

Cost of Quality to the Supply Chain

Large Tonnage HVAC Equipment Example

The intent of this exercise is to show how important all the elements of a process are in providing a client a quality product. A total quality management system throughout the supply chain is needed.

To evaluate the many possible issues, let's consider an air conditioning unit that produces 50 tons or more of cooling. This would include Absorption, Centrifugal, Roof Tops, Air Handlers and Self Contained systems as a starting list.

There are many reasons for a customer to be unhappy with the HVAC unit that they purchased. There are many supply chain businesses involved in the process from manufacture to unit start-up. Any one of the steps can cause the client to not want to order from the same supply chain. Beyond the customer there is a series of businesses that will be impacted negatively with potentially frequent additional costs without compensation for their rework to satisfy the customer.

Let's make a list of potential non-product quality problems (real and perceived) that can impact a customer.

- The unit does not arrive on the scheduled promise date, crane needs to be rescheduled
- The wrong unit is delivered
- The unit arrives damaged due to inadequate packaging or shipping requirements
- The unit does not have the connections installed per the submittal used by the general contractor
- The parts box does is not with the unit or gets separated from the unit in route.
- The shipping instructions deliver the unit to the wrong address.
- The submittal data has errors that impact drains, water, electrical connections locations.
- The submittals have the ducts and unit foot print that differ from what is built.
- Service parts are not available within 24 hours of need for DOA.
- The installing contractor does not properly clean-up after installation.
- There are billing pricing and taxing errors.
- Contractor and owner disagree on warranty expectations as submitted with the billing.

What are the potential product quality problems (real and perceived) that can impact a customer?

- Unit will not start
- Special paint - color is not what the customer thought they ordered
- Insulation of unit not what the customer expected or the workmanship is poor
- Customer expected shipment in a closed trailer and the unit was shipped on a flat bed trailer
- Parts box is for another size unit or is missing components
- Parts box has wrong parts, example, isolator type and size for the loading
- Unit has o-ring and gasket leaks...water or refrigerant
- A valve in a flow line is installed backward
- Fans are turning backwards
- The paint coverage is poor and there are signs of rust in several areas
- Packaging did not protect unit from the environment
- The IOM literature is not with the shipping package, defining the assembly and start-up procedure

Impact on the Supply Chain

Now that we made a list of many real and perceived quality problems, let's take a look at the potential impacts to the Supply Chain (IOM to Owner). We will start with the building owner and work our way backward to the product manufacture.

Owner

- Delay in use of facility
- Possible lost rent or occupancy of the building
- Staff time to follow-up with General Contractor on delays
- Possible need for rental of HVAC equipment pending repair
- Lost production in a process environment
- Lost commitment to using Your products in the future

General Contractor

- Delay in completing job on time (facility use)
- Efficiency of installation team waiting for repaired equipment
- Cost of Sales Engineer's time with customer to resolve problem
- Owner complaints on delay in occupancy
- Penalties for non performance/late completion
- Lost commitment to Your products

Sales Organization

- Sales Eng or Assistant's time to deal with Contractor/Owner
- Cost of sales assistant to work with Service to schedule work
- Cost to process Shipped Product Defect paperwork
- Cost to follow up on problem resolution with Contractor
- Less Sales Engineer feet on the street, dealing with product defect issues

Field Service Organization

- Missed opportunities to service a 3rd party paying customers
- Lost profit dollars associated with SPD labor and materials
- Processing of claim to manufacturing unit of company

Field Parts Organization

- Handling defective material, storage, packaging,
- Shipping to you for evaluation if specified.
- Initiation of PO if repair parts are not in stock
- Processing materials claim

Product Manufacturer

- Cost for the SPD Labor and Materials
- Cost to review SPD Claim if large
- Potential loss of future business
- Small frequent labor claims to control costs
- Additional Tech Service staff to support field
- Sales staff avoids sales of products, pain impact

The above shows the amount of non-value added time, money and energy spent correcting process errors. Everyone who reads this document can add an item to some or all the categories. If you have had an experience that could be added to the any of the categories send you comments to costofquality@gea-consulting.com. Later this year the compiled list will be sent to all those who respond.

Edward Eisermann January 2010