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SUSTAINABLE ASSET & MAINTENANCE MANAGEMENT

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Building an Asset management System, First Edition

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Abstract

This contribution develops a coherent, standards-aligned view of the Asset Management System (AMS) for maintenance-intensive organizations in an Industry 5.0 context. In practice, "AMS" is often used in a vague or fragmented way—ranging from a set of procedures or an ISO 55001 certificate to a maintenance system or digital platform. Here, the AMS is explicitly positioned as a management system for asset management in the sense of ISO 55000:2024, interpreted through a practice-oriented architecture that integrates asset management and maintenance management.

A key clarification is to treat the AMS as a context diagram rather than as a single tool or department. The IAM 10-box landscape is used as conceptual representation: Life Cycle Delivery is the central value-creating box where asset-related activities are planned and executed, while the other nine boxes provide the enabling context in terms of governance, strategy, information, people and risk. In this view, the AMS is the integrated system that coordinates the interaction of all ten boxes so that Life Cycle Delivery is consistently supported and controlled by the surrounding structures.

Within this context, the Asset & Maintenance Management Lemniscate is introduced as a model that visualizes how Asset Management (AM) and Maintenance Management (MM) interact horizontally from corporate strategy to daily execution and vertically from the asset portfolio down to individual items. The lemniscate is translated into a six-layer pyramid (systems, subsystems, function systems, aspect systems, processes, functions and items) that provides a traceable structure from organizational context to the managed asset. In parallel, the SSAMM Maintenance Landscape Model developed based on the CEN/TC 319 standards provides the process architecture in which EN 17485, EN 17007, EN 13306, EN 17666 and related standards specify maintenance processes, functions, indicators, competences and documentation.

The normative backbone is the full ISO 55000:2024 series, with ISO 55000, ISO 55001 and ISO 55002 defining principles, requirements and guidance for the AMS, and ISO 55010, ISO 55011, ISO 55012 and ISO 55013 addressing alignment with finance, public policy, people and data. EN 17485 is positioned as a methodological bridge that explains how maintenance is embedded within physical asset management, while EN 17007 provides a generic maintenance process model, structured into management, realization and support processes. Overall, the AMS is strategically anchored in ISO 55001:2024, structurally organized by the IAM 10-box context and the SSAMM lemniscate/pyramid, and operationally realized through the EN 17007 maintenance process architecture, enabling evidence-based decision-making, continuous improvement and long-term value realization in an Industry 5.0 setting.

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1. Conceptualizing the Asset Management System (AMS)

The starting point for the AMS is the definition given in ISO 55000:2024: a management system for asset management, i.e. a set of interrelated or interacting elements of an organization used to establish asset management policies and objectives and the processes needed to achieve them. This definition is concise but abstract. To gain practical traction, it is interpreted here as a *system-of-systems* that brings together governance, processes, people, information and technology so that physical assets contribute optimally to organizational objectives throughout their lifecycle.

To make this system visible, the IAM 10-box landscape model is used as a context diagram. At its heart lies the Life Cycle Delivery box, which covers the planning and execution of activities that create, acquire, operate, maintain and dispose of assets. Around this core box are nine enabling boxes that represent the organizational context, policy, strategy and planning, asset management decision-making, asset information, organization and people, risk and review and related governance themes. In an AMS perspective, these ten boxes are not independent modules but interdependent elements whose interactions must be designed, implemented and controlled as one coherent management system.

In this representation, the AMS is not merely "the maintenance system" nor "the asset register", but the integrated framework that makes sure Life Cycle Delivery is continuously aligned with organizational objectives, risk appetite, financial constraints and stakeholder expectations. Asset-related decisions are taken within the structured governance of the enabling boxes, implemented through Life Cycle Delivery, and then reviewed through data, performance indicators and feedback loops. The AMS therefore embodies both the *context* in which asset-related decisions are made and the *mechanism* by which they are executed and improved.

The Asset & Maintenance Management Lemniscate provides a second key perspective. It depicts Asset Management and Maintenance Management as two interlinked loops. On the left, the asset management loop focuses on value, risk, governance, finance and lifecycle decision-making. On the right, the maintenance loop focuses on performance, reliability, methods and execution. Strategic intent, policies and plans flow from left to right; operational feedback, condition information and performance data flow from right to left. The crossing point in the middle corresponds conceptually to Life Cycle Delivery in the IAM landscape, where strategic decisions and operational realities meet.

