White Paper

Agilent CrossLab
From Insight to Outcome

5-Year Study Substantiates Value Of Agilent Preventive Maintenance

Executive summary

In an effort to understand the true benefit of Agilent Preventive Maintenance, a rigorous statistical analysis of five years of service calls was conducted by a third-party actuarial firm. The study analyzed more than 38,000 records of service calls made in the United States, comparing two groups of instrument systems comprised of both Agilent and other manufacturers' instrumentation.

Overall findings

Agilent Preventive Maintenance (PM) offers a clear advantage relative to other sources of PM, delivering significant cost savings, reduced repair calls, and increased uptime. Instrument systems receiving both repair and preventive maintenance from Agilent are shown to experience a 24% reduction in the number of repairs, 31% lower repair costs, and 2.4 days less downtime per year, versus systems on Agilent repair-only agreements. Perhaps even more significant, the analysis indicates that regular Agilent PM ensures that problems are caught earlier, resulting in even higher reductions in unscheduled downtime and in the cost and frequency of repairs.

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Study protocol and methodology

Agilent maintains detailed, accurate records of all service calls made by its Customer Support Organization to maintain and repair both Agilent and other manufacturers' instrumentation. This study analyzed more than 38,000 records of service calls made in the United States, and was performed by a third-party actuarial firm that devotes a portion of its practice to analyzing the very large volumes of data associated with clients' extended warranties and service agreements.

– The first group (5600 instrument systems) was covered by Agilent repair services only, and did not receive Agilent PM services. Note: Most of these instruments are maintained by users or by other commercial providers of instrument services.

– The second group (7800 instrument systems) was covered by Agilent for both repair and PM services.

For each instrument group, the total number of repairs, the total cost of those repairs, and the total number of days that the instrument was inoperable due to the need for a repair (downtime) were calculated by instrument category (e.g., LC or LC/MS). In addition, each statistical category was normalized for the amount of time that the instrument had been in service and under agreement, resulting in an annualized number. Each category was then compared for the two groups of instruments to determine any potential benefit due to Agilent Preventive Maintenance

Detailed findings

Repair frequency reduced

The overall benefit of preventive maintenance is substantial, resulting in an average reduction of 24% in the number of repairs for all instruments covered by Agilent PM (Figure 1). The reduction in repair frequency varied with instrument type and complexity. A less complex instrument like the UV-Visible spectrophotometer (UV-VIS) experienced a reduction of less than 10%, while a more complex instrument such as an inductively coupled plasma mass spectrometer (ICP-MS) experienced a reduction in the number of repairs of almost 50% when covered by Agilent PM. Liquid chromatography mass spectrometry (LC/MS) systems also benefited significantly from preventive maintenance, with a 39% reduction in the number of repairs performed. It is important to note that other vendors' instrument systems can benefit from Agilent preventive maintenance programs as well, with a 17% reduction in number of repairs when receiving Agilent PM.

Repair costs lowered

Reductions in the total cost of repairs are even greater, with instruments covered by preventive maintenance experiencing 31% lower repair costs overall (Figure 1). This indicates that not only are repairs less frequent, but the severity of the repairs is also reduced when the instrument receives regular PMs from Agilent. Again, the less complex instruments (UV-VIS) experienced lower cost savings, while the ICP-MS platform benefited from the greatest repair cost reductions. Repair costs for other vendors' instruments were reduced 25% by receiving Agilent PM. The LC platform benefits significantly from preventive maintenance, with a cost reduction of 31%.

Instrument downtime decreased

The most significant Agilent PM benefit to many laboratories may be the resulting decrease in instrument downtime, reflected by the average reduction in downtime for all instruments of 2.4 days per year (Figure 1). In laboratories where the loss of instrument availability is measured by downtime costs per hour or where project timelines are tight, the resulting uptime can translate into significant annual financial or project benefits.

Hidden value indicated for an Agilent PM agreement

One of the advantages of a preventive maintenance program is that problems may be identified earlier, before they can cause significant damage to the instrument or extended downtime. On average, 15% of the repairs made to instruments under an Agilent Repair and PM agreement were made during the scheduled downtime of a preventive maintenance visit. This can have a significant impact on the frequency and cost of subsequent repairs, as well as downtime. When only those repairs done outside the time of the PM are examined, the savings are even more striking (Figure 2). The total average repair frequency drops by 35% (compared to the 24% when repairs at the time of PM are included, in Figure 1). The cost savings are significantly higher as well, at 41% versus the 31% observed for all repairs. Unscheduled instrument downtime is reduced by 3.4 days, versus 2.4 days for all repairs. The study shows that regular preventive maintenance clearly catches problems earlier, before they become more serious and costly.

Preventive maintenance study summary of results

Platform	Average reduction with Agilent PM in:		
	Repair Events	Repair Costs	Downtime (Days/Year)
CE	-32%	-47%	-6.4
GC	-18%	-17%	-0.9
GC/MS	-27%	-31%	-2.0
LC	-26%	-31%	-2.5
LCMS	-39%	-34%	-3.0
Non-Agilent	-17%	-25%	-3.0
UV-VIS	-9%	-15%	-0.5
Total Weighted Average	**-24%**	**-31%**	**-2.4**

Figure 1. Summary of results of the study of a total of 38,460 Agilent service records, in which instruments covered by both repair and preventive maintenance services (7800 instrument systems) were compared to instruments covered only by a repair agreement (5600 instrument systems). The total averages for reduction in number of repairs, repair costs, and downtime across all instruments are shown, along with the same figures for selected instrument platforms. The total figures also included data for ICP-MS and microarray scanner instruments.

The hidden value of an Agilent preventive maintenance agreement

Platform	Average reduction when only repairs not performed at the time of the PM are considered:		
	Repair Events	Repair Costs	Downtime (Days/Year)
LC	-37%	-41%	-3.3
LCMS	-50%	-46%	-4.0
Non-Agilent	-28%	-32%	-3.3
UV-VIS	-31%	-36%	-2.5
Total Weighted Average	**-35%**	**-41%**	**-3.4**

Figure 2. Summary of results of a study in which instruments covered by both repair and PM services (7800 instrument systems) were compared to instruments covered only by a repair agreement (5600 instrument systems). In this case, any repairs performed under a PM agreement at the time of the preventive maintenance service call were excluded from the study. In this way, the impact of repairs made at the time of the PM service call on the number, cost, and downtime of subsequent repairs could be determined. The total averages for reduction in number of repairs, repair costs, and downtime across all instruments are shown, along with the same figures for selected instrument platforms. The total figures also included data for ICP-MS and microarray scanner instruments.

Conclusions

The analysis of this very large body of service call data shows a clear advantage to Agilent Preventive Maintenance, versus other PM sources, on Agilent systems as well as those made by other equipment manufacturers. On average, the number of repairs is reduced 24%, repair costs go down 31%, and instrument downtime decreases by an average of 2.4 days. In addition, regular Agilent PM frequently catches problems at the time of PM, further reducing the frequency, cost, and downtime of unscheduled repairs later on. Laboratories that pay for repairs on a time and materials basis can significantly reduce the frequency and cost of those repairs and reduce the associated downtime by putting their instruments on an Agilent PM agreement. Laboratories that already have their repairs covered by an agreement will not observe a difference in repair costs, since all repairs are covered in the agreement price. However, adding a PM to the agreement provides major productivity benefits resulting in significant reductions in the frequency of repairs and the associated downtime.

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