



Managing Supply Chain Issues in Process Skid Fabrication

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flow technology™		Page	2 of 5
		Rev No:	0
	Managing Supply Chain Issues in Process Skid Fabrication	Date:	7-Jul-22

1. Managing Supply Chain Issues in Process Skid Fabrication

1.1. Current State of the Supply Chain

Many industries across the globe are experiencing unprecedented demand, all competing for finite resources in the supply chain, cause lead times and prices to rise. Many factors are contributing to this:

- Some industries are still trying to ramp up production following the COVID-19 Pandemic.
- Energy and cost of living increases are adding to supply chain costs.
- Zero Covid strategies are still ongoing in crucial Chinese trading ports and industrial cities, which has continued to cause disruption.
- The invasion of Ukraine has caused further turmoil, with energy and nickel prices rising globally.

For the fabrication of process systems for our life sciences customers, we have seen this manifest itself in the following ways:

1.2. Vessels

We have seen increases of between 12-15% in vessel pricing in the last 6 months. Quote validity durations are now down to 2-3 days due to pricing fluctuations from steel mills. This is related to alloy surcharges. Our suppliers advise us that we should see things stabilise over the rest of the summer and slightly decrease in September, but these are predictions at an unpredictable time.

1.3. Heat Exchangers

Expecting increases of 3-5%, with pricing validities now subject to change without notice

1.4. Block Valves

We're seeing 6-10 weeks from drawing approval for blocks in 316L Stainless Steel, but this is up to 20 weeks for blocks in higher alloys such as AL6XN. Prices have increased between 6-8% on 316L valves, with higher alloy prices increasing by up to 14%

1.5. Hygienic Pumps

Similar to Block valves, we're seeing single digit to low double digit increases in 316L SS pumps. "Special Pumps", made in AL6XN or C22 Hastelloy, are resulting in price increases up to 17%.

flow technology™		Page	3 of 5
		Rev No:	0
	Managing Supply Chain Issues in Process Skid Fabrication	Date:	7-Jul-22

1.6. Panel Hardware

As the industry is well aware, there is massive demand globally for electrical componentry, leading to dramatic increases in lead times. We're seeing lead times of 30-40 weeks for DI modules and managed switches.

1.7. Pipes & Fittings

There are still significant backlogs from steel mills. American mills are implementing PIE (Price in Effect), which greatly affects ASME BPE tube manufacturers. Shipping costs are still 3 times the pre-pandemic rates, with Zero Covid strategies at strategic Chinese ports causing backlogs. International drives for "Green Steel", steel produced from less carbon-intensive energy, is also driving up costs of production. Lead times and costs are much worse for higher alloys (C22, AL6XN). For one filter in AL6XN from a major supplier, we saw a price increase of 114% in the space of 2 months.

2. Optimising Skid Lead-times

At the proposal stage of process skid packages, we focus heavily on building a detailed project schedule, to allow us to identify critical path items, and to devise and propose a mitigation strategy. We treat this as being just as important as ensuring our proposal is technically compliant and commercially competitive. We present this strategy at the proposal stage because effective execution requires understanding and collaboration between the supplier and the customer, to align priority items and approval timelines.

2.1. Vessel sizing

If vessels are required, these can often be the longest lead item on a project. It is critical to agree on vessel volumes and dimensions as early as possible so the fabricator's capacity can be booked, and the dished ends can go into production. Nozzle schedules and locations do not have to be finalised to do this.

2.2. IO Count

The other leading culprit for longest lead times is panel hardware. As early as possible in the detailed design, we endeavour to finalise our IO count within 90% accuracy so panel sizing and hardware can be ordered. We will often bump up our spare IO capacity from 20% to 30% just to ensure we have breathing space to order early. Having a slightly oversized panel is often preferable to our customers than a late skid delivery.

flow technology™		Page	4 of 5
Managing Supply Chain Issues in Process Skid Fabrication		Rev No:	0
		Date:	7-Jul-22

2.3. Collaboration on Early Submittals

As outlined previously, it is critical that these key items are identified and discussed at the proposal stage of a package, or at the kick-off meeting at the latest. Getting ahead of possible supply chain delays relies on agreement and alignment on quick turnarounds for approvals on key agreed items. At Flow Technology we work hard to ensure our lead engineers have an open, honest and collaborative relationship with their customer counterparts to facilitate this exchange and ensure the project stays on track. A breakdown in communication leads to delays.

Agreement on early submittals and approvals also helps to protect the customer from supplier increases, which they may not have been able to protect themselves from contractually due to the instability in the market, and the resulting necessity for a sharing of risk. At Flow Technology we're in regular contact with our key suppliers and are well-informed of upcoming price increases. This helps us plan to have our POs issued in advance of increases, where possible.

To aid in this process, particularly when multiple packages are being delivered, we have adopted a staggered approach to the design and drafting process.

This means that while our customer is reviewing a submittal for one package, our team is working on the 30/60/90% design of another package, preparing it for submittal. This is in contrast with the conventional model where multiple design submittals might be transmitted at once.

While this does increase the number of discrete approvals, this approach helps ensure that our team, and the customer's team, isn't overloaded at any one time and ensures that approved designs are moved forward quickly.

2.4. Supplier Flexibility

Many of our customer's standardise on certain OEMs for their instrumentation, valving, and pumping needs across a site. This is done to avail of simplified maintenance, reduce the cost of spares inventory, quality assurance, cost savings through framework agreements with OEMs, etc.

In cases where our customer's have these relationships with large global OEMs, we will often lobby through the customer, for the OEM to prioritise supply to our customer's project. This can yield positive results in reducing lead times.

On other occasions, we will explore alternative proven suppliers in the market for comparable components. It has occurred several times in the past year, where we've been able to secure better lead times from non-standard suppliers for a customer's project. Availing of this requires flexibility and pragmatism on the

flow technology™		Page	5 of 5
		Rev No:	0
	Managing Supply Chain Issues in Process Skid Fabrication	Date:	7-Jul-22

customer's part to work with their wider team to have the alternative supplier approved in their system. Flow Technology work with the customer to vet any alternative suppliers.

2.5. Specification Flexibility

There is a large focus in the pharmaceutical sector on ensuring the correct materials of construction, surface finish, IP rating etc for components is used for their process. The conventional focus has always been to match the specifications to the process, but to always be mindful not to over specify, and buy expensive attributes that you don't need.

There is no need to buy a C22 Hastelloy pumps if a 316L SS pump is perfectly appropriate for the fluids being handled. This approach is sensible and sound, but in recent months we have found that it can be challenged in certain scenarios to available of more favourable lead times, and even better pricing.

Recently we had an example where an AL6XN pump was correctly specified for a process system. While AL6XN is typically a less expensive higher alloy, compared to C22 Hastelloy, it's not as popular, or produced at such a large scale as Hastelloy. We found we were getting better lead times and pricing to buy our pump in the higher-than-needed C22 Hastelloy, than in AL6XN.

It's an interest aspect to explore when trying to creatively manage supply chain hurdles.

These are some approaches that can utilised to manage supply chain issues in a project. The keystone supporting all of these approaches is trust and understanding between the customer and the skid designer/builder. On this solid foundation, creative and collaborative approaches can yield great results.

If you're attending the ISPE Singapore Conference 2022 on the 18th and 19th of August, please stop by the Flow Technology Stand #509. We'd be delighted to chat about solutions for your process.