

Steam Path Audit Using the (eSTPE)[®] computer program

The eSTPE software encodes and extends the turbine performance methodology of K.C. Cotton. Its precision and usefulness derive from the following features:

- eSTPE characterizes and evaluates turbines from any manufacturer.
- eSTPE calculates losses associated with interstage packings, end packings, and tip spill strips with consideration of:
 - changes from design clearances,
 - changes in packing teeth sharpness,
 - differences in interstage packing, end packing, and tip spill strip type and number of teeth, and
 - variations in individual stage thermodynamic properties.
- Using simple measurements of area changes, eSTPE calculates the impact on performance of solid particle erosion, deposits, and mechanical damage. Calculations take into account:
 - changes in stage efficiency,
 - changes in flow, and
 - changes in exhaust loss.
- eSTPE calculates the impact of surface roughness on performance based on measurements taken with a calibrated surface roughness comparator.
- eSTPE evaluates the impact on performance of deposits under rotating blade covers.
- eSTPE evaluates the impact on performance of thickened nozzle trailing edges.
- Using straightforward measurements, eSTPE calculates the impact of miscellaneous leakages.
- eSTPE presents hard-copy results for the entire turbine, for individual casings, and on a stage-by-stage basis.
- eSTPE calculates the potential dollar value of heat rate from plant economic factors.
- Where Encotech is engaged to conduct an audit:
 - The auditor presents complete analytical results prior to departure from the station.
 - The final report contains a complete color photographic record of steam path conditions.

eSTPE-based audits give high quality results from detailed observations and analysis. Program outputs indicate what is wrong with a turbine, what is worth fixing, and what repairs are not cost effective.