

QUANTIFYING THIRD PARTY INSPECTION

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Touting the Value of Third Party Inspection is difficult without it sounding like an advertisement for our own HTS services. The subject would best be considered from the standpoint of any third party inspection as a representative of the actual purchaser.

Its value must be both immediate and long-term. It must also be kept current to justify your quality investment commitment, determinations and goals.

The Quality Commitment

Third Party Inspection is a quality/reliability strategy; it must be performed now, progressively, and continuously to insure the same later. A.S.Q.C. (American Society of Quality Control) states the quality strategy is based on:

- For each failure there is Root Cause.
- Causes are Preventable.
- Prevention is always Cheaper.

Having a Quality Surveillance System must be based on your organization's need for, and commitment to in-Plant Process quality and reliability.

How committed are you? As purchasers? As users? How committed are your suppliers to quality? Their suppliers?

The HC Processing business, providers of quality products, would like to believe they, the purchaser/user, are always guaranteed quality from their suppliers. Truth be known, the HC Processing Industry, while having SET the high standards in industry, has not always received the quality from suppliers they demand of themselves; Not a point to argue, a matter of fact.

What industry, long term, has standards aimed at maintaining the Hydrocarbon Processing strict quality and product reliability?

High Quality standards don't start with manufacturers or suppliers. A vendor will not provide a purchaser with any more quality, performance, or reliability than they are paid to provide.

So how do you know you're getting what you're paying for? How do you, as a user, insure that you do get what you pay for? Trust? Hmm! Maybe, but not without Verification.

One of the largest Oil Companies, and an HTS client, claims as much as 17% of the material and equipment received at site is deficient. They claim that quality and reliability standards, from material grades, weld quality, casting/forging integrity, to overall equipment performance guarantees, too often fall short. Even basic dimensional discrepancies are so prevalent, that without their direct COMPANY involvement in quality assessment AT THE SOURCE OF SUPPLY OR MANUFACTURE, no level of Quality could be assured. Their analysis appears to be "We stand to lose too much if we don't monitor and control critical purchases, DIRECTLY, PERSONALLY". We all realize that bottom line profitability is the ultimate goal. Without reliable quality materials and equipment suppliers, Plant Operational Reliability will not happen.

How much is the quality/reliability concern worth? Today? To you? In an industry that works on a profit margin in the low single digits.

Discovering Quality Deficiencies

When are most quality deficiencies experienced with purchased materials and equipment?

They are first formed at receiving, installation, start-up, elevated demand periods, or cycling. Quality deficiencies can be devastating. Let's face it, there are no good times for failure of your materials and equipment at the plant.

Finding Quality Deficiencies

So when can most deficiencies really be found? HTS' Experience shows that they should be found long before receipt at the site. Ninety-eight percent of product deficiencies, non-conformances, for both materials and equipment occur At The Source. They surface during the testing of materials, the fabrication of components, the assembly of equipment, at testing, or final inspection of the finished product. All of these events take place before shipment from the plant.

Not surprisingly, the further along in the manufacturing process specification non-conformances are detected, the more difficult it is to discover and rectify them. This sometimes leads to casual acceptance of lower standards by suppliers, as well as, forced acceptance of poor quality on the part of purchasers.

It is good sense that your Final order Quality STARTS AT THE BEGINNING, NOT AFTER YOU, THE FINAL USER, DEPEND ON IT IN THE FIELD. If a purchaser/user doesn't participate in the quality effort from start to finish, he shares some of the responsibility for the lack of quality and reliability in his own plant.

The only way to minimize your vendor's quality problems BEFORE THEY ARE YOURS, is Involvement, starting with control; control of your standards, your quote requests, budgeting, suppliers, even sub-suppliers. You cannot avoid involvement. The quality commitment does begin with the Purchaser/User.

Controlled purchasing will improve your chances of securing timely delivery of quality material and equipment.

