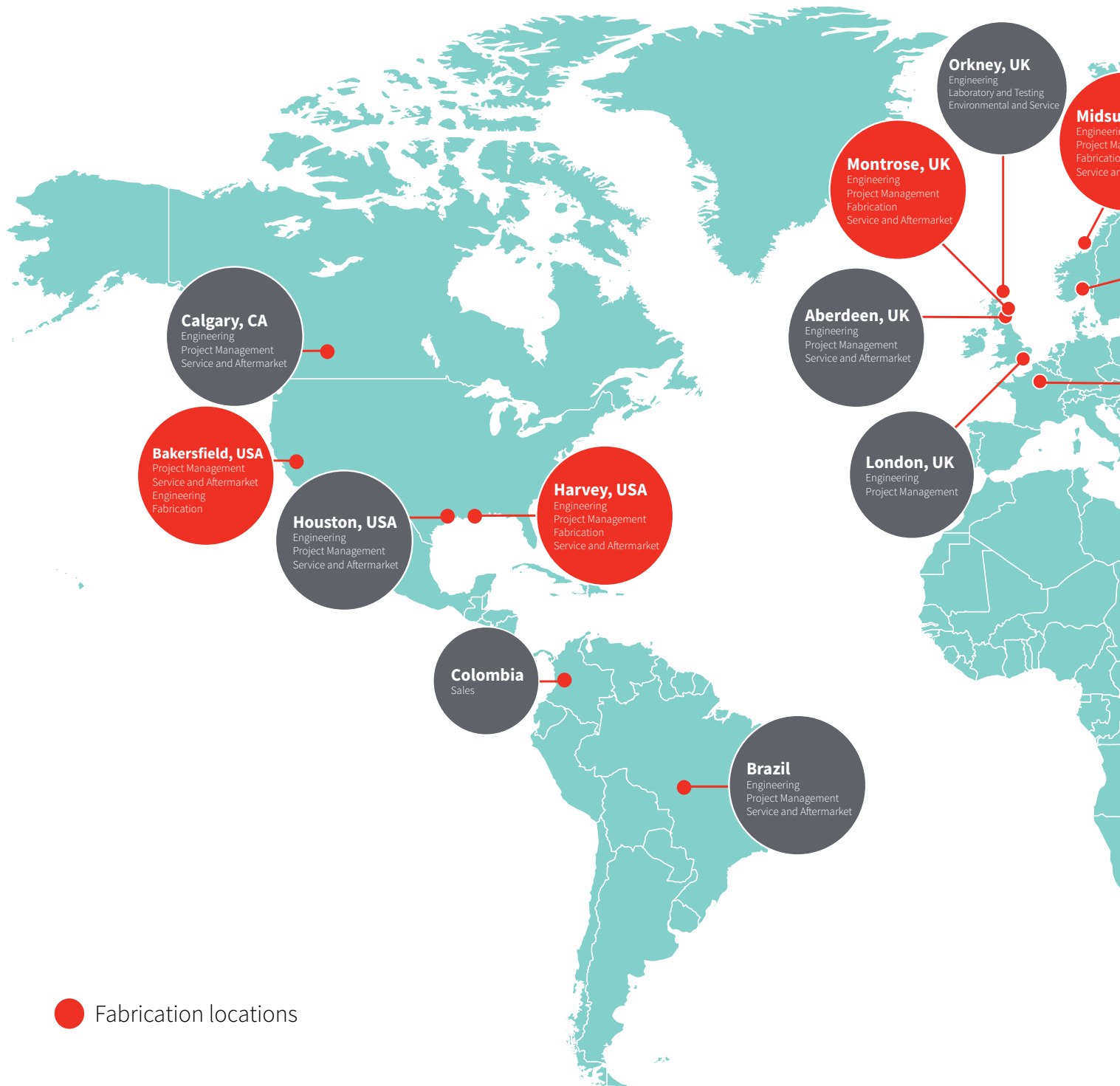
NOV acquires Fjords Processing

We provide separation, dehydration, and desalting solutions for crude **oil**, hydrate inhibition, dehydration and sweetening for **gas**, complete seawater and produced **water** treatment solutions, and **sand** management technologies.



