

eSTPE & Steam Path Audits

A Decision Making Tool

Steam Turbine Performance Evaluation Program Example Electric Unit 1
Audit Results, Open February 2/25/2002 Interstage Packing HP Casing

Description	Leakage Flow lb/h	Average Clearance in.	Corrected Average Clearance in.	Wear in.	Stage Efficiency Loss %	Power Loss kW	Change In G.T.H.R. Loss Btu/kWh	First Year Fuel Cost \$
Stage 2	25285	0.051	0.051	0.036	1.31	57.2	1.66	3359
Stage 3	19828	0.041	0.041	0.026	0.49	22.4	0.65	1313
Stage 4	16613	0.037	0.037	0.022	0.28	13.2	0.38	773
Stage 5	18337	0.046	0.046	0.031	0.96	47.1	1.37	2761
Stage 6	17573	0.053	0.053	0.038	0.96	49.5	1.44	2906
Stage 7	12143	0.034	0.034	0.019	0.17	9.4	0.27	554
Stage 8	13558	0.045	0.045	0.030	1.39	79.5	2.31	4664
Total						278.3	8.10	16355

Q. eSTPE is a computer program that quantifies the hundreds of measurements obtained during a steam path audit. But exactly what output should you get from a steam path audit?

A. You should get output that identifies components that need to be repaired or replaced. In addition a steam path audit frequently identifies situations where it may take a long time to recover the cost of replacement activities, whereas the cost of a less expensive repair procedure may be recovered quickly. Depending on the location in the turbine some or all of the following examples may recover the cost of the audit quickly (or possibly immediately in the case of a modified repair procedure):

- Sharpening packing teeth versus purchase of new rings
- Minor instead of major weld repairs, or vice versa
- Improving final surface finish by using a finer grit or glass beads

In addition to the Interstage Packing losses shown above, a properly performed audit should also evaluate End Packings, Tip Spill Strips, Miscellaneous Leakages, Flow Path Damages, Surface Roughness, Cover Deposits, and Trailing Edge Thickness. Graphs should also be available to view packing clearances both horizontally and vertically. A complete photographic survey as well as a closing audit can help anticipate possible wear for the next outage.