

# APTECH Services for Risk Based Inspection

## RBI Program Development and Execution

APTECH is a leader in developing 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 RDMIP™ software tools for advanced RBI analysis of both simple and complex systems. We are also experienced using API software and can perform the RBI analysis utilizing the client's tool of choice.

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. We require 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.

And finally, we are not an inspection company. We will provide you with the best inspection program definition possible. We do not have inspection services to sell or protect. This can frequently result in greater inspection cost savings to our clients.

## Software Selection, Installation, and Training

APTECH uses our RDMIP software for RBI analysis. We are also experienced with both API and Tischuk software and will use these alternate methods when appropriate. 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, we can help you do so at minimal cost and effort. The implementation cost savings can sometimes be substantial.

## RBI Program Maintenance and Updates

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 we 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

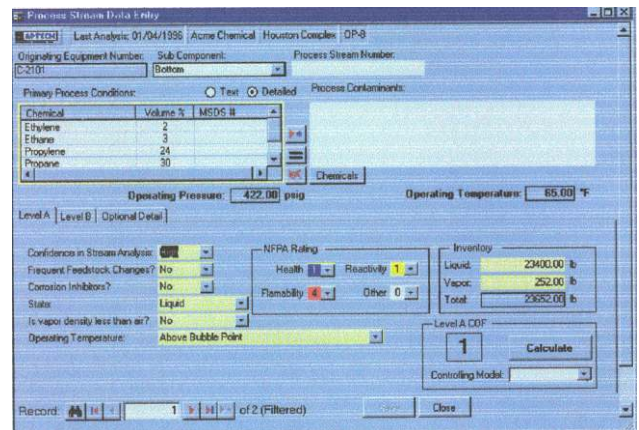
APTECH has developed the RDMIP Software for detailed RBI analysis of pressure vessels and piping. This software produces comparable results to the API software, but requires less data input. It is suitable for oil and gas, refining, petrochemical, and chemical facilities.

### API Software

The API software is suitable for oil and gas and refining facilities. It is not designed to handle other chemical components.

### Tischuk Software

APTECH uses the T-REx™ software modules from TR Systems Development Company for specialized equipment, such as relief valves, instrumentation, and pipelines.



# RDMIP™ Software - Advanced Software for RBI

**APTECH** provides full-featured risk based inspection (RBI) software for Pressure Vessel 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 1600 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

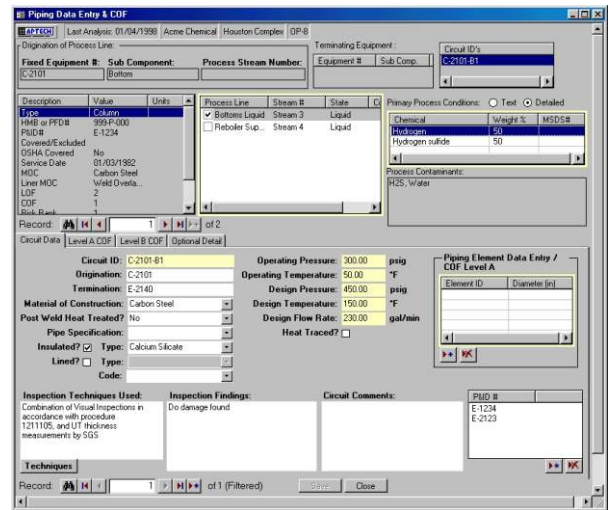
The software handles pressure equipment and piping systems. Equipment can be broken down into multiple subcomponents as required. This allows separate evaluations for equipment sections of concern. As an example, the shell and tube sides of an exchanger can be evaluated separately based on the specific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

## Special Features

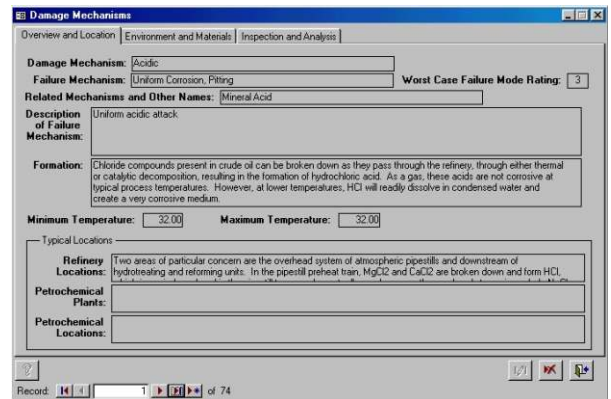
- Allows electronic import/export of data
- Suitable for oil and gas, refining, petrochemical, chemical, and similar process facilities
- Allows addition of damage mechanisms and chemical by the user
- Extensive reporting capabilities are included

## Services Available

- Software sales, installation, and training
- Full turn-key RBI analysis services are available for the client
- Review/audit and update of previous RBI studies
- Inspection program development utilizing RBI study results



Chemical
(2-Aminoethyl) ethanolamine
(2-Hydroxyethyl)-ethylenediamine
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-Triethoxyhexane
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%



## RBI Experience

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

(\* 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, please contact our Houston, Texas office.**

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