



# HFS HEAVY INDUSTRIES SDN. BHD.

Power Generation Division

## HPHTSH OUTLET HEADER IMPROVISED DESIGN

### CLIENT

Malakoff Power Berhad

### PROJECT

Malakoff Prai Power Plant - Major Outage  
July HRSG Scope

### LOCATION

Prai, Penang, Malaysia

### WORK TITLE

Design, Supply and Install New Improved Design of  
HPHTSH Outlet Header (Semi Harp Type) P91 Material



ISO 9001:2015 Reg. No: 17148A-A



OHSAS 18001:2007 Reg. No: 17148A-I



## OBJECTIVES

- ▶ To improve flexibility of the components under cyclic operations in terms of the induce thermal and fatigue stresses.
- ▶ To improve mechanical strength enhancement to consider tube design.
- ▶ To improve reliability and eliminate unplanned outages of the HRSG on both short and long terms, resulted from HRSG tube failures.

## SCOPE INCLUDES

- ▶ Design, fabricate, supply, install, test and commission the modification of one (1) unit of HPHTSH outlet header and tubes for the HRSG in PPP.
- ▶ Installation include welding work for enhance ferrite steels P91 material (ASME P No. 15E) such as SA335P91, SA213T91, SA234WP91 and SA182F91.
- ▶ Engineering study and calculation 'S' type tube run and lower down header about 300mm or more.
- ▶ To conduct Stress Analysis for improved header design combined with new pipe routing and verify the improvement made.
- ▶ To do modification or adjustment on the pipe support related to header modification based on header & pipe stress analysis if necessary.
- ▶ Install one (1) lot of permanent metal skin thermocouples onto selected stub tubes.



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