OEM- Performance Guarantees achievement **v/s** Actual Performance & Impact on Operational cost to CUSTOMER

Proved PG Test Guarantees v/s Actual Performance of Boiler

Cost effective operation of boiler with best efficiency is first priority of each & every company & it's management and staff. **Repeatability & Reproducibility are the key points for Performance Guarantee Test.**

OEM always take advantage of the quote written in ASME PTC 4.0 (latest) as **"code accepts any prior agreements between purchaser & supplier"** like as Reference Temperature, Unmeasured Losses, Surface Radiation & Convection loss need to be calculated but OEM is managing it through ABMA curve as per prior agreements, hence ASME PTC 4.0 accuracy is diluted. Any error in PG Test is directly proportional to fuel cost. Focus on error elimination & correct data recording during the PG test is essential to avoid manipulation of the **Fuel Efficiency**.

A. The major checks as per code during PG test are described below to minimize the error :-

1. **Minimum PG Test Run duration:** Depend on type of boiler and test method of calculation (Energy Balance OR Input / Output). Like Stoker fired boiler minimum test run duration is -
    a. **Energy balance (Heat balance) method - 04 hours**
    b. **Input/Output (Heat Loss) method - 10 hours**
2. **Log reading & sampling duration:** As minimum as possible i.e. 05 minutes to records maximum number of samples & measurements through boiler control system- DCS.
3. **Avoid application of Corrections** to the test results. If unavoidable, study correction curve before starting the PG Test.
4. **Lab testing** of Fuel, Sorbent, Residue as per ASTM code. For accuracy, make it check at your end from best laboratory. Any error in result is cost to customer.
5. **Uncertainty** of the Input/Output (ASME PTC 4.0) method is directly proportional to the uncertainty of measurement of feed water / steam flow, fuel flow and fuel heating value.

6. **Heat loss & Heat credit** calculation for all system & boundaries such as SCAPH (steam coil air preheater), Sensible heat in fuel, Dry air etc
7. **Accuracy & Calibration of Instruments** to be ascertained as per test code, before and after the PG test.

B. The major checks during PG test are described below to minimize the error :-

1. **If boiler is not able to run at 100% MCR load** during PG test due to process restrictions, better to demand for revised efficiency on current average load for your study and correction before starting of test.
2. **Do not allow the tuning of boiler before start of the PG test**, If any adjustment is being done, it should be long lasting and finally set values to achieve the efficiency as per the test results.
3. **Do not allow for any changeover** i.e. auto/manual or vice versa during the PG test. Manual intervention to control parameters to be avoided.
4. **Always run the boiler to test at 110% MCR load**, Super heater temperature control range, De-superheating spray water flow rate etc guarantees to check the system healthiness and record parameters for comparison with standard.
5. **Check correct location of instruments tapping point**. Wrong installation & fitment of Pressure, Temperature, Flow meter etc will lead to error in measurement.
6. **Always operate all fuel feeders at same rpm & fuel flow**, to ensure equal distribution of gas flow in path. Uneven flow in path will lead to error in measurement.
7. **Always record metering / totaliser values** for test duration average, Avoid instant values recorded.
8. **APH Gas exit temperature** is the last parameter for efficiency calculation. Do not use ESP inlet OR Chimney inlet gas temperature for efficiency calculation but always record it for reference.
9. **Oxygen analyser,** Air inlet temperature before APH, Air inlet temperature at fan discharge must be correct & calibrated. They can create tremendous changes in efficiency.
10. **Fuel, Ash, Water, SPM sampling** must be done as per code. Wrong collection & sampling will spoil the objectives of PG test.
11. **Checks for SPM sampling** for monitoring of pollution control equipment's efficiency are

1. Procedure for sampling collection & measurement as per code
2. SPM instrument calibration, thimble pre and final weight, gas temperature, gas flow etc to be verified.

12. **Keep a watch on auxiliaries's power consumption** before & after PG test.
13. **Compare the boiler parameters with design guaranteed** & predicted parameters during and after the test.
14. **Do not allow to change any tuned parameters** after completion of the PG test.
15. **It's better to check the test samples** for your satisfaction & comparison, it may be a beneficial decision in long-term. Always keep your PG test record & samples safe to re-witness the test result.
16. Soot blowing, Blow down (IBD & CBD) etc are direct losses and normally not covered in guaranteed efficiency. Try to cover it.

We hope, the above checks shall help the customer during project ordering & execution stage, plant operation, PG test run duration to get best results and authentic calculation. M/s Unite Energy Corporation LLP suggest to adopt & check the above points during ordering, operation & test run duration.

We will come soon with another concept to fulfil our mission of "ENERGY CONSERVATION & TROUBLE FREE WORK ENVIRONMENT" with an idea to reduce plant's cost & maintenance.

Unite Energy Corporation LLP is keen to provide our best after sales & spare services support to you to mitigate the irregularities in the plant, best technical services to mitigate breakdown, minimize downtime, improvise design and system performance through inspection, operational recommendations, genuine analysis, training and skill enhancement etc, to improve the overall plant's health and performance.

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