

This article is from
issue Number 2, 2020, of

Technical Quarterly

a journal dedicated to the applied and practical
science of the brewing industry published by the
Master Brewers Association of the Americas,
a non-profit professional scientific organization
dedicated to advancing, supporting, and encouraging advances
in the brewing of malt beverages and related industries.

This file is posted with the authorization and permission
of the Master Brewers *Technical Quarterly* Editorial Board.

Through the efforts of Master Brewers membership and authors, like those associated with this article,
Master Brewers leverages the collective resources of the entire brewing community
to continually improve the processes and products of our membership.

For more information on this and other topics
related to the brewing industry,
we invite you to visit Master Brewers at
mbaa.com



CONSULTANT PERSPECTIVE

EHS Compliance: Don't Let What You Don't Know Hurt You

Keith Robinson

Civil & Environmental Consultants, Inc., Worthington, OH 43085, U.S.A.

ABSTRACT

Brewers must recognize that good risk management, as well as good safety and environmental practices, must play an integral role. There are costs associated with safety and environmental compliance; how-

ever, failure here can lead to more costly issues down the road, including injured employees and potential fines. Focusing on safety and compliance can reduce costs in the long run.

It has been said that brewing beer is part art, part science, and part magic. It is also a manufacturing process. As of 2018, there were more than 7,000 breweries in the United States producing more than 182 million barrels of beer. Craft brewers, defined as breweries where less than 25% of the business is owned/controlled by a beverage alcohol industry member and annual production is less than 6 million barrels/year, account for approximately 24% of sales in the U.S. beer market. As the industry grows, brewers must recognize that good risk management, as well as good safety and environmental practices, must play an integral role.

As with everything else, there are costs associated with safety and environmental compliance, and those costs can be scary. Money spent on compliance is money not spent on grain or other raw materials used to make beer, nor on marketing to advertise and sell beer. However, failure to account for those costs can lead to more costly issues down the road. Employees, your most important resource, have been seriously hurt and even killed brewing beer. Improper management of brewery wastes and discharges can lead to significant citations. Not only do these issues adversely affect a brewery's reputation, but they also have a significant negative impact on their bottom line!

As with any business, there are many regulations to comply with on a federal level and on a state level. Breweries are regulated by the Alcohol and Tobacco Tax and Trade Bureau, Occupational Safety and Health Administration (OSHA), U.S. Department of Transportation, and U.S. Environmental Protection Agency, to name a few. Do you have a firm grasp of the applicable environmental, health, and safety (EHS) regulations that may apply to your business?

Keith Robinson lives in Columbus, Ohio, and works for Civil & Environmental Consultants, Inc., as the Vice President of Safety. He has been a safety professional and a home brewer for the past 30 years. He strives to combine his passion for both in a positive and productive way.

E-mail: krobinson@cecinc.com

<https://doi.org/10.1094/TQ-57-2-0325-01>
© 2020 Master Brewers Association of the Americas

Health and Safety Compliance

According to the Occupational Health & Safety website (1), OSHA citations at breweries more than doubled between 2010 and 2015, and the number of nonfatal injuries and illnesses in breweries went up 57% during that time. There were also nearly four times as many safety violations at craft breweries in recent years as at large breweries, according to Reuters (2). Since 2014, OSHA has conducted 63 brewery inspections, resulting in 149 regulatory violations and \$297,093 in penalties, according to OSHA's Establishment Search page (3).

Some of the common hazards and regulatory requirements include the following:

- Ergonomics: injuries due to repetitive motions, awkward body positions, and improper material handling
- Walking and working surfaces: wet and slippery floors, trip hazards, and tight spaces
- Fall protection: required when working at heights above 4 feet
- Confined spaces: cleaning, servicing, and performing maintenance inside fermenters, grain silos, mash tuns, kettles, and more
- Forklifts/powered industrial trucks: failing to train employees to safely operate forklifts and powered trucks in transporting raw materials, move and reach equipment, and lift heavy items
- Chemical safety and hazard communication: a Hazard Communication Program to inform and protect employees of the hazards associated with the chemicals they use, such as cleaning agents
- Personal protective equipment: for example, safety glasses and steel-toe boots when working with boiling water, toxic cleaning chemicals, and hazardous vapors
- Electrical safety and lockout/tagout: equipment must be locked out and energy sources secured when performing maintenance or servicing
- Thermal burns: insulation or guarding from exposed surfaces with a temperature of 140°F or more and within 7 feet of the floor or working platform or within 15 inches of stairways, ramps, or fixed ladders
- Machine guarding: guard bottle indexers, rotating pressure bottlers, conveyors, cappers, labelers, mills, screw

conveyors, pumps, case packers/un-packers, case sealers, pallet stretch wrappers, and others including rotating shafts, chains, and sprockets

Although injuries differ in severity, there were several serious injuries (and deaths) in breweries between 2009 and 2015. Flash fires from welding on fermentation tanks, severe burns from boil-overs, overpressurized kegs exploding, confined space entry fatalities, and people being run over by a forklift have all occurred at breweries (4), both large and small.

The news is not all bleak, however. Over the last few years, the Master Brewers Association of the Americas and the Brewers Association (BA) have worked diligently to improve the safety records of craft breweries. There has been a decline in incident rates over the years. So, while there is still a long way to go, strides are being made.

