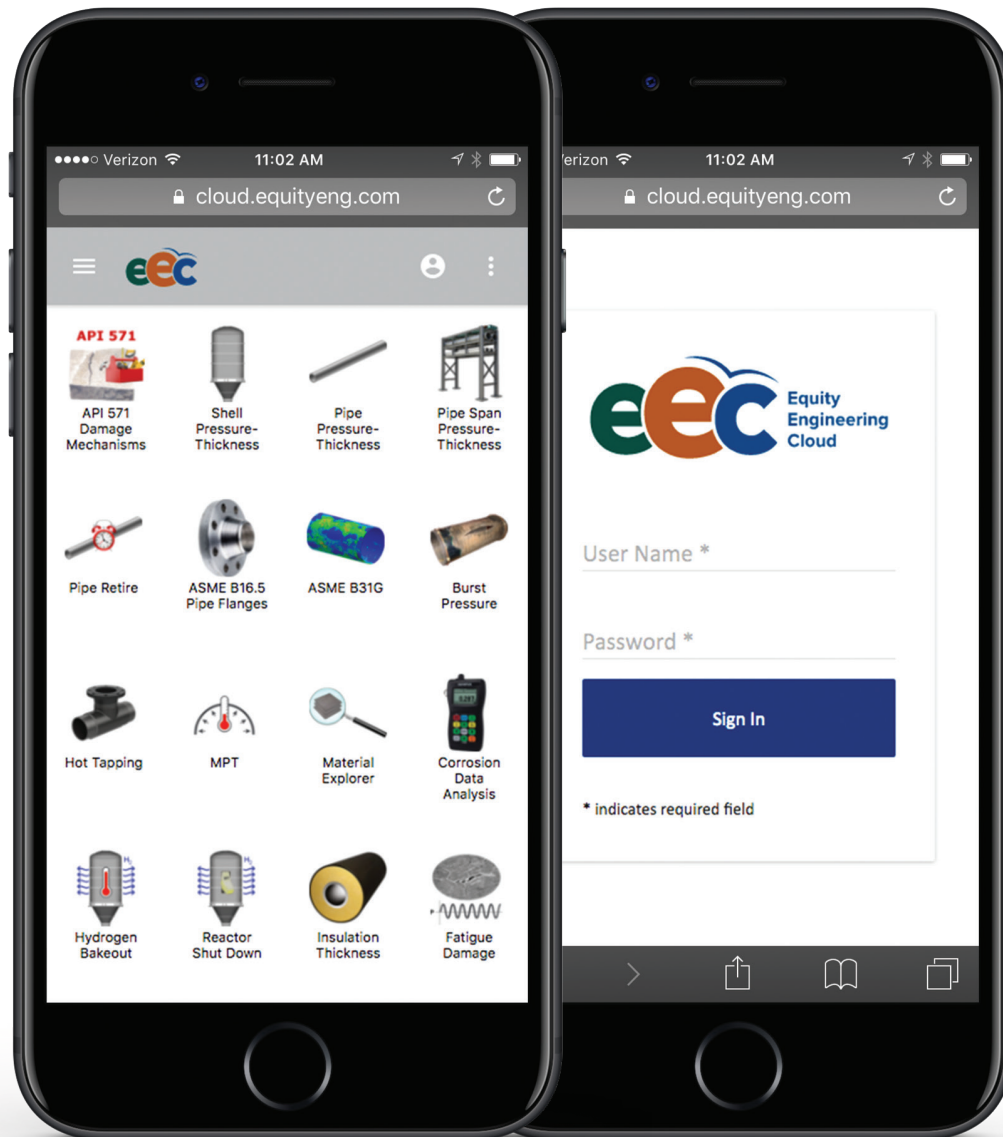


E²G INDUSTRY INSIGHTS

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MECHANICAL INTEGRITY GAP ASSESSMENTS

E²G'S GA-PASS™ TOOL

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MECHANICAL INTEGRITY

MECHANICAL INTEGRITY GAP ASSESSMENTS

E²G'S GA-PASS™ TOOL

BY: JOEL ANDREANI, P.E.

➤ The implementation of a Mechanical Integrity (MI) program at a regulated site, as well as at a non-regulated site, is “good business” along with a means of achieving regulatory compliance. The management of MI over the life-cycle of equipment can improve a site’s safety, reliability, and environmental performance, all of which impact the bottom line.

