T R O U B L E S H O O T I N G

Service Contracts and Repairs

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Warranty inclusions, service contracts to extend warranties, and under-warranty and out-of-warranty repairs are often sources of confusion for chromatographers. In an effort to help users and owners understand the various aspects of service contracts, the major manufacturers of LC instruments were surveyed to determine their general policies regarding these contracts. Information solicited included length of warranties, costs of service contracts to extend warranties, and fees charged for factory versus on-site out-of-warranty service. The following information on the general practices of instrument manufacturers regarding repair work, the range of fees charged, and options available should help LC users make more informed decisions about service contracts and repairs.

SERVICE COSTS

Customers are often surprised to learn that extending their LC service contracts beyond the initial warranty period will cost at least 10% of the purchase price of the liquid chromatograph each year. For a $30,000 instrument, this amounts to $3000/year or $250/month. These yearly service costs add to the true cost of owning a liquid chromatograph, as do the costs of loss in productivity as a result of downtime. Excessive downtime can result either from a frequently failing instrument or slow service response time. An instrument that is inoperative for 48 to 72 hours can prevent 100–550 sample runs from being made and may leave a worker unproductive for two to three days. If downtime is more than 50% of the intended operation time, then it would take two such instruments, and possibly two technicians, to obtain the same productivity as one fully functional instrument. In other words, this situation may double the cost of your analysis.

Productivity and downtime costs make service factors key considerations in the purchase of an instrument. These factors are especially important in labs such as quality-assurance and clinical labs in which reliability and high productivity are critical. In most labs, minimal downtime is important, but other factors, such as inexpensive service, may be a priority.

If minimal downtime is a priority, service factors should be considered *before* buying an instrument. The service may be just as important as the operational features. Companies that will not freely supply service information to a prospective customer may be hiding poor reliability and a mountain of future expenses.

On the other hand, if your primary interest is in exploring state-of-the-art technology or in maintaining a long-term working relationship with a particular manufacturer, you may have to make major concessions in the quality of service you receive.

TYPICAL SERVICE-CONTRACT AND WARRANTY COSTS

From our survey, we received service contract estimates for chromatographic systems that have two-solvent gradient capability, a manual injector, a column, a 254-nm fixed-wavelength UV detector, a printer/plotter (or chart recorder), and an integrator. About half of these LC systems cost less than $15,000; the others cost between $16,000 and $20,000. Remember that there are other, less tangible, features that come with an instrument but are not reflected in the cost, such as the ease of problem diagnosis and repair by the owner, the ability to upgrade components, quality of parts and reliability of service, and, of course, accessibility and cooperation of personnel when you need advice.

Most new instruments have one-year warranties; however, some warranties are for only three months, particularly those that cover system components, such as lamps, that have limited lifetimes.

Costs of extending service contracts beyond the warranty period vary considerably, as do the inclusions, exclusions, and methods of calculating costs. On the lower end, for instruments that cost less than $14,000, a warranty-extension agreement for the second year of ownership was about $1100 (8%) if purchased with the new instrument; however, if purchased later, the cost of the extension agreement increases to about $1950 (14%). Typically, service contracts or warranty extensions are calculated at about 10% of list price if local service is available. Some companies do not offer warranty extensions at all, and one company surveyed based warranty extensions on nine-month periods.

Considering these wide variations in costs, you may want to include the cost of extending the warranty on a new instrument in your purchase plans and as one of the criteria for selecting the instrument. Be aware that some companies offer blank paragraphs in their service contracts so they can tailor agreements to specific owner needs.

PREVENTIVE MAINTENANCE

One or two preventive maintenance (PM) calls per year are recommended and are provided for in most — but not all — new service contracts. Costs for PM calls alone range from about $300 to $500 for each visit, although some companies establish hourly charges as low as $60/hr for labor and travel. Companies will replace some expendable parts during the PM call. You should determine if service contract costs include "inspection and cleaning" or "replacement" of certain critical items such as filters, pump check valves, and pump seals. If you are paying for a one-time visit, you may wish to see that replacement is specified in the contract. The list of expendable parts is long; check valves, pump seals, injector rotor seals, detector lamps, columns, filter frits, and batteries are all expendable, and you should determine which parts are covered. Some companies specify that they do not cover some items, such as injectors (often covered by the company that supplies the injector) and detector cells in their warranties. None offer expendable parts coverage, although parts and accessory discount agreements are available on some special "without parts" service agreements, provided that a minimum total purchase cost is exceeded.