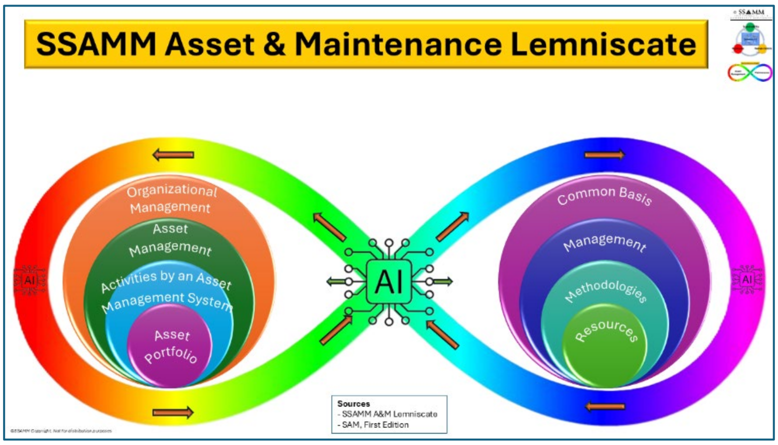

Figure 1: The A&MM Lemniscate

To operationalize this conceptual view, the lemniscate is unfolded into a six-layer pyramid: systems, subsystems, function systems and aspect systems, processes, functions and items. This structure allows the AMS to be decomposed without losing line-of-sight. High-level objectives and policies at system level can be traced down to process-level requirements, functional responsibilities and eventually to the maintenance of specific items. Conversely, failures, deviations and improvements at item level can be escalated through functions and processes back to subsystem, system and organizational levels.

Finally, the AMS is explicitly situated within the paradigm of Industry 5.0. Organizations are expected to deliver not only economic performance, but also environmental sustainability, social responsibility and workforce well-being. The AMS must therefore integrate AI-supported analytics, digital twins, advanced monitoring and data-driven decision-making with human-centric leadership, competence development and ethical risk management. In this sense, the AMS becomes the institutional framework that connects corporate strategy, regulatory context, digital technologies and maintenance execution into a single governance and learning system.

2. Normative Foundations and the Standards Landscape

The normative backbone of the described AMS is the ISO 55000:2024 series. ISO 55000 provides the vocabulary, overview and principles that define what is meant by assets, asset management, value, lifecycle and alignment. ISO 55001 translates these principles into requirements for an Asset Management System, covering topics such as leadership, planning, support, operation, performance evaluation and improvement. ISO 55002 elaborates application guidelines, offering interpretative support and examples to help organizations implement ISO 55001 in a consistent and auditable manner.

Building on this core, ISO 55010:2024 focuses on the alignment of financial and non-financial functions. It highlights that asset-related decisions, including maintenance and investment choices, must be coherent with financial planning, budgeting and financial reporting. ISO 55011 addresses the interface between asset management and public policy, recognizing that many asset-intensive organizations operate within regulatory, societal and political contexts that shape their objectives and constraints. ISO 55012 introduces detailed guidance on people involvement and competence, underscoring that the AMS depends heavily on the capability and engagement of people at all levels. Finally, ISO 55013 deals with data asset management, emphasizing the governance of data quality, lineage, accessibility and security as critical enablers for evidence-based asset decisions.

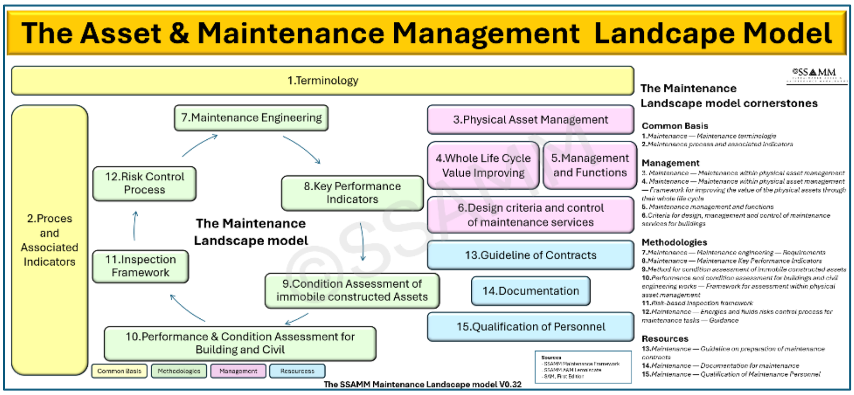

Figure 2: The Maintenance Landscape Model

While the ISO 55000 series defines *what* an AMS is expected to establish and control, it is less specific on *how* maintenance is to be embedded operationally within the system. This methodological gap is addressed by the European standards developed under CEN/TC 319 Maintenance. EN 13306 provides the terminology for maintenance, offering a consistent vocabulary for functions, activities and states. EN 17666 describes maintenance approaches, including corrective, preventive, condition-based, predictive, risk-based, Reliability-Centered Maintenance (RCM) and Total Productive Maintenance (TPM). EN 17007 specifies the maintenance process and associated indicators, structuring maintenance into management, realization and support processes. EN 17485 provides a framework for improving the value of physical assets through maintenance across the entire lifecycle.

