Risk-Based Inspection (RBI) has become integral to the plant work process, as it refocuses maintenance dollars where they are needed most by using risk as a basis for prioritizing and managing an in-service inspection program, as this technology can be applied to pressure vessels, PRDs, piping, and bundles. The industry standard technology for implementing RBI methodology was developed by the American Petroleum Institute (API). Here is why API RBI stands above the rest:

**API APPROVED**
The technology was developed through an ANSI-approved consensus process, and all technology enhancements continue to be reviewed and balloted by owner-user companies through an API-sponsored committee.

**USES QUANTITATIVE VS QUALITATIVE METHODS**
A truly quantitative tool that calculates risk over time—that is, risk due to increasing Probability of Failure (POF) as in-service damage potentially occurs. API RBI calculates POF due to ongoing damage and generates a location on the risk matrix that can move (increase) over time, depending on the impact of the damage rate on equipment integrity.

**MANAGES COST AND IMPROVES SAFETY**
Because a discrete risk is calculated and can change with time, a cost-benefit approach can be used to determine the date when inspection is required. The ability to generate cost benefit (in terms of risk reduction and dollars spent) leads to better information for risk management and assists with making sound budgeting decisions.

**CONTINUOUS IMPROVEMENT**
The technology is documented and will continue to be updated in API RP 581, available for purchase through API. The software is a validation of solid technology, as its output is tested against this documentation for accuracy.
API technology uses a true risk-based interval. The methodology offers the option to set a maximum interval (in practice, 20 to 25 years), and API RBI 581 recommends re-evaluation of the RBI study and basis at a minimum of every 10 years (less if operating conditions change). Through decision logic, generating a recommended inspection is not limited by or based on half-life calculations or prescriptive interval approaches. This approach places MORE emphasis on high-risk equipment (increasing inspection costs) and LESS emphasis on low-risk equipment (decreasing inspection costs). The net result is usually a significant reduction of overall risk, while still reducing costs.

**EFFECTIVE RBI PROGRAM**

An effective RBI program confirms equipment condition, identifies damage mechanisms and rates, and predicts the likelihood of failure. Inspection managers can control the POF in fixed equipment by recognizing the type of damage possible and using the correct inspection method at the right location and frequency to find it. API RBI risk assessment technology helps managers make informed decisions about how, when, and where to inspect assets.

**THE RBI DIFFERENCE**

Various companies have developed RBI approaches based on API RP 580, but most tend to be “black-box” or are too generic to accurately define an auditable inspection plan that provides measures of inspection program improvement. API RBI technology systematically factors risk into decision-making, risk ranking, vulnerability identification, and equipment performance uncertainty reduction. The difference is sound technology that produces POF, Consequence of Failure (COF), and risk numbers you can trust.

**RISK-BASED INSPECTION CONSULTING SERVICES**

- Implementation
- Ongoing RBI program management
- Pressure relief device evaluation
- Atmospheric storage tank assessment
- Heat exchanger bundle analysis
- Design stage RBI

**OFFICIAL API RBI TRAINERS**

E²G is the official API subcontractor for API RBI training programs (API 580/581) and leads the way in the effort to continually update the technology provided in API 581.
THE API RBI SOFTWARE DIFFERENCE

Developed by subject matter experts from top refiners and backed by a prestigious industry association, API RBI software reflects industry best practices and the expertise of the best minds in the industry. As the most comprehensive risk assessment and management tool on the market today, it includes the following:

FLUID PROPERTY MODELER
State-of-the-art fluid property modeler to calculate the properties of multi-component fluid streams and two-phase fluid mixes over a wider range of operating conditions.

PROCESS STREAMS
User-defined process streams created from a fluid property database of more than 500 fluids compiled from such sources as the industry-standard DIPPR database.

RISK VALUES
Outputs that include both the qualitative risk matrix and quantitative risk values expressed in safety area and/or financial terms, in addition to numerous risk, POF, and COF reports. Inspection plan reports can be easily generated for each piece of equipment.

QUANTITATIVE OUTPUT
Quantitative output enables the user to compare risk reduction to the amount of money spent on the fixed equipment reliability program or the cost of repair or replacement.

EXTENSIVE LIBRARY
Most extensive electronic library materials properties is made available for associating each component with the appropriate year and appropriate code for $T_{min}$ calculations.

SOFTWARE CONSISTENCY
$E^2G$ offers the only licensable software package under contract with the API and is required to keep the API RBI software consistent with API 581.