



KEEPING *it legal* by Alex Taylor

No matter what kind of company you work for in the United States, there are plenty of regulations that you will have to deal with. Everyone is familiar with OSHA and the fines or other consequences that can result if an inspection determines that you have failed to comply with their regulations. When it comes to boilers or other pressure vessels, most states and municipalities also have local codes that require equipment to be periodically inspected by a state boiler inspector, the fire marshal's office, or another designated authority.

Annual or biennial inspections are ideally performed during a shutdown period or a convenient time when you can afford to have your boiler down. Planning ahead for this can save you from having additional down time that could cost your organization money. Even more importantly, having a contingency plan in place for your worst-case scenario could save you even more, should your equipment fail. When your boiler is down and you are under heavy stress to get steam or hot water back online, thoroughly considering everything necessary for a temporary replacement may be difficult. Often, one of the things that is forgotten is that in most parts of the country, rental boilers are not exempt from inspections.

Even if it is only temporary, most states will require an inspector to approve two things prior to allowing a fired pressure vessel to be brought online: 1. the vessel itself must be sound and must conform to code (for which an inspection certificate is issued), and 2. the installation must also meet or exceed local code (for which an installation permit is issued). The first inspection of equipment will require both an external and internal examination, so you will need to open the vessel and allow the inspector to see the fire side &

water side and determine the condition of the equipment. This can be avoided in most cases if the boiler has been registered with the state, granted a boiler number, and is still covered under the inspection period posted on its certificate. This inspection process can take several hours to complete, and it might be difficult to get an available inspector on short notice.

These delays may make it tempting to cut corners, but as with any regulatory enforcer, shortcuts should NEVER be taken. The immediate penalty of being caught is that you can face a hefty fine or immediate liability in the event of an accident. Depending on the inspector and the condition of the equipment, an inspector may “red-tag” (or effectively condemn) it and shut you down until they are satisfied that their prescribed changes have been implemented or until a more thorough inspection has been completed and documented. Not only could you possibly be down even longer, but losing the trust of your inspector will not make future inspections any easier. Most inspectors understand that your particular emergency may be an extenuating circumstance, and they simply may be unable to physically get to the site; at their discretion, you may be given permission to proceed with start-up, pending an inspection at a later date. It is advisable to get such permission in writing, if possible.

Just like renewing the registration on a vehicle, there is also a fee associated with both the inspection certificate & the installation permit. In many states, an installation must be performed by a licensed contractor or installer, and they will be responsible for applying for a permit. These fees vary from state to state, coming in the range of \$20-200 for the inspection certificate and either a flat or hourly fee for inspecting the installation. WARE advises clients to contact their boiler inspector office to verify what is needed to make a temporary boiler compliant with local regulations. When you are trying to get back online, the last thing you need to do is risk being shut down, so do yourself a favor and keep it legal—it will save you a lot of trouble down the road!

Using Steam to Unlock Oil Reserves

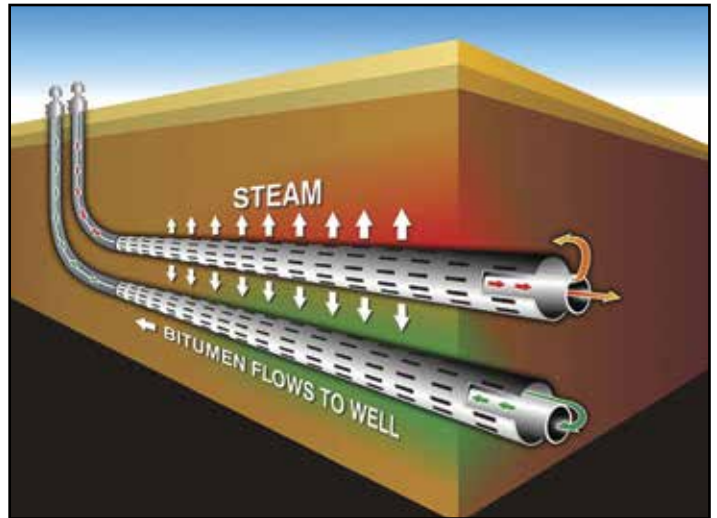
Even with the price of oil unseasonably low, the quest for new forms of energy must forge on. Gaining access to oil reserves previously too expensive to develop is all made possible with steam. Steam Assisted Gravity Drainage or (SAGD) is one process to extract oil from large “oil sands” reserves.

