

PREREQUISITES FOR EFFECTIVE TENDERING, INSTALLATION
AND OPERATION OF GAS CLEANING EQUIPMENT

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PRACTICAL MOTIVATION

Practical control of atmospheric pollution and the whole fight for clean air over all South Africa's cities and towns will be prime casualties if industrialists and gas cleaning engineers fail to find complete and lasting rapport. There must always be cordial relations and mutual understanding between the industrialist who commissions gas cleaning plant and the contractor who installs it. This presupposes trust and confidence and a free flow of communication between the two parties.

Indeed, full and forthright communication both ways is the surest basis for contractual relationship that will produce the most effective devices for controlling atmospheric pollution from industry with the utmost satisfaction for both client and contractor.

TENDERING

1. General Aspects

Since the passing of the Air Pollution Control Act in 1965, backed up by subsequent administrative action from the Department of Health, industrialists in all the sectors covered by the Act have recognised, sometimes painfully, the need for air pollution control equipment to be fitted to new and existing production plant.

The average industrialist knows such equipment must be designed and installed specifically to fit his operation, which immediately adds a new dimension to his expenditure. But he is not likely to have an accurate idea of his budgetary requirements for this item of prime cost.

Naturally he turns to the gas cleaning fraternity for a guide. Of course, he must accept that the answer to his initial request for information from any member of the fraternity will only be a "guesstimate". But it will be a very educated guess; an estimate from a highly qualified expert with long working experience behind him.

Briefly, the industrialist wants to know the cost of gas cleaning equipment within a narrow and practical range of expenditure. If the gas cleaning engineer has had the right kind of contract experience, he should be able to give the client a reliable figure by working it out with the latter's own project engineer. The client must, however, treat this as only a pointer to the final figure to be established by several top contractors bidding to tender. Nevertheless, if the sales engineer is worth his salt his first "guesstimate" should be within 10 per cent of the final bid and the client has a solid base on which to make budgetary provisions.

One of the main stumbling blocks to effective tendering for air pollution control equipment is the repeated need to revise bids. Over the years too many clients have come to believe this is an unavoidable snag inherent in the need to fit gas cleaning plant to a specific production process and cut pollution by up to 99%. Such specifications need not make design revisions inevitable, if tendering procedure follows a coherent and systematic path. In the past invitations to supply gas cleaning equipment for a new factory or plant often went out too early and were issued by the wrong authority. The client aware of his ignorance in such matters left to the main plant supplier what he should really have handled himself. Only when main plant design and supply has been finalised, should the factory owner himself call for air pollution control equipment. This would restrict the number of bids to a single main contractor.

What happens instead, is that each main plant tenderer receives a clutch of quotations for APC. Each inevitably calls for revisions to APC bids received and all the gas cleaning contractors must go through the expensive motions of revising and revising again only to learn that the main contractor himself was unsuccessful.

Gas cleaning is above all labour-intensive. But it is labour-intensive with a special and expensive difference. It requires engineers highly trained and experienced in a new specialism. They are always in short supply which makes their services expensive. A revised bid can keep one or more specialists busy for months on end. It is not difficult to calculate how much it costs a contractor to revise his estimates several times and any layman can grasp the economic importance of getting all the technical requirements for an APC project right first time.

Past experience has also shown that in most tendering situations too many suppliers are asked to bid. In the local market there are already three or four specialists who concentrate on each of the main types of APC contracts. Unfortunately, this fact is not well-known to most industrialists. They simply go to the Yellow Pages and pick a dozen names at random, often leaving out one or more of the real specialists in the field concerned. What South African industrialists need is a specialist's directory and the GCES Association through its SEIFSA secretariat can act in this capacity. This would save clients from wasting time on inexperienced contractors, or even missing altogether the services of the best engineers available.

Even when tenders for APC equipment are invited only after the appointment of the main contractor expensive revisions to bids are still unavoidable because the gas cleaning engineer is not adequately briefed on total technical requirements. In day-to-day operations at the factory concerned there can be a host of imponderables and unknowns which the contractor must know about, if he is to design and install equipment that will not only give the reductions in pollution prescribed but which he can guarantee will go on doing so. These details can only come from the client.

2. Guarantees

Certainly, the APC contractor must have full and accurate production parameters before he can provide the client with practical guarantees.

Predictably, the latter usually demand tough operating safeguards. Normal wear and tear guarantees are given a standard, but operating guarantees can hardly be forthcoming where operating parameters are unknown.

