

Vancouver startup addresses methane emissions in natural gas sector

Shape memory alloys a key technology in valve that reduces methane emissions at natural gas wells



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Dean Pick, president of Kinitics Automation, with actuators that can replace pneumatic valves at natural gas wells that release methane. | Chung Chow

Every time a pneumatic valve at a natural gas well is triggered, a puff of natural gas is released, which is bad for the environment, since methane's global warming potential is so much higher than CO₂.

There are thousands of such wells in B.C. and other natural gas producing regions, so these thousands of small releases can add up to a big problem for a sector that faces increasing regulatory controls on methane emissions.

"We're talking about, collectively, tens of thousands of point sources of emissions in this province operating around the clock," said Dean Pick, president of Kinitics Automation, a Vancouver company that has developed a new type of actuator that replaces pneumatic valves.

The company just last week commercially launched its KVA38 valve, which is an actuator that uses electricity and shape memory alloys to activate valves in the oil and gas sectors, as well as in the chemical and aerospace sectors.

The company was founded in 2017 and currently employs 15 people. The KVA38 actuators have been used in field trials since 2022.

"We've got units in the field," Pick said. "Our focus currently is Western Canada with a particular focus on methane abatement."

Some oil and gas companies operating in B.C. have already switched out pneumatic valves with electric activators. One problem with these conventional activators is that they use motors, and if there is a power failure, they will fail to close.

"The Canadian Gas Association approached us and they told us about this pneumatic problem," Pick said. "They said, 'We're not happy with motorized electric actuators.'"

Pick came up with a design that replaces electric motors with wires made of shape memory alloys, which is a type of metal alloy that can "remember" its original shape and switch back to it.

Shape memory alloys can be made into one shape, then deformed to another shape, and then revert back to their original shape based on temperature changes.

Central to the Kinitics Automation actuators are assemblies created from bundled wires made from shape memory alloys. They are activated using electricity, which causes them to change shape. When they change shape, it opens or closes a valve.

However, if there is a power failure, the valve will close automatically, based on temperature changes, unlike motorized valves.

“Our technology is based around putting shape-memory alloys in industrial applications,” Pick said. “We can program shapes into metal. We’ve been able to demonstrate on our live test sites, in both B.C. and Alberta, that when the lights go off unexpectedly, our spring will close the valves and keep the pressure in the pipe.”

Oil and gas extraction in Canada is the single largest source of fugitive methane emissions. Pick expects there could be a big demand for his actuators in Western Canada, as provincial and federal government implement increasing stringency to methane abatement regulations for the oil and gas sector.

In B.C., the provincial government originally set a target in 2020 of reducing methane emissions by 45 per cent from 2014 levels by 2025. The BC Energy Regulator (BCER) has amended regulations under the *Energy Resource Activities Act* to increase B.C.'s methane reductions targets to 75 per cent below 2014 levels by 2030.

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