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What is the Reasonable Apportionment of Fault? The Case of the CNRL Emulsion Pipeline Failure

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In *Canadian Natural Resources Limited v. Wood Group Mustang (Canada) Inc. (IMV Projects Inc.)*, 2018 ABCA 305, the Alberta Court of Appeal very recently dealt with an appeal arising from a trial judgment involving a novel, though ultimately faulty, underground oil pipeline. The trial judge found all of the parties to be negligent in some respects, and that the Plaintiff had suffered damages in the sum of $45 million. On appeal, the trial judge's apportionment of responsibility was the principal issue.

The Plaintiff, Canadian Natural Resources Limited ("**CNRL**"), decided to build a buried 32 km emulsion pipeline between its Primrose East Plant and its Wolf Lake Plant that would carry extra-hot emulsion (a mixture of bitumen, hot water, and steam). Building such a pipeline underground was a singular undertaking that presented new engineering challenges. CNRL retained IMV Projects to provide it with engineering advice on the design and construction of the pipeline. Shaw Pipe supplied the pipe system, which consisted of a steel pipe, an anti-corrosion coating, insulation, and a waterproof outer jacket. Flint Field Services was retained to install the pipe. The emulsion pipeline had a life expectancy of 30 years. It failed after about three months of operations.

On the eve of trial, CNRL entered into Pierringer agreements with Shaw Pipe and Flint Field Services. Hence, the trial only proceeded against IMV Projects. While the legal liability of Shaw Pipe and Flint Field Services was no longer in issue, their responsibility for the damage to the emulsion pipeline still had to be determined in order to apportion responsibility to the various tortfeasors. The trial judge found that each of CNRL, IMV Projects, Shaw Pipe, and Flint Field Services were in some respects negligent, resulting in the eventual failure of the pipeline.

The pipeline failed for two basic reasons: flawed design and operational error. Firstly, it quickly became apparent that the pipeline system (supplied by Shaw Pipe with the approval of IMV Projects, and selected by CNRL) was very vulnerable to water penetrating the waterproof outer jacket. The insulation was permeable, and any water that leaked through the waterproof outer jacket would eventually find its way through the insulation to the steel pipe. Since the emulsion in the pipe was well over 100°C, when that water touched the steel pipe it would vaporize explosively, expand in volume, and damage the surrounding insulation. That would permit further water to penetrate, touch the steel pipe, and flash, thus repeating the cycle. During construction Shaw Pipe told Flint Field Services that small cracks in the waterproof outer jacket were tolerable. IMV Projects did not correct this advice, and CNRL did not appreciate the consequences of that representation. Due to inappropriate construction techniques used by Flint Field Services, the integrity of the waterproof outer jacket was compromised. The steel pipe would expand and contract, within acceptable tolerances, but it had to be properly supported in the clay and muskeg in which it was placed. Flint Field Services used backfill containing chunks of ice in certain areas, which caused some penetration of the waterproof outer jacket. In muskeg soil, the pipeline had to be held down by weights, but Flint Field Services failed to use proper weights, and used strapping that was too narrow to ensure stability. Further, Flint Field Services failed to place clay soil in muskeg areas to provide the necessary stability for the pipeline.

Secondly, against this background vulnerability of the pipeline to water penetration, a well blowout occurred in the Primson Lake field. Bitumen was produced at Primrose Lake by injecting extra-hot steam into the underground bitumen reservoir, and then recovering

the resulting emulsion at the surface. The steam would both liquefy the bitumen and create pressure to force it to the surface. In January 2009, bitumen started to escape from the underground reservoir. A failure of some sort (which was never clearly identified) had occurred in the producing wells, or the geological formations overlying the reservoir of bitumen, allowing emulsion to leak to the surface. The solution to the reservoir leak adopted by CNRL (and as directed by the Alberta Energy Regulator) was to reduce the pressure in the underground reservoir as quickly as possible. This resulted in CNRL flowing back extra-hot emulsion from the reservoir, directly down the pipeline, without cooling it sufficiently through the heat exchangers. This was not an instant solution; it took at least 11 days to release the pressure. Unbeknown to CNRL's operators, flowing back extra-hot emulsion pushed the pipeline beyond its design limits. The steel pipe expanded because of the extra heat, which caused deflection and further damage to the waterproof membrane. More water leaked in, hit the steel pipe, and vaporized. The pipeline system ultimately failed in many places.

