EXPRO
هيئة كفاءة الإنفاق والمشروعات الحكومية
Expenditure Efficiency & Projects Authority

National Manual of Assets and Facilities Management
Volume 3, Chapter 3

Condition Assessment Survey (CAS)

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1.0 PURPOSE

The purpose of the Condition Assessment Survey (CAS) procedure is to demonstrate how to capture asset condition, by clearly setting out the generic methodology to design a checklist that captures the information and data required. When developed and used, the checklist will address the requirements of the analysis phase.

2.0 SCOPE

This procedure is required to capture asset condition data and information across the Entity's assets, and present the resulting data and information in a format and units of measurement, suitable for incorporation into asset condition analysis.

In the interest of continuous improvement, the method shall be repeatable and data recoverable, from the Asset Management Software (AMS).

3.0 DEFINITIONS

Term	Definition
Asset	An asset is an item, thing, or entity that has potential or actual value to an organization. The value will vary between different organizations and their stakeholders, and can be tangible or intangible, financial, or non-financial.
Asset Condition Register	A list of assets that are held within an Entity, and their respective current condition.
Asset Management	The coordinated activity of an organization to realize the full potential of any asset.
Asset Management System	Any set of interrelated or interacting elements a Company or Entity employs, to keep track of its equipment and inventory, that is vital to the continued operation of its business.
Asset Classification	Asset Class is a term used to refer to a group of assets having a similar nature or function and which, for purposes of disclosure, are shown as a single item.
Asset Lifecycle	The phases an asset transitions through, from inception to disposal.
Asset Management Software (AMS)	A software-based, asset management tool or solution, used to record and track an asset throughout its life cycle, from procurement to disposal.
Asset Register (AR)	A list of all assets, often computerized, that contains pertinent details about each asset to track the value, physical location, operating cost, condition, utilization, and all other details, necessary to better manage the asset.
Condition Assessment (CA)	The process of periodic physical inspections, assessments, measurements, and interpretation of the resultant data to indicate the condition of a specific asset.
Forward Maintenance Register	A projection of work/maintenance required, specifically for assets held within the Entity. Also referred to as the Maintenance Plan.
Industry Best Practice	In relation to any undertaking and any circumstances, the exercise of that degree of skill, diligence, prudence and foresight, which would reasonably and ordinarily be expected from a skilled and experienced operator engaged in the same type of undertaking, under the same or similar circumstances.
International Standards Organization (ISO)	The international, standard-setting body composed of representatives from various national standards organizations.
Lifecycle	The cycle of activities that an asset (or facility) goes through, while it remains an identity as a particular asset, i.e. from planning and design, to decommissioning or disposal

Term	Definition
Linear Asset	Linear Assets often connect with each other, defined by the length (or area), and are often part of a network, such as rail lines for trains, water pipes for water and roadways for cars
Non-Linear Asset	Non-Linear Assets occupy a specific space and can be tracked by their location (Buildings, Offices, Plant and Equipment).
Operating context	The environment within which a physical asset or system is expected to operate.
Quality Management	Quality management is the act of overseeing all activities and tasks needed to maintain a desired level of excellence.
Subject Matter Expert (SME)	An individual who possesses the necessary competence in a subject matter that enables them to offer advice and guidance on all aspects of managing the subject matter in question.
Strategic Plan	A plan containing the long-term goals and strategies of an organization.
Risk Appetite	It is the nature and extent of risks that the Entity is willing to accept, and will impact the asset base and its operating context.
Strategic Asset Management Plan (SAMP)	A documented plan that specifies how the organizational objectives are to be converted into Asset Management activities, the approach for developing Asset Management Plans, and the role of the Asset Management System in supporting the achievement of Asset Management Objectives.
Strategic Plan	A plan containing the long-term goals and strategies of an organization. Strategic plans have a strong external focus, cover major portions of the organization, and identify major targets, actions and resource allocations relating to the long-term survival, value, and growth of the organization.

Table 1: Terms & Definitions

4.0 REFERENCES

- ISO 55000:2014 2.5.3.7 Performance Evaluation
- NMAFM Volume 2: Asset Management
- NMAFM Volume 4: Financial Planning
- NMAFM Volume 10: Health, Safety, Security and Environment
- NMAFM Volume 12: Risk Management
- NMAFM Volume 15: Performance Monitoring
- ISO 13372: 2012 Condition monitoring and diagnostics of machines — Vocabulary
- ISO 13374-1:2003 Condition monitoring and diagnostics of machines — Data processing, communication and presentation — Part 1: General guidelines
- ISO 13374-4:2015 Condition monitoring and diagnostics of machine systems — Data processing, communication and presentation — Part 4: Presentation
- ISO 13379-1:2012 Condition monitoring and diagnostics of machines — Data interpretation and diagnostics techniques — Part 1: General guidelines
- BS ISO 13381-1:2015 – TC Tracked Changes. Condition monitoring and diagnostics of machines. Prognostics. General guidelines
- BS ISO 2041:2018 – TC Tracked Changes. Mechanical vibration, shock and condition monitoring. Vocabulary