EN 17485 in particular plays a bridging role. It positions maintenance explicitly within physical asset management and describes how maintenance can be aligned systematically with business objectives, production planning, finance and technical functions. It distinguishes between the Strategic Asset Management Plan (SAMP), which expresses how organizational objectives are translated into asset management objectives, and the Asset Management Process, which operationalizes these objectives across corporate, plant, technical and operational levels. In doing so, it connects ISO 55001 requirements with the detailed process and indicator structures provided by EN 17007 and other CEN/TC 319 standards.

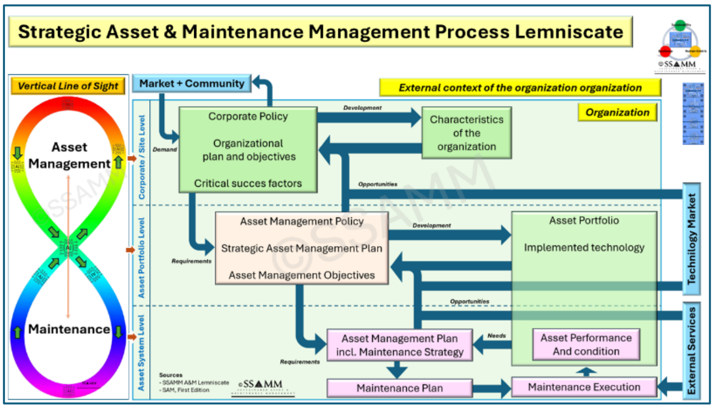

Figure 3: Connecting The SAMP & Maintenance

EN 17007 then provides the universal process architecture for maintenance within the AMS. It introduces three families of processes—management, realization and support—and a three-level decomposition. Level 1 identifies the main processes and their families, Level 2 defines sub-processes with their inputs, outputs, responsibilities and indicators, and Level 3 is left to the organization to describe task-level activities that reflect local context. This process model ensures that maintenance is treated as a structured and measurable set of processes, not merely as a collection of tasks.

Taken together, the ISO 55000:2024 series, EN 17485 and EN 17007, supported by EN 13306, EN 17666 and other CEN/TC 319 standards, create a coherent standards landscape. ISO 55000 and ISO 55001 define what the AMS must achieve; EN 17485 explains how maintenance contributes to asset management; EN 17007 structures the maintenance processes; and the broader CEN/TC 319 family provides detailed guidance on documentation, indicators, outsourcing, competence and cost control. The AMS described in this text is therefore not a new standard, but a structured integration of existing ones into a single architectural view that is especially suitable for maintenance-intensive organizations.

3. Structuring the AMS with the SSAMM Lemniscate and the Six-Layer Pyramid

Within the standards landscape, the SSAMM Asset & Maintenance Management Lemniscate and the associated six-layer pyramid provide a concrete structure for designing and implementing an AMS. The lemniscate captures the continuous interaction between asset management and maintenance management. Strategic objectives, policies and risk criteria are developed on the asset management side and flow into maintenance strategies and plans. Maintenance execution generates data, insights and lessons learned that flow back to inform asset strategies, investment decisions and risk evaluations. This continuous loop embodies the Plan–Do–Check–Act cycles that are central to ISO-based management systems.

To make this interaction implementable, the lemniscate is translated into six layers that define the vertical architecture of the AMS. At the top are **systems**, which represent the largest organizational or infrastructural entities such as a national railway network, a water utility, an airport or a complex industrial enterprise. A system is understood, in line with ISO/IEC/IEEE 15288, as a combination of interacting elements organized to achieve one or more stated purposes.

Below this are **subsystems**, which break down the system into manageable segments such as treatment plants, pumping stations, production lines, logistics systems or ICT infrastructures. At this level the focus is structural and object-oriented: the question is what exists in the system, not yet how it is governed.

The next layer introduces **function systems** and **aspect systems**. Function systems are the organizational parts directly responsible for primary value creation, such as production, operations, asset planning and maintenance. Aspect systems are supporting structures that enable function systems to perform effectively, including HR, finance, ICT, safety, environmental management and quality. Many recurring performance problems can be traced not to weaknesses in function systems, but to deficiencies in aspect systems—for example, good maintenance engineers struggling with poor spare parts logistics or inadequate information systems.