YES, THE BID PROCESS STILL WORKS, as long as money isn't the dominant consideration. Control your purchase before your order is placed by:

- Advance Planning
- Allowing Sufficient Time
- Engineering - In The Quality Standards for all Materials and Equipment Purchased

- Issuing Well-Defined Quote Packages That Include Purchaser Inspection/Test Points
- Quality Audit/Survey Prospective Suppliers
- Select The Best Vendor supplier. Limit Suppliers to One or Two at the Most
- Review Every Vendor's Quality Program Regularly Including Quality Records
- Checking Vendor References Thoroughly
- Control Sub-Vendors Through ASL (Approved Supplier's List)
- Formulate Contracts that Define Standards and Quality Controls Before Issuing Purchase Orders
- Assigning A Quality Representative To Review and Monitor Each Order
- Formulating Your Own Quality Inspection Plan in Advance
- Always Hold Pre-Fabrication Meetings at the Vendor's Site to Qualify Their Quality Control Program And In House Inspection Plan Specific To Your Order Specifications
- Appoint Qualified In-Plant Inspection Representation
- Require Suppliers to Update Their Quality Programs
- Request Strict Quality Records of Material and Equipment Once in Operation

◆ ◆ ◆ If A Surrogate Purchaser Is Used On A Hard Dollar/Turnkey Project, Demand No Less Than The Above From Them. Trust They Will Do Vendor Surveillance Inspection According To A Specific Plan, But Verify These Activities By Auditing Them.

Quality Commitment Options

1. DO NOTHING - Hope for the best.
2. Telephone Quality - Call the vendor and ask if everything is exactly to specification.
3. ISO Quality - Secure paperwork that you're buying Quality. ISO is an administrative system, not a Quality Guarantee. You will do at least as well as Number 1.
4. Perform Vendor Surveillance Inspection with your own Qualified Personnel.
5. Use a Qualified Third Party Quality Inspection Company.
6. Quality audit the inspection commitment of any surrogate purchaser.

Codes and Standards

Over the years, the list of Standards and Codes has become virtually endless. They are referenced every day on all jobs, all materials, all equipment. You know they apply, but HOW must they apply at different manufacturers, cross-referenced and interpreted, by order, need, process, equipment, manufacturing capability, environment, scheduling and safety, and most of all, common sense. This demands a knowledgeable person or a qualified Third Party company with the background and experience.

Disciplines

Broken down, you can see how ninety-five percent of all purchases must involve one or all of the following disciplines; ***Non-destructive Testing, Materials, Fabricated, Mechanical and Electrical equipment***. No individual is capable of being an expert in all these disciplines.

However, the third party Quality Inspection Firm or your own personnel requires representatives that are well-versed in the inspection, manufacturing and testing processes that go into these disciplines. Please review the inspector's credentials. Interview him or her.

Picking the Quality Representative

It is imperative in any inspection effort to have the requisite **management, administrative, and technical support**. Not only should a third-party inspector know the Codes and

Standards normally applicable to the HP Industry, its material and equipment requirements, but have a company support system to back it, from small jobs to large projects. This support system should have the qualified personnel to manage projects supervise, coordinate and administrate jobs and field staff. They should review all technical data, establish inspection programs, insure prompt reporting, non-conformance resolutions, training programs and latest telecommunications. Every third party organization should have their own Quality Manual.

If your inspection representation does not have the above, either from your own organization or a third party company, he will be less effective.

Special Services

- Services helpful to purchasers, and critical for a full service inspection company are as follows:
 - Pre-award Plant Surveys
 - Vendor Performance Histories
 - Custom Report Forms
 - Equipment Inspection Planning
 - Direct Field E-Mail Reporting
 - Site Inspection Capabilities
 - Project Inspection Coordination (PIC)
 - Turnaround Inspection Personnel
 - Damage & Repair Inspection
 - Positive Material Identification (PMI) - Alloy Material Traceability
 - Materials, NDT and Physical Testing Experience

Cost of Quality

But how far does any organization have to go, to insure they get what they are paying for?

Well, obviously, limits must be placed on every endeavor. Limits on Quality Commitments range from failure fear, to budgeting, to intended critical use, to regulatory restrictions, even scheduling constraints.

Third party inspection sounds great, but you have to budget for it. Where do you put it, charge it, or allocate it? Well, there are as many proposed formulas to justify the COST OF INSPECTION as there are to justify quality; whose expense it is, whose responsibility it is, and how do we pay for it. The cost issue often times becomes clouded, even protracted.