Owner responsibilities: Managers have the responsibility of seeing that preventive maintenance procedures are carried out, especially if an instrument is used by many people. Downtime is generally less when one person is responsible for an instrument. Logbooks noting PM schedules, service information, and instrument use can also help minimize downtime.

Most, but not all, instrument companies offer owner/user training courses that include PM and good operator practices to

minimize instrument downtime. As many as 50% of instrument service calls may result from lack of familiarity with, or misuse of, the instrument. Poor instrument design also contributes to failure, as do complex operating and repair instructions. Certainly, both the manufacturer who makes allowances in instrument design for easier operation, diagnosis, and repair, and the operator who learns to use the instrument properly, will benefit. Owners or users should strive to make regular use of instruction manuals and troubleshooting guides and should have lists of key spare parts and ordering information readily available.

In addition to the operating manuals, it is possible to purchase service manuals for many instruments. Trained instrument technicians may be able to use these to perform in-house repairs. When choosing an instrument, however, you should find out whether performing in-house repairs voids warranties or service contracts.

Some companies offer maintenance schools and service training for operators or repair personnel; these could be considered as alternatives to service contracts. Such options should be considered by large companies with many instruments because of the obvious advantages of rapid repairs and reduced costs. Regular service bulletins are sent by some instrument manufacturers to your repair personnel.

TRAVEL COSTS

The distance from the service center to the location of your instrument can radically change the costs of all services. You should find out where the nearest service center is located when you are investigating service charges. Furthermore, you have the right to know about any additional travel costs that would be incurred when the company makes a service call.

The travel costs you will pay are usually calculated as a per-mile charge plus expenses such as air fares, or, more typically, as a zone charge (for instance, there may be no charge within a 50- or a 200-mile zone, but the charge will increase to $100 for each additional 100 miles outside the zone). These subtle but costly differences among company travel charges become apparent when you are faced with paying the full hourly rate for service ($60–$100/hour) or half the hourly rates, as opposed to no charge at all for the service engineer's travel time. When you are considering which instrument to purchase, the salesman should be able to provide you with a written estimate of travel costs that will apply to any service.

If the service center is far from your location, other factors become important. The availability of a toll-free hotline can cut your consultation costs. If a mechanical or electronic problem can be diagnosed either by you or as a result of a phone call to a service engineer, then you should select a company that can ship parts on the same day. If you do not use a service contract, you should provide for some kind of blanket repair purchase-order or credit arrangement so that your order does not get held up by red tape in your company. You should be prepared to authorize parts shipment when you call for service assistance. If a problem cannot be diagnosed by you or as a result of a call to a service engineer, the part (or instrument) may have to be shipped back, which will result in downtime, shipping, and insurance costs, and packing inconvenience.

RESPONSE TIME

Repair departments are expected to make a profit, and training repair experts is expensive. If sufficient service engineers are available to respond to service calls immediately, then their salaries must be paid while they are waiting for those calls. The salaries for underutilized repair experts may come from higher direct-service charges or from a part of the initial cost of the instrument. Good business practice requires that repair experts stay busy, which allows companies to charge less for service. Service may be backlogged to fill in slack time, and, consequently, you may have to wait for service. When choosing an instrument, you may have to decide whether rapid response to service calls at a higher cost is more important than slower response at a lower cost.

Companies may give priority to incoming service requests according to the size or importance of an account; therefore, there may be an advantage to buying many instruments from one company. Nevertheless, you must voice your expectations if you wish to be given priority in service. Furthermore, if the company does establish prioritized service accounts and you are a small account, be prepared to insist that the repair experts follow through on their commitment to arrive on a certain day and at a certain hour.

The term *response time* is used loosely to refer to the time interval between the placement of a service call and the repairperson's arrival. *Same-day response* to an early morning (9–10 AM) request for service can have a broad range of meanings. At one extreme, you may be put directly in touch with a service engineer who can walk you through diagnosis and repair procedures (assuming that you have the parts needed to make the repair). At the other extreme, same-day response can mean that a service engineer will call you before 5 PM and set up an appointment, frequently 24 to 72 hours later. That repair appointment may, in turn, result in ordering a part from a remote stocking center (another 24 to 48 hours) and a second visit from the service engineer. In other words, the response time could result in a same-day return to operation, or in operation a week after the initial service call is made. To combat these problems, some companies offer special faster VIP service for a higher contract fee, which may fill your need for faster service response time.