The **processes** layer then describes how activities are organized, controlled and measured. Here, EN 17007 is the primary reference. Maintenance processes such as asset configuration management, budgeting, corrective actions, data management, optimization, preventive actions and support processes are defined with their interactions. Processes form the bridge between governance and execution: they specify what needs to be done, independent of organizational silos. The **functions** layer assigns roles, responsibilities, competencies and decision rights to people and organizational units. Maintenance itself is defined, following EN 13306, as the combination of technical, administrative and managerial actions during the life of an item intended to retain or restore it to a state in which it can perform a required function. EN 17666 specifies maintenance approaches, and therefore guides which methods—corrective, preventive, condition-based, predictive, risk-based, RCM, TPM—are allocated to which functions and in what combination.

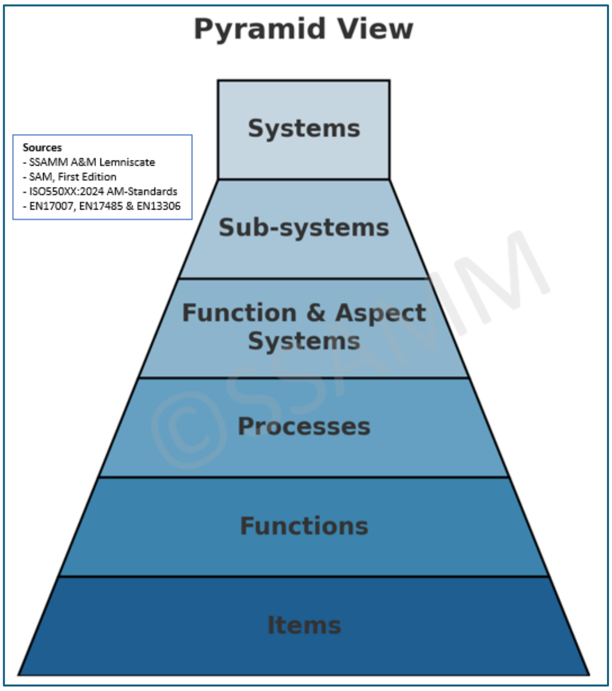

Figure 4: The Maintenance Decomposition

Finally, at the base are **items**, defined in EN 13306 as parts, components, subsystems, functional units, equipment or systems that can be individually described and considered. Only those elements that are explicitly managed as individual units, with recorded data, maintenance actions and decisions throughout their life, are treated as items in the AMS sense.

The importance of these six layers lies in their ability to create traceability. Strategic objectives and policies at the system level can be decomposed into subsystem objectives, process requirements, functional responsibilities and operational tasks on specific items. Conversely, failure modes, recurrent incidents or improvement opportunities at item level can be traced back to processes, functions or subsystems that need adjustment. This layered structure therefore supports both top-down deployment of strategy and bottom-up learning and improvement. It also aligns naturally with the IAM 10-box view: systems and subsystems map to organizational context and asset portfolios; processes and functions correspond to Life Cycle Delivery and decision-making; and the surrounding aspect systems, documentation, data and people map onto the enabling boxes of the landscape.

4. Maintenance Process Architecture in EN 17007 and Its Role in the AMS

Within the AMS, maintenance processes are the primary operational mechanism through which asset performance, reliability and availability are achieved and sustained. EN 17007 provides a universal model of these processes and organizes them into three families: management, realization and support. This architecture ensures that maintenance is treated as an integrated, process-driven domain rather than as a collection of ad hoc tasks.

The **management processes** family focuses on setting strategic directions, defining maintenance policies, allocating resources, monitoring performance and driving continual improvement. It includes activities such as developing maintenance strategies, determining what is carried out internally or externally, designing the maintenance organization, preparing budgets, coordinating actions and managing information. In AMS terms, these processes link the maintenance domain directly to the higher-level governance and leadership requirements of ISO 55001 and to the strategy and planning box in the IAM landscape.