# Engineering and Fabrication Centers

With over 20 facility locations strategically spread across the globe, we're able to serve our customers in any location. From the Gulf of Mexico to the North Sea to Indonesia, we have fabrication facilities with large waterfront locations for easy loadout. Our teams of experienced engineers, project managers, fabricators and service specialists design, fabricate, deliver and service high quality engineered-to-order solutions from a single supplier the first time, on time, every time.







## Engineering

With decades of technology development and process equipment design experience, our teams of engineers have the experience to design and manage your project. We provide concept designs and plans, front-end engineering design (FEED), and continued involvement throughout the fabrication and manufacturing process. Our engineers work together with our project managers to help facilitate design and construction through to commissioning, installation and operation. Having all of these services under one roof helps save customers time and money. Software licenses include programs such as Compress, Caesar II, Autocad Plant 3D and P&ID, Inventor, MySep and Unisim.

## Front-End Engineering Design

We work with your teams to develop robust front-end engineering designs with optimum solutions for your projects. We understand that preliminary engineering decisions impact the manufacturing and ongoing operations, and we are able to meet even the most demanding requirements. The FEEDs we undertake focus on individual technology-based solutions to complete integrated process systems. As we are able to manufacture a large number of components in-house (valves, chokes, piping, internals, etc.), we are able to accurately estimate the cost during preliminary stages. We deliver process solution engineering studies with an integrated approach for lasting production success.

## Process Optimization Studies

Aging equipment can become inefficient, and you may encounter problems like a buildup of solids or inlet condition variations. Our team of engineers can help. With a comprehensive knowledge and understanding of equipment design and operation, we know how to maximize the productivity of your equipment. We can evaluate the current condition and recommend improvements to provide a profitable return on investment. We also can offer rental equipment for temporary trials or as an alternative finance arrangement.

Contact our engineering team today at [processingsolutions@nov.com](mailto:processingsolutions@nov.com).







**NOV** Completion & Production Solutions  
nov.com

**NOV**

WELD HEAT TREATMENT NOT FLAME CUT OR WELDING MBD-1000  
EXTERNALLY COATED ON THIS VESSEL

ZZZ-1000







We have a deep understanding of fluids behavior and an extensive portfolio of processing technologies such as advanced and conventional MEG regeneration and turnkey seawater treatment technologies including filtration, SRUs and coarse strainers.

### **Monoethylene Glycol (MEG) Regeneration**

With our advanced full stream and slip stream designs, matched with our unrivalled experience in the design, operation and manufacturing of MEG regeneration systems worldwide, NOV can provide the optimum solution to your hydrate inhibition needs.

Our system designs are particularly robust, including careful chemistry control, efficient salt and corrosion products removal and low MEG losses. In addition, we ensure clean removal of production chemicals, water and hydrocarbons for efficient re-use of the MEG. This enables us to provide you with the most efficient solution whilst achieving your requirements for reduced footprint, weight, utilities and operating cost.

### **Seawater Treatment**

When it comes to increasing and accelerating your production, Seawater Injection is the primary solution. With our seawater treatment capabilities ranging from our innovative Seabox™ subsea treatment and injection system, to complete topsides Sulphate Removal Systems (SRU), we can help you unlock potential. Utilizing our experience and technology in filtration, compact deaeration and sulphate removal with our own range of fiberglass components, high efficiency mixing devices, pumps, valve products and our own manufacturing facilities, we can provide you with a solution that is highly advanced and cost effective, on time and on budget.





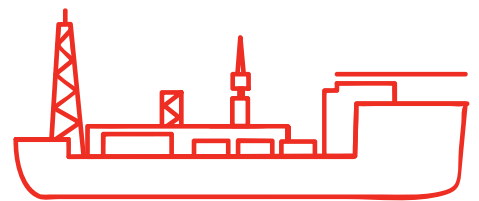


## Fabrication

To service our customers in the areas where offshore production is most prevalent, we have conveniently located waterfront fabrication facilities at the following locations:

- Harvey, Louisiana
- Montrose, Scotland
- Batam, Indonesia
- Midsund, Norway

With a combined total facility area of over 250,000m<sup>2</sup>, our locations boast an impressive array of manufacturing capabilities. Using a wide variety of machinery, we are able to accomplish the majority of the manufacturing steps in-house, which helps to reduce project schedules and ensure quality.



