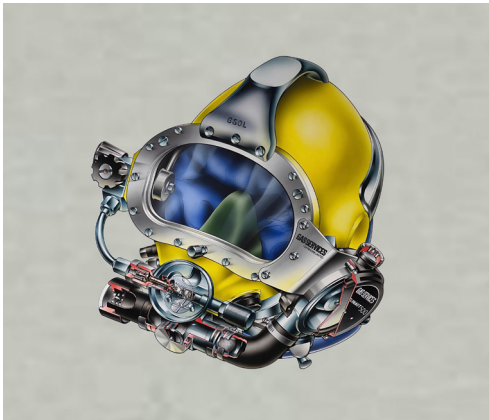


HMS Edinburgh:

The Origins of Gas Reclaim in Commercial Diving



Divex Helinaut Helmet developed for the salvage by GSOL, later to become Divex



Helium price volatility

With diving gas exceeding \$70 per m³ and some dive support vessels (DSV) using over \$1million of it per year, the justification for optimising gas reclaim performance is more important than ever. Escalating helium prices are being driven by the scarcity of this finite element, supply chain constraints and global helium demand. In 2022, some diving gas suppliers increased their prices by as much as 235% and markets expect the helium squeeze to continue well into 2025.

This article explains how the salvage of the secret cargo of a World War II British Royal Navy cruiser was pivotal in the introduction of gas reclaim, without which today's commercial saturation diving would not be commercially practical.



HMS Edinburgh's final voyage

In April 1942, British Royal Navy's cruiser, HMS Edinburgh, with 850 officers and ratings was escorting merchant ships to Russia when on her return journey, she was struck by two torpedoes from the German submarine U-456 north of Murmansk. 56 ratings and 2 officers lost their lives in the attack.

Unknown to many, including those onboard, the HMS Edinburgh was on a mission of her own; carrying 465 gold bullion ingots of Soviet gold as payment to America for munitions produced and delivered early in the war.

Now crippled, the ship was torpedoed again two days later by a German destroyer. Knowing the the precious cargo onboard, HMS Edinburgh's Captain ordered the cruiser be sunk by another British ship and HMS Edinburgh finally slipped under the waves.



Bullion salvage

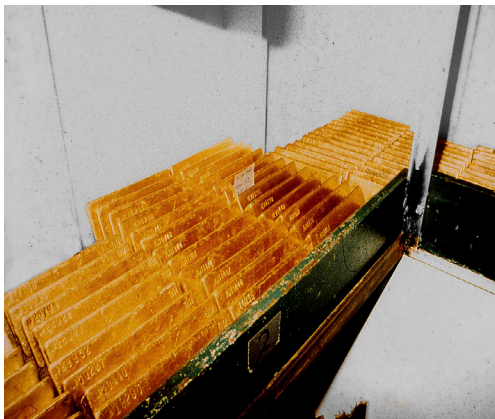
The story of HMS Edinburgh and her precious cargo became a diver's legend and in 1954 Risdon Beazley Ltd, a salvage company operating out of the UK, was offered the salvage rights to the vessel but was then halted due to political tensions between the East and West.

HMS Edinburgh became classified as a British war grave, thwarting further salvage attempts. Then in the 1980s, Keith Jessop of Jessop Marine, due to his proposed diver salvage methods being deemed more appropriate for a war grave than a 'smash and grab' affair, was successful in winning the salvage rights.

In 1981, the diving company Wharton Williams Ltd was then awarded the salvage project but costs of around £3 million meant all those involved had to be on a "no cure, no pay" contract.



HMS Edinburgh departing from the shipyard, Swan Hunter's in Newcastle



Just a few of the 460 gold ingots recovered!



DSV Stephaniturm, used throughout the operation was built in 1978 and continued her diving support until 2010.



