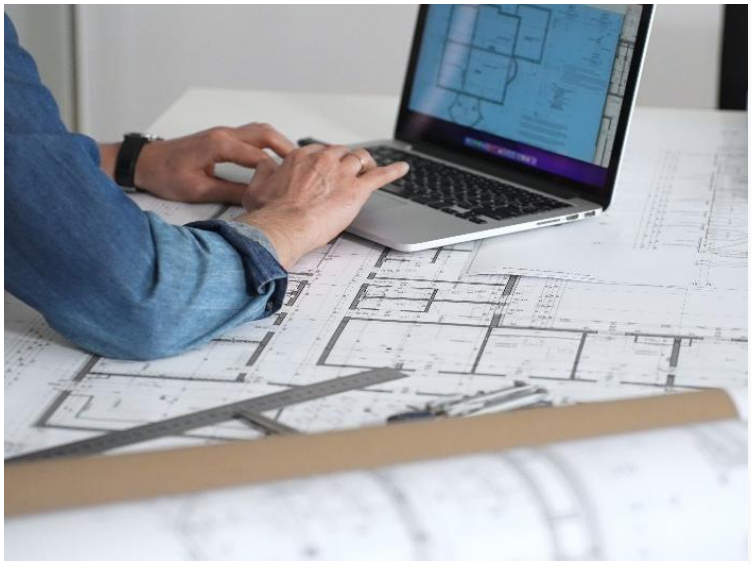

AT A GLANCE

- **Remote design:** Our Reliability Services team works with a contact on your team
- **Drawings your installer can build from:** Enclosure layouts with a bill of materials, wiring diagrams, and redlined drawings
- **Locations recommended on your drawings:** Sensors, interfaces, or cameras, placed for your assets
- **Ready for InsightCM:** Designed to integrate with a new or existing installation, with a final O&M manual
- **Multi-Physics technologies:** ESA, EMI, Thermography, and wired or wireless vibration

The road to a managed reliability program

Strategy | Assessment | Planning | **Implementation** | Improvement

Monitoring System Design and Engineering Services — Designs your hardware, wiring, and layout

A monitoring system works only if its hardware, wiring, and sensor locations are designed for your assets and your site. Our design and engineering services produce that package remotely. You get the drawings your team or contractor needs to build and install the system, and the design is ready to connect to your new or existing InsightCM condition monitoring software.

When do you need design and engineering?

They fit when you are planning a new monitoring system and need drawings to build from.

- Are you planning a new monitoring system and need drawings to install it?
- Do you need to confirm where sensors, current transformers, or cameras go on your equipment?
- Do you need enclosure layouts and a bill of materials to order and build panels?
- Will your own team or electrical contractor do the installation?
- Do you want the design to integrate with a new or existing InsightCM installation?

How the design works

We work remotely, in coordination with a contact on your team. Every technology follows the same four steps.

STEP 1
Kick off
We review scope, design inputs, and schedule with your contact.
REMOTE

STEP 2
Review your data
We review your drawings and data request to confirm signal sources and interface points.
REMOTE

STEP 3
Design
We produce enclosure layouts, wiring diagrams, and redlined drawings.
REMOTE

STEP 4
Review and issue
We review the package with you, fold in your consolidated comments, and deliver the final package.
ELECTRONIC DELIVERY

Technologies we design for

Each design is sized and quoted by the number of assets and enclosures in scope.

Technology	Sized by	What the design confirms
Electrical signature analysis (ESA)	Motors, buses, and data acquisition enclosures	Signal sources and current and potential transformer (CT/PT) interface points, confirmed from your electrical drawings and motor data
Electromagnetic interference (EMI)	Generators, transformers, and data acquisition enclosures	Grounding configuration and high-frequency current transformer (HFCT) interface points, plus the strut rack mounting layout
Infrared (IR) thermography	Cameras and data acquisition enclosures	Camera mounting locations and the lines of sight to your target equipment
Wired and wireless vibration	Monitored assets and enclosures (wired), or wireless gateways (wireless)	Sensor mounting locations, such as bearing housings, and wireless gateway coverage

What is not included

We can add these with further scoping and quote them separately.

- Raceway calculations and drawings, and intermediate or junction box termination drawings.
- Drawings beyond the data acquisition hardware to the instrument.
- Installation and on-site services, and selecting or coordinating your electrical contractor.
- Historian, distributed control system (DCS), or other system integration.
- Customer-required training, such as North American Electric Reliability Corporation Critical Infrastructure Protection (NERC CIP) or safety training.

What you receive

We deliver the package electronically. Extra drawings can be drafted at an additional cost.

- **Enclosure layout drawings:** scale, front-view layouts of the major components in each panel, with a bill of materials
- **Interconnection wiring diagrams:** point-to-point wiring for power, network, and panel inputs and outputs, including signal wiring to the field termination point
- **Redlined customer drawings** showing recommended sensor, interface, or camera locations
- **A final operation and maintenance (O&M) manual** for InsightCM
- **For wireless vibration:** a wireless gateway placement plan that confirms signal coverage of the sensor locations, in place of enclosure and wiring drawings

What we need from you

- Complete and return the Cutsforth data request spreadsheet for the selected technology.
- Provide drawings for the assets in scope, such as one-line diagrams, equipment layouts, and site drawings.
- Name a contact for kickoff and consolidate your team's comments on the draft package into one set.
- Allow the firewall ports that Cutsforth hardware needs.
- Route cable and raceways in the field, through your team or your contractor.
- Tell us when these items are ready, so we can schedule the kickoff.

The Cutsforth Reliability Services Team

Consulting Services	System Implementation	Monitoring & Diagnostic Services

Cutsforth is one of the few companies that combines deep reliability consulting experience with multi-physics condition monitoring system expertise. Our reliability services team has decades of hands-on, plant-floor experience in equipment reliability and asset performance management.

We help industrial organizations define, plan, and implement ER and AM programs, establish M&D Centers, and apply continuous online monitoring. Our approach is consistent with ISO 55000 and with the good-practice ER process in INPO AP-913 and EPRI guidance.

CONSULTING AND PROGRAM SERVICES

- ER and AM program definition, planning, and implementation
- Asset criticality analysis (ACA), sensor gap analysis, and master equipment list foundational data services
- M&D Center assessment, set-up, and deployment

TECHNOLOGY AND MONITORING

- InsightCM condition monitoring software
- Multi-physics monitoring systems, including vibration, electrical signature analysis, electromagnetic interference monitoring, thermography, and more
- Monitoring and Diagnostic services with industry-veteran subject-matter experts in condition monitoring

Start with a scoping conversation

Tell us what you plan to monitor, and we will size the design package.

Request a System Design and Engineering scoping conversation

Contact your Cutsforth representative or visit cutsforth.com.