All companies provide free phone consultation to help you get your instrument operating, but the time it takes to reach the appropriate personnel can be excessive. To determine how easily and quickly you can obtain a phone consultation, try reaching a repairperson before you buy an instrument.

The important consideration then is not the proximity of the service center, but rather the amount of downtime you can afford. It is difficult to obtain a clear answer on the subject of average service response time from a company with which you anticipate doing business. There are, however, a few fair and objective questions that you can ask to help you evaluate response time:

- Can you refer me to other customers of yours with whom I can discuss service?
- How many local repair personnel service liquid chromatographs?
- Are any central or regional parts centers used? What is the delivery time to my area?
- Is a 24-hour repair-call answering service available?

OUT-OF-WARRANTY SERVICE

Out-of-warranty, on-site repair is available, but often at 20% to 40% higher rates than service center rates, and you must pay the travel expenses of the service engineer. Nevertheless, on-site service is faster than shipping instruments back to the manufacturer.

Out-of-warranty service center repair is available from all companies, and generally the customer pays shipping both ways. Service shop rates vary from $50 to more than $100 an hour, plus the costs of parts.

In some cases, a number of somewhat inconvenient procedures are part of the usual service center repair: you must write or call for a "return authorization number," ship the component, wait for a service quote, reply to this, and then wait for the component to be returned. These time delays and inconveniences favor seeking out local or in-house repair.

To determine the variations in repair costs, the companies surveyed were asked to estimate the typical repair costs given the following situation: upon return to the factory, the transformer of a fixed-wavelength UV detector is found to be defective. Estimates, which included repair time, parts, and shipping costs, ranged from $185 to $370.

INDEPENDENT SERVICE ENGINEERS

There is a growing supply of instrument-company-trained independent service engineers who may offer some advantage over service engineers employed by manufacturers. Their fees are sometimes one-half those of the manufacturer, their response time can be much faster, and their commit-

ment to your satisfaction may be greater. Moreover, independent service engineers are often chromatographers themselves and can supply not only repair service, but also operating instruction, separation advice, and equipment evaluation. Independent service engineers, however, must often buy parts at retail prices and, hence, you may find the parts they supply to be more expensive. Some independent service engineers will provide "loaner" components when repairs or parts will be delayed. You may wish to try an independent service engineer when a warranty has expired, although locating them is not always easy. Recommendations from other chromatographers are often the best method to learn about independent service engineers who work in your area.

SERVICE CONTRACT BENEFITS

Service contracts provide a number of benefits for both the manufacturer and the owner. Manufacturers have a guaranteed business relationship for the period of the service contract, which helps them budget for and train service engineers. The service engineers' direct contact with the owner or user often allows them to represent the customer to the manufacturer. This information flow contributes to product improvements, design changes, and even sales leads for the company. If the service contract provides an adequate response time to keep an instrument properly maintained, the owner and user are more likely to favor that company with additional purchases.

Service contracts permit owners to budget maintenance costs and schedule system shutdown for preventive maintenance. The preventive maintenance provided with service contracts often improves instrument performance and lifetime, gives the manufacturer an opportunity to incorporate the latest design changes, and may help the owner or user to become more familiar with the instrument through interaction with the service engineer. A service contract often circumvents the red tape involved in approving purchase requisitions and leads to speedier repair.

CONCLUSIONS

Negotiating a service contract should be considered at the time an instrument is purchased. It is important for the owner, or prospective owner, to establish certain priorities in order to determine the degree and type of service that is needed. If your priority is to minimize costs, simpler instruments with better diagnostics might favor more self-repair. If, however, your priority is to minimize downtime, then the quality of the company's services may be as important as the operational features of the instrument. Obtaining minimum downtime is made easier by more reliable instruments, self-diagnosis and in-house repair capabilities, a telephone service from the manufacturer for repair advice, rapid response for shipping repair parts, and rapid response of fully supplied service engineers. Remember that these factors are not necessarily dependent upon the proximity of the repair service. Assessing these factors is not easy, and, therefore, it may be invaluable for prospective customers to talk with other customers who already own instruments as a means of evaluating the downtime and service factors involved with particular instruments and manufacturers.

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