38 years  
3,000 Projects Completed



## Montrose, Scotland



- **Total Area:** 32,400 m<sup>2</sup>
- **Facility Size:** 3,100 m<sup>2</sup>
- **Loadout Capacity:** 250 tons
- **Certifications Held:** ISO 9001: 2008, ISO 3834-2: 2005, PED 97/23/EC, ATEX 94/9/EC, EN 1090, premium thread licenses for Vallourec, Tenaris, Nippon and JFE Bear
- **Processes:** Plate cutting, welding, NDT and inspection, PWHT, assembly, performance testing, loadout support, pressure testing, procurement, hydrostatic testing, fitting, packing

## Harvey, Louisiana



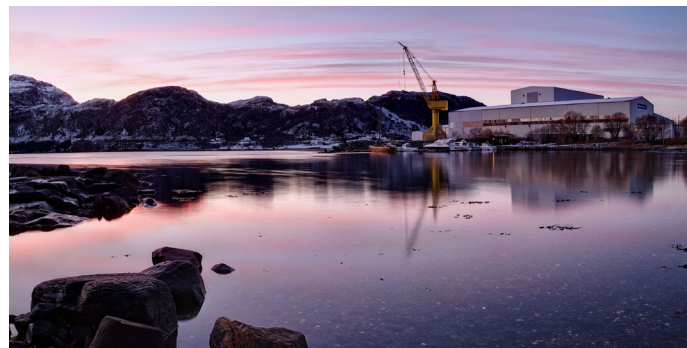
- **Total Area:** 53,000 m<sup>2</sup>
- **Facility Size:** 2,300 m<sup>2</sup>
- **Waterfront Size:** 442 m
- **Loadout Capacity:** 1,500 tons
- **Certifications Held:** ASME Section VIII Division 1 Stamp-U, Division 2 Stamp-U2 and Repair Stamp-R, CRN Registration
- **Processes:** Cutting, welding, NDT, PWHT, performance testing, loadout support, procurement, hydrostatic testing, fitting, packing

## Batam, Indonesia



- **Total Area:** 140,000 m<sup>2</sup>
- **Facility Size:** 27,500 m<sup>2</sup>
- **Waterfront Size:** 350 m
- **Loadout Capacity:** 4,000 tons
- **Certifications Held:** ISO 9001:2008, ASME-U, S, DR, U2, PP, OF, API 2B, SMK3
- **Processes:** Rolling, cutting, assembly, welding, cladding and weld overlay, PWHT, painting and coating (including TSA), loadout support, procurement, hydrostatic testing, fitting, packing and sea fastening

## Midsund, Norway



- **Total Area:** 25,000 m<sup>2</sup>
- **Facility Size:** 8,000 m<sup>2</sup>
- **Waterfront Size:** 100 m
- **Loadout Capacity:** 250 tons
- **Certifications Held:** ASME Section VIII Division 1 & 2, ASME U-Stamp, ISO 9001:2008/NS-EN ISO 3834-2:2006, PED-H1-241 of dir. 97/23/EC Module H1, PD5500, EN13445, NDT Body Level II and III (NTO), NORSOK Requirements, FPAL, Sellihca Achilles
- **Processes:** Rolling, bending, welding, cutting, surface treatment, heating furnace, NDE (Level 3), Surface treatment (FROSIO) Level 3

## Wellstream Processing

---

# Wellstream Processing

With a wealth of experience in process module and package development, and 3,000 projects completed, our team of experts is well equipped to design and fabricate both traditional and custom topside solutions.

