PROCUREMENT RECOMMENDATION AND CAPITAL REQUEST

# HG-1 Online Condition Monitoring: Vendor Selection and Award

Three bids evaluated against mandatory gates, weighted criteria, and 10-year total cost of ownership, and reconciled to the business case approved in ROI-2026-005.

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| | |
|---|---|
| CLIENT | Larkspur Valley Foods, Inc. — Plant 2 (cultured dairy) |
| REQUIREMENT | Wireless vibration and temperature monitoring of HG-1 crankcase bearings and seal leakage, with alarms to the CMMS |
| REPORT NO. | PR-2026-008 · Revision 0 · Issued January 8, 2027 |
| BASIS | ROI-2026-005, option O2 (approved planning value $28,000 capital + $3,000/yr); maintainability requirements from MA-2026-006 |
| EVALUATION TEAM | Apex Reliability Engineering (lead) · Maintenance & Engineering Manager · Controls Engineer · IT/OT Security Lead · Food Safety & QA Manager · Purchasing · Plant Controller |

> **Demonstration document.** Sample report. All company names, people, data, and financial figures are fictional and shown for demonstration only. Vendors are anonymized and fictional. The structure, methods, and level of detail match Apex Reliability Engineering client deliverables.

# Executive Summary

Award recommendation and capital request for approval by the Plant Manager and Plant Controller.

RECOMMENDATION

Award to **Vendor B** at **$31,900**, with a capital authorization of **$33,495** including 5% contingency. Vendor B has the highest bid but the **lowest 10-year cost of ownership** ($48.2K PV) and the highest evaluated score. The lowest bid (Vendor C, $22,800) fails three mandatory gates and would have cost the most to own. Against the approved business case, the award adds $1,723 of PV cost, and the case remains positive.

| BID, RECOMMENDED | CAPITAL AUTHORIZATION | 10-YR TCO (PV) | EVALUATED SCORE | CHANGE TO APPROVED CASE |
|---|---|---|---|---|
| **$31.9K** | **$33.5K** | **$48.2K** | **4.51 / 5** | **+$1.7K** |
| Turnkey, installed, integrated | Bid + 5% contingency | Lowest of the compliant bids | vs. 4.14 for Vendor A | PV cost; O2 NPV stays $316K |

## DECISIONS REQUESTED

1. **Approve the award to Vendor B** and a capital authorization of $33,495.
2. **Approve the commercial terms** in Section 5: 20% of payment held until site acceptance and a 30-day performance period, plus a 2-year warranty.
3. **Fund $3,372 of OPEX** for the network drop, IT/OT review, and commissioning labor.

## WHY NOT THE LOWEST BID

- GATE Vendor C's field devices are not rated IP69K for daily washdown.
- GATE Raw data is available only through the vendor's cloud subscription.
- GATE The cloud-only architecture failed the plant's IT/OT security review.
- COST Annual battery changes and a higher subscription make it the costliest option over 10 years, even before the gates.

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# 1 Need and Approved Business Case

This purchase implements option O2 of ROI-2026-005, which the plant approved. This document selects the supplier, confirms that the approved economics still hold at the actual price, and sets terms that protect the plant.

TABLE 1.1 — WHAT THE BUSINESS CASE REQUIRES

| ITEM | FROM ROI-2026-005 |
|---|---|
| Purpose | Early warning on HG-1's major mechanical failure mode ($150K per event); data feed for the rebuild-or-replace trigger |
| Expected effect | Major-failure risk cut 65% (vs. 30% with routes alone) |
| Planning values | $28,000 capital; $3,000/yr operating; $46,434 10-year PV of cost at 10% |
| Approved economics | O2 NPV $317,720; increment over O1 $18,084 |

**WHAT THIS PURCHASE MUST NOT DO**

The monitoring increment over O1 is positive but modest. A supplier choice that adds more than about $18K of PV cost would erase it. For that reason, total cost of ownership, not purchase price, is the financial test in this evaluation.

