

DESIGN AND CONSTRUCTION TOOL WEAR PROTECTIVE EXTRACTION WELLHEAD BUSHING IN DR-5A MARISCAL SUCRE DRAGON FIELD PROJECT

**José ROLLINSON, Osvaldo ALCALA
SPECIALIZED SERVICES - PDVSA OFFSHORE. Carúpano, Sucre, VENEZUELAN**

ABSTRACT

In the drilling campaign Submarine Gas Field first operated in Venezuela, the first of Trees placed underwater at a depth of 150 meters deep water start, this will use a specialized boat Iron Horse with a compensated crane 400 ton pressure and equipment operated by the ROV's in the campaign a particular problem, which we present and gave his solution that was executed.

Event: Once downloaded the Tree submarine and completed the fitting and securing the tree to wellhead DR-5A, testing proceeded to seal between the connector H4 (head) and the coupling system of the production tree, the which did not succeed. The production tree was removed and inspected subsea wellhead with ROV Bushing Wear observing presence in Profile wellhead STC-10.

Actions taken: If an analysis, the only way to remove the protector was using drill pipe, since the working tools davit rigid hook and then allowed to extract rotate Bushing Wear hence should be position the Drill Ship in DR-5A well. Another important consideration was that when removing the Wear Bushing, there was a risk of damaging the profile H4 Production Tree, so you should take action in this regard.

Solution: To avoid damaging the tree profile Production H4, was designed and fabricated in situ in the vessel IH protective tool, which was coupled to H4 connector in order to protect the polished profile. Designed and built tool was placed and performed extraction operation successfully Bushing Wear. Bushing Wear were recovered accurately and safely, avoiding damage Polished section Production Tree, Let generate a knowledge base creation of specialized tools for recovery cases wellhead protectors.

SUMMARY

In order to develop the country's gas belt that extends from the border with Trinidad coast to the west coast of Falcón State. In this context, the operational phase of the Eastern belt began in the Mariscal Sucre project in the Dragon and Patao fields in the Dragon field were drilled eight wells, which then were to be completed by the fall of the first submarines Trees to be installed in Venezuela. In the initial phase were 4 of the 8 wells that accelerated production schedule (APE) was called.

There planning for completion of such wells, prior to falling trees Submarines, with the addition of specialized equipment, one of them was the boat made Iron Horse, equipped with adequate technology tips to great technical challenge. The descent of the 1st tree was made into the well DR-5A, which presented the problem of not reaching the tightness of the seal and therefore had to remove the tree and perform the respective analysis. In conducting the review will be detected protector used in the drilling phase Wear Bushing, who had remained at the stage of completion of the

well. In order to locate an expeditious solution, a protective tool that was designed and built on site, and managed to make the withdrawal of Wear Bushing safely, without damaging the polished section of the connector H4, which compromised the integrity later seals of the well completion DR-5A.

Innovative activity had a direct economic impact, as it enabled solve an operational problem, which avoided paying extra days stand by or waiting at a rate of \$ 250,000 / day specialized ship Iron Horse, while the solution was located on business continuity installation of Subsea Production trees. Similarly enabled, a knowledge base in building tools for subsea well heads.

OBJECTIVES OF THE TECHNICAL TOPIC

General Scope

Show the innovative design and construction of a protective practice for the safe removal of a guard polished section in H4 wellhead connector.

Specifics Objectives

- Perform problem diagnosis of obstruction in the H4 connector.
- Pattern the functional design or protective tool
- Describe the construction procedures and operational procedures that managed to run the liner removal safely.

PROCEDURES

Once detected or the problem of seal subsea production tree, we proceeded to design a protective tool H4 connector, at the moment of removing the obstruction. [1].

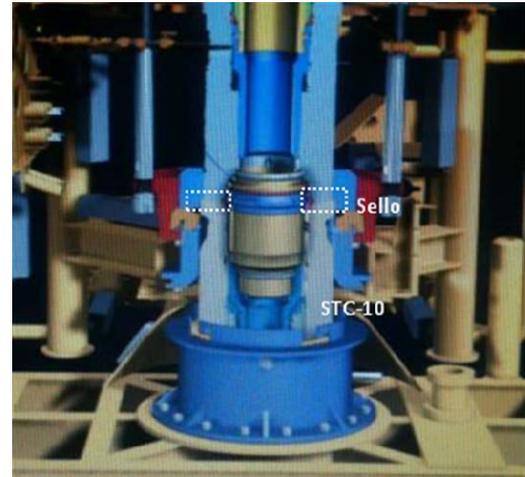


Figure 1. Seal in Conexion STC-10

- Preparation of design, with accurate measurements of couplings and locking systems, with support screws. [2].

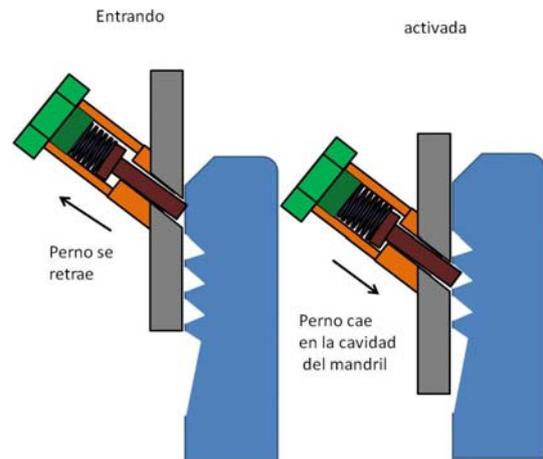


Figure 2. Coupling mechanism

- Manufacture a tool protector at Iron Horse specialized ship with specialized materials and on-site welding. [3].

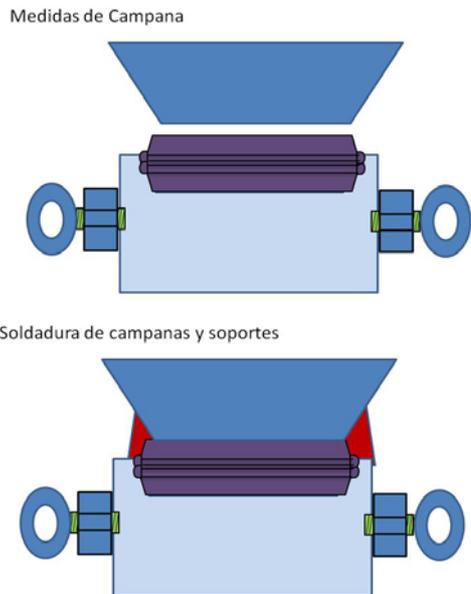


Figure 3. Design of ring and bowl

- Presented protective or tool table scale H4 connector on the ship. [4].



Figure 4. Protector or coupled in table scale

- Down and installed protective tool using the ROV Ship's Iron Horse. [5].



Figure 5. Set down of tool in the wellhead

- Drill ship or placed on well under DR-5A with davit pipe and bushing wear and removal thereof performed successfully without damaging H4 connector.

ANALYSIS AND RESULT

The result of the innovative initiative of designing and manufacturing on-site protective tool to retrieve the wear bushing obstructing the coupling with H4 subsea production tree, was a complete success, which managed to avoid damage to the profile and so ensure business continuity and specialized technical and operational work of great precision, down to the campaign of the first subsea trees in Venezuela.

CONCLUSIONS

- Achievement to recover or Bushing Wear well head in DR-5A accurately and safely.
- Avoided damage or Polished section Tree Production
- It allowed or generate a knowledge base creating specialized tools for recovery cases wellhead protectors.