


APTECH Engineering Services, Inc. Petrochemical Group



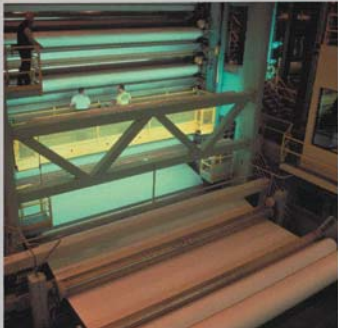
APTECH's Services for Risk Based Inspection

RBI Program Development and Execution



APTECH is a leader in developing Risk Based Inspection (RBI) technology, software, and program implementation. We have established RBI programs at refineries, petrochemical plants, and related facilities throughout the world.

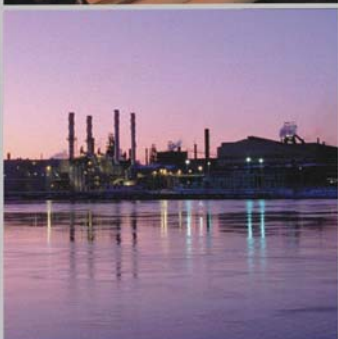
APTECH has developed, installed, and utilized our Risk Directed Mechanical Integrity Program (RDMIP™) software tools for advanced RBI analysis of both simple and complex systems and is based on the American Petroleum Institute (API) API 580 and 581 methodologies.




APTECH uses highly experienced engineers for all RBI analysis work. Our experience level frequently identifies concerns missed by other, less experienced, service providers. Typically, this experience allows us to complete projects in the least amount of time with far less support time from our client's busy staff. This saves substantial dollars in project execution. Our extensive knowledge and experience in corrosion and metallurgy are second to none.

APTECH is not an inspection company and does not have inspection services to sell or protect. APTECH can therefore provide the most cost effective inspection program possible, resulting in greater cost savings to our clients.

Software Selection, Installation, and Training



APTECH is experienced in the implementation of many different RBI methodologies and software tools. This includes RDMIP, API, Tischuk, and others. Our goal is to provide the best solution possible to our clients. We can assist with proper software selection and installation to meet project requirements.



We can also convert your data from one format to another. So, if you decide to switch methods mid-project, APTECH can help you do so at minimal cost and effort. The implementation cost savings can sometimes be substantial.

RBI Program Maintenance and Updates

APTECH's corporate office is in Sunnyvale, CA (San Francisco Bay Area) with regional offices in Houston, TX and Edmonton, Canada. In addition to this, APTECH has representatives in many countries worldwide, including South Africa, Taiwan, Japan, Indonesia, China, Russia, Singapore, and India. Our offices are staffed by senior project management and performance analysis, mechanical, and nondestructive examination (NDE) personnel to allow us to respond quickly to our clients' needs in these geographical locations.

APTECH provides full, continuous service to our clients. We will provide on-going RBI program reviews, audits, and updates based on additional inspection data, as it becomes available. And, if damage or failure should occur, APTECH can provide full incident investigation services to find and eliminate the root cause.

Consulting and Development of Inspection Management Systems

RBI studies ultimately provide definition of the inspection program requirements. Information is generated on what types of damage may be expected, proper inspection techniques to be used, where to look for the potential damage, and how often inspections should occur. This information must be properly utilized to ensure a successful inspection program is in place.

APTECH provides consulting services to set up a proper inspection management program utilizing all available information. We can set up or modify a program to meet your needs. We can also review and audit existing programs to ensure the program meets all your objectives.

When necessary we can also assist in the review and interpretation of inspection results. APTECH can provide the engineering capability to help with those difficult repair, replace, or just-keep-running decisions.



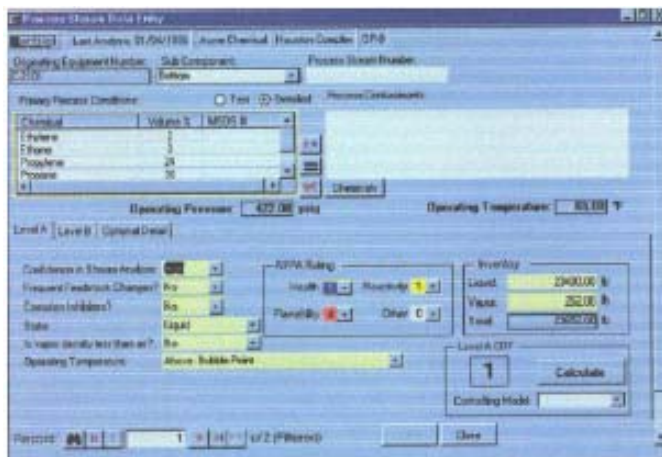
Tools and Techniques Available from APTECH

RDMIP Software

APTECH has developed the RDMIP Software for detailed RBI analysis of pressure vessels, relief valves, storage tanks, and piping. This software produces comparable results to the API software, but requires less data input. It is suitable for oil and gas, refining, petrochemical, and chemical facilities.

In addition to this, APTECH provides the following analyses:

- ◆ Fitness-for-Service – Level 1-3 evaluations to assist with run/repair/replace decisions.
- ◆ FACEUP™ – Software tool to evaluate integrity of ultrasonic or thickness measurement location data.



RDMIP™ Software – Advanced Software for RBI

APTECH provides full-featured risk based inspection (RBI) software for pressure vessel, relief valves, storage tanks, and piping analysis. Our software offers:

- ◆ Exceptionally powerful technical tools
- ◆ Extensive flexibility in evaluation detail
- ◆ Minimal user time to keep costs low

Exceptional Power

The RDMIP software contains extensive data on over 70 damage mechanisms. This allows rapid determination of mechanisms of concern in each system analyzed.