TABLE 1.2 — PROCUREMENT PROCESS

| STEP | ACTIVITY |
|---|---|
| Market scan | Five suppliers screened; three invited to bid on a common specification |
| Bid and clarification | Written bids, a technical clarification call, and site walk-down with each bidder |
| Evaluation | Mandatory gates first, then weighted scoring (70% non-price, 30% TCO) by a cross-functional team |
| Due diligence | Two customer references per passing bidder; IT/OT architecture review; sample sensor washdown inspection |

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## 2 Mandatory Gates

Gates are pass/fail and come before any scoring. A bid that fails a gate is excluded however attractive its price, because each gate protects food safety, plant security, or the business case.

TABLE 2.1 — GATE RESULTS

| GATE | VENDOR A | VENDOR B | VENDOR C |
|---|---|---|---|
| Washdown rating IP69K on all field devices | ✓ Pass | ✓ Pass | × Fail |
| Food-safe housings; no glass or brittle plastic over product zone | ✓ Pass | ✓ Pass | ✓ Pass |
| Alarms delivered to the plant CMMS within 5 minutes | ✓ Pass | ✓ Pass | ✓ Pass |
| Plant owns raw data; local export without subscription | ✓ Pass | ✓ Pass | × Fail |
| Passes plant IT/OT security review (zones and conduits per IEC 62443-3-3) | ✓ Pass | ✓ Pass | × Fail |
| Sensor replaceable in ≤ 10 min without special tools (MA-2026-006, req. 1) | ✓ Pass | ✓ Pass | ✓ Pass |
| **Result** | **Proceeds** | **Proceeds** | **Excluded** |

**WHY THESE GATES**

HG-1 sits over the open-product area and is washed down daily, so devices must be rated IP69K and food-safe. Monitoring data feeds the rebuild-or-replace decision, so the plant must own and be able to export it. Any device on the plant network must pass the IT/OT security review.

**VENDOR C, IN CONTEXT**

Vendor C offered a capable product at the lowest price. Its failures were all architectural (washdown rating, data access, cloud-only design), not minor documentation gaps that could be fixed during contracting.

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# 3 Bid Evaluation

The two compliant bids were scored on eight non-price criteria (70%) and 10-year TCO (30%). Vendor B leads by 0.37 points.

TABLE 3.1 — WEIGHTED SCORING (0–5 SCALE)

| CRITERION | WEIGHT | VENDOR A | VENDOR B |
|---|---|---|---|
| Detection capability (bandwidth, analytics) | 15% | 4 | 5 |
| Hygienic and washdown design | 10% | 4 | 5 |
| Battery life and field maintainability | 8% | 3 | 4 |
| CMMS and historian integration | 7% | 5 | 4 |
| Local service and support | 8% | 3 | 4 |
| Vendor viability and references | 6% | 4 | 4 |
| Data ownership and portability | 6% | 3 | 5 |
| Delivery lead time | 10% | 5 | 3 |
| 10-year TCO (lowest = 5; others pro rata) | 30% | 4.63 | 5.00 |
| **Weighted score** | **100%** | **4.14** | **4.51** |

Scores are the evaluation team's consensus against the rubric in the Appendix. Vendor A scores higher on CMMS integration and lead time; Vendor B leads on detection capability, washdown design, battery life, data ownership, and TCO.

**ROBUSTNESS OF THE RESULT**

Vendor B still wins if TCO is given zero weight, and still wins if lead time is weighted 20% (taken from TCO). The ranking does not depend on a single judgment call.

**TRADE-OFF ACCEPTED**

Vendor B's 8-week lead time is 4 weeks longer than Vendor A's. Planned changes and oil and vibration routes (O1) cover HG-1 in the meantime, so the delay costs little.

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# 4 Total Cost of Ownership and Financial Impact

Over 10 years, the highest bid is the cheapest to own. Subscriptions and battery changes, not the purchase price, decide the ranking.