Environmental Compliance

Wastewater Compliance

On average, breweries use 7 gallons of water to produce 1 gallon of beer. The wastewater generated during the brewing process is considered industrial waste, and the process effluent discharge is high in nutrients (mostly organics). Depending on the brewery effluent volume and concentrations, you may need to pretreat your wastewater prior to discharge. Between 2008 and 2015, D. G. Yuengling & Son (Yuengling), the oldest operating brewing company in America, violated pretreatment permit requirements and had to pay a fine of \$2.8 million (5) and “make significant facility upgrades and operational changes.”

Stormwater Compliance

Permits will likely be needed if you are going to discharge to the ground or surface water. Check with your state agencies to determine if an industrial stormwater permit or certificate of no exposure is needed.

Solid Waste/Hazardous Waste Compliance

Your brewery will also generate solid waste and may generate hazardous waste as well. Hazardous wastes may include cleaners, light bulbs, or batteries. These wastes must be properly managed and disposed of.

Air Compliance

Most breweries are small enough that they do not have to worry about air permits. Boilers are likely the biggest reason a brewery would need an air permit. However, grain handling and

drying equipment, back-up generators, and the fermentation process may also contribute to the need for an air permit. You may also need an air permit to control the volatile organic compound (mainly ethanol) and carbon dioxide (CO₂) loss that occurs during the fermentation and bottling processes.

Identifying the Return on Investment (ROI) of EHS Compliance

It is likely difficult for management to see the ROI when discussing EHS. It is far easier to see the ROI when discussing brewing ingredients and physical objects such as tanks, bottling lines, and brewing vessels. If managers in your company (your CEO, your CFO, your HR Department, your production line, etc.) do not understand EHS regulations or their importance, they likely will ignore compliance or the necessary training. If management doesn't take EHS compliance seriously, then the employees won't either. Yet your employees are your most important resource and asset!

So how *do* you identify the ROI of EHS compliance? A focus on EHS can reduce costs in the long run. A focus on environmental compliance can reduce violations that result in fines. A focus on health and safety can reduce and/or prevent:

- The number, severity, and financial impacts of injuries
- Insurance and worker's compensation costs
- Equipment downtime and product loss
- A tarnished reputation with your customers

Where to Go for Help

All of these issues can be overwhelming. For many, it is easier to ignore them rather than deal with them, hoping that nothing happens. I realize that this is a bit cliché, but with respect to safety and environmental compliance, brewers don't know what they don't know. So how do you find out?

There are resources out there that can provide guidance and support to brewers to ensure that they keep their breweries safe and compliant. The Master Brewers, BA, and most state brewers' organizations provide safety and compliance assistance and resources. Also, brewing is one of the most collaborative industries around, and many other brewers are willing to help and provide assistance when they can. Lastly, there are consulting companies with the knowledge and experience to evaluate your current levels of compliance and come up with plans designed to close any gaps. I realize that many think that consultants are expensive. However, look at it as an investment. If a consult-

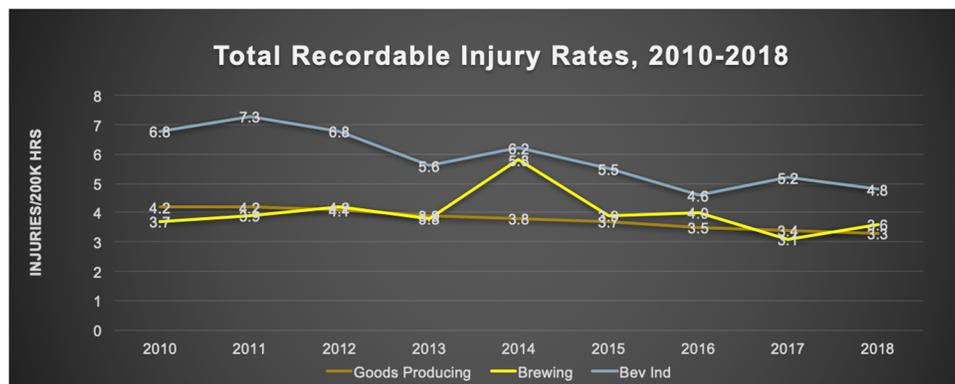


Figure 1. Brewery recordable injury rates 2010–2018. ©Brewers Association. Reproduced by permission.

ant's visit prevents a major injury to an employee or an expensive citation from a regulatory agency, it is worth the investment.

REFERENCES

1. Wastradowski, M. 2016. Brewery safety: Common violations and how to stay safe. <https://ohsonline.com/blogs/the-ohs-wire/2016/07/brewery-safety.aspx>.
2. Pell, M. B. 2013. Insight: Fast-growing U.S. craft brewers struggle with worker safety. <https://www.reuters.com/article/us-brewing-safety-idUSBRE96B0MW20130712>.
3. Occupational Safety and Health Administration. 2020. Establishment

search. <https://www.osha.gov/pls/imis/establishment.html>.

4. American Brewery Insurance. 2015. The worst brewery injuries. <http://www.americanbreweryinsurance.com/blog/the-worst-brewery-injuries>.
5. U.S. Environmental Protection Agency. 2016. <https://www.epa.gov/enforcement/dg-yuengling-and-son-inc-clean-water-act-settlement>.

SUGGESTED RESOURCES

- Master Brewers Brewing Safety Resources: <https://www.mbaa.com/brewresources/brewsafety/Pages/default.aspx>
- Brewers Association Safety Resources: <https://www.brewersassociation.org/resource-hub/safety/>