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# RECENT EXPERIENCES WITH MULTI PURPOSE OXYGEN GENERATORS (MPOGS)

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- Introduction and background.
- The Multi-Purpose Oxygen Generator (MPOG).
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- What next?

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# Introduction and background

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# The Multi-Purpose Oxygen Generator (MPOG)

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- 0.5mm outer stainless steel canister
- Integral carry handle on top
- Tear strip seal to open
- Pressure tested at manufacturer
- Lot number (and 2D bar code) and expiry date indelibly pin marked on external canister
- Operating instructions attached to every can
- 10 year shelf life
- Strict quarantine regime to reject any contaminated or significantly damaged MPOGs.


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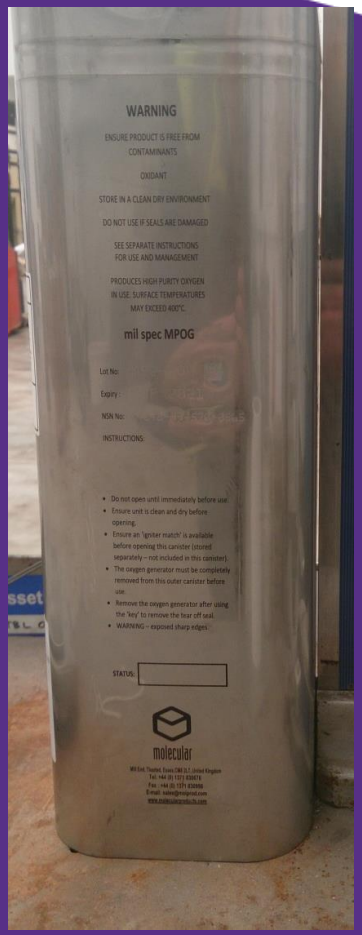
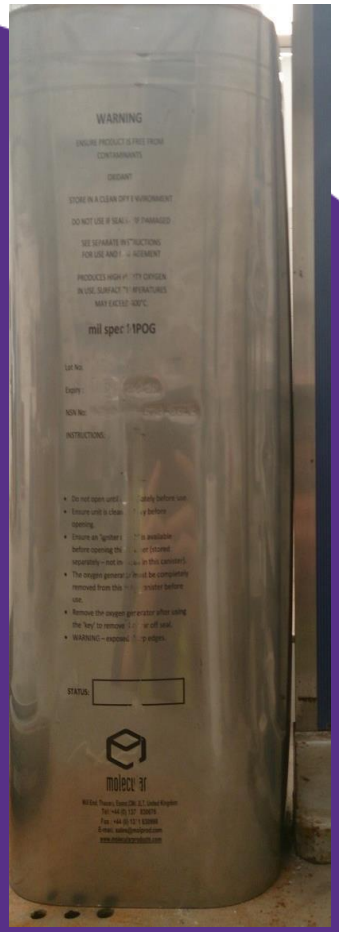
# Recent developments



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# Identifying the root cause


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# Identifying the root cause

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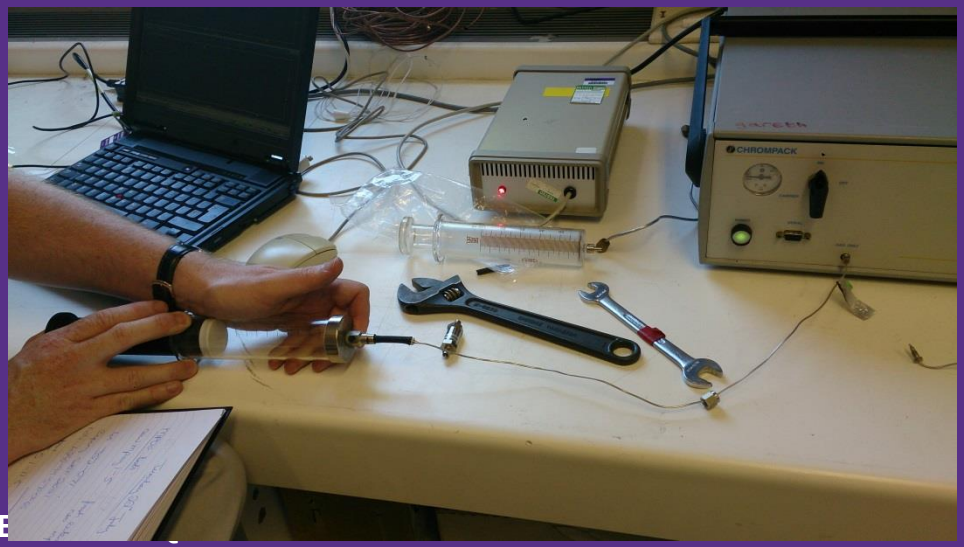
# Identifying the root cause



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# Analysis and observations

- All swollen and non-swollen MPOGs were found to have oxygen rich gas inside the inner can and in the void space between inner and outer can.
- Most, but not all of the swollen examples had been stowed in compartments at elevated temperature.
- Levels inside the inner can ranged from 30-55%v/v Oxygen.
- Levels between inner and outer can ranged from 22-42%v/v Oxygen.
- No other atmosphere gases were detected at elevated levels.
- No organic contamination was detected in any gas samples collected.
- All swollen MPOGs returned to their original shape after being sampled.
- None of the inner cans exhibited any distortion.
- All MOGs sampled were successfully ignited.
- Since April 2014 further examples have been reported and actioned.

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# Guidance for the end user

- A Submarine Operating Instruction has been issued with the following requirements.
  - Locker contents inspection frequency increased for early detection.
  - All findings to be reported to the Equipment Authority.
  - Swollen MPOGs to be prioritised for initiation as/when required.
  - If initiation not possible, swollen MPOGs to be quarantined.
  - Quarantined stores are to be removed from the submarine at the earliest opportunity.

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# What next ?

- Further analysis is required to understand the mechanism of oxygen enrichment.
- NAVSEA have been approached to share findings and to identify options.
- An option to employ NASA (via NAVSEA) is being explored.
- The OEM, having been closely involved throughout, are also looking at options.
- It has been proposed that the slow decomposition of Barium Peroxide may be a candidate for future analysis
- It is very plausible that this slow effect is common to briquette's of similar composition.
- Evidence to date has shown that the capability (for O2 production) remains unaffected by this anomaly.