

CONDENSER AND FEED HEATER REFURBISHMENT

FIFFOOTS POINT & KILROOT POWER STATIONS

Fifoots Power Station, Newport - formerly Uskmouth Power Station and now owned by the AES Corporation - has been successfully broughtback into operation. A key feature of this has been the refurbishment by TEi of the three original steam turbine condensers and the nine high pressure feedwater heaters.

Tight Programme

In winning this work, TEi was able to offer shorter overall programme times than its competitors by using state-of-the-art tube pulling and disposal equipment available through TEi's exclusive licence agreement with Retubeco, the USA's leading condenser and heat exchanger refurbishment company.

The condensers were re-tubed with 33,600, 1" dia, 18 gauge, 70/30 Cu/Ni tubes, air freighted from the USA due to the tight programme.

Collaboration

Close collaboration between TEi business units played a big part in the success of the project: at its Wakefield factory, TEi fabricated four new carbon steel water boxes, developing the design using the original cast iron water box drawings; TEi YIMPACT - specialists in explosive welding and heat exchanger inspection/repair - provided the hands-on retubing and expanding skills; and the entire project was co-ordinated and managed by the TEi regional office in Cardiff.

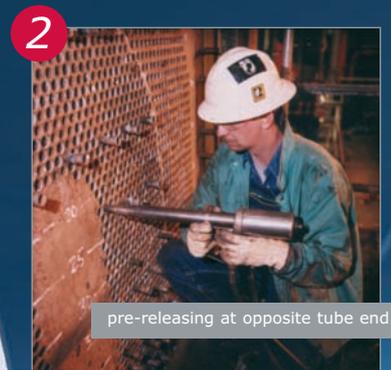
Major work on HP Heaters

The nine HP heaters needed extensive refurbishment. The two highest pressure heaters on units 13 & 14 were completely retubed using tube-to-tubesheet explosive welding by TEi YIMPACT, thus guaranteeing the highest possible level of joint integrity.

The remaining seven heaters were all extensively refurbished with specialist weld repairs to tubesheets, flange machining, renewal of bolting materials (many to thread profiles no longer in common use) and full tube bundle pressure testing.



1
internal bore cutting
at one end of condenser



2
pre-releasing at opposite tube end



3
tube extraction



4
tube extraction close up

tube extraction utilising Retubeco tube pulling gear capable of extracting and flattening tubes at up to 1.2m/s (240ft/min)

KILROOT POWER STATION

The success of Fifoots condenser retubing by TEi gave the owner, AES Kilroot, the confidence to contract with TEi for this challenging work.

Little time to decide

Eddy current inspection of the condenser tubes carried out during a planned four-week outage on Kilroot's No.2 unit showed that deterioration of the tubes had reached the point where a crucial decision had to be taken whether to plug further tubes, or carry out a full re-tube within the outage window.

Working closely with AES Kilroot

Close collaboration between TEi and AES Kilroot staff was a key feature in the project: station maintenance personnel removed two water boxes from one end of the condenser and a scaffolding access platform was erected by AES Kilroot ready for TEi to start work.

Rapid response

Very shortly after contract award, TEi started work on site cutting the 11,300, 1" dia, 18 gauge aluminium brass tubes and setting up the Retubeco tube pulling gear capable of extracting and flattening tubes at up to 1.2m/s (240ft/min).

The flattened tubes are then 'walked' to a specially designed Retubeco cropping machine which cuts them into short lengths, collects them in a skip and enables them to be taken directly off site for disposal. The condition of the chopped tubes makes them highly sought-after by the material reclamation industry.

Round-the-clock-working

TEi worked round the clock to extract all the tubes, clean and prepare the tube plates, re-tube and roller expand the tubes into the inlet and outlet end tube plates.

Thirteen days after commencing work TEi delivered the condenser back to AES Kilroot, tested ready for service and ahead of the agreed re-tubing programme.



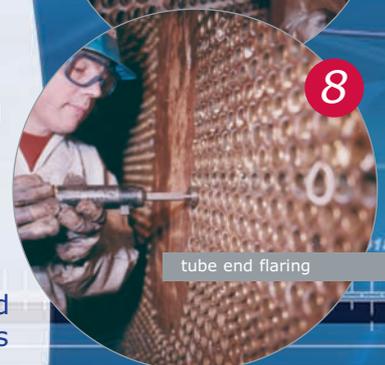
removing flattened tube



self-feeding scrap chopping machines



tube expanding



tube end flaring



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