

ISO 14001 IMPLEMENTATION HUB

Volume 2 • Guide 5 of 6

Clause 9: Performance Evaluation

Monitoring, Compliance Evaluation, Internal Audit Maturity, and Management Review as Genuine Governance

Clause-by-Clause Practitioner's Guide • ISO 14001:2015

9.1.1 Monitoring and Measurement • 9.1.2 Compliance Evaluation • 9.2 Internal Audit • 9.3 Management Review

How to Use This Guide

This is Guide 2.5 in Volume 2 of the ISO 14001 Implementation Hub. It covers Clause 9 — the performance evaluation requirements of ISO 14001:2015 — at the analytical depth required to build evaluation systems that generate genuine insight rather than compliance evidence, and to defend those systems under the more probing scrutiny of Year 2 and Year 3 surveillance audits.

Clause 9 is where the EMS answers the question: is it working? The four sub-clauses — monitoring and measurement (9.1.1), compliance evaluation (9.1.2), internal audit (9.2), and management review (9.3) — form a cascading evaluation and governance cycle. Each feeds the next: monitoring data informs the compliance evaluation; compliance evaluation findings feed the internal audit scope; audit findings and monitoring trends are management review inputs; management review decisions direct the next cycle's monitoring priorities and audit focus. When this cycle functions with integrity — when data is analyzed rather than merely collected, when compliance evaluation goes beyond data availability to actual compliance determination, when audits challenge rather than confirm, and when management reviews produce decisions rather than observations — the EMS is a functioning environmental governance system. When any link in the cycle is weak, the system loses its self-correcting capacity.

Clause 9.1.1 — Monitoring, Measurement, Analysis, and Evaluation

Standard Requirement

ISO 14001:2015, Clause 9.1.1: "The organization shall monitor, measure, analyze and evaluate its environmental performance. The organization shall determine: a) what needs to be monitored and measured; b) the methods for monitoring, measurement, analysis and evaluation, as applicable, to ensure valid results; c) the criteria against which the organization will evaluate its environmental performance, and appropriate indicators; d) when the monitoring and measurement shall be performed; e) when the results from monitoring and measurement shall be analyzed and evaluated. The organization shall ensure that calibrated or verified monitoring and measurement equipment is used and maintained, as appropriate. The organization shall evaluate its environmental performance and the effectiveness of the environmental management system. The organization shall communicate internally and externally relevant information on its environmental performance, as identified in its communication process and as required by its compliance obligations. The organization shall retain appropriate documented information as evidence of the monitoring, measurement, analysis and evaluation results."

What to Monitor: Beyond Permit Compliance

Most industrial organizations enter ISO 14001 implementation with a well-developed permit compliance monitoring program — they already measure what their permits require because regulatory consequences make permit monitoring non-negotiable. The challenge that Clause 9.1.1 presents is not building permit compliance monitoring; it is determining what to monitor beyond permit compliance, and why.

The standard requires monitoring of "environmental performance" — which is a broader concept than permit compliance. An organization can be in full permit compliance while its environmental performance is deteriorating: if a permit limit is set at 100 tons of VOC annually and the organization is emitting 95 tons (compliant), but emissions were 60 tons five years ago (compliant and improving), the permit compliance data tells you the organization is compliant while the trend data tells you environmental performance is declining. ISO 14001:2015 requires monitoring capable of detecting both — compliance status and performance trend.

The Five Monitoring Determination Questions

Clause 9.1.1 specifies five determinations the organization must make about its monitoring program. A monitoring program that has not explicitly addressed all five has gaps that generate audit findings:

Determination	What It Requires and Cascade Application
(a) What to monitor and measure	Two categories must be covered: (1) Compliance monitoring — what permits and regulations require, determined from the compliance obligations register Section B. (2) EMS effectiveness monitoring — what the organization needs to know about environmental performance beyond compliance, including objective metrics, significant aspect performance indicators, and EMS process performance measures. Cascade monitors: daily VOC emission data (permit compliance + EO-01 objective); monthly VOC emission calculations vs. permit limit and trend; pre-discharge pH and metals (permit compliance); stormwater monitoring (permit compliance + trend); hazardous waste generation volume (EO-02 objective); energy consumption by fuel type (customer GHG

