

On-Line High Resolution NMR

The History

The People

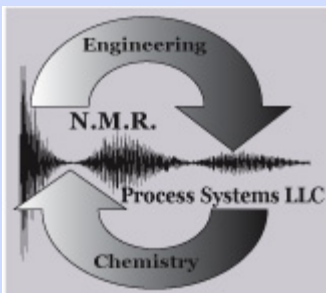
The Future

Prepared by:

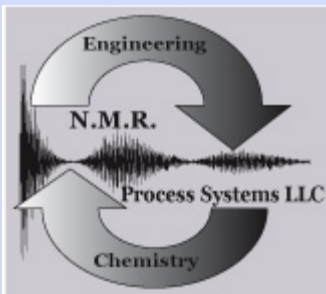
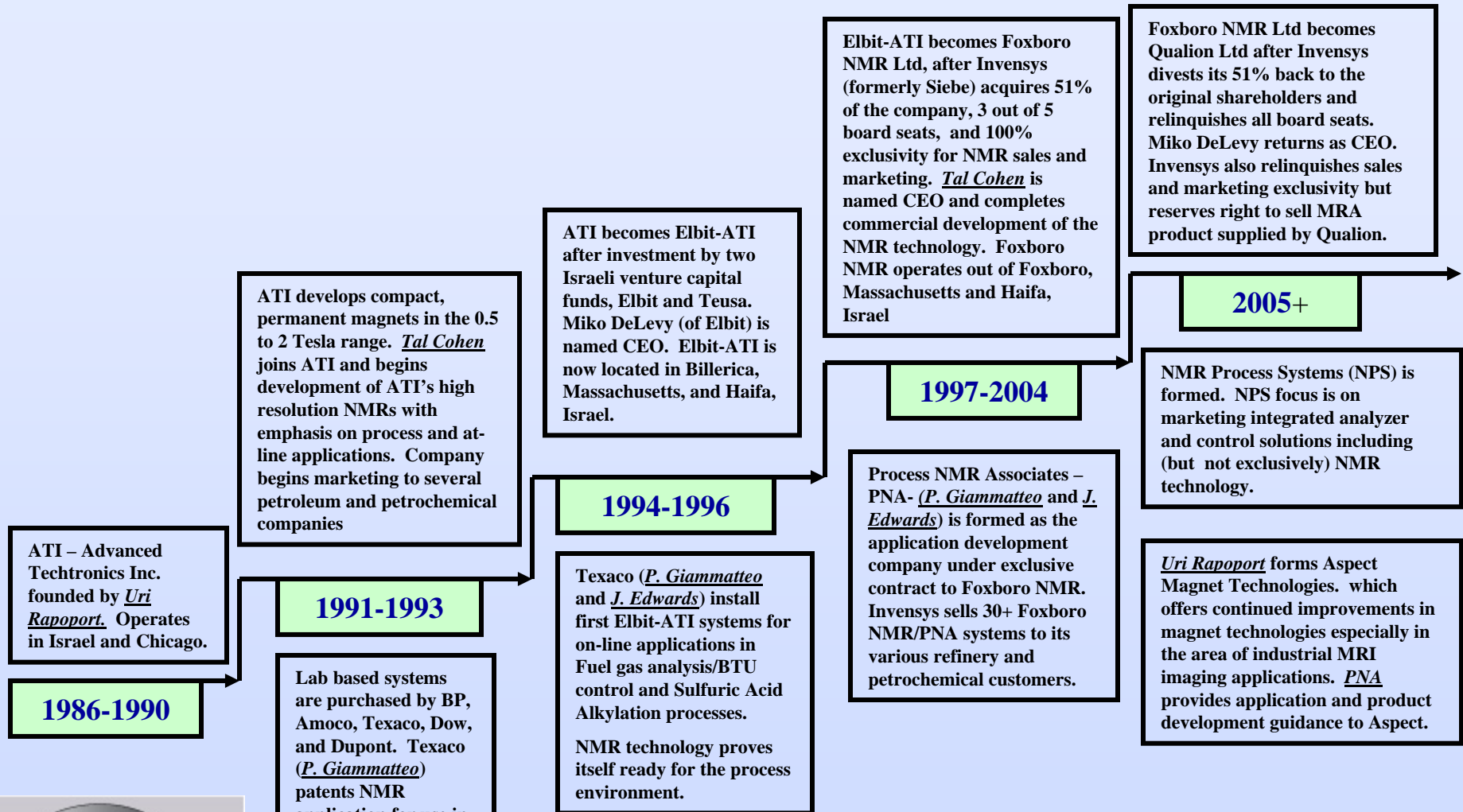
Paul J. Giammatteo

Process NMR Associates, LLC

Danbury, CT



The Time Line of High Resolution Process NMR/MRA



Key Personnel

The “Founding Fathers” of On-Line High Resolution NMR Technology.

