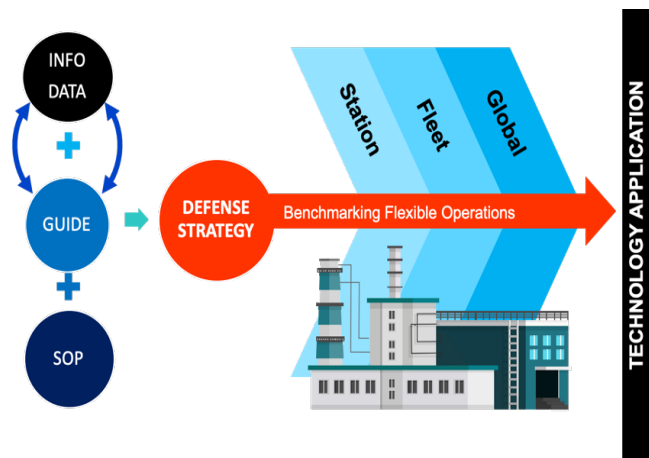


# High-Level Flexibility Assessment and Benchmarking Tool for Conventional Steam Generators



SOP: Standards Of Performance

## Benefits:

- Provides a systematic approach to evaluate existing coal power plant flexibility by identifying technical issues and roadblocks impeding flexible operation.
- Helps to develop a strategy to balance these implications with reliable plant operation.
- Includes ten user-friendly benchmarking assessment templates with >600 plant design and operating items to evaluate coal plant flexibility against a high-level set of standards for “acceptable,” “needs improvement,” and “at-risk” operations based on decades of related EPRI work.
- Helps align people, process, and technology through Information management and benchmarking as a part of a defense strategy to battle challenges of flexible coal power plant operations.

## Contact Information, including templates:

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The rapid growth of lower-carbon intermittent energy resources connected to the grid is transforming the mission of conventional steam generating stations around the world in terms of their share of electricity generation and operating mode. Most affected are fossil fuel-fired and nuclear thermal generating units. Many of the dispatchable units being used to balance the grid are conventional coal-fired steam plants, which were often designed to operate as baseload facilities with limited turndown and ramp rate capabilities. Because the frequency and severity of cycling these units to match grid demand can significantly impact their reliability, grid stability can subsequently be negatively impacted if their operation is not properly managed.

Coal-fired steam generators that are capable of flexible operations can play a key role in ensuring grid stability. However, as these units age, their reliability can be challenged by thermal transients associated with cyclic operations. These conditions may need further assessment and monitoring to help mitigate potentially costly equipment damage and to promote safe, efficient, and event-free operations without depleting the plant’s operating and maintenance budgets.

Through bilateral discussions with India under the Power & Energy Efficiency Pillar of the U.S.-India Strategic Energy Partnership (SEP), the U.S. Department of Energy’s Office of Fossil Energy supported development of a coal power plant flexibility tool. This public-domain tool provides operators with a systematic approach to evaluate existing coal power plants by identifying technical issues and obstacles impeding flexible operation.

The high-level assessment templates, included in this tool and intended to help identify areas of vulnerability that require attention, are applicable to coal-fired subcritical and supercritical steam power plants rated >100 MW. Because the design and operation of each unit varies, the templates are intended to be used to evaluate individual units. However, multiple units at a given plant can be evaluated in parallel.

The operating mode (baseload or cycling) of existing steam generators are usually driven by their production cost and energy market demand. To achieve successful cyclic operation, plant management and staff will need to adopt new strategies, including different procedures and condition-based maintenance, along with the possibility of upgrading their process control systems. This tool will help operators not only to identify but also to prioritize actions needed to improve the flexibility of their coal units and to avoid costly unplanned repairs which would impact their competitiveness.

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