

WILLIAMS ENERGY



HYDROCARBON LIQUID

Williams Energy relied on an open shop construction strategy for its Redwater plant expansion.



CONSERVATION PROJECT

Thanks to a period of high oil and gas prices, demand for industrial construction in Alberta has been very strong. One recent project in the oil and gas sector is the Williams Energy Hydrocarbon Liquid Conservation Project. The Williams project is an interesting study on many different fronts — it is technically sophisticated; illustrates some new construction labour strategies and offers a glimpse of the potential to expand the province's petrochemical industry.

In a joint interview, Mike Hantzsch, vice president of business development and Michele Coughlin, senior representative of government and community affairs provided details of the project as it neared completion.

The project was centered around expansion of Williams' liquids fractionation plant in Redwater, located 30 kilometers northeast of Edmonton. The Redwater fractionator has been in operation since 1998, separating natural gas liquids such as ethane, propane and butane from feedstock which came from a variety of sources, including Williams' plants in northeastern B.C.

The expansion was designed to utilize a new feed source – off-gases from the coking process at an oilsands plant – and to produce a new product-polymer grade polypropylene. According to Coughlin, the size of the expansion does not reflect its importance to Williams Energy. "Expansion only produced a 20 per cent increase in throughput but it is a high value throughput," she says. Her comment about value is very relevant. To politicians and economists, "value added" is the holy grail of economic development and the term rolls from their lips at every opportunity. There is perhaps no better example of "value added" than the Williams project.

The project consisted of two parts – the construction of new facilities in Fort McMurray and the expansion at Redwater. In Fort McMurray, the liquids-rich gases produced in the upgrading of bitumen are captured, then in Redwater, the components are separated. The coking process, which is integral to upgrading the raw bitumen derived from oil sands mining into marketable crude, produces off-gases rich in liquids. Williams has constructed a facility at Suncor's Fort McMurray oil sands operations that compresses the off-gases and sends them to another adjacent Williams plant that strips the liquids and returns methane gas back to Suncor to be used as fuel. The liquids are pipelined in batches to the Redwater plant.

"This is about a best use of a resource," explains Coughlin. "Rather than having it burnt as fuel, we take valuable liquids out of the gas stream – components that have the potential to support a whole list of downstream enterprises – and at the same time return a pure methane fuel that is cleaner and more environmentally friendly."

In addition to taking advantage of a new source of feedstock, the Redwater project allowed them to bring on a new product – polymer grade propylene. Propylene is the raw material for producing polypropylene, which in turn shows up as the plastic components in a myriad of

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consumer products. The Williams Redwater plant is the only facility in Alberta that can produce the 99.5 per cent pure polymer grade of propylene required for feedstock in the manufacture of polypropylene.

The key to producing the polymer grade of propylene, and the reason for the construction at Redwater, was the installation of a new 600-ton vessel that allowed a pure propylene fraction to be split out of the liquids stream. Installing a new processing train for that new vessel required a major construction effort. Hantzsch and Coughlin estimate the price tag for the new facilities at both the Redwater and McMurray parts of the project at \$350 million, with the costs split about evenly between the two sites.

Construction was also an interesting aspect of this project in that it involved both union and open shop subcontractors. Typically in Alberta, very large industrial projects have been built on a union-only or project agreement model. That is the case for current expansions at Suncor and Syncrude and for Shell's entry into the oil sands mining business. While open shop contractors have always been active in the industrial market, they are usually only chosen by owners for small and medium-sized projects. For the Williams project, the Fort McMurray facilities were built by union forces while the Redwater expansion had a large portion of the work completed by open shop contractors.

Milestone Construction, part of the Edmonton-based Churchill group, was responsible for some of the civil and structural work and the majority of the mechanical work at Redwater. Len Draganiuk, Milestone's superintendent for the Williams expansion at Redwater, describes the project as both interesting and demanding due to the fast track design and construction process. The most challenging aspect of the project, Draganiuk says,

was responding to scope changes, explaining how the initial scope of work, first estimated at 12,000 lineal inches of welding, grew to 32,000 as the design process and construction proceeded.

With the amount of construction underway in Alberta, manpower availability is a concern on all projects. Redwater's proximity to Edmonton allowed work to proceed without a camp, but it also meant competing for manpower in the Edmonton-area market which included the huge Shell refinery expansion that is located within sight, across the North Saskatchewan River from the Redwater plant.

Despite the challenges of a tight labour market, Milestone is proud of their safety and productivity statistics. Draganiuk cites 500,000 hours worked with no lost time accidents and 130 pieces of equipment set with no craneage or rigging incidents.

