DRINK INDIGENOUS

Planning New Glarus' Brewery expansion

Drink Indigenous – No other brewery represents this idea as much as the Wisconsin based craft brewery New Glarus Brewing Co. Although only selling its outstanding and award-winning beers in its home state Wisconsin, New Glarus Brewing has become one of the nation's 20 largest craft breweries and the 25th largest overall brewing company in the USA if you count all breweries including MillerCoors and Anheuser-Busch.

Named for the small Swiss-style town south of Madison, Deborah and Dan Carey started in 1993 the brewery with used equipment and a yearly capacity of 3,000 barrels. Moving fast forward, nearly 25 years later in 2017 the brewery produced a staggering 240,000 barrels per year. This success is no coincidence. Deborah, with her entrepreneurial spirit and far-sighted business sense together with Dan, a devoted diploma master brewer, both then and now build the perfect hardworking team ensuring continuous success and growth of the brewery. From the humble beginnings down-town New Glarus to the state-of-the-art brewery located just outside New Glarus at the top of a hill over-looking lush farmland, the brewery has established itself as a producer of world-class beers not just around the state, but around the nation. With a growth rate of 10 % per year, anticipating similar growth in the future and to meet the growing customer demand for New Glarus' beers, with distinctive names like: Spotted Cow, Fat Squirrel and Moon Man. New Glarus Brewing Co. contacted BeerBev LLC, a consulting and engineering specialist, to jointly develop, plan and design an expansion of the brewery by extending the existing fermentation and storage area.

Dan Carey

New Glarus Brewery

Joachim Gunkel

BeerBev LLC

This was not the first contact between the both companies as over the last years BeerBev has successfully supported New Glarus on several projects such as the installation of a new canning and bottling line as well as the engineering and design for a craft distillery.

Planning the future

The expansion project scope covered value and detailed engineering, design, planning and tendering of a new fermentation and storage cellar to sustainably increase the production capacity, while taking process specific requirements, high process flexibility, peak season capacity, local regulations as well as layout limitations into account. In addition to this, it was required to ensure an efficient and process orientated integration of the new fermentation and storage cellar into the existing process. As the fermentation and storage area expansion cannot be seen as a stand-alone, BeerBev applied a holistic project approach to ensure a sustainable extension of the production capacity without causing any limitations in the existing process. Applying a holistic project approach means here to take the entire brewing process from malt intake to filling and packaging into consideration, including the scope relevant supply of refrigeration capacity, water and CO₂.

In order to define the required cellar capacity, BeerBev carried out a thorough capacity calculation for the new cellar. This calculation was based on the annual required capacity, while factors such as peak season demand, fermentation and storage times for different beer types, brew schedule, working days per week and year, as well as extract losses throughout all the steps of production are taken into consideration.



Delivery and installation of the new tanks



Individual process solution

Brewing outstanding beers continuously with consistent flavor profile and of highest quality demands innovative and individual technical solutions.

To maintain these high standards, it was of utmost importance to review applicable technologies and evaluate important project objectives and requirements together with the team of New Glarus to ensure a sustainable expansion of the fermentation and storage cellar. BeerBev developed therefore several scenarios out of the value engineering.

After reviewing the different solutions and analyzing the arguments, New Glarus Brewing decided to integrate existing cylindroconical tanks, currently used as bright beers tanks, into the existing pipe fence and to extend the pipe fence to handle eight additional new fermentation vessels. For the bright beer cellar, eight new tanks with double-seat manifolds were considered, allowing a fully automated bright beer cellar until the beer filling area for bottles, cans and kegs.

In consideration of all the process relevant details and information (e.g. tank sizes, cooling rates, tank surfaces, CIP concept) that were discussed with New Glarus Brewing during the project assessment, BeerBev developed detailed process and instrument diagrams (PIDs) for the different production, beer filling and refrigeration area.

Main project parameters

In close cooperation with the team of New Glarus Brewing, BeerBev defined the following main project parameters:

- Flavor match for the new cellar
- No interruption of beer production during the installation
- Highest possible process flexibility
- High automation level
- Highest production, operation and energy efficiency
- Highest hygienic design standards
- Highest quality standard of the equipment
- Coordination of all project interfaces.

Layout planning

Based on the calculations for cellar capacity and the definition of the number of tanks required



The layout for the cellar expansion

for fermentation and storage (cylindroconical and bright beer tanks), BeerBev developed several concepts for the cellar extension (e.g. outdoor, on top of building, indoor with and without insulation) to identify the best CAPEX and OPEX solution which also has to meet specific project requirements regarding building dimensions, compliance with local requirements, architectural aspects as well as the process integration.

Together with the BeerBev team, New Glarus Brewing Co. reviewed the provided concepts and related locations on the breweries premises. The team decided to go for an indoor location of insulated tanks in a new building close to the existing fermentation and storage cellar.

BeerBev provided all civil work relevant data like foundation details, drainage concept, etc.



New Glarus Beers are in high demand, but they're only available in Wisconsin.

The challenging architectural and civil work design was enthusiastically mastered by Katherine May, daughter of Deborah and Dan.

Tender Process

Following the detailed engineering, BeerBev provided New Glarus Brewing with a comprehensive tender documentation and related tender management for the project, including all scope relevant engineering and commercial terms and conditions to allow for a proper tendering procedure. Accordingly, this allows an objective and project centric comparison of the different supplier proposals.

BeerBev developed two tender packages for this expansion project. One package covered the tanks (CCTs and BBTs) only while the other one covered the coldblock (pipe fence and double-seat manifold) only.



Cooperation in all aspects (f.l.t.r.): Joachim Gunkel, BeerBev; Dan Carey, New Glarus; and Stefan Castritius, Beer Bev

This approach ensured that only qualified and capable suppliers would submit proposals. Each tender package contained the following:

- Description of the scope of work
- Drawings (layouts, equipment & tank drawings, PIDs, etc.)
- Technical specification sheet
- Definition of KPIs
- Interface definition
- Definition of the acceptance procedure
- Installation, start-up&commissioning procedure and timeline
- Commercial terms & conditions
- Warranties
- Life cycle costs total cost of ownership (TCO)
- Price sheet data
- Performance trials and guarantees
- Applicable codes/norms
- Definition of brands, types and makes
- Highest quality standard of the equipment
- Coordination of all project interfaces

New Glarus Brewing, as project owner invited several suppliers from Europe and the USA to quote on this expansion project. Afterwards, BeerBev reviewed, compared and evaluated in detail each tender submission to ensure that the technical scope as well as the commercial terms and conditions were tender compliant and complete.

Based on the tender evaluation in regard to quality, efficiency and total-cost-of-ownership, New Glarus selected the following suppliers:

Edel Tank GmbH, Germany, to supply eight new fermentation tanks (CCT) and eight new bright beer tanks (BBT) according to ASME code.

Albert Handtmann Armaturenfabrik GmbH&Co. KG, Germany, for the supply of the coldblock process equipment for the new BBTs and CCTs, as well as the integration into the existing coldblock process.

The new tanks and process equipment for the fermentation and storage cellar extension were installed in summer/autumn 2017 and by January 2018 the new fermentation and storage cellar was successfully and smoothly put into operation, allowing New Glarus to produce more than 400,000 barrels of their unique beers per year.