The oil sands, also known as the tar sands, are largely located in remote areas of Canada and Venezuela. With approximately 450 billion barrels of oil between the two countries, those reserves match the approximate size of the oil reserves in Saudi Arabia. Oil sands are either loose sands or partially consolidated sandstone containing a naturally occurring mixture of sand, clay, and water, saturated with a dense and extremely viscous form of petroleum technically referred to as bitumen.

Previously this bitumen was mined by primarily traditional surface mining extraction methods which leaves an indelible mark on the land. SAGD allows access to the bitumen using a far less invasive strategy.

How does SAGD work?

It's actually very simple. Two parallel wells are dug, tapering into two parallel horizontal wells. The top well is known as the steam injection well. The bottom well is known as the production well.



After the wells are dug, steam is forced into the injection well. The steam heats the surrounding bitumen which loosens/liquefies the mixture making it less
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STEAM – It's Going Places



Steam has been powering industry for hundreds of years. It was also used to move people from a to b, develop the United States, and gain access to resources that spurred the industrial revolution.

Did you know portable boilers have been around since the 1800's? They originally gained popularity with the invention of the high pressure steam engine by Richard Trevithick. With the industrial revolution gaining steam, pun completely intended, the high pressure steam engine became a necessary piece of the puzzle to success.

In February 1804 the world's first locomotive-hauled railway journey took place as Trevithick's steam locomotive hauled a train along the tramway of the Pen-y-darren Ironworks, in Merthyr Tydfil, Wales. His technology would be pivotal to the success of the United States and their development of the western regions.

In the 1860's farmers began using portable steam boilers to run their threshing operations. The original portable boilers were run off of coal or wood. Some farmers figured out how to use the straw by product from the threshing operation to fire their boilers. One might call them the first biomass fired boilers.

Also, in the 1860's the oil industry's need for steam power was growing. It wasn't based solely on drilling or pumping oil wells, but also for refineries and even for river vessels that transported oil. By 1863 a company called Wood, Taber

and Morse manufactured and sold portable steam engines from 3 to 20 HP for \$350 to \$1500, most of which went to facilitate the steam needs of the oil boom.

In the early 1900's, steam powered automobiles were a major contender to gas powered automobiles. Of the 4,192 vehicles accounted for being produced in the United States in the 1900 Census, just 936 of them ran on gasoline, 1,575 were electric, and 1,681 ran on steam. There were a few drawbacks to steam powered cars, one being that it was estimated that a steam engine would use 4.5 liters of water per mile; for long distances, one would need inconveniently large tanks. Another drawback was that it took 10 to 15 minutes for the car to "warm up."

In 1933 the first steam powered flight was achieved by George D. Besler and William J. Besler's flying over Oakland California. It was powered by a two-cylinder, 150 hp (110 kW) double-expansion V-twin reciprocating engine and was said to be so quiet that people on the ground could hear them calling to them from the air.

All throughout history, steam has been used in a portable manner. In today's day and age, portable steam can be generated by trailer-mounted industrial steam boilers. WARE is a leading provider of portable steam solutions that can be deployed at any time to meet needs for emergency steam production. For more information about WARE's portable rental fleet, call us today! (502) 968-2211