Over 1,600 chemicals are listed in the database. The software allows definition of chemical mixtures and easily evaluates the consequences of failure for the mixture. Both toxic and flammable hazards are evaluated for each system studied.

Flexibility and Detail

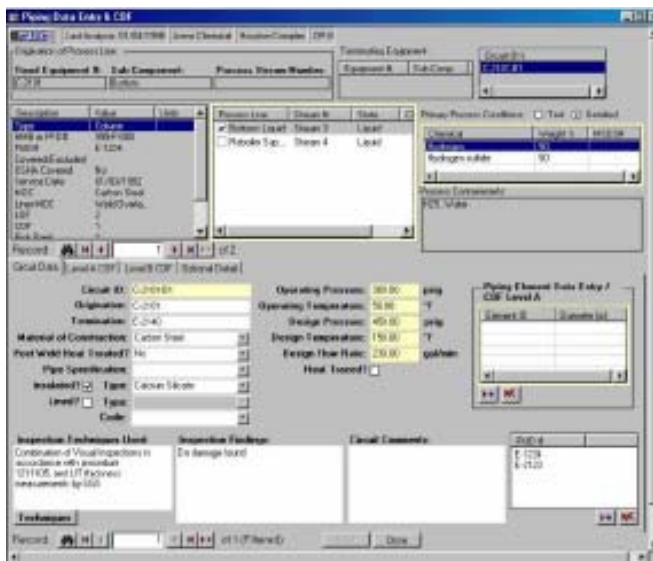
The software evaluates pressure equipment, relief valves, storage tanks, and piping systems. Equipment can be broken down into multiple subcomponents as required. This allows separate evaluations for equipment sections of concern. As an example, the shell and tube sides of an exchanger can be evaluated separately based on the specific hazards on each side. Piping can be broken into multiple circuits and even multiple elements as needed.

Special Features

- ◆ Based on API 580, 581
- ◆ Allows electronic import/export of data
- ◆ Suitable for oil and gas, refining, petrochemical, chemical, and similar process facilities
- ◆ Allows addition of damage mechanisms and chemical by the user
- ◆ Extensive reporting capabilities are included
- ◆ Ability to link to other software tools (PCMS, UltraPipe, Meridium)
- ◆ API 571 database

Services Available

- ◆ Software sales, installation, and training
- ◆ Full turnkey RBI analysis services are available for the client
- ◆ Review/audit and update of previous RBI studies
- ◆ Inspection program development utilizing RBI study results
- ◆ Ongoing RBI evaluations and updates (Evergreen)
- ◆ Turnaround planning



Chemical
(2-Aminoethyl) ethanola mine
(2-Hydroxyethyl)-ethylene diamine
1-(2-Hydroxyethyl) piperazine
1, 1, 1- Trichloroethane
1, 1, 2, 2 Tetrabromoethane
1, 1, 2-Trichloroethane
1, 1, 3, 3-Tetramethoxypropane
1, 1, 3-Trithoxyhexane
1, 1-Dichloro-1-nitro ethane
1, 1-Dichloro-1-nitro propane
1, 1-Dichloroethene
1, 1-Dimethylhydrazine
1, 1-Diphenylbutane
1, 1-Diphenylethane
1, 1-Diphenylpentane
1, 1-Diphenylpropane
1,1-Ethylidene dichloride
1, 2, 3, 4, 5-Pentamethyl benzene 95%

Partial List of RBI Experience

Altura Energy (Occidental Permian – Texas)	RBI Program for 4 Gas Plants using API Methodology
Aristech Chemicals (Sunoco) – West Virginia	RBI Study
BHP Hawaii Refinery, Inc.* (Now Tesoro Petroleum Hawaii)	Risk Based Mechanical Integrity Program
Caltex Oil (SA) (PTY) Limited – South Africa*	RBI Study
Chevron	RBI Study of Boiler Equipment
Eastman Chemical Company Tennessee Eastman Division – Tennessee	RBI Corporate Wide Program
El Paso Corporation – Aruba* (now Valero Energy Corporation)	RBI Pilot Study using API Methodology
Engen – Division of Engen Petroleum – South Africa	RBI Program
EOTT Energy Liquids, L.P. – Texas	RBI Pilot Study
Huntsman Chemical Company – Texas	RBI Study of 600 Vessels
Huntsman Chemical Co. Australia Pty Ltd – Australia	RBI Study
Marathon Ashland Petroleum LLC – Kentucky*	RBI Study and Inspection Pilot Study
Occidental Permian LTD – Texas	RBI Study and Inspection Planning Report
OMV Refinery – Germany*	RBI Study
Premcor Refinery, LLC – Tennessee* (now Valero Energy Corp.)	RBI Study
Samsung General Chemicals Co., Ltd. – South Korea	RBI Study of Styrene Unit
Sasol North America Inc (Condea Vista – Louisiana)	RBI of Ethylene Unit
Tesoro Refining & Marketing Co. – North Dakota*	RBI Study
Yukong Co. (SK Chemical Co. Ltd) South Korea*	Safety Assessment of Category A Equipment for SK Corporation, HOU Plant
Sidi Kerir Petrochemicals Company (SIDPEC)	Purchase of RBI Software (SQL Version), Training, and Technical Support

(* Designates Refineries)

Our Staff of Highly Experienced Risk Analysts Can Help You With:

- ◆ Understanding your options and setting goals and objectives
- ◆ Ensuring you meet requirements and guidelines
- ◆ Deciding on scope and how to start your assessment
- ◆ Gaining maximum benefit from your risk ranking results
- ◆ Ensuring your information is properly organized and retained
- ◆ Training and Certification
- ◆ Keeping the costs down

For More Information, Contact One of These Offices.

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