Determination	What It Requires and Cascade Application
	reporting). All six monitoring streams are connected to either a compliance obligation or an environmental objective.
(b) Methods for monitoring, measurement, analysis and evaluation to ensure valid results	The monitoring method must be appropriate to the measured parameter and capable of producing valid (accurate, reproducible) results. For regulated parameters: methods specified in permits (e.g., EPA Reference Method for stack testing; ASTM methods for wastewater analysis). For EMS performance indicators: clearly defined calculation methods with consistent input data sources. At Cascade: VOC emission calculation uses material usage data from daily logs multiplied by SDS VOC content data — this calculation method is documented in MPC-EMS-PRO-008 and referenced in PSCAA permit conditions.
(c) Criteria for evaluating environmental performance and indicators	What does the organization compare monitoring results against to determine whether performance is acceptable? Three reference points: (1) permit limits and regulatory thresholds (compliance floor); (2) environmental objective targets (performance goal); (3) historical baseline trend (performance trajectory). Monitoring that produces data without defined evaluation criteria produces data that cannot drive decisions. Cascade's VOC emission data is evaluated against three criteria: PSCAA permit monthly limit (compliance); EO-01 annual target (objective progress); Year 1 baseline monthly average (trend).
(d) When monitoring and measurement shall be performed	Monitoring frequency must be defined and followed. The frequency should be appropriate to: the rate of change in the measured parameter (a continuous emission source requires more frequent monitoring than a batch discharge); the consequence of exceeding a limit (parameters where exceedance has immediate legal reporting implications require monitoring frequent enough to detect the exceedance before the reporting deadline passes); and the permit or regulatory requirement for the parameter. Cascade: daily for VOC emission log entries; pre-discharge for wastewater parameters; quarterly for stormwater monitoring; monthly for VOC emission calculation and compliance evaluation.
(e) When results shall be analyzed and evaluated	Data collection and data analysis are not the same activity. Many organizations collect monitoring data diligently but do not formally analyze it — they produce records without producing insight. The analysis and evaluation frequency should enable timely decisions: if the VOC emission calculation is conducted monthly and the permit has a monthly limit, the analysis must be completed early enough in the month to allow operational adjustment if the trend suggests the monthly limit may be approached. Cascade: monthly VOC emission calculations completed by the 5th of the following month; trend analysis (month vs. prior 3 months vs. same month prior year) completed at same time and included in management review input package.

Environmental Performance Indicators — Beyond Permit Data

An environmental performance indicator (EPI) is a specific, quantitative measure of an aspect of environmental performance that enables trend analysis and comparison over time. Well-designed EPIs are the foundation of a monitoring program that can demonstrate environmental performance improvement — the core continual improvement requirement of ISO 14001:2015.

Environmental Performance Indicator	Unit of Measure	Data Source	Evaluation Criteria
Total VOC emissions from coating operations	Tons per rolling 12 months	Monthly emission calculations from daily logs (MPC-EMS-FRM-002)	PSCAA permit limit; EO-01 annual reduction target; Year 1 baseline
VOC emission intensity — emissions per unit of production	Lb VOC per 1,000 sq ft of coated surface	Monthly VOC calculation divided by production area data from job tracking system	Year 1 baseline; trend vs. prior quarter; target set in Year 2 management review
Hazardous waste generation — spent solvents	Gallons per quarter	Hazardous waste manifests (MPC-EMS-FRM-002)	EO-02 annual reduction target; Year 1 quarterly baseline
Pre-treatment compliance rate — discharges within permit limits	% of discharge samples within all permit limits	Pre-discharge monitoring records (MPC-EMS-FRM-004)	Target: 100%; Year 1 actual (reference); trend vs. prior quarter
Natural gas consumption — curing ovens	MMBtu per month	Utility invoice data; oven meter readings	Year 1 monthly baseline; customer GHG reporting data; trend vs. prior year same month
EMS compliance status — % of obligations evaluated as compliant	% of tracked obligations compliant at most recent evaluation	Compliance evaluation record (MPC-EMS-CER series)	Target: 100%; trend — has compliance rate improved since previous evaluation?

Best Practice

The most valuable environmental performance indicator for most regulated industrial manufacturers is the emission intensity metric — emissions per unit of production — rather than absolute emission volumes alone. Absolute emissions can increase when production increases while the environmental control effectiveness actually improves. Emission intensity normalizes the environmental impact against the level of productive activity, enabling a genuine assessment of whether the organization is becoming more or less environmentally efficient over time. When Cascade installs the high-solids coating system (EO-01), both absolute VOC emissions and VOC emission intensity should decrease — but if production volume increases significantly in the same period, only the intensity metric will reveal that the efficiency improvement was real rather than attributable to reduced production.