## Pressure and Flow Control Systems

---



- Production headers/manifolds
- Production chokes
- Compact front-end solids removal

## Pressure Vessels

---



- 2-, 3- & 4-phase separation vessels
- Absorption and stripping towers
- High-efficiency internals for separation and mass transfer
- High pressure
- Exotic materials

## Gas Treatment

---



- MEG regeneration
- Gas dehydration and desiccant regeneration
- Sweetening and amine regeneration
- Gas conditioning
- High-efficiency compact scrubbers
- Hydrocarbon Dew Point and Combined
- Hydrocarbon/Water Dew Point
- Vapour Recovery

## Crude Oil Treatment

---



- Heater treaters
- Electrostatic coalescers
- Desalting
- Stabilization
- Separators with high-efficiency vessel internals



# Wellstream Processing

---

## Produced Water Treatment

---



- Deoiling hydrocyclones
- Desanding hydrocyclones
- Flotation Technologies (traditional and compact, hydraulic, mechanical or, vertical-induced)
- Media filtration
- Cartridge filtration
- Gravity Separators and Skimmers

## Solids Handling

---



- Separator desanding
- Produced water treatment (PWT) desanding
- Sand cleaning
- Bulk desanding

## Seawater Treatment

---



- Self-cleaning coarse strainers
- Media filters, cartridge filters, ultrafiltration
- Sulfate Removal Units (SRU)
- Deoxygenation – gas strip/vacuum
- Reverse osmosis desalination
- Low-salinity system (lo-sal)

## Separation

---



- Production and test separators
- Slug catchers
- Free water knock-outs (FWKOs)
- Well cleanup

## Wellstream Processing

---

### Specialty Process Packages



- Petro-Pile™ sump caisson
- Pig launchers and receivers
- Chemical injection
- Flare scrubbers
- Fuel gas treatment
- Process pump skids
- Metering
- High-integrity pressure protection systems (HIPPS)

### Ancillary Offshore Equipment



- Gate valves
- Ball valves
- Boarding valves
- API forgings and block fittings
- Fiberglass piping and structure
- Fiberglass decking
- Progressing cavity pumps
- Reciprocating pumps
- Static mixers
- Heat exchangers

### Wellhead Platforms

---



- Platforms and decks



## Services and Aftermarket

---



We draw on our many years of experience in upstream processing with dedicated, focused teams around the world that provide operational expertise for the service, support and analysis of upstream, midstream and downstream production systems. Our services include:

### **GoConsult: Consulting and Engineering Services**

- Process scheme selection – Brownfield/Greenfield
- Upstream process engineering
- Process simulation
- Equipment sizing
- Environmental services - Ecotoxicology testing and environmental consultancy
- Capacity assessment
- Troubleshooting
- Debottlenecking

### **GoSpares: Spare and Universal Parts**

- Original factory replacements for our NOV products
- Original factory replacements for competitive products
- Universal parts
- Equipment upgrades

### **GoServe: Field Services**

- Failure analysis
- Repair and refurbishment
- Start-up and commissioning
- Troubleshooting routine maintenance/reliability analysis
- Condition monitoring (oil samples, vibration analysis, etc.)

### **GoConnect: Automation and Technology Support**

- Network and communication installations and hookups
- Controller sales and installation
- Automation consultation
- Aftermarket support

### **GoDevelop: Training Services**

- Produced solid handling and cleaning education
- Produced water treatment education
- Courses tailored to client's specific needs

By consistently providing reliable technical solutions, we will help your business grow and provide you with the confidence you are looking for in a strategic partner. Contact our service team today at [pftservice@nov.com](mailto:pftservice@nov.com).



---

National Oilwell Varco has produced this brochure for general information only, and it is not intended for design purposes. Although every effort has been made to maintain the accuracy and reliability of its contents, National Oilwell Varco in no way assumes responsibility or liability for any loss, damage or injury resulting from the use of information and data herein. All applications for the material described are at the user's risk and are the user's responsibility.

**Corporate Headquarters**  
7909 Parkwood Circle Drive  
Houston, Texas 77036  
USA

**PFT Headquarters**  
10353 Richmond Avenue, 10th Floor  
Houston, TX 77042  
USA