

RBI Software for the 21st Century - the *de facto* Standard for Managing Risk

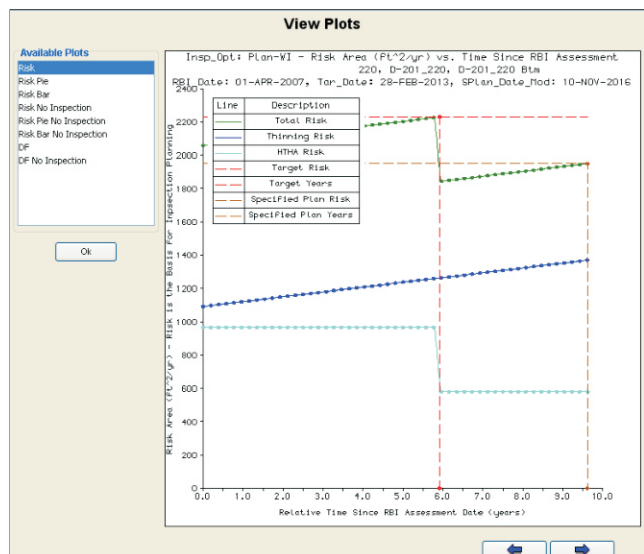
Developed as a Joint Industry Project by members from the major refining and petrochemical companies, API RBI software technology was vetted and standardized through the API consensus balloting process, ensuring approval and acceptance by industry experts worldwide. API RBI is the industry-wide standard for measuring risk.

API RBI V8.0 is available as a network or single-use PC application. The software drives the technology with a powerful calculator engine through an easy-to-use interface.

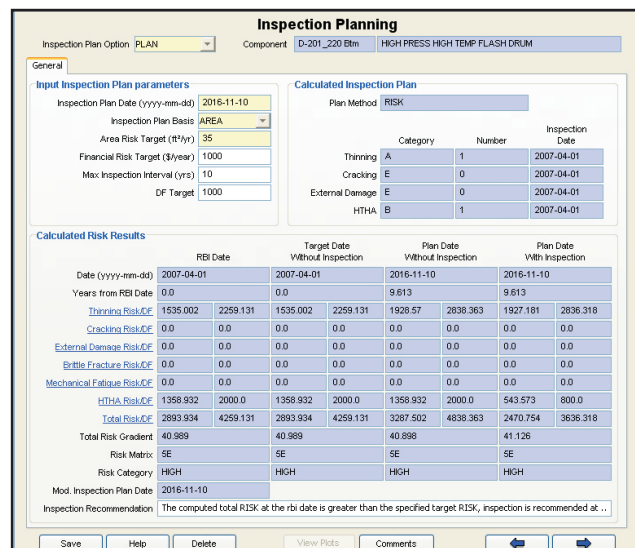
The core API RBI V8.0 technology has been updated and improved to produce more accurate risk calculations. Its use has been broadened to other industries, materials and process applications beyond pressure vessels and piping. Integrated standalone modules include fixed equipment, heat exchangers, atmospheric storage tanks, and pressure relief devices.

Various companies have developed RBI approaches based on API 580, but most tend to be "black-box" approaches that are too generic to accurately define an auditable inspection / maintenance plan and provide measures of inspection program improvement. While others may focus on aesthetics, API RBI focuses on sound technology to produce risk numbers you can trust.

Updates to the technology behind API RBI will continue to be documented in API 581, *Risk-Based Inspection Technology*. As custodians of API RBI, The Equity Engineering Group will continue to pioneer probability of failure and consequence modeling technology in conjunction with risk-based inspection planning methods, and bring that technology to API for standardization.



This plot shows the calculated damage progression over time, and "time stamped" date when the acceptable risk target will be reached. A recommended inspection plan is then generated based on the percentage of total risk by each individual damage mechanism.



Software analysis capabilities

- Smart Planning module based on probability of failure, safety and financial risk providing a recommended inspection date and plan
- A wide range of damage mechanisms covering refining and petrochemical applications
- ASME Code t_{min} calculations for vessel components and piping, structural t_{min} specification, and/or input of user-defined t_{min}
- ASME Code material specification database covering allowable stresses and engineering properties of base and overlay/clad materials
- State-of-the art consequence modeler with direct event tree solution using an embedded cloud dispersion modeler
- Time stamping of risk calculations to facilitate use of data from existing plant integrity database systems
- New state-of-the-art fluid property modeler completely rewritten to use improved algorithms that are more robust and accurate to calculate the properties of two-phase fluid mixtures (recipes) over a wider range of operating conditions
- Ability to develop almost unlimited user-defined mixtures for modeling process streams created from a fluid property database of over 200 fluids compiled from such sources as the industry-standard DIPPR database, which is regularly tested and updated for accuracy
- Data import/export capability for reporting and initiating new studies, including inspection planning
- Finger-tip diagnostic reports showing full derivation of all risk analysis
- Translation tool for upgrades from older software versions



Equipment analysis

- Pressure vessels and piping addressing various component types, such as heads, elbows, conical sections and spheres
- Atmospheric Storage Tanks (AST) considering risk scenarios for tank shell and floor components
- Heat exchanger bundle (shell and tube) equipment module with experience database capabilities to forecast future performance based on users experience in operation conditions for selected services
- Pressure Relief Devices (PRDs) defined at the equipment level with risk computed for various overpressure scenarios
- Database filtering and reporting functionality that allows the user to do risk analysis or create reports for subsets of the corporation or plant database
- Database hierarchy allowing all company data (plants and units) in one, multi-user database

Links for Inspection Data Management

API RBI software is built upon an open architecture to ease linking and data migration with other platforms and databases, seamlessly integrating database tools and planning practices. This 'Plug & Play' approach enables users to link to existing tools and databases without requiring them to change products or pay additional license fees.

Software and System Requirements

This software is a 3-tiered system: Client, Server, Database. It can be set up to collapse to a single or 2-tiered system.

Installation Type	Hardware	Software
Client Machine (2-Tiered [C-S/D] or 3-Tiered [C-S-D] installations only)	RAM: 1 GB 1GHz or better Hard Drive: 80 MB drive available	Windows 2000/XP OS Java 1.6.0 (minimum)
Client Machine (Standalone 1-Tiered [C/S/D] or 2-Tiered [C/S-D] installations)	RAM: 1.5 GB 2GHz or better Hard Drive: 1 GB drive available	Windows 2000/XP OS Java 1.6.0 (minimum) .Net Framework 2.0 (minimum)
Application Server	RAM: 1 GB 2GHz or better Hard Drive: 500 MB drive available	Windows Server 2003 (minimum) Java 1.6.0 (minimum) .Net Framework 2.0 (minimum)
Database Server	Per database requirements	MySQL, SQL Server, Oracle