## Benefits from the Use of eSTPE

An examination of about twenty of the recent opening audits that we have performed shows an average degradation identified by the audit of about 3 %. Within that sample we have one unit that had about a 16% degradation in performance. Usually not everything is returned to new-and-clean condition so the recovery is typically about 80% which gives an average recovery of about 2.4% improvement in heat rate.

It is certainly appropriate to ask if this same degradation would have been identified and repaired without the use of an audit? It is very likely that some portion of it would have been. However, some might have been missed and/or there may have been some repairs undertaken that were not really needed. The advantages of performing the audit with eSTPE are:

1. The program provides an organized and specific guide to identification of the kinds of degradation that can occur and quantifies the impact on efficiency of any that is found.
2. Because it quantifies the significance of degradation, it identifies items that are not worth fixing
3. Each repair decision can be made on the basis that it will or will not prove to be an economical investment of funds.
4. With the rapid response of suppliers today, many parts need not be ordered ahead of time and then only ordered if needed. Many parts typically used for repair during an outage can be provided fast enough that there is no delay in reassembling the unit for a return to service.
5. A closing audit will quantify the expected recovery and assure that all repairs that were desired were in fact carried out. Subsequent enthalpy drop testing can determine if any degradation occurred during the return of the unit to service.

We know of no evidence that says any one manufacturer's turbine degrades significantly more or less than any other. We would say that benefits from the program depend primarily on the skill, training, and sense of responsibility of the operators and plant management. There is no fundamental reason why a steam turbine should degrade at all. It is primarily problems with poor water chemistry, vibration and rubs, water injection, carry-over of foreign material from the boiler or piping, etc. that result in turbine degradation. Answering this question really points out an additional benefit from use of eSTPE which is that it identifies and quantifies items of degradation that could be lessened by modifications in plant operating procedures. It is a good management and operator's teaching tool.