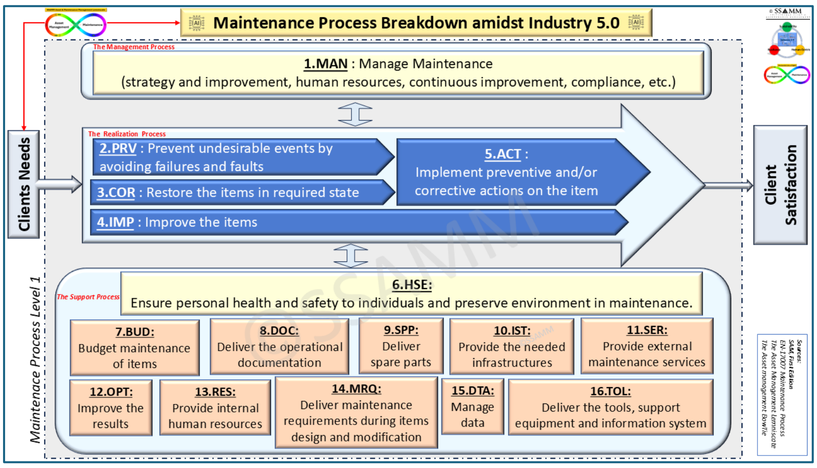

Figure 5: The Maintenance Breakdown

The **realization processes** family covers those processes that directly act upon the assets. These include processes such as PRV (preventing undesirable events), COR (corrective maintenance), IMP (improving items) and ACT (implementing preventive and corrective actions on items). Through these processes, asset conditions are monitored, failures are prevented or corrected, items are improved and maintenance tasks are prioritized, prepared, scheduled, executed and finalized. Realization processes therefore form the operational heart of Life Cycle Delivery, where maintenance directly influences asset availability, safety and performance.

The **support processes** family provides the enabling environment for both management and realization. These include HSE (health, safety and environment), BUD (budgeting), DOC (documentation), DTA (data management), SPP (spare parts), IST (infrastructure), SER (external services), RES (internal human resources), TOL (tools and information systems), MRQ (modification and renewal) and OPT (optimization and continuous improvement). Without these support processes, the management and realization processes cannot function reliably or efficiently.

EN 17007 also structures these processes into three levels of detail. At **Level 1**, the standard maps the main processes and assigns them to one of the three families, providing a conceptual overview that is useful for designing the AMS architecture and for communication with leadership and stakeholders. At **Level 2**, each process is broken down into sub-processes with defined objectives, inputs, outputs, roles, constraints and indicators. This level is particularly important for governance, as it allows organizations to define responsibilities, interfaces and performance measures. **Level 3** is left deliberately open: organizations must define the detailed tasks that implement each Level 2 sub-process in their own context. This encourages standardization at the conceptual level while preserving flexibility in operational practice.

The maintenance process architecture described in EN 17007 thus acts as a “process backbone” for the AMS. It provides the structure through which maintenance execution can be aligned with asset management strategies defined in ISO 55001 and EN 17485. It also enables indicators to be defined consistently across management, realization and support processes, so that performance can be monitored and improved systematically. When combined with the SSAMM lemniscate and the six-layer pyramid, EN 17007 allows organizations to see maintenance not as a separate world but as an integral part of Life Cycle Delivery within the wider AMS.

5. Key Management and Realization Processes as AMS Building Blocks

Among the processes defined in EN 17007, several management and realization processes play a particularly central role in operationalizing the AMS.

The **MAN process** (Manage Maintenance) represents the strategic and organizational dimension of maintenance. It includes the establishment of maintenance policy and strategy, the determination of what work is done internally or externally, the design of the maintenance organization, the preparation and negotiation of maintenance budgets, the coordination of maintenance actions, the management of maintenance-related information and the identification of improvement areas in policy and strategy. Through these activities, MAN ensures that maintenance is aligned with company objectives, regulatory requirements, risk criteria and resource constraints. It also provides leadership, governance and accountability for the maintenance function, connecting maintenance to the wider AMS and to the enabling boxes of the IAM landscape.

The **PRV process** (Prevent Undesirable Events) is a realization process that embodies the preventive maintenance philosophy. It is typically divided into two sub-processes. The first, often referred to as PRV.1, focuses on characterizing undesirable events: identifying potential or historical failures, analyzing their causes and effects, classifying them in terms of criticality and determining which are observable and

Figure 6: The MAN Proces

which are hidden. The second, PRV.2, uses this knowledge to establish, use and update maintenance plans that prevent or mitigate these events, including time-based, condition-based and risk-based tasks as well as operational and design improvements. PRV translates risk-based thinking into concrete maintenance activities and interacts closely with data (DTA), documentation (DOC), optimization (OPT) and modification (MRQ) processes.

The **COR process** (Corrective Maintenance) deals with restoring items to their required functional state when failures have occurred. It includes prioritizing and scheduling corrective events, diagnosing faults and degradation mechanisms, and deriving lessons learned for future prevention or improvement. Corrective tasks often carry operational urgency, and the COR process ensures that they are handled in a structured way: events are ranked based on risk and impact, diagnosis is carried out using methods such as root cause analysis, and feedback is provided to preventive and improvement processes. Performance indicators such as mean time to diagnose, recurrence of unresolved failures and the proportion of corrective work orders that lead to learning are used to monitor and improve the process.

