

UMS Group Inc. Custom Commissioned 'Voice of the Customer' Study Focusing on High Voltage Vacuum Circuit Breakers



COMPANY

A North American leader in the design and manufacturing of electric and electronic products, systems and services. They serve the North American power systems, rail transportation, and large visual display markets with electrical and electronic products, systems and services.



CHALLENGE/OVERVIEW

Vacuum interrupter technology is already commercially available and has been demonstrated to be highly reliable in medium voltage circuit breakers. These breakers use vacuum interrupters and dry air, a mixture of N₂ and O₂, as the insulation medium during switching functions. Expanding the technology up to 145 kV is in development and the client is expected to have this product commercially available in 2022. This client was looking to enhance the development process by incorporating customer feedback and information on features, benefits and drivers that may influence their consideration of this technology.

The client engaged UMS Group to facilitate a Voice of the Customer (VOC) study of targeted electric transmission organizations, focusing on their needs and expectations of high voltage vacuum circuit breakers, in turn providing the client with valuable insights for their product development efforts.



METHODOLOGY

In preparation for the utility interviews, UMS Group worked with the client's High Voltage Team to scope a targeted engagement and interview process for leading North American companies. Development of the interview materials was an interactive process involving both the UMS Group and client teams. UMS Group led the client through a series of challenge sessions to define the desired VOC feedback in two focal areas of Commercial and Technical requirements.



SOLUTION

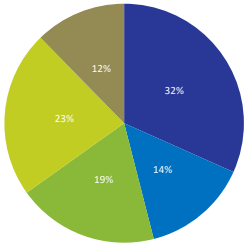
Using our extensive list of industry contacts, UMS Group attained participation of 20 leading transmission organizations for the study. Participants were provided with a quantitative data survey for their completion. In conjunction with distribution of surveys, UMS Group scheduled and conducted phone interviews, reviewed survey answers, answered questions identified during a review of the responses, and gained a deeper understanding of their views. Transcripts of all interviews were shared with the client along with the UMS Group report compiling and summarizing survey results and insights.



RESULTS

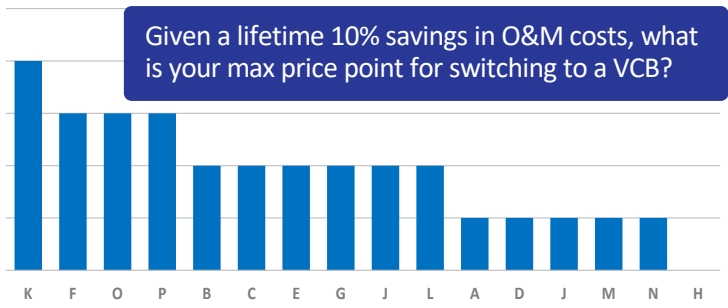
Key quantitative results were charted and graphed, accompanied by relevant captions / insights / takeaways for the client. Qualitative insights and findings were provided in both an executive summary and detailed discussion format of the final report.

Concerns to consider to have breaker at xxx Voltage



- Unproven technology that may or may not meet all of the current standards
- Environmental concerns of breaker are overstated
- Concerns of a (theoretically) larger equipment footprint
- Concerns of it (theoretically) being more costly than current product
- Other

Operation and maintenance costs over the life of the VCB



Sample Feedback:

What technical/design considerations make VCB a compelling choice?

- The most apparent and obvious is the elimination of greenhouse gas concerns / issues associated with SF6. Most respondents voiced concerns about future regulations in this area and acknowledged early constraint trending from international peers.
- Technical advancements that will reduce O&M over the life of the VCB is also a compelling factor.

Executive Summary

- All participating companies expressed that they have a favorable experience with VCB's at the low and medium voltage applications.
- Positive VCB experiences at low and medium voltages, specifically the high reliability, have translated into high voltage VCBs as the preferred alternative to SF6 CBs if all technical specifications specific to system needs can be met.
- Survey results support this preference by 65% of respondents indicating they are interested in this technology to mitigate the risk of SF6 gas emissions.
- Some western region respondents are under increased pressure from stakeholders to reduce SF6 gas emissions – i.e. internal 'green' initiatives as well as increased regulatory oversight for reporting. Others believe they will face similar challenges in the near future so they are very interested in moving to VCBs. Information regarding the EPA's activities in this area can be found at <https://www.epa.gov/f-gas-partnership-programs/electric-power-systems-partnership>.
- The following were identified as considerations for technology adoption:
 - Capital costs
 - Operational and maintenance (O&M) cost savings
 - Physical footprint of the breaker
 - Standards for alternatives



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