5.0 RESPONSIBILITIES

Role	Description
Entity	Each Entity will have the following responsibilities and be accountable for: • Providing support and advice on development and deployment of the Asset Management System • Responsible for developing the risk management system in compliance with Saudi Law, Industry-specific, and local regulations. • Preparing plans for appropriate Condition Assessment (CA). • Ensuring that Condition Assessments are aligned with Government Regulations, and the details laid out in Volume 3 of the NMAFM. • Identifying or sourcing the appropriate resources to carry out the Asset Management System' tasks. • Training or briefing (whichever is more appropriate depending on resources selected), the selected resources to ensure uniformity across all asset categories, and conformity to the NMAFM. • Assisting in the compilation of the Condition Assessment Report (CAR), particularly in the prioritization of assets, and possible future requirements for their use. • Planning and implementing recommendations established by the Condition Assessment Report (CAR) • Establishing Entity-specific, Asset Management stewards and Entity champions, to accelerate deployment of Asset Management policy • Establishing Entity-specific asset data management stewards and Entity asset data champions to manage data quality to the highest standards.
Service Delivery Team	• Carries out workplace risk assessments, and supports the development of method statements. Supports risk assessment management across Entities. • Provides detailed reports and advice, based on facts and evidence, in collaboration with the Entity.

Table 2: Responsibilities & Accountabilities

6.0 PROCESS

Condition Assessments are made of three key phases, and each phase is comprised of key elements, as shown in Figure 1 (below). The measure of success for this process, is the completeness of asset condition data and information acquired, during a designated CA.

The Condition Assessment Survey (CAS) combines all the preparation of the planning phase, into a task that captures current asset condition, and sets out the results in a factual, standardized, and methodical manner. The results shall be meaningful to the relevant Asset Manager such that credible asset lifecycle planning decisions will be properly informed, and therefore of value to the AMS.

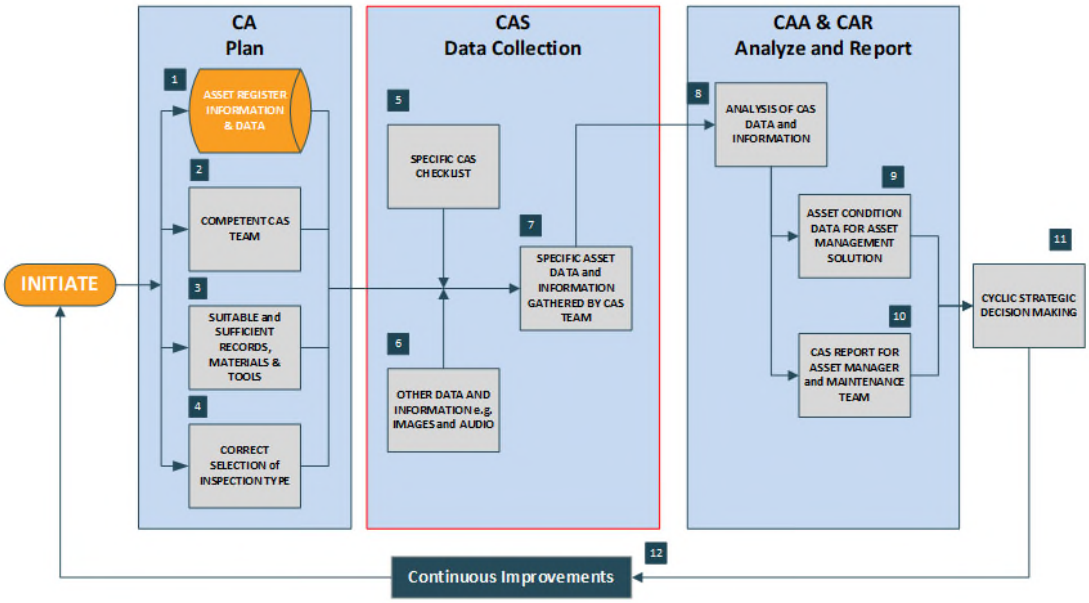

Figure 1. High Level CAS Process Flow

By breaking down the CAS phase into its three key elements, it can easily be deduced what needs to be carried out, to fulfill the requirements of the analysis and reports phase (CAA and CAR).

6.1 Data Collection

Preparation for the collection of current asset condition information shall be conducted in accordance with the CA Plan, as stipulated in Volume 3 Chapter 2:

- Asset information for CAS taken from the Asset Register (AR)
- Competent CAS team assigned
- Suitable and sufficient records, materials and tooling acquired
- Correct selection of inspection type

With these four elements in place, the acquisition of asset condition data and information can commence.