The trial judge attributed 50% responsibility to CNRL, 20% to IMV Projects, 25% to Shaw Pipe and 5% to Flint Field Services. The relationship between CNRL, on the one hand, and IMV Projects, Shaw Pipe and Flint Field Services, on the other hand, was primarily in contract. The indemnity clauses in the applicable agreements, however, allocated responsibility for damage to "the Work" based on the negligence of each contracting party. The relationship between the parties was therefore a hybrid of contract and tort. The parties all applied a tortious analysis to the apportionment of responsibility for the damage to the pipeline. In determining the apportionment of liability, the Court of Appeal re-affirmed the use of the "comparative blameworthiness" approach, which requires the assessment to be based on fault, as opposed to causation or a combination of fault and causation. This approach requires a consideration of all the circumstances of the case to assess the degree of departure from the standard of care. The Court of Appeal outlined a number of relevant factors, such as:

- the nature of the duty owed
- the number of acts of negligence committed
- the timing of the negligent acts
- the extent to which the conduct breaches statutory requirements
- the likelihood of injury
- the gravity of the injury which might occur
- the costs of avoidance
- the general practice of those engaged in a similar activity
- the importance or urgency of the task
- other options or alternatives available to the parties
- whether one party had greater knowledge or greater control over the activities or the location

A significant feature of this case is that no party was found to be at fault for the well blowout itself. The exact cause of that event was never determined either by CNRL or the Alberta Energy Regulator. While the steam pressure used at the Primrose East field was higher than usual, the production method had been approved. This case was therefore distinguishable from many others, where at least one of the parties was at fault for every event leading to the damage. The Court of Appeal found that the construction of a pipeline with inherent vulnerability to water penetration fell largely on Shaw Pipe, the experts who designed, developed, constructed, and actively promoted the buried pipeline system. The problem was exacerbated when Shaw Pipe advised Flint Field Services that small cracks in the waterproof outer jacket could be tolerated. In fact, any penetration of water was unacceptable. Liability for the background vulnerability also fell to IMV Projects, whose specific responsibility was to audit the recommendations of Shaw Pipe, and recommend to its client, CNRL, a suitable pipeline system. Finally, Flint Field Services was partly responsible for inappropriate construction techniques that contributed to the problem. The Court of Appeal also found that the negligence of the CNRL operators in responding to the well blowout was a legal cause of the catastrophic failure of the Emulsion Pipeline.

The Court of Appeal concluded that the trial judge's apportionment of responsibility reflected a number of errors that undermined the ultimate outcome. Among other things, the Court of Appeal's view was that:

- Shaw Pipe's responsibility as the manufacture and vendor had been underemphasized;
- the role of IMV Projects had also been underemphasized;
- the apportionment did not reasonably reflect that CNRL was faced with an emergency situation (that did not result from its fault) and it had limited available options to respond; and
- the apportionment also did not reflect that CNRL's contributory negligence primarily related to only that one third of the pipeline that was exposed to the extra-hot emulsion.

The end result was that the apportionment of responsibility at trial reflected palpable and overriding error. Given the respective roles of the four responsible parties, the Court found that it was unreasonable to assess 50% of the fault to CNRL. Instead, a reasonable apportionment of fault for CNRL's damages was 25% to CNRL, 35% to IMV Projects, 35% to Shaw Pipe and 5% to Flint Field Services.

The CNRL decision is a very good demonstration of the myriad of factors which a Court will look at in assessing comparative fault. This is particularly relevant with respect to complex claims, such as oil and gas projects, which can involve a number of different professional disciplines. Further, it is important to focus on the degree of departure from the standard of care, and not issues of causation. Caution should be taken to ensure that these factors are addressed by expert evidence called at trial on the applicable standard of care.

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