



# PACKINOX UPGRADE HEAD REFITTING

CASE STUDY

**CATEGORY**  
SERVICES / SITE WELDING

**Industry :** Oil & Gas

**Reference :** LA2909

**Client:** Caltex NSW

**Year :** 2011

## Overview and Planning

The refurbishment of Caltex's packinox heat exchanger required a bundle replacement to solve efficiency problems. To do this the 80mm thick head needed to be cut off then re-welded into position. With asset down time being costly an accelerated welding method was required to be able to complete the refurbishment within a planned refinery shutdown window.

The project was schedule focused with a need to achieve the Packinox refurbishment within the planned refinery wide shutdown to minimise process cost losses. The re-welding of the Packinox's dished end was a critical path task. Conventional stick welding posed a schedule risk in arc time required and welding floor in such a large weld, so an alternative process was needed for the horizontal site joint.

By scheduling continual welding over two shifts, using a qualified welding team with redundancies in place, the duration of the project was compressed to just 6 working days in order to align with the shutdown window.

## Scope

- Develop and qualify weld procedure
- Qualify welders and contingency operators
- Configure three welding machines plus redundancy units
- Supply consumables and all documentation
- Advice on head cutting & work area setup
- Arrange head weld prep machining
- Carry out shell shell prep in position
- Arrange NDE and PWHT



# PROJECT DETAILS

## Welding Details

- Process - STT Root, GMAW fill
- Position - Horizontal (2G)
- Runs - 330
- Arc hours - 360
- NDE - 100% visual, MT & UT
- Pre-heat - 180°C
- Interpass - 300°C
- PWHT - 720°C to 740°C



## Materials

- ASTM A387-87 (1¼Cr x ½Mo, P4 Group 2)
- 80mm thick
- 7m Circumference

## Equipment & Resources

- Welders - 6 off across two 10 hrs shifts
- Assistants - 2 off across two 10 hrs shifts
- Weld supervisors - 2 off across two 10 hr shifts
- Welding Machines - 5 off Lincoln 455M/STT





## Challenges

The issue with utilising workshop GMAW welding equipment on site 30m in the air are many. Maintaining the gas shield required an enclosure tent to eliminate the breeze. But enclosing such a welding zone (80mm thick and pre-heated to 180°C) introduced other WHS challenges. The welding machines were modified with longer cables, so they were outside the immediate work area. With such a high deposition rate gas and wire spools needed to also be stored on the work platform to support a quick consumable turn around. This added to the work platform load. Because of the pre-heat and three welders continually operating, a ventilation system was also required, but it could not create a draft that would disrupt the shielding gas.

## Notes

To enable the utilisation of GMAW in this scenario, a weld procedure needed to be designed and then qualified to conform with both the pressure equipment standard and the project specifications. A two meter long test plate was setup complete with a pre-heating system to simulate the job and used to qualify both the procedure and the welding team.

## Client Feedback

“It’s hard to engage and retain such expertise and professionalism in the tough manufacturing environment in Australia, so it’s good to know that LA Services is there to continue it’s support to our industry and that we can always rely on your “can-do” attitude when working together”

*Jeff Andrews, Acting Reliability Manager, Caltex Australia*

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