Any and all ATI, Elbit-ATI, Foxboro NMR, and/or Invensys MRA NMRs installed on-line, at-line, or in laboratory environments between 1990 and 2005 involved these four people. All were integral in hardware, software, and application development and integration. Project management, sample handling, and site preparation were typically performed by other parties including (but not inclusive) Invensys, third party engineering companies, and/or the end user. From 1997 through 2005 Invensys had exclusive sales and marketing rights of for the NMR hardware manufactured in Israel (Foxboro NMR) as well as the applications developed by Process NMR Associates. As of the last quarter 2005, Invensys no longer has such exclusivity.

Uri Rapoport

NMR magnet technology innovator. Developer of all magnet technology used in on-line, high resolution NMR applications.

Uri’s innovative magnets for industrial MRI applications offer improved performance and application expansion for high resolution NMR.

Tal Cohen

NMR system developer and integrator. Completed total system commercialization including software, probes, enclosures, multi-stream analysis, certifications, and DCS integration.

Dr Paul Giammatteo

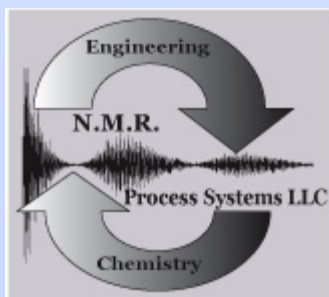
Application and market developer with in-depth understanding of the chemistry underlying the process unit. Technical marketing support directed toward defining and delivering economically sound, integrated analyzer and control solutions.

Paul is strategic in defining a total analytical solution independent of platform or technology.

Dr John Edwards

Application and parameter integrator with an in-depth understanding of the chemistry underlying the process unit. Analytical and chemometric development and support directed toward delivering validated analytical measurements.

John is strategic in defining the protocols and strategies necessary in making successful analysis work in an engineering environment.



The New On-Line NMR

Delivering analytical solutions integrated with the advanced control technology.

- **The People**

- **Uri Rapoport** – Entrepreneur and innovator of unique magnet designs that enabled the development and implementation of high resolution NMR for process analysis and control. He continues to develop new magnet technologies through ASPeCT Magnet Technologies Ltd in Israel. While his current focus is on magnetic resonance imaging, he continues to develop innovative magnets with wide ranges of applications including high resolution NMR.
- **Dr Paul Giammatteo** – Process NMR Associates principle liaison to NMR Process Systems with focus on the proper utilization of strategic analyzer and control solutions. Through NMR Process Systems PNA will re-establish NMR's importance as a strategic analyzer technology for petroleum, petrochemical, food and pharmaceutical applications.
- **Dr John Edwards** – Process NMR Associates principle technologist responsible for analytical, chemometric, and application integration. Through NMR Process Systems John will direct integration of analyzer applications with focused advance process control and optimization to deliver manufacturing and economic benefits for petroleum, petrochemical, food and pharmaceutical applications.

- **The Companies**

- **NMR Process Systems** - Combining the strengths of Process NMR Associates LLC and TTC Labs Inc. Providing process analytical solutions to maximise plant and manufacturing operations in the refining, petrochemical, pharmaceutical and food industries. NPS is the principle sales and marketing channel for Qualion Ltd in the Americas.
- **Process NMR Associates** - process analytical consulting company and NMR testing laboratory with over 40 years of experience in the field of nuclear magnetic resonance ("NMR") spectroscopy applied to the petroleum, petrochemical, pharmaceutical, and food industries particularly in the application of high resolution NMR spectroscopy to on-line applications.
- **Qualion Ltd** - develops and manufactures an on-line, continuous, flow-through nuclear magnetic resonance measurement solution capable of providing real-time and quantitative measurements of different processes for the petrochemical industry.
- **Aspect Magnet Technologies** - developing cutting-edge permanent magnet systems for MRI and NMR for industrial applications.

