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## Investigation Saves Money on Tank Explosion Claim

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### The Facts

A manufacturing plant contracted two welders to replace access doors on the outside wall of a building. To replace the doors, the welders used "air arc" cutting devices. They were working on a catwalk located above a storage tank containing No. 6 fuel oil.

No. 6 fuel oil is a thick, gooey substance that smells like fresh tar. At room temperature, it poses little threat as a combustible substance. When cool, it would be difficult to start a fire by throwing a match into an open container of the oil. It only becomes dangerous when subjected to changes required by industry.

To be used, No. 6 fuel oil must be heated. Heating the oil decreases its viscosity, making it flow more easily. Spray nozzles in the burner are then able to turn the oil into a mist for maximum burning efficiency. The flashpoint, or temperature where No. 6 fuel oil gives off enough vapors to sustain a flame, is 150 F degrees. It is at this temperature or higher that the plant usually heats the oil for use.

### The Explosion

During the cutting and welding operation an explosion of the fuel oil storage tank occurred. No one was seriously injured, but the plant suffered extensive property damage. Let's look at the factors that contributed to the explosion. No. 6 fuel oil in the tank was being heated to a temperature where flammable vapors were given off. It was being pumped to the boiler and unburned heated oil was recycled to the tank. Vapors collected in the headspace of the heated storage tank and excess vapors were vented into a moat surrounding the tank.

Before the welders began work to replace the doors, a hot work permit was signed by all parties involved - the welding company, the welders and the plant supervisor. This permit gave the welders the "green light" to begin the project. According to the hot work permit, the work area was a safe non-combustible environment. The welders were never made aware of the risks of working near No. 6 fuel oil.

They had placed flame resistant blankets on the catwalk to prevent sparks and molten metal from falling below. However, the blankets were insufficient to protect the tank from falling sparks. As a result, sparks and molten metal from the air arc cutters came into contact with the No. 6 fuel oil vapors around the tank and an explosion occurred.

## Settling the Claim

The plant's initial investigation found the welding company solely responsible for the loss.

If your insured is the welding company, how do you handle the claim? Sometimes it can be very difficult to determine and assign responsibility for such a loss. The Warren Group engineers developed a tool, called the Involvement Matrix, to make this task a little easier. The Involvement Matrix works by graphically depicting the parties involved and their responsibility for the loss. Let's plug the facts of this case into the matrix below to decide if the initial investigation was correct.

First, let's name the two parties involved - the manufacturing plant and the welding company. They are located atop the chart. A list of the causes contributing to the claim is located down the left side of the chart. Black boxes show who was responsible for each problem listed. As you can see from the chart, most of the black boxes are in the manufacturing plant's column. Yes, the explosion was started by the hot metal and sparks falling from the welding devices, but the plant had superior knowledge of the welding conditions and failed to properly inform the welder of the hazards, and ensure that the area was properly safeguarded from explosive threats.

Using the Involvement Matrix can be a valuable tool when settling a claim. The initial claim for this case was reserved for approximately one million dollars. The welding company settled out of court paying less than 40 cents on the dollar.

Investigating a No. 6 fuel oil or similar explosion can be a complicated task. The engineers at The Warren Group have experience with these investigations and would be happy to assist you on these claims.

[Download the Involvement Matrix here](#)

## Involvement Matrix

### Involvement or Problem Involved Parties

	Plant	Welding Contractor
No. 6 fuel oil vapors vented from day tank into surrounding moat	■	
The moat was not tested to check for the presence of explosive gas mixtures	■	
The moat contained No. 6 fuel oil and wood chips, both of which are flammable	■	
A hot work permit was issued without all of the proper safeguarding measures being performed	■	
Safeguards were inadequate to prevent sparks and molten metal from reaching flammable vapors in moat		■
A hot work permit was issued while an adjacent tank was being ventilated	■	
The welders were not notified of the release of flammable vapors by the plant	■	