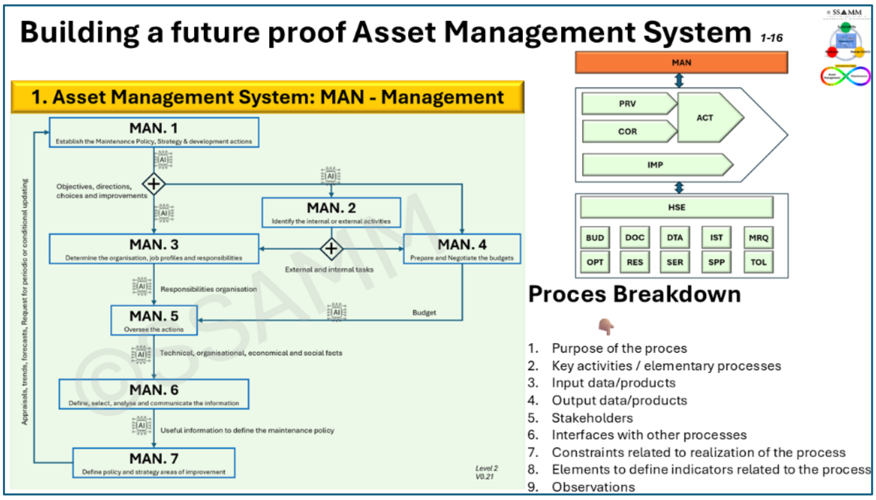

Figure 7: The MAN Proces break-Down

The **IMP process** (Improve the Items) addresses situations where repeated preventive and corrective activities are not sufficient, and where modifying or upgrading items is required to achieve sustainable improvements in reliability, maintainability, safety or supportability. IMP includes collecting data, defining reliability and maintainability requirements, establishing specifications for improvements, issuing and evaluating tenders, supervising implementation, verifying conformity, establishing initial maintenance plans and logistical resources and identifying skills and training needs. It therefore connects maintenance experience directly to design and engineering decisions. IMP is closely related to MRQ (modification and renewal) but focuses mainly on improvements that remain within the existing asset configuration rather than on full renewal or major investments.

The **ACT process** (Implement Actions) is the operational core that executes both preventive and corrective tasks. It includes ranking events, preparing tasks (including tools, materials and safety measures), setting the optimal sequence of tasks, scheduling them, starting execution, performing the work and finalizing tasks. ACT integrates information from PRV, COR, RES (internal resources), SER (external services), SPP (spares), TOL (tools and systems) and HSE (safety) to ensure that work is carried out safely, efficiently and in line with the schedule. It provides the point at which work orders are converted into physical interventions, and where execution data is collected for future analysis by DTA and OPT.

Together, these processes illustrate how the AMS translates strategic intent into operational reality. MAN connects maintenance to asset management policy and corporate strategy. PRV and COR structure the prevention and handling of failures. IMP links operational experience to design improvement. ACT orchestrates the actual work. All are designed, monitored and improved within the framework of the AMS and in alignment with ISO 55000, EN 17485 and EN 17007.

6. Enabling Support Processes and Their Role in AMS Performance

Support processes provide the environment and resources that make management and realization processes effective, safe and sustainable.

The **HSE process** (Health, Safety and Environment) ensures that maintenance activities are conducted in a way that protects people, assets and the environment. It includes preparing risk assessments, identifying and prioritizing risks, proposing preventive and mitigating measures and monitoring and reviewing risk management performance. Indicators such as accident rates, near-misses, waste volumes and coverage of risk assessments are used to track performance. HSE is deeply embedded in AMS governance, linking maintenance operations to legal obligations, corporate social responsibility and the broader sustainability objectives associated with Industry 5.0.

The **BUD process** (Budgeting) provides financial governance for maintenance. It supports the identification and allocation of costs by item, maintenance type and resource category, the development of short-term budgets for regular maintenance, the estimation of budgets for exceptional maintenance and long-term interventions, and the analysis of deviations between planned and actual costs. BUD is a crucial link between maintenance, asset management and financial management, allowing organizations to align maintenance expenditure with value realization, risk management and capital planning.