E²G has developed a process and software tool (GA-PASS™) for performing MI program gap assessments, or MI audits, as some refer to this process. The software tool accumulates important gap assessment data and observations, provides a score or ranking of MI program performance in critical areas, and develops and tracks a list of findings (key MI items requiring further attention). GA-PASS results can be compared across sites within corporations to determine common areas where MI development and improvement might be needed, as well as to identify best practices that should be extended to all sites. Results can be time-stamped and stored, allowing the site to track both continuous improvements and follow-ups on findings to their completion. In some MI areas, the results can be benchmarked against other known best practices in industry. All of this is available in a software tool currently being added

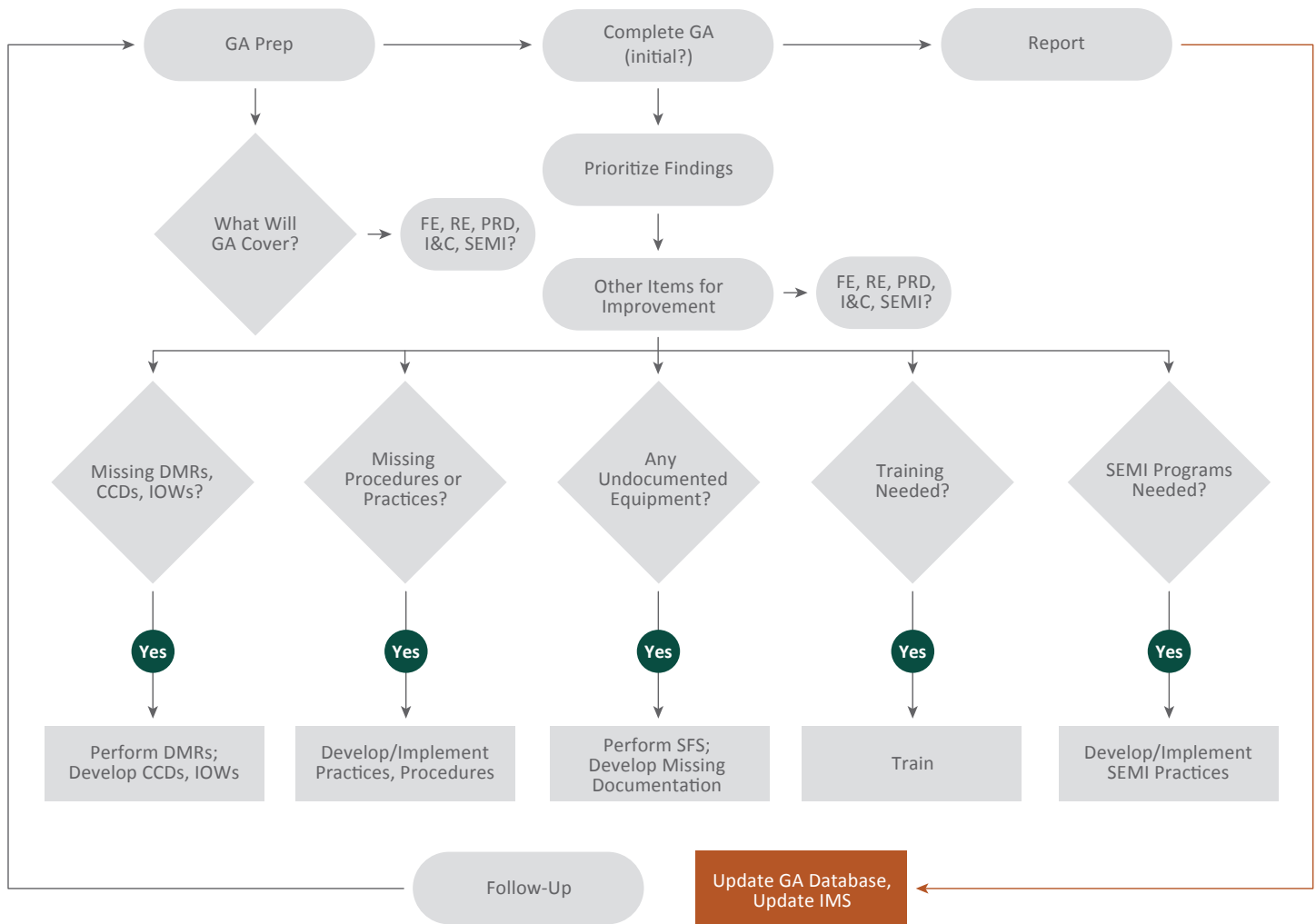
to E²G’s toolkit of web-based tools available on the Equity Engineering Cloud (EEC).

WHAT IS THE GA-PASS PROCESS?

The gap assessment process usually involves a team selected based on the needs of the assessment (MI specialists, fixed equipment or rotating equipment SMEs, inspectors, etc.). Typically, the team will include external SME resources. The team reviews the site’s procedures and documentation and interviews site personnel to evaluate the current state-of-facility processes and performance in key MI areas. The GA-PASS tool facilitates this process. Usually some qualitative rating or score is desired, but the key result(s) are areas where the MI program falls short (findings) or improvement is desirable.

The team then provides a report with concrete recommendations for gap closures – how to fix/mitigate findings – and a time frame for corrections based on their severity. If a previous MI assessment or audit has been performed, the results can be transferred into GA-PASS and improvements in the site’s MI program can be assessed with a follow-up GA-PASS assessment. At the same time, the previous audit can be extended with the addition of an examination of “Special Emphasis MI” (SEMI)

Figure 1: GA-PASS Process



programs and non-fixed equipment. Once data is in the GA-PASS system, the site can track correction of findings, can track MI program improvements, and can perform re-assessments when needed. Figure 1 illustrates the GA-PASS process.

