From one perspective my “coming of age” was by accident, the accident at the Three Mile Island (TMI) nuclear power plant to be specific. That event changed the course of history for nuclear electric generation in the United States initially, for the broader nuclear world subsequently, and gave impetus to the “discovery” of what we now call high reliability theory. It also set me on a path of inquiry that led to a professional practice in high reliability.

Subsequent to that accident I had the opportunity to join the Institute for Nuclear Power Operations (INPO), a not for profit Institute formed to “promote the highest levels of safety and reliability - to promote excellence - in the operation of commercial nuclear power plants”. The CEO of the Institute had commanded the world’s first nuclear powered submarine, and I had the great good fortune to receive the tutelage of a gentleman who crewed with him on the USS Nautilus’ maiden voyage. Having come not from the Navy nuclear program but from the electric utility industry after a stint in the academic world, I felt much like an initiate into a mystery society where one gains status by faith - accepting the rituals, beliefs and language in hopes of eventual enlightenment. From this experience I was able to don the mantle of management consultant supporting startup and “troubled” nuclear plants. Success in these endeavors came from applying what I had learned with my INPO mentors.

The Chernobyl nuclear accident in the Ukraine prompted questions about nuclear safety in the U.S. Department of Energy (DOE). I and others with post TMI experience were invited to join DOE to instill commercial nuclear lessons learned. The initial thrust to “fix” DOE was to impose modern nuclear practices. While well intended the fixes were greeted with the enthusiasm of the villagers’ for Dr. Frankenstein’s monster. DOE was far from a nuclear reactor culture. It was in fact a loose confederation of hugely diverse mission areas linked only by Congressional funding for energy related science and technology. Mix a hodge-podge of cultures, some of the world’s brightest minds in science and technology (with associated egos), and a strong dollop of success oriented command types from navy and commercial backgrounds, and you have a recipe for confrontation. Thrown into this cauldron of cultures I soon began to feel like Alice down the rabbit hole – things were getting curioser and curioser - "It would be so nice if something made sense.

Stumbling through an existential fugue seeking to understand how otherwise intelligent beings could so blatantly reject such obvious wisdom I encountered papers by the early HRO researchers. They provided perspectives from outside; they gave voice and form to that which had I had previously received only by myth, ritual, practice and following the guidance of mentors. This fortuitous encounter with the research literature set me on a path of joining practice and theory.

For me HRO gives meaning to practice. It serves as an empirically derived conceptual framework that allows me to make sense of that which I observed working with over 40 commercial nuclear plants and an equivalent number of complex high hazard facilities within DOE. In contrast to quality studies focused on relatively prosaic (no offense intended) manufacturing and service organizations, HRO is rooted in complex sociotechnical systems in
which death, mayhem and financial disaster are all too real consequences of non-reliability. Whether we engage in nuclear, petrochemicals, transportation, electrical distribution, bio-tech, nano-tech, medicine or emergency management, we share fundamental challenges. Our science and technologies may be different; some may wear lab coats while others wear turn out gear. Yet at the core we are similar. We are people organizing together, relying on our fellow professionals, forming relationships, learning by doing, harmonizing the perspectives of diverse stakeholders, adapting as circumstances change, all the time having to be aware that danger is omnipresent.

It is a sad irony that people schooled in the principles of their disciplines fail to grasp that HROs succeed due to underlying principles. HRO’s share similar cultures, think in particular ways and share key organizational processes – such as learning. As with the quality journey many enamored with the HRO vision stumble, fall and fail because they see only the surface level of HRO’s. Reliable organizations have an overall framework that guides their actions. Not so successful companies focus on tactical approaches, like six sigma, process re-engineering, MBO, etc. without a guiding framework. Deming spoke about having a "theory" - his 14 points described a “theory of profound knowledge” very similar to HRO. Drucker challenged organizations to define and examine their "theory of business”. Stanford professors Pfeffer and Sutton reviewed studies on why quality and knowledge management initiatives fail and concluded that the key distinction of success was having a "philosophy that provides a foundation" for the practices.

Steven Spear and H. Kent Bowen, writing for the Harvard Business Review, explain Toyota’s success this way: “for outsiders, the key is to understand that the Toyota Production System creates a community of scientists. ….why has it been so difficult to decode the Toyota Production System? The answer, we believe, is that observers confuse the tools and practices they see on their plant visits with the system itself. ...Activities and processes are constantly being challenged and pushed to a higher level of performance, enabling the company to continually innovate and improve.”

Fads can be fun for fashion and entertainment but fatal when dealing with hazardous science and technology. Mediocre organizations jump from one management fad to the next; failing to understand fundamental principles. Excellent organizations have an enduring core of shared theory, cognitive models, language and stories; the robustness of which enable adaptation and innovation. Sustainability, reliability, resilience; safety, performance; all are variations on a common theme. Theory informs practice; practice refines theory and keeps it vital. Grounded in the fundamentals we can adapt and create. The rest, borrowing from Dr. Einstein, are just details.