Akademik Tofiq Ismayilov (ATI)

CASE STUDY	
Client	SUBSEA 7
Completed	2021

THE PROJECT

From early 2020 to Q3 2021, JFD was pleased to be able to support SUBSEA 7 with reactivating the Dive System on the Akademik Tofiq Ismayilov (ATI) to enable the vessel to be utilised by a major IOGP client in the Caspian Sea region. As the vessel had not performed as a Saturation Diving Vessel for an extended period, as well as having mature systems and equipment on board, it was recognised that there were some significant upgrades required. Due to JFD's knowledge of the system, experience in Dive System upgrades, engineering and technical expertise, and tailored product range, SUBSEA 7 enlisted our services to support several aspects of the project.

INITIAL FMECA (Failure Mode Effects & Criticality Analysis)

SUBSEA 7 took up lease of Akademik Tofiq Ismayilov (ATI) in 2019 to support diving work in the Caspian region, and due to the period of inactivity of the Diving System SUBSEA 7, initially asked JFD's technical services team to go onsite and provide a FMECA (Failure Mode Effect and Criticality Analysis) report on the Dive System to determine where system upgrades/maintenance were required.

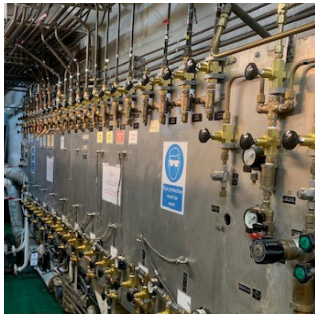
The purpose of the FMECA was to ensure systematic assessment was carried out on the Saturation Dive System and where required, identify any areas where the system interfaces may fail due to equipment operational reliability, as well as lack of redundancy and critical spares required for safe operation.

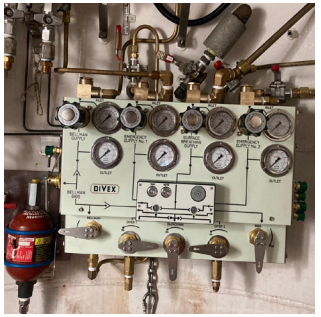
To support, JFD sent Mechanical and Electrical Engineers and a Mechanical Technician to Baku to perform an initial system assessment. The assessment required 8 days onboard for the JFD team to inspect all parts of the Saturation Dive System against the gas, fluid and electrical drawings, operating procedures and equipment manuals.

Following the onsite assessment, JFD FMECA SME Team of Dive Systems Technical Authority, Mechanical and Electrical Engineers and Operations Manager, performed a desktop review going through all documentation on the system, sub-system and vessel interfaces.

From the documentation and onsite review, JFD FMECA practitioners identified all potential failure modes, their level of criticality in regards to the safety of the dive team and the diving operations, as well as the mitigating steps already in place to reduce the probability or severity of the risk.

Following onsite assessment and desktop review, the JFD FMECA Team delivered their findings to SUBSEA 7, which listed a number of Category A, B and C findings that required changes to the system, with Category A requiring immediate action/mitigation prior to manned diving on the system.





FMECA RECOMMENDATIONS

Following the delivery of the FMECA report, SUBSEA 7 engaged JFD to provide a further report outlining proposed solutions and costs against rectifying all the Category A listed recommendations. JFD engineers, technicians, dive technical advisors and product sales personnel worked together to produce the report and quotes to rectify each of the issues.

The proposed solution was a mixture between replacement parts/products, engineering solutions and onsite technical solutions. Due to JFD's large range of product and service offerings, as well as the in-house Dive System technical expertise, we were able to provide solutions for each of the recommendations.

VALVE REPLACEMENT

One of the major scopes of work identified by SUBSEA 7 at the beginning of the vessel reactivation was the need to replace the obsolete valves on the Dive System following an issue with one of the System Oxygen Valves. After a competitive tendering process, JFD was awarded the contract for the valve replacement, installation and gas leak testing.

The remit was to provide compatible replacement valves, approx. 800 in total, on the Dive System, as well as over 5000 fittings. SUBSEA 7 requested that JFD also provide technicians to replace the valves and fittings as well as conduct gas leak testing of the replacement valves to ensure system integrity and support the client's final class society approval.