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List

All equipment listed is for sale or lease and subject to availability

Unit	HP/PPH	Year	Manf.	Fuel	Type	PSI	Ctrl.
779	82,500	2013	Victory Energy Limpsfield	G/#2	Steam	350	IRI
767	75,000	2011	Victory Energy	G/#2	Steam/SH	750/750	IRI
747	75,000	2000	B&W (Low NOx)	G/#2	Steam/SH	750/750	IRI
750	70,000	1996	Nebraska (Low NOx)	G/#2	Steam/SH	750/750	IRI
709	60,000	1979	Zurn (Low NOx)	G/#2	Steam	500	IRI
741	60,000	1979	Zurn	G/#2	Steam	550	IRI
SB79	40,000	1986	Cleaver Brooks	Gas	Steam	260	IRI
496	800	1990	York-ShipleY (Low NOx)	G/#2	Steam	200	IRI
634	800	1972	York-ShipleY	G/#2	Steam	150	IRI
620	800	1975	York-ShipleY	G/#2	Steam	250	IRI
SB139	500	2001	Cleaver Brooks		Steam	150	
SB138	350	1994	Cleaver Brooks		Steam	150	
SB137	250	1994	Cleaver Brooks		Steam	150	
415	250	1980	Eclipse	#2 Oil	HT/HW	954	IRI
SB148	200	1995	Kewanee	Gas	Steam	325	IRI
SB146	200	1995	Kewanee	Gas	Steam	325	IRI
SB216	250XID	2015	York-ShipleY(Low NOx)	G/#2	Steam	150	UL/CSD1
SB213	175XID	2014	York-ShipleY	G/#2	Steam	150	UL/CSD1
SB220	175XID	2015	York-ShipleY	G/#2	Steam	150	UL/CSD1
SB210	175XID	2014	York-ShipleY	G/#2	Steam	150	UL/CSD1
SB217	150	2015	York-ShipleY	G/#2	Steam	150	UL/CSD1
SB224	150	2015	York-ShipleY	G/#2	Steam	150	UL/CSD1
RB769	150	1998	Precision	Electric	Steam	150	UL
SB225	100XID	2015	York-ShipleY	G/#2	Steam	150	UL/CSD1
SB221	100XID	2015	York-ShipleY	G/#2	Steam	150	UL/CSD1
SB222	50	2015	York-ShipleY	G/#2	Steam	150	UL/CSD1

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continued
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List

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Unit	HP/PPH	Year	Manf.	Fuel	Type	PSI	Ctrl.
SSB33	50 hp	2015	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB32	150	2015	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB20	175XID	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB25	250XID	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB14	300XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB15	500XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB28	600XID	2012	York Shipley	(Low NOx) G/#2	Steam	250	UL/CSD-1
SSB30	800XID	2014	York Shipley	(Low NOx) G/#2	Steam	250	UL/CSD-1

Unit	Size	Manf.	Volt.	Type	Year
RC-24	30 ton	Mc Quay	480v	3 ph	2000
RC-21	40 Ton	Mc Quay	480 v	3 ph	1999
RC-1	60 Ton	Mc Quay	480 v	3 ph	1995
RC-2	60 Ton	Mc Quay	480 v	3 ph	1995
RC-13	60 Ton	Trane	200-230 v	3 ph	1989
RC-5	95 Ton	Mc Quay	480 v	3 ph	1995
RC-6	105 Ton	Mc Quay	480 v	3 ph	1995
RC-8	155 Ton	Mc Quay	480 v	3 ph	1995
RC-10	195 Ton	Mc Quay	480 v	3 ph	1995
RC-11	195 Ton	Mc Quay	480 v	3 ph	1995
RC-25	300 Ton	Mc Quay	480 v	3 ph	2003
Two Water Cooled	200 Ton	Trane	480 v	3 ph	2015

Chillers



Contact your local representative
 (800-228-8861)
 for Steam Studies

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Using Steam continued from pg. 2

viscous and free flowing. Gravity allows the mixture to seep into the bottom production well. Pumping equipment is then used to take the bitumen to the surface where the water and oil are separated and go through a "clean up" process that readies the oil for commercial use.

SAGD is not the only way you can access the oil in the oil sands using steam. There is also a method called Steam Enhanced Extraction, or (SEE) for short. SEE is also known as steam flooding – aptly named, steam flooding is a process by which steam is pumped into the ground and forces steam horizontally. As the steam cools it turns back into water (hence "flooding") and forces its way into a nearby production well. This method is not only used to extract bitumen, but is used to remove contaminants from the ground.

At the heart of these enhanced oil recovery methods is steam. Having a resource that can properly select a steam boiler for these applications is critical to the operation's success. For more information about industrial steam boilers for SAGD and SEE applications, contact WARE today (502) 968-2211.

Check out our video "History of Portable Steam Boilers" on WARE's YOUTUBE channel WAREBOILERS.



All net proceeds from the sale of SteamWARE T-shirts go to Kosair Charities, where health care is provided to Children when there is no one else to turn to.

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