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Innovative Power Poles for Challenging Distribution Situations

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The growing severity of Australian bushfires, consequent property damage and all too often tragic loss of life have focussed utilities as never before on bushfire risks and their effective management. Pole top fires can initiate bushfires and poles can easily be destroyed with consequent loss of power supply, sometimes for days or weeks, impeding not only firefighting but also essential services re-instatement for community support and rehabilitation.

Other distribution system challenges experienced include termites, wet conditions, rust, rot and access difficulties for installation and inspection.

Initially almost universally wood, today's pole options include a range of manufactured alternatives engineered to meet specific challenges. Conductive poles include cement steel composite such as the Stobie, galvanised steel and steel reinforced concrete - spun, compressed or cast. Non-conductive poles include fibre reinforced plastics (FRP) and glass reinforced cement. All possess attractive individual properties sought by system designers but the pole selected will depend upon the needs of the specific system. Correct selection for the intended purpose is far from a simple choice based solely on first cost. The best value proposition for the individual circumstances is paramount.

System vulnerability is substantially dependent on the materials selected, especially for poles and crossarms for which the choice is wide; even wood having several variants. Increasingly manufactured poles offer a wide range of material options; producers can expand facilities to meet demand, arising either from traditional pole supply shortages or from technical analysis of desired system attributes and risk analysis of the location environment.

Pole selection and performance prediction is increasingly optimised using engineering principles associated with purpose made design software. Whole of life cost, and indeed lifetime performance, are increasingly included in the selection process.

This paper discusses Australian pole usage practices and the challenges faced by distribution system designers, operators and owners. The material properties and performance attributes of most common alternatives are discussed and compared objectively.