To support the installation, JFD sent its flushing container for the cleaning of any renewed or altered pipework to site, which allowed the trained technicians to provide pipe cleaning with the valve replacements. The cleaning was carried out to industry standards using JFD's DNV approved breathing gas and oxygen pipework cleaning procedure, again supporting overall system class approval for SUBSEA 7.

Following delivery of the valves, JFD mobilised a team of specialist technicians to site to perform the replacement. Despite a stop-start schedule caused by COVID-19 travel and access issues, the technicians were able to complete the installation, including a complete gas leak testing programme, within estimated onsite time.

SYSTEM UPGRADES

In addition to the valve replacement and FMECA support, SUBSEA 7 had also addressed many items on the Dive System that required upgrading or replacing and asked JFD to quote, and ultimately provide solutions, for these elements.

The solution was a mixture of upgraded Dive System products, engineering solutions and onsite technical support, all of which JFD was able to support by using a combination of our existing product range, bespoke solutions and internal engineering and technical resources.

FLUSHING

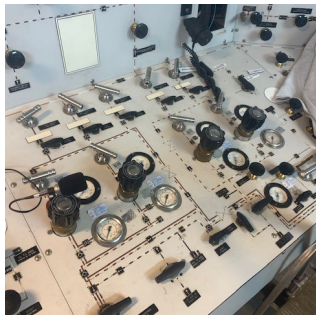
As the project developed with a number of parties on the vessel providing upgrades, it became evident that there was further Dive System pipework cleaning required. Due to the success of the valve installation and the gas leak testing JFD had just finished, JFD was requested to provide technicians to carry out this additional cleaning on the SDC main umbilical as well as additional pipework on the vessel that was not covered under the initial scope.

This required JFD to mobilise 4 Flushing Technicians and consumables to Baku to carry out this additional scope, again utilising the mobile flushing container and internal DNV-approved pipework cleaning procedure to conduct the process and give SUBSEA 7 the assurances they required in regards to the whole pipe system on the vessel.

FATHOM

Prior to the acquisition of Fathom Systems by JFD in March 2020, Fathom had been identified as the preferred choice for the upgrade of safety and mission critical sub-systems as part of the vessel 5 year life extension programme. Initial engagement between Fathom and the IOGP Client preceded discussion with SUBSEA 7 in proposing a cost effective 'best in class' system solution retaining all the quality, reliability and advanced technology typical of Fathom fully engineered product solution.

Now firmly part of the JFD capability portfolio, the 15 year Fathom pedigree as industry experts allowed a fully engineered turnkey, compliant system, centred around replacing the existing Bell Power & Signals System, as well as Diver Voice Communications, both of which play an important role in enhancing the performance of the Dive Support Vessel which remains in a key support role to subsea operations in the Caspian Sea region.



Fathom, now part of JFD, has a long-standing reputation for instilling an acceptance of new technology to prolong system life and guarantee a range of benefits to the owner and operator including significantly improved performance, durability, reliability and importantly enhancing diver safety. The project deliverables included:

- Project Management, Engineering, Procurement & Administrative Services
- Bell Power & Signals/Instrumentation System c/w Topside AC Cabinet, HMI & Proprietary GUI Software
- Bell, Chamber & SPHL Digital Diver Voice Communications System
- Electro-Optical Slip Ring, Winch Static/Rotating Power/ Signals Junction Boxes
- Chamber Signal Electrical Penetrators

CLIENT TESTIMONIAL

"The reactivation of a 33-year-old dive system in a remote location under C19 was a huge challenge, technically, commercially and logistically. Long established relationships between Subsea 7 and JFD and a mutual understanding of each other's needs allowed us to safely and successfully return the dive system to commercial diving operations to a high standard. JFD understood our needs and proved responsive, even out of hours for emergent issues. We could not have met all the regulatory requirements without their support. We look forward to completing the FMECA update."

Michael Campbell
Vessel Superintendent

SUMMARY

From the beginning of the project in early 2020 to the completion in Q3 2021, JFD was able to work closely with SUBSEA 7 and their local partners, Caspian Marine Services and BP, to support in getting the vessel Dive System back to a high standard, enabling safe and efficient return to Saturation Diving operations. JFD's proven track record, varied range of products and services and extensive experience in supporting Saturation System builds and refurbishments, led to SUBSEA 7 entrusting JFD to support throughout this project. Despite the many challenges faced in providing equipment and personnel to support the system upgrade during the COVID-19 pandemic, JFD was able to successfully deliver on all scopes, on time and within budget.