WHAT ARE SOME TYPICAL FINDINGS AND SOLUTIONS IN A GA-PASS ASSESSMENT?

Some of the typical findings (gaps) in a gap assessment include:

- Inspection or maintenance activities are out-of-date, or deferrals are not properly documented.
- Equipment is missing design, inspection, or maintenance documentation.

- Damage Mechanism reviews and/or Corrosion Control Documents (CCDs) or Integrity Operating Windows (IOWs) are needed.
- Various MI-related procedures lack sufficient written documentation.
- Training is needed in certain MI areas - reliability, inspection, operations, etc.
- RBI procedures are not documented and/or consistently applied.

When E²G performs a gap assessment, we will provide recommendations on how to close these gaps, along with a

Figure 2: Example MI Finding Recommendation: Implementation of an Inspection Deferral Process

specific timeline that can be documented in the GA-PASS tool. For example, if sufficient design documentation is missing for some covered equipment, a Suitability for Service (SFS) assessment will be recommended. If MI training is inadequate, a curriculum (training matrix) can be developed and the training provided. Or, if a written inspection/maintenance deferral process is required, one similar to the Equity Engineering Practices® (EEP) deferral process can be implemented. For example, Figure 2 is part of an EEP with an inspection/maintenance deferral process that can be implemented at a site.

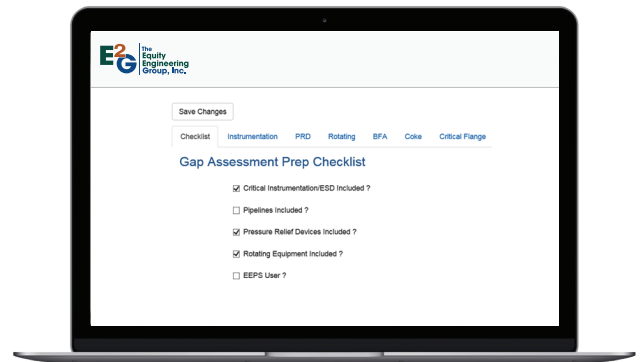
WHAT SETS E²G GA-PASS APART?

E²G’s GA-PASS process can be customized and scaled to meet the requirements of the facility’s gap assessment needs based on the type and complexity of the facility. The GA-PASS process can be applied everywhere from complex processing sites to non-regulated storage terminals. In fact, a special subset of GA-PASS, Terminal-Wise™, takes E²G’s decades of subject matter expertise in the area of storage tanks, tank farms, and terminals, and applies them to the specific MI needs of a terminal or tank farm.

E²G’s GA-PASS process also allows the site to decide whether to include only fixed equipment (pressure vessels, piping, and storage tanks) in the assessment or to extend the assessment to other equipment included in the OSHA 1910.119 regulation (relief systems, controls and emergency shutdown systems, and rotating equipment).

The GA-PASS can also be used to assess MI performance in areas of SEMI programs. SEMI programs, such as Corrosion Under Insulation (CUI), Brittle Fracture Assessment (BFA), and Critical Flanges, are among the 17 areas of special MI focus evaluated in GA-PASS. Also, for EEP users, the GA-PASS process allows the MI program at a site to be evaluated in terms of various EEP MI requirements. Figure 3 is an example of a GA-PASS preparation checklist, where the desired assessment details are defined.

Figure 3: GA-PASS Example Setup Screen (Selected Equipment and SEMI Programs included in the assessment)



WHY DO I NEED E²G GA-PASS?

In addition to complying with mandated requirements from regulatory bodies and industry standards, development of a sound MI program is crucial in managing the life-cycle of equipment. A sound MI program can improve facility reliability and a site’s safety and environmental performance, all of which impact the site’s bottom line. Along with the GA-PASS tool and process, E²G can perform many of the related MI assessments – such as SFS, BFA, CCD development, implementation of best practices (EEPs), and Training – that are required to bring a site’s MI program into top-tier MI performance.



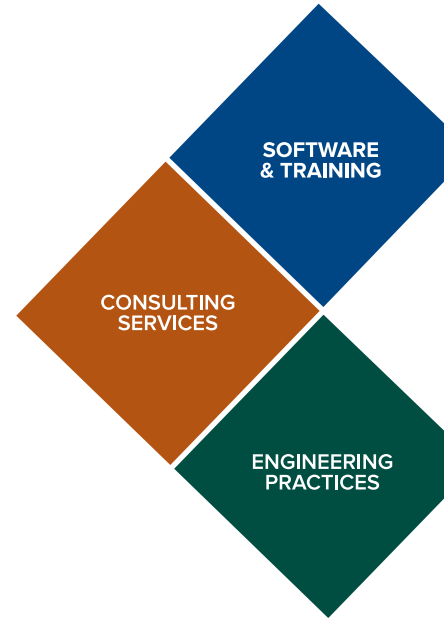
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