Integrating chemical oxygen generators into existing platforms

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Integrating chemical oxygen generators into existing platforms

Over the past few years several nations have integrated MPOG and EO2-30 chemical oxygen generators into their existing platforms. This is either as a direct replacement for outdated technology or to provide supplemental oxygen capability onboard for operational and tactical use.

The Royal Norwegian Navy is the latest nation to deploy MPOGs across their Ula-class fleet. This session will share how the partnership developed between Molecular Products and the Navy and how we are supporting the platform-wide conversion from obsolete aerospace oxygen generators to chemical O2 designed for submarine use.

The session will also discuss chemical oxygen generators as a supplemental oxygen source onboard Class 209 submarines.

Mission critical
Atmosphere management solutions

Highly technical chemical media solutions that maintain breathable and high purity atmospheres in life and mission critical applications

RESPIRATORY PROTECTION
Contaminant removal

SOLID OXYGEN SYSTEMS
Oxygen generation

ATMOSPHERE CONDITIONING
CO_2 absorption

GAS PROCESSING
Purification and catalysis

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Why oxygen generators?

- Oxygen generators are used to supply emergency O_2 solutions for submarines, mine refuge chambers, aircraft, safe havens and to start a reaction
- Deployed when primary system failed, or alternative source needed:
  - Safe, simple and reliable oxygen source
  - More efficient than compressed O_2
  - Long shelf-life
  - No external power required
  - Self-contained
  - No stored pressure
  - Easier to stow

Solid Oxygen	Compressed Air
High O2 storage density	Low storage density
No maintenance	Maintenance every 6-12 months
Not explosive	Explosive if punctured or exposed to fire
No valves/pressure regulators	Valves and regulators can fail
No stored pressure	Bottles can leak
10 year shelf-life	Need regular refilling

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Oxygen generator portfolio

CAN33

OXYGEN (LITERS)
3341

SIZE (MM) H X D X W
295x165

WEIGHT (KG)
12.7

DURATION (MINS)
40-60

MPOG

OXYGEN (LITERS)
2600

SIZE (MM) H X D X W
400x133x133

WEIGHT (KG)
12.2

DURATION (MINS)
60-90

eMPOG

OXYGEN (LITERS)
2600

SIZE (MM) H X D X W
385x128x128

WEIGHT (KG)
12.2

DURATION (MINS)
60-90

EO2-30

OXYGEN (LITERS)
3000

SIZE (MM) H X D X W
420x142x140

WEIGHT (KG)
15

DURATION (MINS)
25-45

ROG

OXYGEN (LITERS)
90

SIZE (MM) H X D X W
284x119x118

WEIGHT (KG)
2.3

DURATION (MINS)
15

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MPOG start

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Royal Norwegian Navy and Molecular Products

The challenge

- Existing 1500L generator being discontinued and replaced with 300L alternative
- Presented storage issues onboard – 240 more generators per compartment
- Requirement for product designed to withstand submarine environment
- Rebuilding the stowing racks on the submarines

1500 litre
138mm x 285mm

300 litre
85mm x 250mm

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Royal Norwegian Navy and Molecular Products
The opportunity / solution

- Proven technology:
  - MPOG widely used onboard submarine fleets
- Designed for application:
  - MilSpec MPOG designed for use onboard submarines, in partnership with Royal Navy
- Reduces storage space:
  - More than halves the required storage space compared to the 300L generator
  - Square vs Round
- Partnership approach:
  - Molecular Products has long history of partnership working with navies and shipyards to integrate O2 generators into new and existing platforms

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Royal Norwegian Navy and Molecular Products
The relationship

- First meeting at SAMAP 2019 in Crete
- Supported Navy with team made up of commercial, technical and quality representatives
- March 22 - Norway ready to start replacement programme onboard their 6 submarines
- Urgent requirement to fit out first submarine in for maintenance – production schedule changed to meet this requirement for them – first delivery June 2022
- June 2022 - Site visit by Norwegian Navy, including crew trainer for our products, to show manufacturing site, answer technical/use questions
- Supported Navy after first delivery – technical questions/test data

Royal Norwegian Navy and Molecular Products
The solution

Right - Aus Navy holder for active MPOG
Left – Norwegian Navy solution for active MPOG
Bottom left – Stowage solution for MPOG units
Bottom Right – Can33 furnace

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Type 209, 212 and 214
Supplemental oxygen

- Increase in demand for backup oxygen for Type 209, 212 and 214 platforms
- Molecular Products' working with these nations to work through safety and change protocols
- End user product training is encouraged to ensure safety and understanding

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Thank you