The HMS Edinburgh Salvage Team, masterminded by Keith Jessop. Founder of Jessop Marine

As the HMS Edinburgh was laying at 840 feet (256m), the attempt using The Stephaniturm dive support vessel would also be setting a new depth record for sustained commercial SAT diving. However, for this to be viable, it would require a major technology innovation to capture and recycle the diver's gas instead of all the valuable helium and oxygen simply being bubbled away.



How did gas reclaim play its part?

On the project was Gas Services Offshore Ltd of Aberdeen, latterly becoming Divex and subsequently JFD Limited - established by ex-US Navy diver Don Rodocker who designed the Gasmizer Reclaim System. Don also equipped the diver helmets for gas recovery with British inventor, Alex Copson's Helinaut valve to provide the first practical heliox recovery system.

The modified diving helmets and valves enabled the diver's gas to be recycled back to the surface up a reclaim line in the umbilical instead of just expelling all the helium and oxygen mixture they breathe. The Helinaut valve acted in the helmet exhaled gas path to regulate the pressure in the helmet while recycled gas was getting drawn back up to the surface. This helmet arrangement would later evolve into JFD's present-day Divex Ultrajewel 601 helium reclaim helmet.

The Gasmizer Reclaim System then used a gas booster water traps and CO2 scrubbing, to recover and store over 90% of the diver's exhaled gas



The outcome

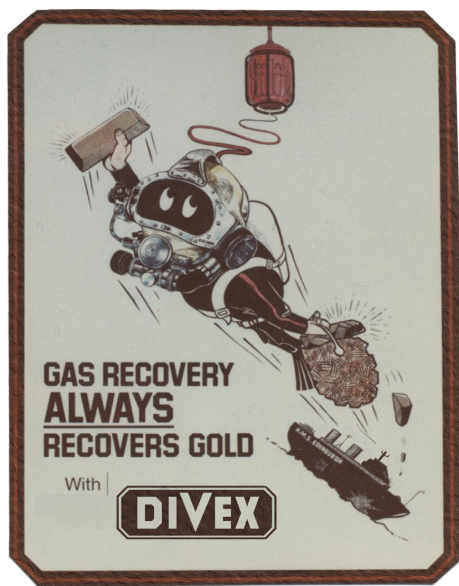
On 16 September 1981, the first gold bar was found by diver John Rossier. 431 of the 465 gold ingots had been recovered throughout the initial salvage project diving from The Stephaniturm. However, the operation was terminated due to the onset of winter in the Arctic. Another salvage operation was conducted in 1986 using a new high-tech Wharton Williams dive support vessel and a further 29 gold bars were retrieved. However, 5 bars which had been ready for lifting when the 1981 operation had been performed, had gone missing!

This salvage operation undoubtedly changed the world of commercial SAT diving. The introduction of the Gasmizer Reclaim System was a major step forward providing dive operators with significant economical savings on gas and logistics. It also meant divers could spend longer in the water and work in deeper waters became more accessible.

The HMS Edinburgh bullion salvage was the first commercial use of gas reclaim systems, working fantastically throughout and shining a light on the huge commercial value of gas reclaim systems. The operation, which was the deepest-ever sustained diving operation of its type, would have been financially and logistically compromised without gas reclaim due to the volume of helium required to sustain the complexity and length of the dive operations.



The 4.57 tonnes of sunken gold would be valued at almost £200m today!



Conclusion

After more than four decades, the Divex Gasimizer Diver Gas Recovery System from JFD Limited remains the benchmark in the diving industry and continues to provide dive operators with huge savings on breathing gas costs around the globe, year-round.

Ric Wharton, co-owner of Wharton Williams Ltd who were the diving contractor responsible for the planning, survey, salvage and funding of the Edinburgh operation, recalled:

"The Edinburgh project was the first commercial use of gas recovery. Despite reluctance from divers to use the new technology, it worked well. Without it, the operation would have been seriously compromised by the need to send more supply vessels with helium up to the Barents Sea. It is fair to say that the Edinburgh job proved the commercial value of gas recovery systems."



Divex Reclaim System