Calibrated Equipment and Measurement Validity

Clause 9.1.1 requires the organization to "ensure that calibrated or verified monitoring and measurement equipment is used and maintained, as appropriate." In the EMS context, this calibration requirement applies to any instrument used to generate compliance monitoring data — not only laboratory instruments, but also field instruments used in operational monitoring.

At Cascade, the instruments requiring calibration management include: pH meter used for pre-discharge wastewater assessment (calibrated against buffer standards before each use); turbidimeter for treatment system monitoring; differential pressure gauge on spray booths (monthly functional verification); continuous emission monitors if installed; portable air quality monitors if used for fugitive emission monitoring. These instruments must be maintained on the calibration register with defined calibration frequencies and must be calibrated before their results are used in compliance evaluations or permit submissions.

The critical compliance implication: permit monitoring data generated with an uncalibrated or out-of-tolerance instrument may be invalid — potentially requiring the data to be flagged as suspect and resampling conducted. An exceedance that was actually within limits, or a compliance result that was actually an exceedance, both represent serious regulatory consequences when instrument validity is questioned. Calibration is not an administrative exercise; it is the foundation of data validity.

Clause 9.1.2 — Compliance Evaluation: Systematic Legal Assessment

Standard Requirement

ISO 14001:2015, Clause 9.1.2: "The organization shall establish, implement and maintain a process needed to evaluate fulfilment of its compliance obligations. The organization shall: a) determine the frequency and method(s) for evaluation of compliance; b) evaluate compliance and take action if needed (see 10.1 and 10.2); c) maintain knowledge and understanding of its compliance status. The organization shall retain documented information as evidence of the compliance evaluation result(s)."

The Compliance Evaluation Process vs. Compliance Monitoring

The most important distinction for practitioners to hold clearly is the difference between compliance monitoring (Clause 9.1.1 — collecting data about compliance-relevant parameters) and compliance evaluation (Clause 9.1.2 — systematically determining whether each compliance obligation is being met based on available evidence). Many organizations conduct robust compliance monitoring and produce abundant compliance data without ever conducting a formal compliance evaluation — they have data without determination.

Compliance monitoring answers: "What does the pH meter show?" Compliance evaluation answers: "Based on pH meter data for the past quarter, is Cascade meeting State Waste Discharge Permit Condition 3.2 (pH 6.0 to 9.5 SU for all discharges)?" The first requires an instrument and a record form. The second requires a structured comparison of data against requirements with a documented conclusion. Both are necessary; neither substitutes for the other.

Designing the Compliance Evaluation: Frequency, Method, and Documentation

A well-designed compliance evaluation process answers the five questions implicit in Clause 9.1.2(a):

Frequency: How Often Is Enough?

The compliance evaluation frequency must be sufficient to maintain "knowledge and understanding of compliance status" — the Clause 9.1.2(c) requirement. This means the evaluation must occur frequently enough that any compliance failure is detected and addressed within a timeframe that enables corrective action before regulatory consequences become unavoidable. Three factors determine adequate frequency for each compliance obligation:

- Regulatory consequence timeline: obligations where a compliance failure triggers an immediate regulatory notification requirement (PSCAA permit exceedance reporting within 10 business days) need evaluation frequent enough to detect the failure before the notification deadline. If monthly VOC calculations are conducted on the 5th of the following month, and the permit requires exceedance notification within 10 business days, evaluation of the prior month's compliance within the first week of the following month satisfies this requirement.
- Rate of change in the measured condition: obligations tied to continuously variable parameters (pH, temperature) require more frequent evaluation than obligations tied to static conditions (whether the SPCC Plan is current). A static condition evaluated annually is adequate; a continuously variable parameter evaluated annually may leave a compliance failure undetected for months.

- Consequence severity: obligations where non-compliance would have the most severe regulatory or environmental consequences should receive the highest evaluation frequency. RCRA management standards for hazardous waste — where failure can result in criminal liability in addition to civil penalties — warrant at minimum quarterly evaluation of all management standard requirements.

Method: What Does the Evaluation Actually Do?