6.2 CAS Checklists

The design for specific CAS checklist shall be based on the example provided, and explained here. The minimum design requirements of a CA checklist are:

- A unique identification per CAS
- Contain the unique identity of the asset, and its location
- Stored and recorded on an electronic device
- Date of CAS
- Identity of the CAS Inspector
- Easy to follow and use in the field
- Clearly shows the options for asset condition ratings
- A breakdown of the asset, and its classification coding
- An indication of the priority for any remedial works
- Recommendations and notes, for future actions

An example of a CAS Checklist is given below in Attachment 1.

In practical terms, a CAS can include the inspection of many assets at a time. Therefore, the CAS may require many checklists to be provisioned and populated and hence, the advantage of using an electronic format. The sequencing and routing of this aspect to the CAS and the checklist, will be a function of the AMS

6.3 Supplementary Information

During the CAS it will be necessary to supplement the checklist with other information, to further provide evidence for the accurate analysis of data and information acquired during the CAS, about specific assets. This can include:

- Digital images taken on site during the CAS
- Audio recordings during the CAS
- Environmental conditions during the CAS
- Historical data and/or information taken from Asset records/AMS
- Advice, data and/or information from OEM
- Lessons learnt from previous CAS
- Advice of SME

The Inspector shall cross link any supplementary data or information to the checklist, by including the asset's unique identification, location, and CAS identity, in the images and audio recordings. There must be no doubt as to the identity of this supplementary data, and information.

6.4 Data & Information Combined

The combination of the populated checklists and other supplementary data and information shall be combined into a synchronized and linked package of CA data and information (7). It shall meet the requirements of the next phase of the CA i.e. the data and information analysis (CAA), and reports (CAR).

7.0 ATTACHMENTS

1. EOM-ZC0-TP-000001 - Condition Assessment Survey (CAS) Checklist Template
2. EOM-ZC0-TP-000004 - Condition Assessment System (CAS) Checklist

Attachment 1. EOM-ZC0-TP-000001 - Condition Assessment Survey (CAS) Checklist Template

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Condition Assessment Survey (CAS) Checklist
(EOM-ZC0-TP-000001)

BRIDGES CONDITION			PRIORITY			Asset Name	
A	NEW	New or almost new condition: no reported problems or expected failures.					
B	Excellent	**Excellent condition:** performance is as desired, with no problems or concerns reported.	1		URGENT	Asset Number	
C	Very Good	**Very good condition considering the age of facility:** asset is not new, but there is no problems or concerns reported.	2		ESSENTIAL	Location	
D	Good	**Good condition considering the age of facility:** asset is not new, and there are some problems that does not affect its performance.	3		DESIRABLE	Inspection Date	
E	POOR	**Asset is usable but due to frequent ups and it approaching the end of its lifetime:** asset does not [illegible]	4		LONG-TERM work outside 5-year planning	Inspector	
F	Very Poor	**Critically worn out or damaged:** asset has expired and is about to cause a near risk or failure.				Overall Asset Condition	ADEQUATE ☐ SUBSTANDARD ☐ INEQ ☐

		CONDITION							Recommended Priority			
	Inspection Activity	A	B	C	D	E	F	Identified Defects / Recommended Action	1	2	3	4

Attachment 2. EOM-ZC0-TP-000004 - Condition Assessment System (CAS) Checklist

CONDITION			PRIORITY		Asset Name					
A	NEW	New or almost new condition: no reported problems or expected failures.			Asset Description					
B	Excellent	**Excellent condition:** performance is as desired, with no problems or concerns reported.	1	URGENT	Asset Number					
C	Very Good	**Very good condition considering the age of facility:** asset is not new, but there is no problems or concerns reported.	2	ESSENTIAL	Location					
D	Good	**Good condition considering the age of facility:** asset is not new, and there are some problems that does not affect its performance	3	DESIRABLE	Inspection Date					
E	POOR	**Asset is worn out due to frequent use and is approaching the end of its lifetime:** asset does not work as intended.	4	LONG-TERM work outside 5-year planning	Inspector					
F	VERY POOR	**Critically worn out or damaged:** asset has expired and is about to cause a near risk or failure.			Overall Asset Condition	ADEQUATE ☐	SUBSTANDARD ☐	INADEQUATE ☐		

		CONDITION RATING								Recommended Priority			
	Inspection Activity	A	B	C	D	E	F	N/A	Identified Defects / Recommended Action	1	2	3	4
A10	**Foundations**												
	Footings												
	Walls												
	Damp Proofing												
	Waterproofing												
	Excavation												
	Backfill												
	Piles												
	Caissons												
A20	**Basement**												
	Slabs												
	On-Grade												
	Columns												
	Column Fireproofing												
B10	**Superstructure**												
	Beams												
	Pre-engineered Buildings												
	Floors												
	Roof Structure												
	Fire-Proofing												