1. **Prevention Costs** - Funds budgeted to prevent non-conformances. The engineered quality level that goes into purchased items.
2. **Appraisal Costs** - Funds budgeted in the formal evaluation of quality/reliability to secure specified standards from the available market.
3. **Failure Costs** - Catastrophic costs incurred when materials and equipment FAIL to meet specified levels of quality/reliability, the replacement costs and delays (Damage, repair, replacement time, production time and material losses). Your vendor quality effort and its costs are part and parcel of all these elements.

The actual bottom line cost of vendor inspection **CAN BE DETERMINED AND LIMITED** by the purchaser. Evaluate the costs as follows:

+Purchased item cost - Not every order dollar value, or every nut and bolt justifies inspection. Be selective, establish cost guidelines for what needs source inspection.

+Intensity - of inspection required by material or equipment purchased - Define the coverage necessary as Final, Partial, Percentage, or Complete Inspection. How much vendor monitoring is required to insure the quality paid for in a purchase? How critical to your process/operation is the material/equipment. Always consider the failure costs.

+Vendor Locations - Location, location, location still counts. Getting to the Vendor Source location will affect the cost of inspection. Secure a qualified representative as close to vendors as possible.

+Third Party Service Rates - Estimate and compare your own company's cost to execute the proposed quality surveillance plan. The total cost analysis must be developed to properly compare your costs versus third party coverage.

Third Party Inspection Advantages.

- Third Party has a readily available, experienced, quality staff.
- Third Party coverage is used only when needed and not paid for when not needed.
- Third Party Companies are more likely located closer to the source where Inspection Surveillance is needed (The travel expense savings is a definite plus).

A REAL GOOD AGENCY OFFERS INTERNATIONAL INSPECTION REPRESENTATION.

- Third Party Companies should be able to qualify each inspector by C.V. and by the material/equipment being Quality monitored.
- Third Party Companies must have General Liability insurance for all personnel to enter vendor facilities.
- The third party company can supply complete inspection management, coordination, administration and reporting.
- Monthly invoice justification and cost accounting.

Actual Third Party Quality Inspection Cost

Knowing the competition, HTS' clients and our own charges, I will offer this educated estimate of vendor source inspection:

PURCHASE VALUE	ESTIMATED % COST OF INSPECTION
75 million - 100 million	1 to 1.2
50 million - 75 million	1 to 1.4
25 million - 50 million	1.3 to 1.6
10 million - 25 million	1.5 to 1.8

***Here are actual costs for recent major project inspections performed by HTS:**

1. HTS just completed inspection of a \$75 million purchase value Full Inspection

Coverage contract with:

- +Four prime vendors
- +Sixteen major suppliers

+Twenty-three sub-vendors

+Twenty-seven inspection locations in US and Europe

+One year, seven months inspection activity.

+++From Inspection Plan Formulation, through in-process coverage, to performance testing, to final shipment Inspection Release to documentation control.

TOTAL INSPECTION COST \$561,000 OR 0.77% OF PURCHASE VALUE.

2. HTS initiated full coverage inspection on \$110 million project. Our client budgeted 1.3% for complete inspection coverage. HTS Quoted 0.9%.

HTS INVOICED 0.81%.

Quality Auditing Costs

Quality Auditing the Inspection activities of Surrogate Purchasers made responsible for Vendor Quality Surveillance can only be estimated. It is suggested that Quality Auditing costs should be in the range of .25% of purchased value, based on one fourth actual inspection coverage costs.

Conclusion

According to a recent newspaper article, one hundred and thirty-two (132) Hydrocarbon Processing plants have shut down operations in the last sixteen (16) years. This has translated into the loss of thousands of technical positions, as well as tight-fisted fiscal policies.

Yes, most Hydrocarbon Processing facilities today are technically & financially leaner. However, more critical to the survivors in this industry, is the sustained operational reliability that demands quality at all levels, including Vendor Sources. Many wise companies have found it cost effective to rely on qualified Third Party Inspection Companies for technical, efficient personnel to represent them for small jobs, to large projects AT THE VENDOR SOURCE.

"THE BITTERNESS OF POOR QUALITY LINGERS LONG AFTER

THE SWEETNESS OF CHEAP PRICE IS FORGOTTEN."

Technical References and Quotes: ASQ
Publication

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