The compliance evaluation method must be specific enough to produce a genuine compliance determination rather than a presumption. Three complementary methods used in combination provide the most robust compliance evaluation:

- Record review: systematic review of compliance monitoring records against permit conditions and regulatory requirements. For each obligation, the evaluator reviews the available data, compares it to the specific requirement, and documents whether the data confirms compliance. This is the primary method for quantitative compliance obligations (emission limits, discharge parameters, monitoring frequencies).
- Physical inspection: direct observation of compliance-critical equipment, facilities, and practices. For management standard obligations (waste container labelling, secondary containment integrity, SPCC Plan posting) where record review is insufficient to confirm compliance, physical inspection provides the evidence. Physical inspection is also the primary method for detecting unintended operational changes that may have introduced compliance risks since the last record-based evaluation.
- Inquiry and confirmation: direct questioning of responsible personnel about compliance activities and status. Useful for verifying that training obligations were met, that procedures were followed during a specific period, and that notification obligations were discharged on time. Inquiry confirms what records show and physical inspection observes.

Cascade Compliance Evaluation — Year 2 Annual Evaluation Structure

Cascade's compliance evaluation for Year 2 covered 27 compliance obligations drawn from all sections of MPC-EMS-LEG-001. The evaluation used a differentiated frequency approach: high-regulatory-consequence obligations (PSCAA permit conditions, State Discharge Permit conditions) evaluated monthly as part of the emission and discharge monitoring process; medium-consequence obligations (RCRA management standards, SWPPP compliance) evaluated quarterly; and static or lower-consequence obligations (SPCC Plan currency, permit renewal dates, voluntary commitments) evaluated annually. The following extract illustrates the evaluation structure for the three permit compliance streams:

Obligation ID	Compliance Obligation	Evaluation Result (Year 2 Annual)	Evidence and Notes
CA-L-001-01	PSCAA Permit Condition 4.2: Annual VOC emissions must not exceed [X] tons per rolling 12 months	COMPLIANT	Year 2 rolling 12-month total: [X-Y] tons — [Y] tons below permit limit. Represents [Z]% reduction from Year 1 total consistent with EO-01 trajectory. Monthly calculation records MPC-EMS-FRM-002-Y2 reviewed — all 12 months available and complete.
CA-L-001-02	PSCAA Permit Condition 4.5: Record coating material identity, VOC content, and quantity applied for each operating day	PARTIALLY COMPLIANT — Minor Gap	Daily emission logs (MPC-EMS-FRM-001) reviewed for all 245 production days in Year 2. 241 days fully complete. 4 days had blank VOC content fields for one or more coating

Obligation ID	Compliance Obligation	Evaluation Result (Year 2 Annual)	Evidence and Notes
			materials. Gap identified and escalated to EHS Manager. Root cause: two operators unclear on which SDS field to reference for VOC content. Training corrective action initiated (MPC-EMS-CAR-016). PSCAA notification evaluated — gap was identified and corrected within the permit period; no exceedance of permit limits resulted from the gap; regulatory notification not required. Corrective action to be confirmed complete before next evaluation.
CA-L-002-01	State Discharge Permit Condition 3.2: All wastewater discharges must have pH between 6.0 and 9.5 SU	COMPLIANT	Pre-discharge monitoring records (MPC-EMS-FRM-004) reviewed for all 87 discharge events in Year 2. All 87 pH readings within 6.0 to 9.5 SU range. Range: 6.8 to 8.9 SU. No values approaching limits.
CA-L-002-04	State Discharge Permit Condition 3.4: Zinc in discharge must not exceed 2.0 mg/L (new requirement — added in Year 1 permit renewal)	COMPLIANT	Lab reports for 12 zinc samples reviewed (quarterly sampling per permit + 8 additional due to new treatment chemistry in Q2). All results below 2.0 mg/L; range 0.18 to 0.74 mg/L. New treatment chemistry (added Month 19) has not adversely affected zinc results. Trend stable.
CA-L-003-03	RCRA 40 CFR 262.17: Hazardous waste satellite accumulation containers must be labelled with contents, marked as hazardous waste, and kept closed except when adding waste	COMPLIANT (with observation)	Physical inspection of all 6 satellite accumulation areas conducted Month 24. All containers properly labelled and marked. Containers observed closed at time of inspection. Observation: two containers in the paint mixing area had labels partially obscured by overspray — labels technically legible but reduced visibility. Labels replaced same day. No regulatory gap; observation documented for management review.
CA-L-006-01	Customer commitment: Annual GHG emissions data submitted to two OEM customers by March 31	COMPLIANT	GHG data submissions confirmed: Customer OEM-1 submitted March 15 (16 days early). Customer OEM-2 submitted March 28 (3 days before deadline). Third customer (Allied Manufacturing Group) submitted March 20 (first year of commitment; new voluntary compliance obligation added to register Year 1). All submissions confirmed received by

Obligation ID	Compliance Obligation	Evaluation Result (Year 2 Annual)	Evidence and Notes
			customers via email acknowledgement.