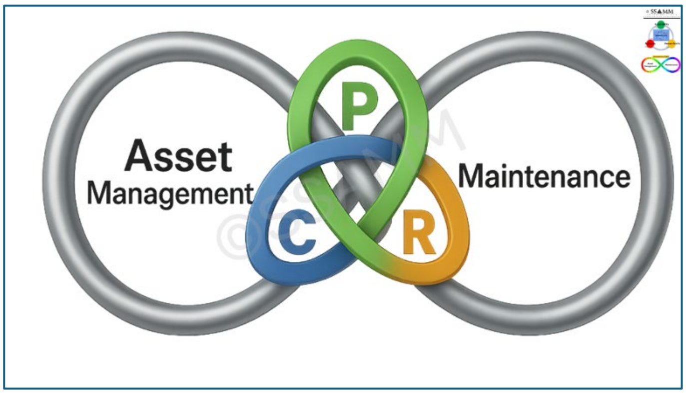

Figure 8: The PCR Trefoil

The **DOC process** (Documentation) ensures that up-to-date and usable documentation is available for maintenance planning, execution and verification. It involves defining rights and responsibilities for documentation, classifying and structuring documents, compiling reference documentation (such as standards, specifications, procedures and safety data sheets), updating documents and ensuring user access. Given that documentation can represent a significant share of asset value and ongoing costs, its management is treated as a strategic activity rather than as an administrative afterthought. DOC supports compliance, knowledge retention and efficient execution.

The **SPP process** (Spare Parts Provision) manages the lifecycle of spare parts and consumables. It encompasses defining stock requirements, managing inventory, issuing purchase requests, placing orders, monitoring supplier contracts, receiving and inspecting deliveries, storing spares under suitable conditions, performing preventive maintenance on stock where needed, delivering spares to maintenance teams, evaluating replaced items for repair or disposal and managing repairs and scrapping. SPP directly influences maintenance responsiveness, cost efficiency and operational resilience.

The **IST process** (Infrastructure Support) provides and maintains the physical environment in which maintenance occurs: workshops, storage areas, utilities and services. It ensures that workspaces are safe, ergonomic and fit for purpose, and that utilities such as electricity, compressed air, steam, telecommunications and waste management are reliable. Without adequate infrastructure, even well-designed maintenance processes and competent staff cannot perform effectively.

The **SER process** (External Services) governs the engagement with external service providers. It includes identifying qualified providers, establishing contracts and service-level agreements, managing service delivery and evaluating performance. SER is essential in contexts where specialized skills, capacity flexibility or geographical coverage require outsourcing. It ensures that external contributions are integrated into the AMS, adhere to internal standards and contribute to asset performance and risk management.

The **RES process** (Internal Human Resources) focuses on jobs, skills, recruitment, training and deployment of internal staff. It ensures that the organization has the right competences in place, that staff are trained and certified, and that they are allocated effectively to maintenance tasks. Indicators such as turnover, absenteeism, training coverage and delays due to resource unavailability are used to monitor the process. RES is a direct operationalization of ISO 55012's emphasis on people involvement and competence within the AMS.

The **MRQ process** (Modification and Renewal) manages investments and major modifications in assets. It covers gathering feedback and data for investment needs, conducting risk analyses, defining technical and support requirements, developing specifications, engaging suppliers, evaluating solutions, overseeing implementation, verifying conformity, establishing initial maintenance plans and logistical resources, and defining skills and training needs for new or modified assets. MRQ aligns asset investments with the AMS by ensuring that maintainability, reliability and supportability are considered from the design phase onwards.

The **DTA process** (Data) is the intelligence core of the AMS. It covers storing and validating raw data, evaluating reliability and maintainability, maintaining lists of critical items, analyzing maintenance and HSE data, analyzing spare parts and obsolescence, benchmarking external events and practices, monitoring regulations and technologies, integrating data into information systems and generating indicators. DTA transforms raw data into actionable information and supports evidence-based decision-making and continuous improvement.

The **TOL process** (Tools and Information Systems) ensures the availability and quality of tools, support equipment and maintenance information systems (such as CMMS or EAM platforms). It includes determining and providing tools, storing them properly, maintaining and updating them, delivering them to users and providing and maintaining information systems. TOL connects the physical and digital infrastructure of maintenance and ensures that execution is supported by reliable tooling and data systems.

Finally, the **OPT process** (Optimization) ties these support processes together by identifying improvement opportunities across all processes, prioritizing them, evaluating options, addressing deviations in management processes, improving support processes themselves, translating improvement needs into item modifications and feeding improvements into future investments. OPT uses indicators generated by DTA and feedback from other processes to drive continual improvement in alignment with ISO 55000's principles.

Collectively, these support processes create the enabling environment in which management and realization processes can function effectively. They reflect the enabling boxes around Life Cycle Delivery in the IAM landscape—providing finance, information, people, tools, infrastructure, external capacity and improvement mechanisms. In the AMS, they are not separate administrative domains but integral, measured and continually improved components of the system.

