

The Titan search-and-rescue effort shows that risky undertakings need to consider any potential rescue needs

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Credit: AI-generated image ([disclaimer](#))

Since [the disappearance of the OceanGate submersible Titan on June 18](#), search-and-rescue operations continue for the missing submersible carrying five people to visit the Titanic wreckage. Teams from different countries—including the United States, Canada, the United Kingdom

and Germany—are joining the operations under a very tight timeline as oxygen runs out on the submersible.

[As the situation unfolds](#), questions are being raised about risk management, search-and-[rescue operations](#), costs and ethical aspects of responses to such incidents.

There is no doubt that, at this point, agencies participating in the search-and-[rescue effort](#) should do whatever is within their abilities for a successful operation while minimizing any potential additional risks.

These agencies include the [Canadian Coast Guard](#), [Transport Canada](#), the U.S. and Canadian militaries and private companies.

Ocean incidents

A significant number of economic activities—including shipping, fishing and offshore oil and gas drilling—are conducted in marine environments. These activities can lead to occurrences of accidents and casualties of different types.

Annually, a large number of incidents happen in the Canadian marine environment. Between 2011 and 2020, [284 occurrences were reported each year](#) that had an annual average of 15.6 fatalities during the same period.

These numbers suggest that relative to the huge number of marine activities and the number of incidents, conventional marine-based operations are relatively safe and the [emergency responses](#) to them are effective.

An unusual situation

The search-and-rescue operations [for the Titan](#) have been proven to be unusual, as measured by the complexity, costs, time sensitivity and scale. Unlike search-and-rescue operations on the ground that can be undertaken by volunteers and with little or no equipment, marine search and rescue is a [highly specialized operation](#).

It requires high-tech equipment, tools, training, co-ordination and capacity. In the current case, [the search-and-rescue area is not measured in square kilometers or miles](#)—rather, it is in cubic measurements (3D), because the vessel could be anywhere around the surface, in shallow or [deep waters](#), [or on the ocean floor](#).

While there are capable teams with the needed equipment and training, they are not sufficient to cover a large area with [limited information](#) or uncertainty about the situation.

Operational outcomes

If successful, this search-and-rescue operation will be among the costliest in recent history. We need to wait to see how much of this cost will be covered by insurance, OceanGate or the public.

If the operation fails, this will be a single incident that could count for about one-third of Canada's annual average marine fatalities if it's considered a Canadian incident.

Regardless of the outcome, this event will generate significant discussions around the public burden of private risks and risk-taking behaviors, and how risks in certain areas are regulated.

Particularly, it will bring to the forefront questions about [balancing acceptable risks with available emergency response capacities](#), including search-and-rescue.

Risk assessments

When embarking on risky operations, such as deep-sea touristic exploration, two elements need to be added to [risk assessments](#): 1) Do we have adequate and timely internal and external capacity to handle a potential incident?; and 2) What are the total response costs of an incident?

While certain risky activities or operations may be acceptable based on a private [assessment](#) of risk, they may not be acceptable if we ponder these two aspects.

Unfortunately, many conventional risk assessments, particularly in the private sector organizations, do not pay sufficient attention to available emergency response capacities.

When considering the information that is coming out [regarding the Titan's search-and-rescue operation](#), it's becoming clear that this small emergency has surpassed the capacity of the resources that were operating in the area.

That teams from other places and countries are joining the effort confirms this. However, even these additional resources may not be sufficient for this operation. It is only in the fourth day since the Titan's disappearance that a unified command center for search-and-rescue is taking shape.

Conducting a survey of available emergency response capacities to risk assessments can make a significant difference in risk management and regulation.

Similarly, many current risk assessments do not fully include emergency response costs in their calculations. While it is not a major consideration

for many regular daily activities and operations because the emergency response is within regular possibilities, certain operations—particularly on remote [marine environments](#)—ought to add these costs into their risk assessment.

In doing so, risks may become more or less acceptable in terms of mitigation policies and regulations. Incorporating these aspects into risk assessments and regulations could help ensure that private operators provide additional safety and risk mitigation measures and assume responsibility for incurred costs.

The priority in this case should be on the success of the ongoing search-and-rescue operations. This achievement alone will be a huge success for all involved. But we can observe this event as it unfolds, and implement lessons learned in [risk management](#) and regulation for future risky operations.

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