Year 2 compliance evaluation summary: 27 obligations evaluated. 25 fully compliant. 1 partially compliant with minor gap (CA-L-001-02 — corrective action initiated). 1 compliant with observation (CA-L-003-03 — no regulatory gap; observation only). 0 noncompliant. Overall compliance rate: 96% (improvement from Year 1: 91%). Evaluation report filed as MPC-EMS-CER-003. Reported to Jennifer Ramos at Year 2 management review.

Clause 9.2 — Internal Audit: Maturity Beyond Initial Certification

Standard Requirement

ISO 14001:2015, Clause 9.2.1: "The organization shall conduct internal audits at planned intervals to provide information on whether the environmental management system: a) conforms to: 1) the organization's own requirements for its environmental management system; 2) the requirements of this International Standard; b) is effectively implemented and maintained.

Clause 9.2.2: The organization shall establish, implement and maintain an audit program(s) taking into consideration the importance of the processes concerned, changes affecting the organization, and the results of previous audits."

Audit Program Maturity: What Changes in Years 2 and 3

The first internal audit cycle — conducted before Stage 2 certification — serves a specific purpose: demonstrating to the registrar that the organization has the capacity to evaluate its own EMS. Year 2 and Year 3 audits serve a fundamentally different purpose: evaluating whether the EMS that was built at certification is still functioning as designed, whether it has adapted appropriately to operational changes, and whether it is producing the environmental performance improvement that the standard requires.

A Year 2 audit that simply repeats the Year 1 audit structure — same checklist, same scope coverage, same level of evidence scrutiny — has not matured with the organization. The post-certification audit program should evolve along four dimensions:

Maturity Dimension	How the Audit Program Should Evolve Post-Certification
Scope and focus evolution	Year 1 audit: broad coverage demonstrating that all major EMS elements exist and are operational. Year 2 audit: deeper examination of areas where Year 1 found findings or observations; increased focus on how the EMS has adapted to operational changes since certification; coverage of EMS elements that received lighter attention in Year 1 due to time constraints. Year 3 audit (pre-recertification): comprehensive coverage across all clauses, with particular attention to EMS elements most likely to have drifted — register currency, procedure consistency with current practice, training record currency following personnel changes.
Finding trend analysis	The Year 2 audit program should include a review of Year 1 findings and corrective actions as a mandatory audit item: were the corrective actions effective? Has the underlying condition that produced the finding recurred? If the Year 2 audit identifies findings in the same areas as Year 1, this pattern suggests either that corrective actions were inadequate or that a systemic condition is producing recurring nonconformances that have not been addressed at the root cause level. Recurring findings escalate in significance — a minor finding in Year 1 that recurs in Year 2 reflects poorly on the corrective action system and may be escalated to a major finding by a registrar auditor.

Maturity Dimension	How the Audit Program Should Evolve Post-Certification
Effectiveness focus deepening	Year 1 audits primarily verify conformance: does the EMS element exist? Year 2 audits should evaluate effectiveness: is the EMS element producing its intended outcome? Does the compliance evaluation detect compliance status accurately? Is the objectives program driving actual environmental improvement? Is the management review producing decisions that change EMS performance rather than acknowledging data? These effectiveness questions require more sophisticated evidence gathering than existence verification.
Auditor competence development	Auditors trained for the first certification audit are competent to conduct existence-based audits. Effectiveness-based audits require deeper standard interpretation and more sophisticated evidence evaluation. Year 2 auditor development should include: review of surveillance audit reports to understand what registrar auditors look for; participation in an external auditor training refresher or advanced auditing course; mentored co-auditing with an experienced external auditor for at least one Year 2 session.

The Recurring Finding Problem — Root Cause vs. Symptom in the Audit Context

The most consequential audit program failure in the post-certification period is the pattern of recurring findings — the same gap appearing in successive audit cycles despite corrective action. Recurring findings reveal one of three systemic problems:

- Corrective action at the symptom level: the corrective action addressed the specific instance identified in the audit (retrained the operator who made the error) without addressing the system condition that allowed the error to occur (no supervisor review of log completion). A Year 2 finding in the same area confirms that the corrective action was insufficient.
- Change in personnel without transfer of competence: the person who was trained after the Year 1 finding has left the role, and their replacement has not received the same training. The corrective action closed correctly in Year 1 but the competence it produced was person-specific rather than role-specific and was not sustained through the personnel change.
- Systemic operational pressure overriding environmental controls: a recurring finding that the emission log is incomplete or that waste containers are not always closed when not in use may reflect not a training gap but a production pressure that consistently causes operators to skip environmental control steps when throughput demands peak. This type of systemic finding requires a management-level intervention — not another training event.

