

The Viability of the Competitive Procurement of Black Start: Lessons from the RTOs

The procurement of black start services is a vital component of system restoration in all markets, not only deregulated ones. ERCOT and other jurisdictions have working methods of competitive procurement that allow an explicit market mechanism to make the cost tradeoffs, while taking account of the network topology.

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I. Introduction

Black start services are a small but vital part of the plethora of products and services necessary for the reliable operation of a grid, a fact brought home whenever there is a serious blackout. In such a situation black-start-capable units bear the responsibility to start themselves and begin the islanding process that is the first step of any system restoration plan. Some black start capability is a necessary component of reliable grid operation. Although the need for this service is clear, its procurement in a deregulated

environment is quite varied. Traditionally, black start was provided by integrated utilities and the costs were rolled into a broad tariff for cost recovery. In the deregulated environment this legacy of cost-based provision has persisted, and even recent overhauls of black start procurement practices, such as that by the New England Independent System Operator (ISO-NE), have not necessarily shifted to competitive procurement, despite the fact that deregulated entities have a bias for market solutions rather than cost-of-service (COS) solutions.

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The fact that black start procurement costs are relatively minor belies their true importance. Blackouts when they occur can cost millions of dollars per hour in lost production for the economy generally. By implication, an optimal islanding process born of an efficient structure can save some of those millions. This article explores why and how black start might be competitively procured, and examines the practices of a number of different system operators to see how their experiences shed light on the procurement of black start services. It emphasizes the procurement structure of the Electricity Reliability Council of Texas (ERCOT) as a framework for making the procurement of black start competitive.¹

II. Why Competitive Procurement?

The first and most obvious question to ask is simply, why might competitive procurement be better than COS procurement? Those who advocate the competitive procurement of black start generally cite two reasons why competitive procurement might be a better solution than traditional COS. Both of these reasons relate to costs. There are two cost structures associated with black start, namely the direct procurement cost (which is generally minor; in ERCOT this is generally less than \$10 million per year), and the value of lost load

(VoLL) in the face of a blackout, which is obviously huge.

- *Reduced procurement cost:* competitive solutions are perceived to be cheaper than cost-based solutions as a general principle, so they are favored in the deregulated environment. Competitive solutions are seen as favoring and promoting lower-cost technologies and methods. COS systems have no efficiency incentive as the rate of

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return is often fixed and based on the capital employed. In the absence of innovative ratemaking methods COS methods favor greater capital deployment. This is a widely held view generally, although research on deregulation has returned mixed results.²

- *Institutional efficiencies:* it is quite possible to have an effective system restoration plan without competitive procurement, and many utilities have such plans. The benefit of a competitive solution is that their two- or three-year contracting cycle forces the periodic re-examination of system restoration studies, and in this

manner counteracts any complacency. Competitive procurement provides a natural cycle to keep system restoration studies up to date. Cost-based systems, especially at integrated utilities, are often very long term and they are perceived to be more vulnerable to complacency. While the direct procurement costs are minor, the VoLL is huge, and a more efficient restoration program, born of an institutional periodic re-examination of system restoration studies, holds the promise of decreasing the enormous costs associated with lost load. These savings could easily dwarf the savings associated with direct procurement.

Although the level of empirical research into black start provision is low there is a general presumption within the industry that ancillary services in RTOs should be procured competitively unless that is shown not to be possible due to some other over-riding concern, such as market power. Of the various ancillary services procured by RTOs, only voltage control and black start tend to be procured via COS rather than competitively.

III. Conditions for Competitive Procurement

A fundamental question to ask about black start is whether or not it can be competitively procured. Conceptually, competitive procurement works best when the

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