Guarantees for bag life are also often demanded but cannot be readily given where there is no certainty that operating loads will always be kept down to specification. This is rather like demanding guarantees for tyre life on motor cars then using them at Kyalami. As APC engineers cannot control plant operations they can hardly give unconditional guarantees for bag life in writing.

Providing contractors with operating parameters raises another logical consequence for APC design. The contractor is a business man as well as an engineer who always keeps an eye on costs. He naturally designs plant down to match the normal workload of the industrial process involved. His equipment will not stand up to the odd, abnormal load sometimes required by an industrialist outside regular production scheduling. If the client wants APC plant to carry loads way above normal he must brief the contractor on all operating possibilities, so the latter can fit them into his final design. The client must also understand he must pay more for extra capacity.

3. On-Site Services

Any review of general tendering conditions must include the provision and cost of certain, indispensable on-site services such as off-loading, storage, cramage, security, occasional unskilled labour and basics like water, electricity, compressed air and accommodation. If clients supply these normal on-site facilities themselves the contractor can deduct them from total cost. It should be realised that it costs the contractor more to bring these on site than it would cost the client to put his usual equipment at the disposal of the former. Frequently, such facilities are not part of the contractor's regular stock in trade and he cannot supply them readily. It will cost him more to provide them than it will cost the client and this can only boost the contractor's bid unnecessarily.

PRACTICAL TENDERING

In the South African APC scene contracts for gas cleaning equipment fall into two categories:

- Plant for existing industrial processes; and
- Plant for new works and factories yet to be built.

Existing Plant

- (a) The problem of basic production parameters -

Earlier we said that a two-way flow of technical information between client and contractor was a sine qua non. Nowhere is this more necessary than with the basic operating parameters of an existing plant that has to be fitted with APC equipment.

The question: "What are the basic parameters of a plant?" begs another question: "Does the client really know his own operations?" Logically, the contractor requires very detailed data on plant operations to assess the type of APC equipment required. Sometimes, however, the client contemplating installation of such equipment knows almost as little about his detailed operations as about his APC requirements. Original operational conditions often change to meet subsequent production requirements and data of original factory design are no longer adequate or even relevant. Production parameters which are frequently modified to meet new situations, are feed-stock changes, through-put increases, changes in dust burden and working temperatures. No APC engineer can design effectively in such situations. He is a highly skilled technologist, not a magician.

Genuine ignorance of production parameters on the part of clients is a common reason why APC plant fails. The gas cleaning engineer has learned to be wary of this fact and lacking sufficient information, is forced by professional considerations to draw assumptions which lead to incorporating technical "extras" into his final design. This must push up the cost of the project sometimes needlessly.

(b) Compatability -

Another common problem posed by long established plant requiring APC equipment is that of compatability. In short, APC equipment may not be compatible because of existing production plant or even buildings. There is also the question of production plans for the future. Unavoidably, these factors can obstruct APC installation, especially when the contractor is underbriefed.

No aspect of compatability is more obstructive than space limitations. Existing factories are a demonstrably physical fact but when they limit the space available for installing APC equipment the difficulties facing the contractor deserve the client's sympathy, not his scorn. Another headache encountered at existing factories and plants springs from leaving all planning to plant engineers without any reference to the client's own production staff. Consequently day-to-day snags arising from process flow and other production factors do not come into the reckoning and are left out of APC designs. This results in expensive technical modifications after installation which is bad for client-contractor relations.

New Plant

Tendering prerequisites for new industrial plants are basically the same as for existing ones. Only here the problem of inadequate data on operating parameters is aggravated because the manufacturing process does not yet exist and the relevant parameters are unknown even to the client. The APC supplier is tempted to design equipment upwards to ensure that it can meet tough guarantees against any eventuality.

Ignorance among clients has fathered the myth that APC equipment can be designed along general lines to fit all similar industrial applications. Unfortunately, in actual practice the facts usually turn out quite

differently, and substantial redesign and reinstallation of plant are required at painful cost to the client.

Again, less reputable operators sometimes offer equipment at lower cost. This, predictably is underdesigned as it is based on nominal parameters matching only the superficial aspects of factory design. They leave out those technical considerations which reputable engineers have learned to provide for after years of experience.

In the current industrial context no new factory or works can start production until pollution is reduced to the level prescribed by the Air Pollution Control Act. The industrialist only pays the bill for delayed production. In his own interest he must ensure that not only he but the main contractor briefs the gas cleaning engineer fully on all relevant factors so that the latter can get his equipment to work properly first time.