Auditor Perspective

Registrar auditors at Year 2 and Year 3 surveillance audits pull prior audit reports as a routine step. They compare prior findings to current audit status with a specific analytical purpose: determining whether the corrective action system is functioning effectively and whether the EMS demonstrates genuine improvement from cycle to cycle. A surveillance auditor who finds a Year 2 minor finding in an area where a Year 1 minor finding had been issued and closed will classify the Year 2 finding more seriously — potentially as a pattern that reflects inadequate corrective action depth. Three consecutive cycles with similar findings in the same area constitute evidence of a systemic corrective action failure that may warrant escalation to a major nonconformance.

Clause 9.3 — Management Review: Governance, Not Reporting

Standard Requirement

ISO 14001:2015, Clause 9.3.1 (General): "Top management shall review the organization's environmental management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness."

Clause 9.3.2 (Management review inputs): "The management review shall include consideration of: a) the status of actions from previous management reviews; b) changes in external and internal issues that are relevant to the environmental management system, including: 1) the needs and expectations of interested parties, including compliance obligations; 2) its significant environmental aspects; 3) risks and opportunities; c) the extent to which environmental objectives have been achieved; d) information on the organization's environmental performance, including trends in: 1) nonconformities and corrective actions; 2) monitoring and measurement results; 3) fulfilment of its compliance obligations; 4) audit results; e) adequacy of resources; f) relevant communications from interested parties, including complaints; g) opportunities for continual improvement. The management review shall include decisions related to: h) conclusions on the continuing suitability, adequacy and effectiveness of the environmental management system; i) decisions related to continual improvement opportunities; j) any need for changes to the environmental management system, including resources; k) actions, if needed, when environmental objectives have not been achieved; l) implications for the strategic direction of the organization, if any."

What "Continuing Suitability, Adequacy and Effectiveness" Actually Means

Clause 9.3.1 requires top management to ensure the EMS's "continuing suitability, adequacy and effectiveness." These three terms have distinct meanings that together define the full scope of the management review:

- **Suitability:** Is the EMS still appropriate for this organization, given its context, activities, and environmental impacts? Has the context changed in ways that make the current EMS design inappropriate — new processes, new regulations, new market requirements? A suitable EMS is one designed for the organization it serves, not a generic template loosely applied.
- **Adequacy:** Does the EMS have the necessary elements, resources, and documented information to meet the standard's requirements and the organization's own requirements? Adequacy is the question of whether the system is complete — whether it covers what it needs to cover with sufficient depth. An adequate EMS has no major gaps in required elements.
- **Effectiveness:** Is the EMS actually producing the outcomes it is designed to produce — environmental performance improvement, compliance with legal obligations, achievement of objectives? Effectiveness is the quality question — not whether the system exists but whether it works. An effective EMS is one where environmental performance is demonstrably improving over time.

A management review that concludes "the EMS is suitable, adequate, and effective" without supporting evidence for each conclusion has produced a conclusion, not an evaluation. The management review minutes should show the evidence that supports each conclusion — the monitoring trends, compliance evaluation results, audit findings, and objective achievement data that together justify the suitability, adequacy, and effectiveness assessments.

The 12 Required Input and Output Categories

Clauses 9.3.2 and 9.3.3 specify 12 categories of required management review inputs and outputs. An audit of the management review minutes against this list is a standard surveillance audit procedure. The most frequently missing categories:

Required Input/Output	Most Common Gap and What Adequate Treatment Looks Like
9.3.2(b)(1): Changes in compliance obligations	FREQUENTLY MISSED. Most reviews cover compliance status but not whether any new compliance obligations have emerged. Adequate: a standing agenda item — "Regulatory and Compliance Obligations Changes" — that reports any new regulations, permit amendments, or voluntary commitment changes since the last review. At minimum, the minutes must show that this was considered even if the conclusion is "no changes identified."
9.3.2(b)(2): Changes in significant environmental aspects	FREQUENTLY MISSED. Reviews discuss aspects-related topics (monitoring, incidents) without explicitly addressing whether the significant aspects have changed or whether significance scores should be revised. Adequate: explicit confirmation that the aspects register was reviewed for currency and that any operational changes since the last review have been evaluated for aspect implications.
9.3.2(d)(1): Trends in nonconformities and corrective actions	FREQUENTLY UNDER-ANALYSED. Reviews present the count of CARs opened and closed without analyzing whether the pattern reveals systemic issues. Adequate: analysis of whether CARs cluster in particular process areas (suggesting a systemic control weakness) or particular obligation types (suggesting a compliance management gap); trend comparison (is the number of nonconformances increasing, decreasing, or stable?).
9.3.2(e): Adequacy of resources	FREQUENTLY PASSIVE. Resource adequacy is often addressed with "resources are sufficient" without discussion. Adequate: specific assessment of whether EHS Manager time is sufficient for all EMS obligations; whether monitoring equipment is calibrated and functional; whether training budget is adequate for planned competence activities; whether any resource gap is constraining EMS effectiveness. Specific resource allocation decisions as outputs.
9.3.2(f): Relevant communications from interested parties, including complaints	FREQUENTLY OMITTED. Reviews often address customer performance data without addressing environmental communications specifically — complaints about odor, noise, or appearance; regulatory correspondence; community inquiries. Adequate: explicit review of all environmental communications received from interested parties since the last review, even if the conclusion is "none received."
9.3.3(l): Implications for strategic direction	MOST OFTEN MISSING. This output connects the EMS to the organization's strategic planning — a distinction of ISO 14001:2015 from earlier versions. Adequate: explicit consideration of whether EMS performance and trends have implications for business strategy — competitive positioning, customer relationship management, capital investment priorities, regulatory

Required Input/Output	Most Common Gap and What Adequate Treatment Looks Like
	risk management. A review that does not address strategic implications has treated the EMS as an operational compliance program rather than a strategic management tool.

Management Review as Governance: What the Minutes Must Demonstrate

The management review minutes are the primary evidence of EMS governance. They must demonstrate two things that are distinct from data presentation: that data was evaluated (analyzed for implications, not just presented), and that decisions were made (specific commitments with owners and timelines, not general acknowledgements). The auditor test for governance vs. reporting:

If the management review minutes consist primarily of data tables and summaries with no action items, no specific decisions, and no strategic conclusions — then the review was a reporting session, not a governance event. A governance event produces specific commitments: "The VOC emission trend shows Q3 approaching 85% of the annual permit limit. Decision: EHS Manager to evaluate whether the high-solids transition schedule can be accelerated to bring the Year 2 annual total below 80% of the permit limit. Owner: Marcus Webb. Date: by next management review."

Cascade Case Study

Cascade Year 2 Management Review — Governance in Practice: The Year 2 management review was conducted in Month 24 post-certification, chaired by Jennifer Ramos. Total duration: 3 hours. The meeting was structured around the required input categories, with Marcus Webb presenting each data set and Jennifer Ramos and David Chen leading the evaluation discussion. Six specific management decisions were documented in the minutes:

Decision 1: EO-01 (VOC reduction) is on track — high-solids transition completed on Lines 2 and 3 (Month 20). Year 2 emission total confirms 22% reduction from Year 1 baseline, trending toward the 25% annual target. Decision: Proceed with Phase 2 of the high-solids program — evaluate Lines 1 and 4 for transition in Year 3. Marcus Webb to prepare feasibility assessment by Month 27.

Decision 2: EO-02 (hazardous waste reduction) is behind — 9% reduction achieved against 15% target. Root cause: solvent recovery program not yet implemented; procurement of recovery equipment delayed. Decision: Approve procurement of solvent recovery equipment (budget: \$28,000). Operations Manager to complete installation by Month 26.

Decision 3: Compliance evaluation result (96% compliance rate; one partial compliance gap closed) is satisfactory. Regulatory relationship status with PSCAA is strong — no enforcement actions or compliance concerns raised in Year 2. Decision: No change to compliance management approach required.

Decision 4: Context change identified — PSCAA permit renewal scheduled for Month 30. Risk R-02 (permit tightening) is now 6 months from materialization. Decision: Marcus Webb to engage PSCAA permit renewal process as a stakeholder by Month 25; prepare an internal briefing on anticipated new conditions for the leadership team.