Productivity on industrial construction jobs is of increasing concern to owners. Several recent large, high-profile projects have experienced serious cost increases directly related to labour productivity. In this area, Milestone's management believes the open shop option returned big dividends to the owner. Despite changes that saw the work expand to twice its original scope, they were able to deliver with only a month added on to the schedule and put in place the 35,000 meters of pipe and 32,000 diameter inches of welding with a less than three per cent x-ray rejection rate. The productivity and schedule performance is even more impressive when you consider the fast track design and construction mode and that the new construction took place within an operating facility and approximately 50 per cent of construction hours were done under work permits.

Also of concern to owners of industrial construction is the potential for labour unrest. The Redwater project was note-

worthy on this front as well. The project was of particular interest to the U.S.-headquartered building trades unions who enjoy a near monopoly on large industrial projects in the Fort McMurray area. The presence of open shop contractors on the Redwater site was not well received by union officials, especially as it had been expected that the project would be built by union forces.

This union attention resulted in organizing attempts directed at some of the open shop contractors working on the site. Two Merit contractors, Northern Insulation and Phoenix Scaffolding, were engaged as subcontractors at the Redwater job and received union certification applications. In both cases, employees rejected the union by wide margins in secret ballot votes.

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The Williams project has implications for the future which lead to some “big picture” speculation about future expansion of the petrochemical industry in Alberta. Mike Hantzsch is careful not to oversell the potential suggested by the completion of the first Alberta source of polymer grade propylene, but suggests it is possible that their Redwater facility could be the first step towards manufacturing of polypropylene in Alberta.

He estimates that for a polypropylene plant to be viable in Alberta, one billion pounds of propylene must be available annually. The Williams plant will initially produce 160 million pounds per year, but the expansion has the capacity to take production to 500 million pounds annually and ultimately, with a refit of the splitter, to 700 million pounds.

“This is a new molecule for Alberta,” he says, describing the plant’s market implications. The comparison, of course, is with the molecule ethylene – another natural gas fraction that prompted the investment of billions of dollars to construct a world-scale petrochemical development at Joffre. When asked if he thinks Alberta could become a player in the global market for polypropylene as it has for polyethylene, he answers, “Absolutely, I have no doubt.”

The success of the open shop construction strategy can be attributed to two factors: a workforce contented with the wages, benefits and working conditions provided on a non-union project and a clear message from the owner and the project management team that their concerns are not with labour relations but only with the on-time, on-budget delivery of a quality project.



Hantzsch stresses that Williams is not about to become a manufacturer and will continue to concentrate on their business niche as a service provider and supplier of components. Still, the company is well aware of the possibilities it presents in Alberta. “We see this as a strategic investment in developing a North American olefins business.”

The initial propylene production from the Redwater plant will be shipped by rail to the U.S. Gulf Coast so the expansion at Redwater included some rail facilities dedicated to handling propylene. Because propylene is chemically similar to other gas fractions such as propane, it is not only more difficult to split out from the feedstock, but can also easily be contaminated by those other components. That necessitated new facilities at Redwater devoted to the new product stream. One existing advantage of the Redwater site was the five million barrels of storage capacity provided by nine underground salt caverns.

Williams’ Hydrocarbon Liquid Conservation Project is far from being the biggest of recent projects in Alberta’s industrial construction sector, but it is instructive as a case study. It illustrates how far the province’s oil and gas industry has moved since its early days and the future potential for on-going expansion and diversification. The industry has advanced considerably since the time when drilling rigs punched holes across the province so the resulting wells could be hooked up to a pipe that eventually terminated in Chicago or Los Angeles.

Alberta is gradually leaving behind its role as a primary producer and developing a sophisticated and diversified industrial infrastructure. The now mature yet rapidly expanding oil sands sector in Fort

McMurray, the petrochemical facilities at Joffre, the sour gas processing industry and Edmonton’s refinery row are all testimony to this. Williams Energy’s recent project employing sophisticated technology to produce a new product from an unexploited source is another example of that trend and one that clearly points to future potential.

Another important aspect of the project is the performance of the open shop workforce. For the open shop construction industry, the expansion at Redwater is an important project because it can be easily benchmarked and compared to similar industrial construction work recently undertaken in Alberta.

In further developing the oil and gas industry Alberta has many advantages: abundant resources, good infrastructure, favourable regulatory and tax regimes and a well-educated work force. But it also has disadvantages: climate, distance to markets, sparse population and availability of capital. A key component to the continued industrial expansion is the ability to provide cost-effective construction services.

The products we produce are not unique and are subject to worldwide competition. Global economics dictate prices and, unless we can develop our resources efficiently, the customers we compete for will turn to lower cost suppliers elsewhere. An efficient and cost-effective construction industry needs to be a part of the “Alberta Advantage” if we are to continue to attract capital for new projects. Open shop contractors believe their method of project delivery can provide a cost-effective service and Williams’ Redwater expansion is an outstanding example of that.

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