TE-4 Valve Compliance to ASME TDP-1

A Cornerstone Valve Case Study



About the Author

Cornerstone Valve's Vice President of Strategy NK Gupta brings an extensive background in severe service valve applications across the power generation, refining, and petrochemical markets. His experience spans engineering, application support, and commercial leadership, giving him a practical understanding of how valve performance in the field translates into plant reliability and lifecycle cost.

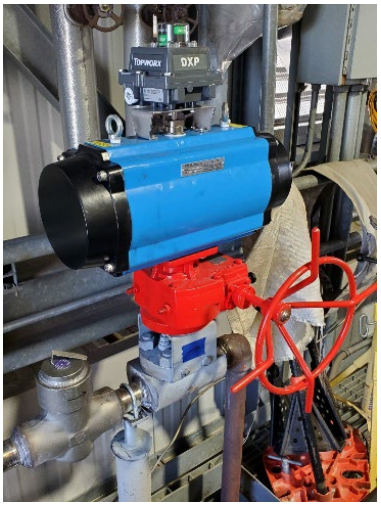
NK leads Cornerstone's strategic planning, market development, and key customer partnerships. He works closely with owners, EPC contractors, and Cornerstone's engineering team to align product development with emerging industry standards and end-user requirements, helping customers specify and apply the right valve for their most demanding services.

Owners and EPC contractors for power generation projects increasingly reference ASME TDP-1 in valve specifications for main steam, hot reheat, turbine bypass, and extraction steam systems. As a result, Cornerstone Valve is regularly asked a direct question: “Is the TE-4 certified to ASME TDP-1?” This case study explains what TDP-1 actually governs, why no valve can carry a TDP-1 certification, and how the TE-4 is documented and specified to support TDP-1 objectives in turbine protection service.

What ASME TDP-1 Is

ASME TDP-1, *Prevention of Water Damage to Steam Turbines Used for Electric Power Generation*, is a recommended practice. Its purpose is to protect the steam turbine from water induction, where water or cold steam enters the turbine from drains, attemperators, extraction lines, or bypass systems. Water induction can cause thrust bearing failure, blade damage, rubbing, and casing distortion, and has historically been responsible for major forced outages.

To prevent it, TDP-1 addresses the plant and its systems rather than individual components. It provides guidance on drain system design, warm-up procedures, turbine protection logic, system configuration, and the instrumentation and controls used to detect and remove water before it reaches the turbine.



Cornerstone Valve TE-4 – Steam Service

Why TE-4 Cannot Be “TDP-1 Certified”

Because TDP-1 is a plant and system standard, it is not a valve manufacturing code. Unlike component codes, it carries no ASME stamp, has no third-party certification program, and maintains no component listing program. A valve manufacturer therefore cannot issue a formal “ASME TDP-1 certified” certificate in the way it can issue an API 6D certification, an ASME B16.34 compliance statement, or Material Test Reports (MTRs).

Component / Piping Codes (ASME B16.34, B31.1, Section VIII)	**ASME TDP-1**
Govern design, materials, and testing of the valve or pipe	Governs how the turbine’s steam and drain systems are designed and operated
Manufacturer issues compliance statements, MTRs, and test reports	No stamp, certification program, or component listing
Compliance verified at the component level	Compliance determined at the system design level

TDP-1 does not replace ASME B31.1 or B16.34. A TE-4 in turbine protection service is still designed and built to its applicable component codes; TDP-1 then shapes how that valve is selected, located, actuated, and controlled within the system.

How the TE-4 Supports TDP-1 Objectives

In turbine inlet, bypass, and drain service, TDP-1 places heavy reliance on valves that open when called upon, close tightly when required, and keep performing through repeated thermal cycles. The TE-4 design addresses these reliability objectives directly:

- **Shutoff reliability and leakage performance** through metal-to-metal sealing
- **Defined fail position and response time** to suit the plant's turbine protection logic
- **Material suitability** for high-energy steam, with high temperature capability to 1200°F
- **Maintainability** through a truly in-line repairable design that does not require cutting the valve out of line

These features support TDP-1 reliability objectives, but they do not constitute a certification. Final TDP-1 compliance remains a function of how the overall system is designed and operated.

What Cornerstone Provides

For a TE-4 supplied for main steam, hot reheat, or bypass service, Cornerstone Valve provides a full compliance documentation package, including the ASME B16.34 design basis, pressure class rating documentation, material certifications, NDE records, pressure test reports, seat leakage test results, and QA documentation. Where the project specification references TDP-1, Cornerstone can also issue a vendor statement of conformance, for example:

"Model TE-4 valve supplied in accordance with project specification XYZ, which references ASME TDP-1 for turbine protection applications."

This is a vendor compliance statement to the client's project specification, not an ASME certification.

Specifying the TE-4 Correctly

Rather than requesting a TDP-1 certified valve, Cornerstone Valve recommends the following engineering language:

"Valve shall be suitable for turbine protection service in accordance with ASME TDP-1 recommendations."

The specification should then require enhanced NDE, PWHT documentation, seat leakage test requirements, actuator performance verification, and full material traceability. These are verifiable deliverables that the end user, EPC, and inspector can confirm at the component level.

Conclusion

Cornerstone Valve cannot provide an ASME TDP-1 certification, because no such certification exists for valves. What Cornerstone can provide is documented compliance to the project specification that references TDP-1, backed by a TE-4 design built for reliable shutoff, high-temperature steam service, and in-line maintenance. With TDP-1 compliance ultimately determined at the system design level, specifying the TE-4 with the language above gives owners and EPCs a clear, auditable path to meeting their turbine protection objectives.