INSTALLATION

Every industrialist now realises that his new works cannot come on stream until fitted with AP controls operating at the reduction levels prescribed. He knows that production delays cost plenty yet he often refuses to face the practical problems that hold up installation of APC plant.

Perhaps this all stems from the fact that gas cleaning engineers are saddled still with an "inadequate status" problem. All the other people on the factory site are involved in the eventual production of commodities that can be sold in the market at a profit.

The gas cleaning engineer is seen as a non-earner. Some old-fashioned production men even regard his efforts as a wasteful luxury, nothing better than a sop to latter-day environmentalists and the strictures of the Chief Air Pollution Control Officer. He appears the apotheosis of "tail-end Charlie" and gets less respect for his technical attainments than other on-site operators.

This shows first with the submission of his technical drawings to the client for approval. The spatial and other physical requirements of his installation do not receive just consideration. Consequently, the gas cleaning engineer encounters many obstructions on site, which stretch out the time required to bring his equipment on stream.

He often finds the client unco-operative and is placed last in the queue when the needs of all on-site operators are reviewed.

When the client and main contractor draw up a total installation timetable the APC contractor is again put last in the picture. Yet he must have his equipment fully operational by "switch-on" day. If the industrialist wants production to start on the scheduled date he must give the gas cleaning engineer sufficient time to design and install his equipment.

The client's own engineers can also help by keeping a close check on the main contractor's objectives to ensure that APC equipment meets all the requirements of production plant.

OPERATING MAINTENANCE

The derogatory attitude towards gas cleaning engineers and their equipment as non-earners also hampers the maintenance of such plant to keep up maximum operating efficiency. Production plant is maintained at highest operating level for the simple reason it earns the bread and butter of companies. But gas cleaning devices are neglected to a point where reduction of pollution falls well below the standards required by the law or they break down completely. Either way the vigilant Chief Officer can step in and stop production altogether.

In Europe trained engineers are assigned to maintain all factory plant including APC equipment. In South Africa with its shortage of engineers maintenance of APC devices is usually left to unqualified and semi-skilled workers.

The concept of gas cleaning plant as a non-earner is short-sighted, since the Air Pollution Control Act insists on AP controls and can close down factories which pollute the atmosphere. In future industrialists will be forced increasingly to recognise pollution as a charge against final profit. So indirectly anti-pollution equipment does contribute to profit making.

Atmospheric pollution is already a top social priority all over the world. There are many recorded cases of the community protesting against industrial pollution by obstructing production and there has been litigation against offending industries with suits for damages. This is probably just around the corner for South African industry.

Generally speaking local industrialists have accepted legal strictures against the pollution and spent millions installing APC equipment. Where they let themselves and the public down is their failure to maintain plant at the operating levels specified. Improved maintenance standards call for better maintenance staff. A practical solution might be formal programmes for training new operators in maintenance work.

A new and positive development in the area of maintenance is the recognition of its economic importance by isolated large-scale industrialists, who keep costly gas cleaning plant at peak efficiency by retaining contractors to carry out regular maintenance checks and repairs. This arose from conscientious after-sales policies followed by certain members of this Association. These members believe it is ethical practice to keep close relationships with clients long after installation of the equipment.

CONCLUSION

The need for lasting relationships between clients and contractors fits the Association's view of itself as an ongoing forum for the exchange of expert knowledge in the areas of gas cleaning. A clearing house of technical know-how at the disposal of clients.

Industrialists will always be at the mercy of low-cost fly-by-night APC

operators. Hence the Chief Air Pollution Control Officer's endorsement of this professional body. There are, of course, also disingenuous industrialists lacking conscientiousness and sincerity when it comes to installing APC equipment. This minority calls for tenders readily enough but is in no hurry to decide on bids. In fact, the longer it takes to finalise a contract the better it suits this client's pocket.

In short, invitations to tender are only a front. The Law demands action to protect the atmosphere so this kind of industrialist calls for bids. But spreading the tender process over anything over several months is only a dodge for giving the impression of taking action.

The client keeps stalling by sending bids repeatedly back to the contractor for further revisions. Needless to say each revision is an expensive exercise in skilled engineering manhours.

The ultimate tactic is for the client company to appoint its own specialist engineer with technical knowledge enough to find a new difficulty to obstruct each revised bid. No action is better calculated to block the policy of the Department of Health which is to keep pollution out of South Africa's atmosphere.