7. Synthesis: An Industry 5.0-Ready AMS for Maintenance-Intensive Organizations

The picture that emerges from this integrated description is of an Asset Management System that is at once conceptual, normative and operational. Conceptually, the AMS is visualized as a context diagram using the IAM 10-box landscape, with Life Cycle Delivery at the centre and nine enabling boxes providing governance, information and capability. The Asset & Maintenance Management Lemniscate adds a dynamic view of how asset management and maintenance management interact, and the six-layer pyramid provides structural traceability from system to item. Together, these models ensure that the AMS is understood not as a fragmented set of tools and documents, but as a coherent system with clear lines of sight.

Normatively, the AMS is anchored in the ISO 55000:2024 series, which defines principles, requirements and guidance, and in the CEN/TC 319 maintenance standards, which provide detailed process, terminology, competence and documentation frameworks. EN 17485 clarifies how maintenance fits within physical asset management processes, and EN 17007 structures maintenance into management, realization and support processes. The AMS therefore stands on a mature, internationally recognized foundation, allowing organizations to demonstrate compliance, benchmark themselves and participate in broader communities of practice.

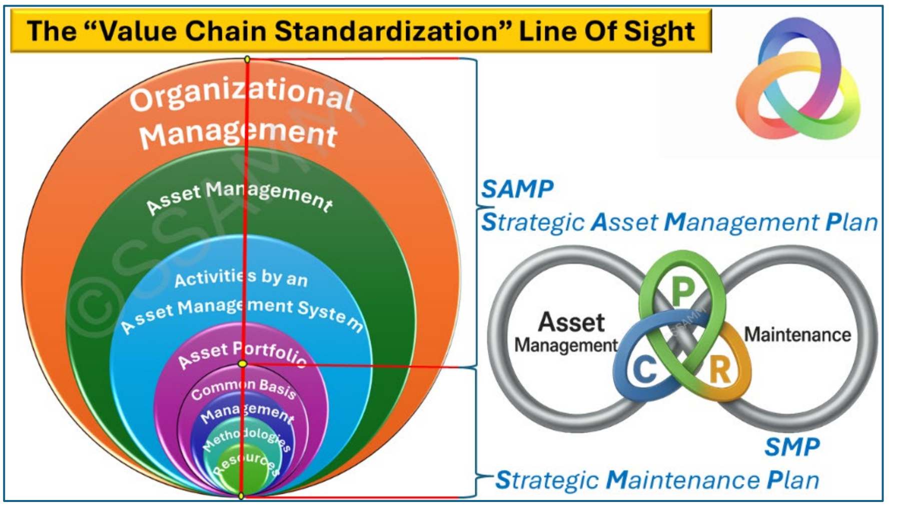

Figure 9: The Value Chain Standardization Line of Sight

Operationally, the AMS is realized through the maintenance process architecture and support functions described in EN 17007 and related standards. Management processes such as MAN insert leadership, governance and policy into maintenance. Realization processes such as PRV, COR, IMP and ACT ensure that failures are anticipated, managed and used as learning opportunities. Support processes such as HSE, BUD, DOC, SPP, IST, SER, RES, MRQ, DTA, TOL and OPT provide the environment, resources, data and improvement mechanisms needed for robust and efficient maintenance.

In an Industry 5.0 context, this integrated AMS must be capable of absorbing and leveraging new technologies and societal expectations. AI, machine learning and digital twins can enrich the DTA and OPT processes, providing predictive insights and simulation capabilities. Advanced sensors and connectivity can support PRV and ACT by enabling condition-based and remote maintenance. At the same time, human-centricity requires that RES, HSE and DOC support safe, meaningful and competent work; that stakeholder engagement and transparency are embedded in MAN and HSE; and that sustainability objectives are reflected in MRQ, SPP, IST and BUD.

For maintenance-intensive organizations in sectors such as infrastructure, utilities, mobility and the built environment, the benefits of this AMS architecture are manifold. It provides conceptual clarity on what an AMS is and is not; it integrates asset management and maintenance management into a single system; it offers a traceable structure from strategy to item; it enables standardized yet flexible processes; and it supports continuous improvement based on data and feedback. It also positions maintenance not as a cost centre, but as a strategic enabler of lifecycle value, risk control and resilience.

In summary, the AMS described in this text can be understood as a structured integration of the IAM 10-box landscape, the SSAMM lemniscate and six-layer pyramid, the ISO 55000:2024 series and the CEN/TC 319 maintenance standards, with EN 17485 and EN 17007 as key bridging standards. This integration yields a practical, standards-aligned and Industry 5.0-ready framework that organizations can use to design, implement, operate and continuously improve their Asset Management System, with maintenance firmly embedded as a central, value-creating component.