Decision 5: Resource adequacy — Marcus Webb flagged that the PSCAA permit renewal process will require approximately 40 hours of EHS Manager time over a 3-month period. This is not currently reflected in his workload allocation. Decision: Defer two lower-priority internal EMS improvement projects (document control system upgrade and supplier questionnaire update) to Q1 Year 3 to create capacity for the permit renewal engagement.

Decision 6: Strategic direction — Jennifer Ramos noted that two customer conversations in the past quarter specifically referenced Cascade's ISO 14001 certification as a competitive differentiator in bid evaluation. Decision: Marketing team to develop a one-page environmental performance capability summary for use in bid proposals; Marcus Webb to provide the data; target completion Month 25.

The Year 2 management review minutes were reviewed at the Year 2 surveillance audit. The registrar auditor's comment: "Management review demonstrates active governance — six specific decisions with owners and dates, resource reallocation to accommodate a compliance priority, and strategic linkage between EMS performance and business development. This review is functioning as a governance event, not a performance report presentation."

Quick Reference: Clause 9 Audit Readiness

Most Common Clause 9 Audit Findings

Finding Area	Clause	Typical Finding Statement
Monitoring beyond permit not determined	9.1.1(a)	The monitoring and measurement program (MPC-EMS-PRO-008) documents the monitoring activities required by the PSCAA Air Quality Permit, the State Waste Discharge Permit, and the NPDES General Permit. The program does not identify monitoring of the organization's environmental objectives (reduction in VOC intensity; reduction in spent solvent generation) or monitoring of EMS process effectiveness beyond compliance data. Clause 9.1.1 requires the organization to determine what needs to be monitored; the current program is limited to regulatory monitoring without addressing the environmental performance monitoring required to evaluate objective achievement or EMS effectiveness.
No analysis — data without evaluation criteria	9.1.1(c)	Monthly VOC emission calculations are completed and filed. Review of 12 months of calculation records identified that the calculations produce a monthly emission total for each emission source but do not compare the monthly total to the applicable PSCAA monthly limit, the EO-01 objective target trajectory, or the Year 1 baseline for the same month. The data is collected but not evaluated against criteria. Clause 9.1.1(c) requires the organization to determine criteria against which environmental performance will be evaluated and to evaluate performance against those criteria.
Compliance evaluation absent	9.1.2	The organization maintains compliance monitoring records for all permit-required parameters. Review confirmed that monitoring data is consistently collected and filed. However, no documented compliance evaluation exists — no record demonstrates that the organization has systematically compared the monitoring data to the specific permit conditions and determined whether each condition is being met. Clause 9.1.2 requires a separate evaluation process that uses monitoring data to determine compliance status; collecting data is not equivalent to evaluating compliance.
Recurring finding without escalated response	9.2	The Year 2 internal audit identified that daily emission logs for 4 of 245 production days had incomplete VOC content fields. A Year 1 internal audit finding (CIC-AUD-001-F03) had identified the same gap (4 of 87 sampled days incomplete) and a corrective action was closed (operator retraining). The Year 2 finding represents a recurrence of the same gap 14 months after the corrective action was closed. The corrective action record does not document root cause analysis depth or an evaluation of whether the retraining produced sustained competence. A recurring finding after corrective action closure indicates that the corrective action was insufficient.

Finding Area	Clause	Typical Finding Statement
Management review — missing required inputs	9.3.2	Review of the Year 2 management review minutes confirmed that 8 of the 12 required input categories were addressed. Not addressed: (1) 9.3.2(b)(1) — changes in compliance obligations since the last review; (2) 9.3.2(b)(2) — changes in significant environmental aspects; (3) 9.3.2(f) — relevant communications from interested parties including complaints. The management review minutes do not demonstrate that the review considered these required inputs.
Management review — no governance output	9.3.3	Management review minutes for the most recent review document compliance status data, objective performance data, and internal audit results. The minutes contain no specific decisions — no resource allocation, no action items with owners and target dates, no determination on whether the EMS is suitable, adequate, and effective. Clause 9.3.3 requires decisions including continual improvement opportunities, changes to the EMS, resource needs, and actions where objectives have not been achieved. A management review that produces no decisions is functioning as a reporting session rather than a governance mechanism.

Next in Volume 2: Guide 2.6 — Clause 10: Improvement. The final clause in the EMS — nonconformity and corrective action examined at the depth needed for effective root cause analysis; continual improvement beyond corrective action; the distinction between EMS improvement (improving the management system) and environmental performance improvement (producing better outcomes); and how the improvement cycle connects back to every preceding clause to complete the EMS loop.