FIGURE 4.1 — 10-YEAR TOTAL COST OF OWNERSHIP, PRESENT VALUE AT 10%

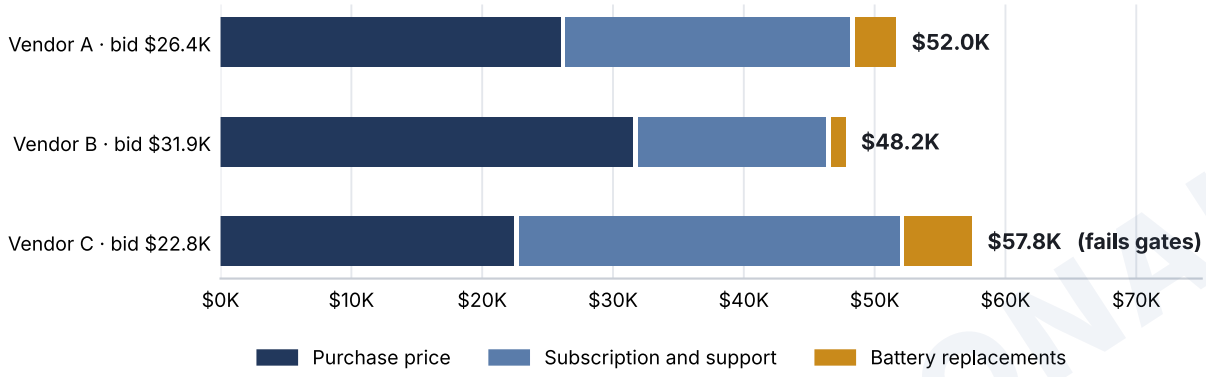



TABLE 4.1 — TCO COMPONENTS

| | VENDOR A | VENDOR B | VENDOR C |
|---|---|---|---|
| Purchase price (installed, integrated) | $26,400 | $31,900 | $22,800 |
| Annual subscription, support, IT upkeep | $3,600 | $2,400 | $4,800 |
| Battery replacements over 10 years | $6,000 | $3,000 | $9,000 |
| 10-year cost, nominal | $68,400 | $58,900 | $79,800 |
| **10-year cost, present value** | **$52,032** | **$48,157** | **$57,824** |

TABLE 4.2 — RECONCILIATION TO ROI-2026-005

| ITEM | VALUE |
|---|---|
| Approved planning PV of cost | $46,434 |
| Vendor B PV of cost | $48,157 |
| **Change** | **+$1,723** |
| O2 NPV, updated | $315,997 |
| **O2 increment over O1, updated** | **$16,361** |

**ACCOUNTING AND CASH TIMING**

The $31,900 is CAPEX, depreciated over 7 years under MACRS (year-1 depreciation $4,559; 100% bonus depreciation may apply if the Controller elects it), subject to Controller review. Contingency is released only on change order. Cash leaves in three milestones (Section 5), with $6,380 held until the system has proven itself in service.

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# 5 Commercial Terms and Risk

Payment tied to proven performance, measurable acceptance criteria, and a risk register owned by named roles.

TABLE 5.1 — PAYMENT MILESTONES

| MILESTONE | SHARE | AMOUNT |
|---|---|---|
| Purchase order | 30% | $9,570 |
| Delivery and installation | 50% | $15,950 |
| Site acceptance plus 30-day performance period | 20% | $6,380 |

TABLE 5.2 — KEY CONTRACT TERMS

| TERM | REQUIREMENT |
|---|---|
| Warranty | 2 years, parts and labor, from acceptance |
| Price hold | Support fee fixed for 3 years; then capped at CPI |
| Data | Plant owns all data; export in open format at no charge |
| Exit | Gateway and sensors keep working locally if support ends |

