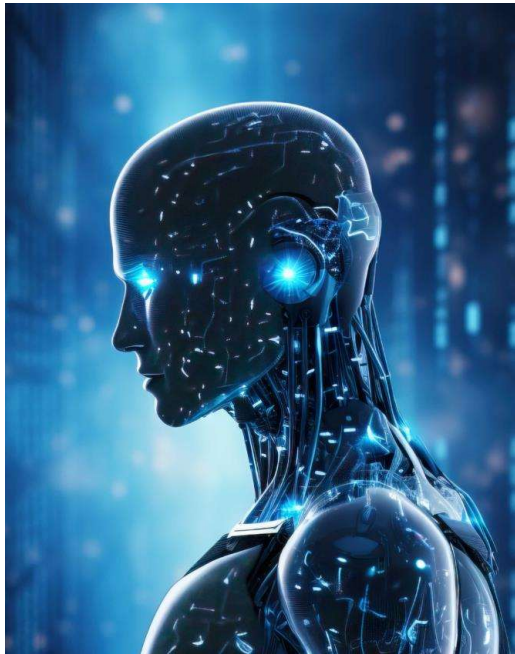


## TO1. Artificial Intelligence (AI)

*Artificial intelligence, generative AI and advanced analytics tools*



### TECHNOLOGY DESCRIPTION

**Artificial Intelligence (AI)** is used as a catch-all for modern computational analysis techniques that replicate some element of human decision-making processes. **Generative AI (GenAI)** and **Large Language Models (LLMs)** are modern AI tools.

Relevant examples for AM practitioners include:

- **Computer Vision:** techniques where high-volume data from cameras and similar scanners is analyzed to identify assets and/or defects, removing the need for manual inspection
- **Predictive Analytics:** modern analytical methods to predict parameters like asset health to support asset management and maintenance activities
- **Co-pilots and Agents:** built-in AI LLM tools in software packages that can help accelerate workflows including retrieving, reviewing and generating content, as well as analysis and modelling. This can include GenAI models for engineering design / option analysis and AM planning.

AI deployment in AM is typically evolution of existing analysis, but the newer tools provide additional capabilities that can help deliver AM activities.

### SAMPLE USE CASES:

#### *Determining AM interventions*

Combining maintenance and performance data with insights generated from applying LLMs to analyze large quantities of text-based information, such as O&M manuals and standards, to predict interventions.

#### *Demand Analysis*

AI tools analyze large volumes of customer usage data to understand patterns and predict future demand volumes. LLMs support sentiment analysis of social media data to assess customer satisfaction, issues and priorities.

**AI is only as good as the data it is trained on:** if your organization is trying to deploy AI without a solid grasp of its data fundamentals then it is unlikely to succeed. In the absence of appropriate data, AI can 'hallucinate' results, so organizations must understand and control this.

**AI brings its own challenges:** organizations need to consider the ethics, security and sustainability issues of AI. Not all AM processes will need an AI solution, and like any other AM decision, when to use AI in asset management needs to balance value and risk.

**Keep the human in the loop:** think about the AM roles and decisions that AI tools are supporting and/or automating, and involve these roles in training the AI. This will help with both understanding and articulating the benefits of AI, and making sure the results are robust.