TABLE 5.3 — ACCEPTANCE CRITERIA (SITE ACCEPTANCE PLUS 30-DAY PERFORMANCE PERIOD)

| CRITERION | PASS CONDITION |
|---|---|
| Data availability | ≥ 98% of expected readings received over 30 days |
| Alarm delivery | Test alarms reach the CMMS within 5 minutes, 10 of 10 times |
| Measurement validity | Vibration readings within ±10% of a calibrated portable analyzer on the same points |
| Washdown survival | No device faults or ingress after 30 daily sanitation cycles |
| Maintainability | Sensor swap demonstrated in ≤ 10 min without special tools |

TABLE 5.4 — RISK REGISTER

| RISK | RATING | MITIGATION | OWNER |
|---|---|---|---|
| False or nuisance alarms erode trust | MEDIUM | Alarm limits baselined over 30 days; two-stage alarms; monthly review | Reliability Engineer |
| Supplier exits the market | LOW | Local operation without support; data export; references checked | Purchasing |
| Network or security issue at go-live | MEDIUM | Gateway in a segmented OT zone; IT/OT sign-off before connection | IT/OT Security Lead |
| Monitoring benefit below the business case | MEDIUM | Tracked at the ROI's month-12 review; O1 practices continue regardless | Reliability · Controller |

SAMPLE — FICTIONAL D

# 6 Implementation and Approval

From approval to accepted system in about 14 weeks.

TABLE 6.1 — SCHEDULE

| WEEK | MILESTONE | OWNER |
|---|---|---|
| 0 | Approval; purchase order issued (30% payment) | Purchasing |
| 1–8 | Supplier lead time; network drop and OT zone prepared; alarm routing configured in the CMMS | Vendor B · Controls · IT/OT |
| 8–10 | Installation in sanitation windows; commissioning; QA sign-off on device placement (50% payment) | Vendor B · QA |
| 10–14 | Site acceptance and 30-day performance period; final payment on pass (20%) | Reliability Engineer |
| Month 12 | Benefit review within the ROI-2026-005 verification | Reliability · Controller |

## APPROVAL ROUTING

**Recommended by**
Lead Reliability Engineer, Apex Reliability Engineering
Signature _____ Date _____

**Technical acceptance**
Maintenance & Engineering Manager
Signature _____ Date _____

**Security review**
IT/OT Security Lead
Signature _____ Date _____

**Food safety review**
Food Safety & QA Manager
Signature _____ Date _____

**Financial approval**
Plant Controller
Signature _____ Date _____

**Capital approval**
Plant Manager
Signature _____ Date _____

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# A Scoring Rubric and References

TABLE A.1 — SCORING RUBRIC

| SCORE | MEANING |
|---|---|
| 5 | Exceeds the requirement with demonstrated evidence (test, reference, or site inspection) |
| 4 | Fully meets the requirement with evidence |
| 3 | Meets the requirement on the supplier's statement, without independent evidence |
| 2 | Partially meets the requirement; gap closable in contracting |
| 1 | Does not meet the requirement |

TABLE A.2 — BIDDER PROFILES (ANONYMIZED)

| BIDDER | OFFER | LEAD TIME |
|---|---|---|
| **Vendor A** | Cloud-hosted wireless monitoring (subscription) | 4 weeks |
| **Vendor B** | Wireless sensors with on-premise edge gateway | 8 weeks |
| **Vendor C** | Low-cost cloud-only sensors | 3 weeks |

TABLE A.3 — STANDARDS AND REFERENCES

| REFERENCE | TITLE AND USE |
|---|---|
| **IEC 62443-3-3** | Security for industrial automation and control systems — Part 3-3: System security requirements and security levels. Basis of the IT/OT security gate. |
| **IEC 60300-3-3:2017** | Dependability management — Part 3-3: Application guide — Life cycle costing. TCO structure. |
| **21 CFR 117.40** | Equipment and utensils. Food-safe device requirements over the product zone. |
| **ROI-2026-005 · MA-2026-006** | Prior Apex analyses at Plant 2. Approved business case and maintainability requirements. |

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